



APPLY QFD METHODOLOGY TO CAPTURE ‘UNHEARD’ VOICES
OF UK CARE HOME RESIDENTS AND TRANSLATE THEM INTO
QUALITY MEASUREMENT TARGETS FOR FUTURE
IMPROVEMENT

A thesis submitted for the degree of Doctor of Philosophy

by

Sanaz Abdollah Shamshirsaz

School of Engineering & Design

Brunel University

September 2014

ABSTRACT

In the planning and delivery of services the voice and choice of consumers have appeared as the foremost key factors. For a large number of organisations the received feedback from customers about the quality of services, which are the criteria and indication of their level of satisfaction play a crucial role in the improvement of quality. Although across developed western communities, the importance of customers' views has gained acceptance, few studies have been dedicated to the exploration of the voice of the residents in care homes.

The review of the literature regarding residents' satisfaction and quality in care homes revealed that the voices of residents in care homes are usually not heard or are absent. Moreover, the adoption of quality improvement tools in health care has lagged behind that in other industries and there is generally a failure to use an appropriate methodology in care homes, one based on residents' voice, for improving quality. As a result, the main aim of this research is to investigate residents' voice regarding improving their satisfaction in care homes. Further, the researcher seeks to obtain data by using an appropriate methodology to assist care home managers in enhancing the quality of the services they offer by assigning weights to quality indicators pertaining to improving quality and residents' levels of satisfaction.

For this purpose, this research employs both qualitative and quantitative approaches to develop a research process entailing: (1) a comprehensive literature review to recognise the phenomenon; (2) interviews with fifteen older people who lived in three different care homes in order to discover the most important residents' needs and requirements in such homes; (3) a resident survey with one hundred and two residents in thirty five care homes. These were conducted to assess their preferences for the importance of demanded qualities; their satisfaction with provided services and the attributes of each demanded quality based on the Kano model, in order to identify the priority of improvement. Next, (4) there was the development of the House of Quality (HoQ) to optimize quality to assure residents' satisfaction; and finally, (5) an evaluation study was conducted with thirteen service providers, in order to assess the accuracy and appropriateness of the methodology.

This research has contributed towards a better understanding of the residents' voice, and applying it for enhancing quality and residents' satisfaction in care homes. For the first time residents' requirements are prioritised and classified in this context through accurate methods. Moreover, an understanding of the attributes of care home residents' needs in relation to a Kano model has been elicited. The novelty of this proposed methodology is in utilising the Quality Function Deployment (QFD) in care homes to translate the voice of residents' regarding their requirements into service planning. The research methodology and results facilitate care home managers with a hierarchy for improvement planning at both service and executive management levels.

AUTHOR'S DECLARATION

I hereby declare that I am the sole author of this thesis.

I authorise Brunel University to lend this thesis to other institutions or individuals for the purpose of scholarly research.

Signature

Sanaz Abdollah Shamshirsaz

Date: 9.Sept.2014

I further authorise Brunel University to reproduce this thesis by photocopying or by other means, in total or in part, at the request of other institutions or individuals for the purpose of scholarly research.

Signature

Sanaz Abdollah Shamshirsaz

Date: 9.Sep.2014

ACKNOWLEDGEMENTS

I am very grateful to many people who have supported and assisted me during this long journey of my education and I would like to express my gratitude and thanks towards those whose help, guidance and support made this work possible.

I need to thank my dearest parents Shahnaz and Mohammad for having offered their unequivocal non-stop support throughout the years, for which I am lost for proper words of gratefulness and I am forever indebted. My heart-felt sense of gratitude goes to my charming spouse, Tigran, whose love, encouragement and patience have been a source of endless hope and motivation. Without him I certainly would not have been able to face the challenges of this programme. His love was the foremost hope during these years. And also, I am grateful to my dearest brothers Ali and Amir for their continuous support and encouragement.

My special thanks go to my supervisors, Professor Ray Holland for his great help and encouragement through the entire course of this research, Professor David Harrison for all his support and guidance during all these years, and Dr. Hua Dong who supported me in the initial stage of my PhD programme. I am also indebted to Dr. Siamak Aghlmand for his advice and assistance during all these years. This research would never have been close to fruition without them.

I acknowledge with great appreciation, contribution and participation of all residents, staff and care home managers and in particular Touran Watt.

And the last but certainly not the least I need to thank Soraya as she always is there to offer her best support like a sister even in the toughest times. I am indeed much thankful to my friends: Saba and Mahshid for their love and support.

Dedicated to my beloved ones;
Shahnaz Hamzianpour, Mohammad Abdollah Shamsirsaz,
and Tigran Samadi

Table of Contents

ABSTRACT.....	II
AUTHOR'S DECLARATION	IV
ACKNOWLEDGEMENTS	V
TABLE OF FIGURES	XI
LIST OF TABLES.....	XIV
1 INTRODUCTION.....	1
1.1 DEFINITION OF CARE HOMES FOR THE ELDERLY	1
1.2 CARE HOMES IN THE UK TODAY	2
1.2.1 <i>Private and public sector</i>	3
1.2.2 <i>Population in care homes</i>	3
1.3 MOVING INTO CARE HOMES	4
1.4 DEMAND FOR CARE HOMES	6
1.4.1 <i>Demographic trends</i>	7
1.4.2 <i>Trends in family structure</i>	8
1.4.3 <i>Government policy</i>	9
1.4.4 <i>Technological advances</i>	10
1.5 AIMS AND OBJECTIVES	11
1.5.1 <i>Aims</i>	11
1.5.2 <i>Objectives</i>	11
1.5.3 <i>Key Question</i>	12
1.6 THESIS STRUCTURE	12
2 LITERATURE REVIEW	15
2.1 A GLANCE AT THE QUALITY PROBLEM.....	15
2.1.1 <i>What is the nature of quality?</i>	15
2.1.2 <i>The definitions of quality</i>	16
2.2 THE MEASUREMENT OF QUALITY	19
2.2.1 <i>Service quality vs product quality</i>	19
2.3 EVALUATING SERVICE QUALITY	20
2.4 MEASURING PRODUCT QUALITY	21
2.5 QUALITY IN CARE HOME SETTINGS	25

2.5.1	<i>Quality of life (QOL)</i>	26
2.5.2	<i>Quality of care (QOC) in care homes</i>	33
2.6	CONCLUSION AND SUMMARY.....	54
3	RESEARCH METHODOLOGY	56
3.1	RESEARCH EPISTEMOLOGY	56
3.1.1	<i>Positivism</i>	56
3.1.2	<i>Interpretivism</i>	57
3.2	THE NATURE OF RESEARCH.....	57
3.2.1	<i>Qualitative research, quantitative research and mixed methods</i>	58
3.3	ADOPTING A RESEARCH STRATEGY	62
3.4	GENERAL RESEARCH METHODOLOGIES	63
3.4.1	<i>Design Research Methodology (DRM)</i>	65
3.4.2	<i>The quality function deployment (QFD) method</i>	67
3.5	THE RESEARCH METHODOLOGY APPLIED IN THIS STUDY	71
3.5.1	<i>Research Clarification</i>	72
3.5.2	<i>Descriptive Study I</i>	73
3.5.3	<i>Prescriptive Study</i>	94
3.5.4	<i>Descriptive Study II</i>	105
3.6	CHAPTER CONCLUSION	106
4	STUDY I: IDENTIFYING RESIDENTS’ NEEDS AND REQUIREMENTS IN CARE HOMES.....	108
4.1	IDENTIFYING THE KEY CUSTOMER SEGMENT	109
4.2	VOICE OF THE CUSTOMER.....	112
4.2.1	<i>Selecting care homes</i>	113
4.2.2	<i>Resident selection criteria</i>	114
4.2.3	<i>Obtaining VoC data</i>	115
4.2.4	<i>Pilot Study: interviewing</i>	117
4.2.5	<i>Designing the interview questions</i>	118
4.2.6	<i>Conducting the interviews</i>	121
4.2.7	<i>The Voice of the Customer table (VOCT)</i>	122
4.2.8	<i>Structuring the needs and requirements or demanded qualities (DQs)</i>	125
4.2.9	<i>Comparing all the DQ subgroup Elements</i>	138
4.3	CHAPTER CONCLUSION	143

5	STUDY II: ASSESSING HIGH-RANKED DQS	144
5.1	QUESTIONNAIRE DESIGN	145
5.1.1	<i>Pilot Survey</i>	151
5.1.2	<i>Testing the reliability</i>	151
5.1.3	<i>Care homes selection and collecting the residents' responses</i>	155
5.2	ANALYSIS OF THE DATA	158
5.2.1	<i>Analysis of Part 1</i>	159
5.2.2	<i>Part Three (Kano model)</i>	159
5.2.3	<i>Analysis of Part 2</i>	162
5.2.4	<i>Analysing residents requirements using quality planning table (QPT)</i>	162
5.3	CHAPTER CONCLUSION	167
6	IDENTIFYING THE PRIORITY OF QUALITY INDICATORS USED FOR IMPROVEMENTS	169
6.1	CREATING A FISHBONE DIAGRAM	170
6.1.1	<i>Caring and Sensitive Staff</i>	172
6.1.2	<i>Social Interaction</i>	175
6.1.3	<i>Autonomy</i>	178
6.1.4	<i>Meals</i>	180
6.1.5	<i>Accessible Equipment</i>	181
6.1.6	<i>Safety</i>	183
6.1.7	<i>Family Support</i>	185
6.1.8	<i>Accurate Medical Care</i>	186
6.1.9	<i>Homelike Environment</i>	188
6.1.10	<i>Daily Living Activities</i>	190
6.1.11	<i>Involvement</i>	193
6.1.12	<i>Suitable Design</i>	194
6.2	SELECTING MAIN FACTORS AFFECTED IN DQS	196
6.3	DEVELOPING PERFORMANCE MEASURES	199
6.4	ESTABLISHING RELATIONSHIP BETWEEN DQS AND PMS	204
6.5	PRIORITISES OF PERFORMANCE MEASURES AND RELATIVE WEIGHTINGS	206
6.6	CHAPTER CONCLUSION	212
7	EVALUATION WITH EXPERTS.....	213
7.1	EVALUATION FRAMEWORK.....	213
7.2	DESIGNING THE QUESTIONNAIRE.....	214

7.3	SAMPLING OF EXPERTISE	218
7.4	ANALYSIS OF THE DATA	221
7.4.1	<i>Reaction (Q8, Q9, Q10, Q11, Q12, Q13)</i>	221
7.4.2	<i>Learning (Q14, Q15, Q16, Q17)</i>	223
7.4.3	<i>Behaviour (Q18, Q19, Q20)</i>	225
7.5	CHAPTER CONCLUSION	227
8	CONCLUSION	229
8.1	CONCLUSION: DESCRIPTIVE STUDY I	230
8.2	CONCLUSION: THE PRESCRIPTIVE STUDY.....	234
8.3	MAIN CONCLUSION FROM DESCRIPTIVE STUDY II	236
8.4	CONTRIBUTION TO KNOWLEDGE.....	237
8.4.1	<i>Prioritising residents' requirements</i>	237
8.4.2	<i>Residents requirements' attributes</i>	237
8.4.3	<i>Applying QFD methodology in care homes</i>	238
8.5	LIMITATIONS	238
8.6	FUTURE WORK.....	239
9	REFERENCES.....	240
APPENDIX A	ETHICS APPROVAL	275
APPENDIX B	BASIC DATA ON THE INTERVIEWEES	276
APPENDIX C	VOICE OF CUSTOMERS TABLE	277
APPENDIX D	RANKING DQS USING ANALYTIC HIERARCHY PROCESS (AHP).....	290
APPENDIX E	USING TREE DIAGRAM TO COMPARE ALL DQS .	295
APPENDIX F	QUALITY PLANNING TABLES (QPTS).....	297
APPENDIX G	THE EVALUATION QUESTIONNAIRE	305
APPENDIX H	LIST OF PUBLICATIONS.....	311

TABLE OF FIGURES

Figure 1-1 Number of residents in care homes (Source: Office of fair trading, 2011, p.35)	2
Figure 1-2 Type of ownership of nursing and residential care (Source: OFT, 2011).....	3
Figure 1-3 Sources of admission (OFT, 2005, p. 24)	5
Figure 1-4 Population by Age, United Kingdom (Source: Office for National Statistics, 2011)	7
Figure 1-5 Outline of this thesis.....	14
Figure 2-1 Core domains of residents' quality of life in care homes (Schenk et al., 2013, p. 2933)	32
Figure 2-2 Donabedian's Framework.....	35
Figure 3-1 The research sequence (Source: Gill & Johnson, 2010)	64
Figure 3-2 Research methodology in social sciences (Source: Robson, 2002)	65
Figure 3-3 The DRM methodology framework (adapted from Blessing and Chakrabati, 2009)	66
Figure 3-4 QFD as a process. Adopted from: Lim et al. (1999) and Zhanga & Awasthi (2014)	68
Figure 3-5 The Research Methodology for this study	72
Figure 3-6 Methods for evaluation of the data on customer needs. Taken from Duhovnik et al., (2006, p. 75)	82
Figure 3-7 The Kano model	89
Figure 3-8 Classification based on frequency.....	92
Figure 3-9 Adopted methodology to identify the final importance of DQs (adapted from Chaudha et al., 2011)	98
Figure 3-10 Quality Planning Table.....	99
Figure 3-11 The House of Quality (HoQ).....	103
Figure 4-1 Customers and stakeholders categorised according to their internal and/or external status.....	110
Figure 4-2 Pairwise comparison matrix created for identifying the main customers ...	112
Figure 4-3 Interview flowchart	120
Figure 4-4 The Affinity Diagram for sorting the DQs.....	131
Figure 4-5 A matrix table for pairwise comparison.....	133
Figure 4-6 Comparison matrix continued	135
Figure 4-7 Comparison matrix continued	136

Figure 4-8 Comparison matrix data converted to decimals	136
Figure 4-9 Comparison matrix, with calculations.....	137
Figure 4-10 Comparison matrix: normalising data and calculating weight.....	138
Figure 4-11 Ranking demanded qualities	139
Figure 5-1 Questionnaire for part 1.....	147
Figure 5-2 Questionnaire for part 2.....	149
Figure 5-3 Questionnaire for part 3, Kano model.....	150
Figure 5-4 The modified Kano questionnaire	153
Figure 6-1: Fishbone diagram template	170
Figure 6-2 Initial fishbone diagram with respect to the DQ caring and sensitive staff (drawn by the researcher).....	173
Figure 6-3 Fishbone diagram with respect to the DQ caring and sensitive staff with the items which were reconsidered, following on from Fig 6-2	173
Figure 6-4 Fishbone diagram with respect to the DQ caring and sensitive staff (drawn up during the brainstorming group work)	175
Figure 6-5 Initial fishbone diagram with respect to the DQ social interaction (drawn by the researcher)	176
Figure 6-6 Fishbone diagram with respect to the DQ social interaction with the items which were reconsidered, following on from Fig 6.5	177
Figure 6-7 Fishbone diagram with respect to the DQ social interaction (drawn up during the brainstorming group work)	178
Figure 6-8 Fishbone diagram with respect to the DQ autonomy (drawn up by the researcher and approved by the group)	179
Figure 6-9 Initial fishbone diagram with respect to the DQ meals (drawn by the researcher).....	180
Figure 6-10 Fishbone diagram with respect to the DQ meals (drawn up during the brainstorming group work)	181
Figure 6-11 Initial fishbone diagram with respect to the DQ accessible equipment (drawn by the researcher).....	182
Figure 6-12 Fishbone diagram with respect to the DQ accessible equipment (drawn up during the brainstorming group work)	183
Figure 6-13 Fishbone diagram with respect to the DQ safety (drawn up by the researcher and approved by the group)	184
Figure 6-14 Initial fishbone diagram with respect to the DQ family support (drawn by the researcher)	185
Figure 6-15 Fishbone diagram with respect to the DQ family support (drawn up during the brainstorming group work)	186

Figure 6-16 Fishbone diagram with respect to the DQ accurate medical care (drawn up by the researcher and approved by the group)	187
Figure 6-17 Initial fishbone diagram with respect to the DQ homelike environment (drawn by the researcher).....	188
Figure 6-18 Fishbone diagram with respect to the DQ homelike environment (drawn up during the brainstorming group work)	189
Figure 6-19 Initial fishbone diagram with respect to the DQ daily living activities (drawn by the researcher).....	191
Figure 6-20 Fishbone diagram with respect to the DQ daily living activities (drawn up during the brainstorming group work)	192
Figure 6-21 Fishbone diagram with respect to the DQ accurate involvement (drawn up by the researcher and approved by the group)	193
Figure 6-22 Initial fishbone diagram with respect to the DQ daily suitable design (drawn by the researcher)	195
Figure 6-23 Fishbone diagram with respect to the DQ suitable design (drawn up during the brainstorming group work)	196
Figure 6-24 Demanded Qualities and Performance Measures Matrix.....	205
Figure 6-25 House of Quality	208

LIST OF TABLES

Table 1-1 Proportion of gender regarding the elderly being accommodated (Laing, 2011, p.150)	4
Table 1-2 Reasons for people’s admissions to care homes (OFT, 2005, p. 23)	6
Table 1-3 Percentage living in care homes or long stay hospital by age, UK April 2011 (Source: Laing, 2011)	8
Table 2-1 Five approaches to the definition of quality (Garvin, 1984, p.26)	17
Table 2-2 A comparison of quality methods in industry and health care (Komashie et al., 2007, p.363)	24
Table 2-3 The three progressive stages of dementia (Bowman, 2010, p.17).....	29
Table 2-4 Residents’ outcomes domains	46
Table 2-5 Satisfaction domains identified from extant studies.....	52
Table 3-1 The difference between qualitative and quantitative research (Source: Blaxter et al., 2010, p.65).....	59
Table 3-2 The purpose of research (Source: Neuman, 2007, p.15)	62
Table 3-3 Advantages of the Analytical Hierarchy Process. Adopted from Saaty (1993)75	
Table 3-4 Comparison of Approaches to Survey Data Collection (Source: Czaja & Blai, 1996 p.32)	85
Table 3-5 Paired questions for Kano questionnaire (Gupta & Srivastava, 2011).....	90
Table 3-6 Kano evaluation table (Gupta & Srivastava, 2011).....	91
Table 3-7 A conceptual framework of evaluation criteria	106
Table 4-1 Pilot study questions.....	116
Table 4-2 The main body of questions, after the review of the pilot interview questions119	
Table 4-3 Voice of Customer table-template	122
Table 4-4 A sample of the Voice-of-the- Customer table.....	123
Table 4-5 Items were captured from the VOCTs.....	126
Table 4-6 Demanded Qualities	128
Table 4-7 Affinity Diagram for the Demanded Qualities	131
Table 4-8 The nine-point scale (Saaty, 1997).....	134
Table 4-9 The percentage of ranking	140
Table 4-10 Prioritised Demanded Qualities.....	142
Table 5-1 High ranked Demanded Qualities.....	144

Table 5-2 Kano evaluation table	151
Table 5-3 Reliability Statistic (Part 1)	152
Table 5-4 Reliability Statistics (Part 2).....	152
Table 5-5 Reliability Statistics (positive part of the Kano questionnaire).....	153
Table 5-6 Reliability Statistics (negative part of the Kano questionnaire).....	153
Table 5-7 Modified Kano Evaluation Table	154
Table 5-8 Reliability Statistic (positive part of the modified Kano questionnaire).....	154
Table 5-9 Reliability Statistics (negative part of the modified Kano questionnaire)....	154
Table 5-10 Part 1 statistics: median value for each DQ.....	159
Table 5-11 The results of the analysis of the Kano questionnaire data	161
Table 5-12 QPT according to Chaudha et al. (2011) for a specific care home.....	164
Table 5-13 Average of relative weight	166
Table 6-1 All factors could have influence on the 12 main DQs.....	197
Table 6-2 Main factors affecting DQs	198
Table 6-3 Performance measures	200
Table 6-4 Degree of relationship between DQ and PM.....	206
Table 6-5 Degree of relationship between PM and PM.....	206
Table 6-6 Performance measures with a strong relationship	209
Table 6-7 Key performance measures	211
Table 7-1 Kirkpatrick Model	214
Table 7-2 Pre-testing questions.....	215
Table 7-3 Reaction questions.....	216
Table 7-4 Learning questions.....	217
Table 7-5 Behaviour questions	218
Table 7-6 Result questions.....	218
Table 7-7 Final evaluation questions based on Kirkpatrick's Model	220
Table 7-8 Response to the evaluation question 15.....	224
Table 8-1 Summary of descriptive study I.....	232

1 Introduction

This chapter begins by describing the definition of care homes and the care homes' market, and then describes the demand for care homes in the UK. It also provides the research aims and objectives and structure of this PhD thesis.

1.1 Definition of care homes for the elderly

A care home for the elderly can be defined as a place that provides care services and accommodation for older people who have ongoing health or social care needs. In these institutions, a diverse array of services is provided in order to support a range of individuals, from those who have minimal needs for maintaining everyday life to those who require full care, thus indicating that homes often offer services over a sustained period of time for older people with chronic conditions and functional limitations. In respect to this the Care Quality Commission (CQC) (2010) defines a care home as a place that provides both personal care and accommodation for persons who need support and points out that people can live in them, short or long term, but do not legally own or rent the accommodation.

Generally, in the UK there are two main types of care home services for older people; residential homes and nursing homes. The former provide personal (such as washing, dressing, and using the toilet) and social care services, in combination, for older people who are usually unable to manage at home. The latter offer the same range of services as the former but in addition there is skilled nursing care with on-site, qualified staff employed to provide 24-hour nursing care for people who are unable to function independently (Froggatt et al., 2009). In a nursing home, the term specialised unit usually refers to special care and sub-acute care units. These two forms of units may be merged in order to meet the needs of residents with severe medical problems, such as those with Alzheimer's disease or with short-term post-acute care needs (Wunderlich & Kohler, 2001). By contrast, in care homes, medical advice and support are given by external services with nursing and medical care being provided for residents by general practitioners (GPs) and district nurses (Szczepura et al., 2008). These are considered entitlements for all care home residents who receive direct patient services without payment of a fee to the GP (Froggatt et al., 2009).

The care home clearly provides a level of health care that differs from that offered by hospitals, for the residents are considered to be living in the facility as their home and their stay is usually long term. Rather than specific health problems that can be treated with established medical protocols, the residents of care homes often have multiple issues that affect their quality of life (Reed, 2003).

1.2 Care homes in the UK today

Market changes have been introduced within the UK regarding where older patients are cared for with a gradual move from long-term stays in hospitals to various types of care homes (Tune and Peter, 2000), and, nowadays, care homes provide the majority of long-term and intermediate care for older people (Davies et al., 2011). Over half of the health care beds in the UK belong to independent nursing homes for older people with the majority being operated by the private sector (Kerrison and Pollock, 2001). In 2010, approximately 18,255 registered care homes were reported (CQC, 2012), with about 486,000 care home places available throughout the UK providing nursing and/or personal care for people with a range of different needs (Laing and Buisson, 2011). There was a significant decline in the number of older people residing in care homes between 2000 and 2006 and this reduction has corresponded with changes in demand. Since 2006, the proportion of care home users has not changed substantially and has remained steady (see Figure 1.1).

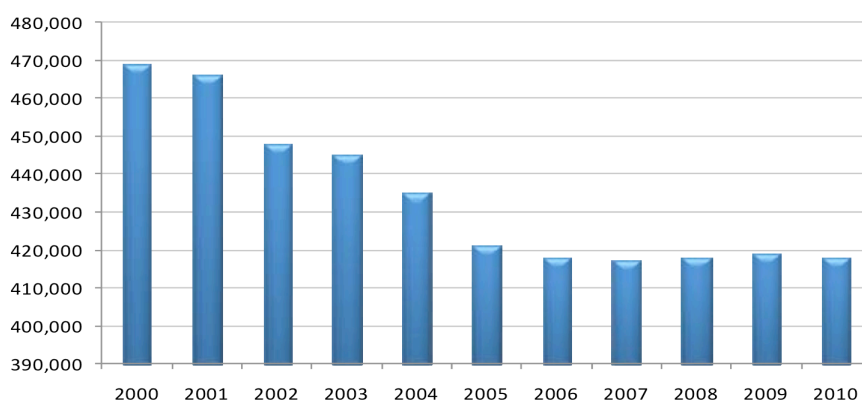


Figure 1-1 Number of residents in care homes (Source: Office of fair trading, 2011, p.35)

Funding for residents in care homes depends on each resident's financial situation and often comes from different sources. Older people whose health is deteriorating are eligible to have their health needs assessed by their local authority. Generally, health

monies are available to people who are assessed to have nursing needs, and social care funding is allotted for personal care (Froggatt et al., 2009). If a resident’s savings are less than a certain limit, then the local council will pay their care home costs, however, when the resident’s savings exceed this limit, the resident will be expected to fund his or her own care. If the resident’s savings are between the upper and lower limits, then the local council will decide how much residents should contribute to the fees (Age UK, 2011).

1.2.1 Private and public sector

Local authorities, volunteer organizations and private companies own and manage care homes in the UK (Age UK, 2011). In the last few decades, there has been a shift from the public sector toward the private sector, with the latter now being the major provider of care. These range from large chains that manage many large care homes to small, limited companies that cover one or more care homes. Based on a 2011 report by the Office of Fair Trading, about 75 percent of places in care homes are provided through the private sector, approximately 15 percent are supplied by the voluntary sector, and fewer than 10 percent are provided by local authorities or the NHS (Figure 1-2). As shown in this figure, the relative proportions of the market taken up by the different ownership types have not changed considerably since 2007.

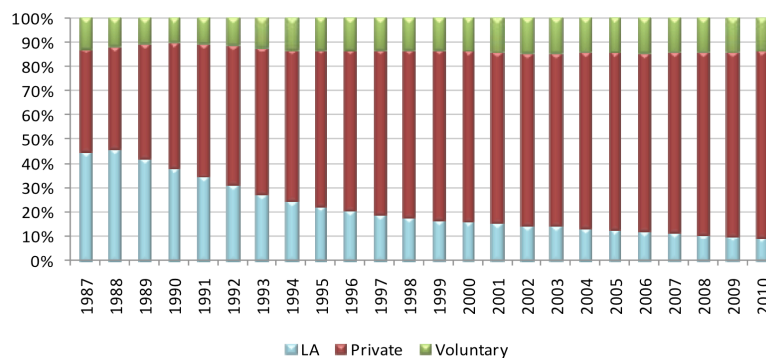


Figure 1-2 Type of ownership of nursing and residential care (Source: OFT, 2011)

1.2.2 Population in care homes

The population in care homes is ageing. Recent data published by Laing and Buisson (2011) show that the care home population has increased in age, with most residents now being over 75 years old. From the table below, it is clear that 82 percent of people

living in nursing homes are 75 years of age and older, and 92 percent of those in residential care are 75 or older, whilst the proportion of care home residents is very small amongst those in the under-75 years groups (Table 1-1).

Table 1-1 Proportion of gender regarding the elderly being accommodated (Laing, 2011, p.150)

<i>Age groups -Nursing Care</i>	<i>Males (%)</i>	<i>Females (%)</i>	<i>Total (%)</i>
Under 65	3	4	7
65-74	5	6	11
75-84	11	23	34
85 plus	9	39	48
All Ages	28	72	100
<i>Age groups- Residential Care</i>	<i>Males (%)</i>	<i>Females (%)</i>	<i>Total (%)</i>
Under than 65	1	1	1
65-74	3	4	7
75-84	9	23	32
85 plus	10	50	60
All Ages	22	78	100

As shown in Table 1-1, the great majority of care home residents are female. Banks et al. (2006) reported that in 2001, females aged 65 or older were more likely to be residing in a care home than were men in the same age range. In fact, at some time during their lives, one out of every three females is likely to enter a care home. Moreover, one man in six and one woman in three can expect to enter an elder care home for a long-term stay (Bebbington et al., 2001).

1.3 Moving into care homes

It has been widely recognized that the majority of people residing in care homes are increasingly frail and dependent. They often have multiple medical needs, a situation that may be compounded with high levels of cognitive impairment and other communication problems (Froggatt et al., 2009). The type of people who enter a care home, however, is not limited to those with health problems and the move can be the

result of the individual's own decision, but often this is not the case. Generally, people enter the home because they are no longer able to live alone and/or independently. Admissions to care homes, according where people are living before their move to a home, can be from various different sources, as shown in Figure 1-3.

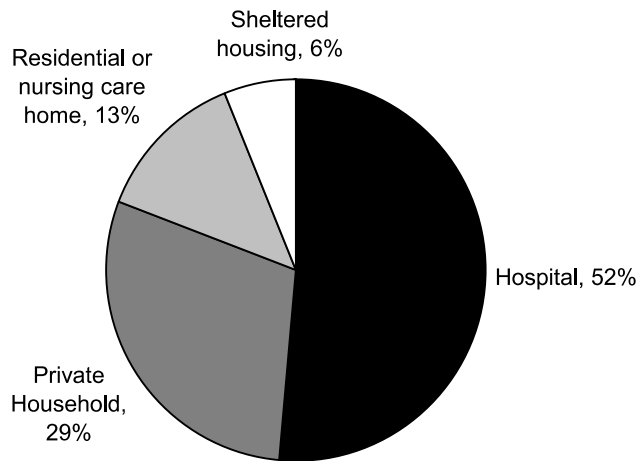


Figure 1-3 Sources of admission (OFT, 2005, p. 24)

As illustrated in Figure 1-3, the majority of people admitted to care homes come directly from hospitals (approximately 52 percent). They may enter a care home as the result of the decision to discharge the patient into a care home because this is where the most appropriate level of care is available.

Some research indicates that more people are entering care homes because of failing health and increased dependency but others still move for social reasons (Timline and Rysenbaty, 2010). Marital status has been identified as a significant predictor of care home admission with a large majority of care home residents being single, widowed, or divorced (Laing, 2011). Thus, people may enter a care home because there is no one at home to look after them (Timline and Rysenbaty, 2010). A second factor can be financial, as some people enter care when they can no longer support themselves at home or afford to pay for care in their own homes. A report by the Office of Fair Trading (2005) identifies a number of reasons for admission (see Table 1-2).

Table 1-2 Reasons for people’s admissions to care homes (OFT, 2005, p. 23)

<i>Reasons for admission</i>	<i>Percentage</i>
Physical health problems	69%
Mental health problems	43%
Functional disability	42%
Caregiver stress	38%
Lack of motivation	22%
Present home physically unsuitable	15%
Family breakdown (including loss of carer)	8%
Rehabilitation	6%
Fear of being a victim of crime	4%
Abuse	2%
Loneliness or isolation	2%
Homelessness	1%

Based on the data in Table 1-2, people enter care homes for various reasons but many older people who move to care homes face more than one problem at the same point in time. For instance, some residents may have physical health problems that lead to a high level of dependency on staff, but still be cognitively alert. Alternatively, others can be physically capable but have cognitive impairments that place them at great risk if they are living independently. Indeed, some individuals might be physically weak and also have cognitive impairments. These different constellations of needs create pressure on care home staff who must design programmes that offer appropriate treatment and activities for all residents, despite their range of needs (Timline and Rysenbaty, 2010).

1.4 Demand for care homes

In the UK, as in other Western nations, people are living longer and this demographic trend is likely to have a significant impact on the demand for care homes. As Hough (2011) reports that “more than half a million elderly people are in nursing homes, and the number is expected to rise to 1.3 million by 2050.” Along with this demographic shift, the demand for care homes is expected to grow in the future and brings with it a variety of challenges, which are outlined below.

1.4.1 Demographic trends

Demographic data show that people in the UK are living longer (Figure 1-4). The UK's older population has increased significantly for "in 2010, there were 1.4 million people in the UK aged 85 and over; this number is projected to increase to 1.9 million by 2020 and to 3.5 million by 2035, more than doubling over 25 years" (Office for National Statistics, 2011). In light of this projection, according to the Care Quality Commission (2010), "the care home market requires ongoing further development to meet future needs."

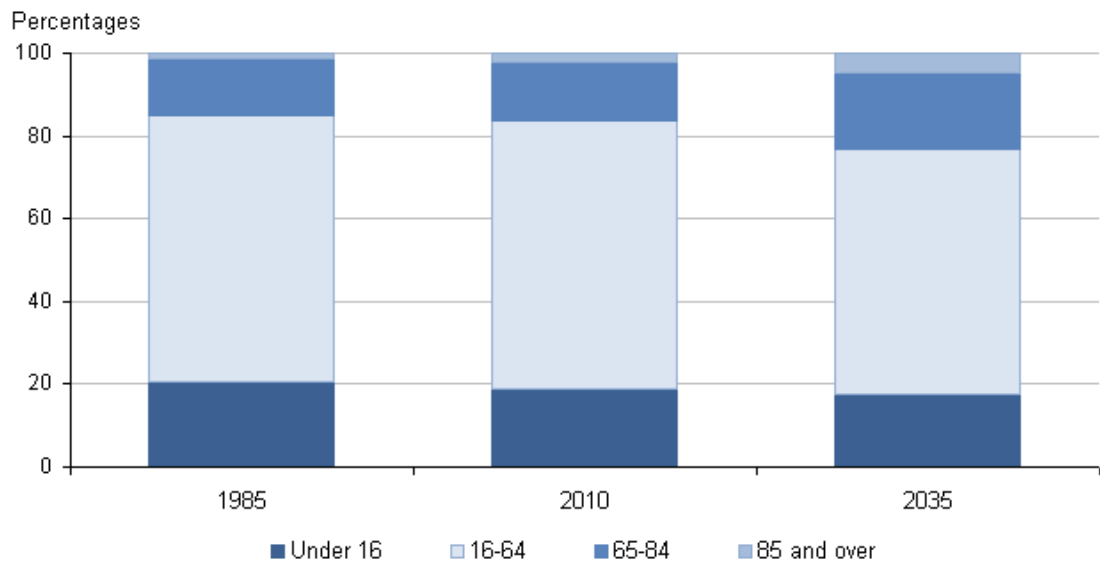


Figure 1-4 Population by Age, United Kingdom (Source: Office for National Statistics, 2011)

The process of ageing is generally associated with a complexity of needs as well as dependency, which have a major impact on care services. As Patterson et al. (2011) reported, compared to those aged between 15 and 39 years old, those aged 85 years and older living in the UK are 14 times more likely to be admitted to hospital on average per year. Further, it is expected that there will be 2.4 million older people unable to perform at least one daily activity (such as eating, bathing, or dressing) by 2041 (Wittenberg et al., 2008). Thus, because of increasing life expectancy and the growing complexity of needs, it is reasonable to expect a substantial increase in the demand for care home places. The ageing population and the projected growth of the oldest segment of the population play influential roles not only on the demand for care homes but also on the

resources needed to provide such services. Table 1-3 shows the increasing demand (in percentages) placed on specific care services by age group (Laing, 2011).

Table 1-3 Percentage living in care homes or long stay hospital by age, UK April 2011 (Source: Laing, 2011)

<i>% Living in homes or hospitals</i>	<i><65</i>	<i>65-74</i>	<i>75-84</i>	<i>85+</i>
	0.03%	0.67%	3.90%	15.85%

The issue of how to pay for and provide the amount and levels of long-term care that an ageing population will require has been a topic of discussion not only in the UK but also in other Western nations. The growing number of elders with medical and social needs, cognitive impairment, and increasing frailty and dependency will undoubtedly put under strain the available healthcare resources and funds for these (Szczepura et al., 2008).

1.4.2 Trends in family structure

The trend regarding the shift in family structure from an extended family unit to smaller ones combined with the fact that members of the family have little time or inclination to care for elders, may help to explain why there has been a decline in elders being cared for in the family home. Nonetheless, informal care for elderly people has underpinned their long-term care in the UK and many other countries and the family has been deemed a key factor regarding levels of informal care and support (Lee, 2004).

To some extent, traditionally, some older people could rely mostly on informal (unpaid) caregivers; that means that usually their relatives provide free care for their support. In recent years, however, the nature of elder care has changed because of increasing life expectancy and changing patterns of relationships among family members which compounds the problems brought forward by the shifting composition of family and social structures (Lee, 2004; Ku et al., 2013). In other words, adult children are less likely to care for their elderly parents which has resulted in a decline in the provision of informal (unpaid) elder care, and this in turn, is likely to cause an increase in demand for long-term formal care services for the elderly (Laing, 2011).

1.4.3 Government policy

The demand for care home places is affected not only by the increasingly ageing population but also by government policy. It should be noted that levels of demand for care home places can, however, be offset by changes in government policies regarding the provision of various types of care services made available to older people in their own homes.

In any discussion that concerns the future regarding sustainable healthcare resources, the concept of at-home-care, ranging from domestic aid to technical nursing care, is an important point. The government of the UK has been focusing on at-home-care and at present the stance taken can be summarised as follows: “Current policy in England emphasises both the importance of caring for highly dependent older people for as long as possible in their own homes, and the development of specialist care services for people with dementia” (Venables et al., 2006). Because of the growing concern regarding meeting the challenges of an ageing population in many EU countries, expenditures on home health care have grown between 2003 and 2009, and are expected to increase further in line with the ageing of their populations (Genet et al., 2013). Further, at present, care and support from government and most local government councils is often allotted to people who need a high level of care in their homes. The provision of care from a health and social care team is known as delivering a ‘package of care’. The ‘package of care’ involves planning care for an older adult in his or her home, taking into account the duration and frequency of visits and the duties to be performed by the allocated caregiver in the home.

Most people in need of care prefer to stay in their own homes, and policymakers view this model as a way to help ageing people maintain their independence as well as a way to potentially save money (Genet et al., 2013). It was noted by the BBC (2011) that on “an individual basis, it might seem a cheaper option to pay a carer than a care home, but to pay all carers would not be feasible.” A shift towards providing care in people’s home gives them more opportunities to maintain their personal preferences and to support them to live as independently as possible. To a limited extent, the steps taken to carry out this policy may potentially reduce the demand for care homes.

1.4.4 Technological advances

The last few decades have witnessed rapid growth in all kinds of technology. Medical advances, in particular, have improved life expectancy dramatically through the use of modern diagnostic instruments, surgical procedures, and new pharmaceutical drugs. As advances have improved medical treatments, there have been significant enhancements in not only life expectancy but also quality of life (López-Valcárcel & Pinilla, 2008). These advances have affected the demand for care home places in two ways that, on the surface, seem counter-intuitive.

First, it would seem that the demand for care homes would be reduced due to these medical and technological advances that improve people's overall health levels. Many older people are living healthier lifestyles and making wiser choices regarding diet, exercise, and the use of tobacco and other substances. Combined with medical advances, these have led to a longer period of health and independence as well as longer life expectancy (Thie'baut et al., 2013). As Wunderlich and Kohler (2001) noted, older people generally enjoy better health than their counterparts in previous decades which is also likely to be the outcome of improvements in medicine science and technology. For example, medical advances have allowed people with some types of cancer to live longer, and while no cure exists for Alzheimer's disease at present, there are medicines that can reduce or arrest the progress of the disease (Laing, 2011). Thus, science and technology have created more opportunities for older people to enjoy their later years and even remain in their own homes which may have an impact that reduces the demand for care homes places.

Second, in spite of generally better levels of health, prolonged life expectancy can mean that many more people will eventually suffer frailty and become dependent as they succumb to one or more chronic conditions. While science can delay many symptoms of advanced age, at some point most elders will experience reduced functioning in cognition, memory, and perception, as well as deteriorating physical abilities such as coordination, balance, muscle strength, and aerobic capacity (Kalisch et al., 2011). As Yayan (2012) asserted, comorbidity and dependency increase with age and chronic health conditions are common in elderly people who are living longer. Therefore,

increased life expectancy will ultimately result in the need for care and raise demand for care home places.

Based on the above discussions highlighting the magnitude of growth in the aged population, governmental policy, trends in family composition and technological advancement it becomes clear that the expansion of demand for care home places is an immediate need, which has to be addressed with practical measures. This situation has been remarked on by the BBC (2011) which reported that the need for more care home places for older people will be in the region of an 82 percent increase by 2030. Establishing and providing sufficient numbers of care homes to satisfy this demand is important. Moreover, in a time of rapidly increasing health care costs and diminishing resources, it is critical to identify ways in which quality of care can be improved without raising the cost of care. Thus focusing on the quality of what is being offered in the care homes is of vital importance.

1.5 Aims and Objectives

1.5.1 Aims

The main aim of this research is to capture unheard voices of residents and translate them into quality measurement targets for future improvement in quality and residents' levels of satisfaction in care homes.

1.5.2 Objectives

- To understand the concepts of quality and satisfaction in care home settings
- To review the domains of quality and satisfaction in the context of care homes
- To explore the needs and requirements of older people in care homes
- To examine the importance of residents' needs and requirements
- To investigate gaps between residents' requirements and the services provided
- To translate residents' voice into quality characteristics
- To analyse and evaluate the outcome of the investigation
- To assess the appropriateness of the methodology with experts

1.5.3 Key Question

- How appropriately the voice of residents can be heard, in order to boost the levels of quality and satisfaction in care homes?

1.6 Thesis structure

This thesis comprises eight chapters the contents of which are summarised below.

- **Chapter 1: Introduction**

The first chapter provides an overview of definitions, including care homes, types of services, the care home market, demographic trends, trends in family structure, government policy and technological advances in the UK. Further, the study aims and objectives and an overview of the thesis structure are given.

- **Chapter 2: Literature Review**

In this chapter a review of previous research relating to the definitions of quality, quality measurement, quality of life, quality of care and customer satisfaction in care homes is carried out. The factors that determine satisfaction of residents and quality in care homes are also investigated.

- **Chapter 3: Research Methodology**

The research strategy, methods, methodological approach and methodology are presented and justified in order to decide on an appropriate research methodology for carrying out the investigation.

- **Chapter 4: Identifying Residents' Needs and Requirements in Care Homes**

In this chapter the methods adopted for obtaining data from residents in order to identify residents' needs, wants and expectations are given along with, in particular, the qualitative techniques and the process of collecting data from residents being outlined in detail.

- **Chapter 5: Assessing High-Ranked Demanded Qualities (DQs)**

The contents of this chapter cover the design of the survey carried out with 102 residents in 35 homes in order to identify the importance of residents' requirements. In addition, the levels of residents' satisfaction with given services and the attributes of each of their requirements are assessed.

- **Chapter 6: Identifying Quality Indicators Improvement Priority**

The tools and methods used to identify the factors that can impinge on residents' requirements are described and justified. This information is used to define measures of residents' requirements and subsequently, targets based on these are identified, using the House of Quality (HoQ).

- **Chapter 7: Evaluation with Experts**

The research process, the tools and results generated from the preceding Chapters 3, 4, 5 and 6 are evaluated with thirteen care home managers and the relevant feedback and information received from them is given.

- **Chapter 8: Conclusions, Limitations and Future Work**

In this final chapter the overall research conclusions are summarised, the contribution to knowledge, and the limitations of this research as well as proposals for future research work are set out.

Figure 1-5 presents the outline of this thesis.

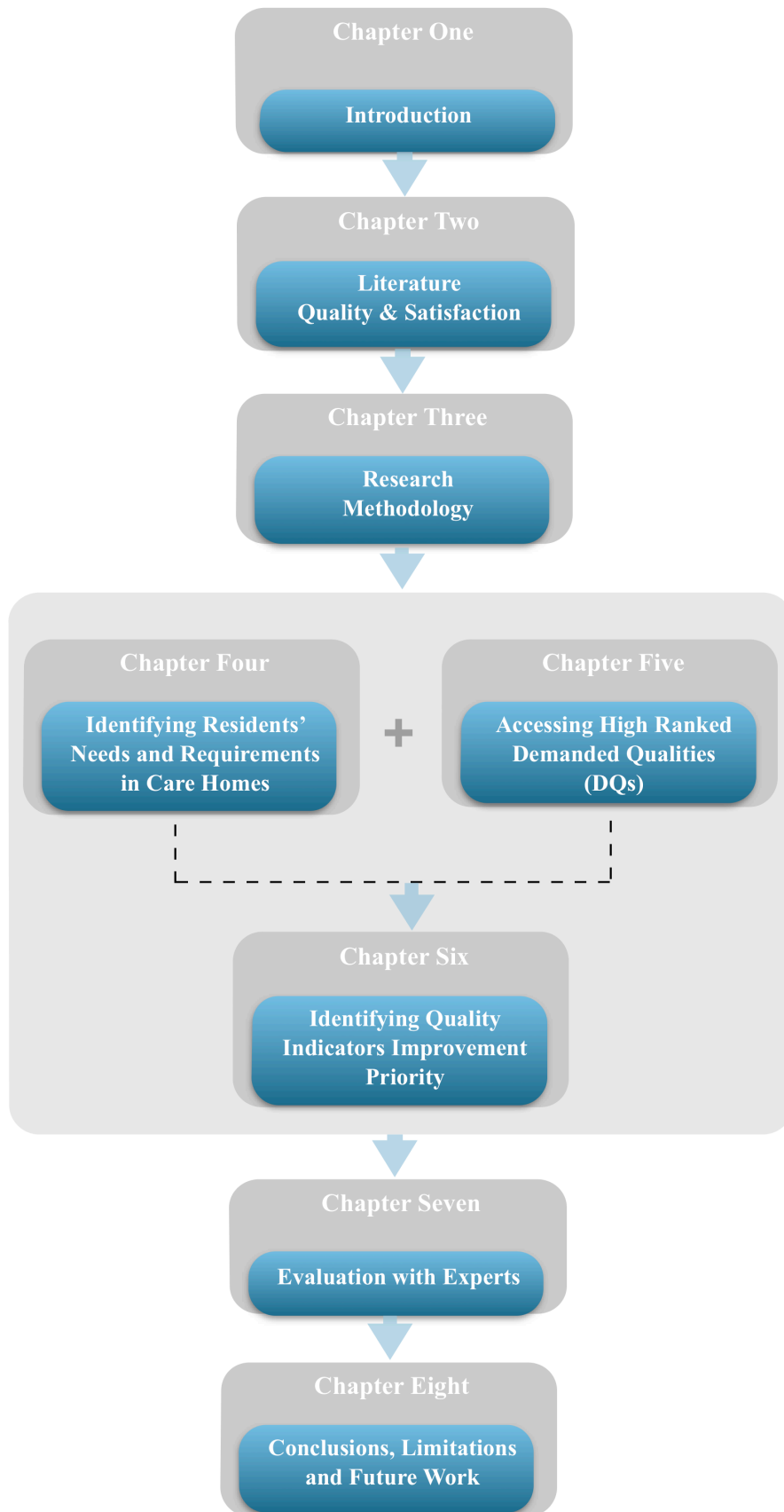


Figure 1-5 Outline of this thesis

2 Literature review

The aim of this chapter is to review and appraise the research evidence and literature supporting the research objectives. In this regard, the issues of care homes in the UK as well as pertinent quality indicators, particularly those concerning the satisfaction of their residents, are considered. Through reviewing these literatures, the gaps in adopting quality improvement tools and techniques in care homes were identified. Although a thorough review regarding quality of life, quality of care and satisfaction in care homes was carried out, it was clear that the voice of residents in care homes is usually not heard. In fact, it transpired that when improving residents' satisfaction and quality in care homes, the focus is on the perspectives of professionals, policy makers and families, rather than those of the residents who actually live day to day in such a setting.

2.1 A glance at the quality problem

Quality with regard to care homes has received extensive consideration (Chou et al., 2002) but as yet, there still remains the question of what constitutes good quality (in care homes), that is, a level of quality which meets and even goes as far as increasing residents' satisfaction in care homes. This issue does not just pertain to care homes, and over many years, quality regarding health care organisations has remained a major issue in many countries. According to (Komashie et al., 2007) the major underlying challenges associated with the concept are: (1) definition, (2) measurement, and (3) monitoring.

The remainder of this chapter addresses the nature of and seeks a definition of quality and in particular, focuses on understanding the issue of quality with respect to care homes.

2.1.1 What is the nature of quality?

The complication of comprehending the nature of quality emerges from its heterogeneity and the context (Grewal, 1995) by virtue of the fact that quality is an abstract entity (Harteloh, 2003). This consensus indicates that there is an uneven path regarding attaining a unified concept about the real nature of quality. This challenge may be partly an outcome of the strongly held confidence that scholars have regarding their self-defined views regarding the notion of quality. In its most simplistic view,

when we compare things, we commonly use quality as a gauge. . For example, although the distance between the individual's home and two care homes is a factor in making a comparison, the quality of service provided by the two care homes, excluding the distance, is the dominant factor that we consider before choosing between the two. In sum, "Quality . . . you know what it is, yet you don't know what it is. But that's self-contradictory. But some things are better than others, that is, they have more quality. But when you try to say what the quality is, apart from the things that have it, it all goes poof!" (Pirsig, 1974, p.184).

A variety of approaches for quality conceptualization have been proposed but philosophical debates and arguments surrounding the concept of quality are beyond the scope of the present research. Reference can be made by readers to the relevant literature (e.g. Harteloh, 2003; Hardie & Walsh, 1994; Pirsig, 1974). As can be observed from the range of definitions presented in the next section, any preferred perception of the nature of quality impacts upon how the concept is defined.

2.1.2 The definitions of quality

Seeking a global definition for quality yields a multiplicity of results, as one single definition of quality does not prevail in many disciplines, such as management, consumer products, marketing, and health care (Penneys & Missouri, 1997; Sousa & Voss, 2002). In fact, the concept of quality is defined in different ways by various authors (Mitra, 2008) and researchers and practitioners concur that presenting a single definition for quality is an intractable problem (Idvall et al., 1997).

Definitions of quality might be generic or disaggregated (Campbell et al., 2000), which means that they are not essentially mismatched but rather, can be considered as opposing ends of a continuum. Generic definitions of quality are composed of notions concerning excellence, expectations or goals which have been met, zero defects, or, fitness for use. Other forms of generic definitions are more complex and, in addition, are subject to sensitivity and specificity regarding the particular context to which they pertain. Based on the disaggregated approach to defining the essence of quality, it has to be noted that this concept has an intricate and multidimensional nature (Donabedian, 1980; Jüni et al., 2001).

One of the few authors who have analysed the range of definitions given with respect to the notion of quality is Garvin (1984) who identified five major approaches (Table 2-1).

Table 2-1 Five approaches to the definition of quality (Garvin, 1984, p.26)

<i>Approach</i>	<i>Definition</i>
<p>Transcendent definition (Excellence, the highest standard)</p>	<ul style="list-style-type: none"> • “Quality is neither mind nor matter, but a third entity independent of the two... Even though quality cannot be defined, you know what it is.” (Pirsig, 1974, pp. 185-213). • “...a condition of excellence implying fine quality as distinct from poor quality...quality is achieving or reaching for the highest standard as against being satisfied with the sloppy or fraudulent.” (Tuchman, 1980, p. 38).
<p>Product-based definition (Dependent on the attributes)</p>	<ul style="list-style-type: none"> • “Differences in quality amount to differences in the quantity of some desired ingredient or attribute.” (Abbott, 1955, pp.126-127). • “Quality refers to the amounts of the un-priced attributes contained in each unit of the priced attribute.” (Leffler, 1982, p 956).
<p>User-based definition (Satisfying the requirements of a customer, fitness for use)</p>	<ul style="list-style-type: none"> • “Quality consists of the capacity to satisfy wants...” (Edwards, 1968, p. 37). • “In the final analysis of the marketplace, the quality of a product depends on how well it fits patterns of consumer preferences” (Kuehn & Day, 1962, p 101). • “Quality is fitness for use.” (Juran, 1974, p. 2).

<p>Manufacturing-based definition</p> <p>(Conformance to requirements)</p>	<ul style="list-style-type: none"> • “Quality means conformance to requirements.” (Crosby, 1979, p. 15). • “Quality is the degree to which a specific product conforms to a design or specification.” (Gilmore, 1974, p. 16). • “Quality is the degree of excellence at an acceptable price and the control of variability at an acceptable cost.” (Broh, 1982, p. 3).
<p>Value-based definition</p> <p>(Value for money)</p>	<ul style="list-style-type: none"> • “Quality means best for certain customer conditions. These conditions are (a) the actual use and (b) the selling price of the product.” ((Feigenbaum, 1961, p. 1).

Similar definitions of quality have been proposed by Reeves & Bendnar (1994), who concluded that not only is there no universal definition, but multiple and often muddled definitions have been used in different circumstances. From Table (2-1) it is notable that there is little consistency and agreement even amongst those definitions which are categorized in the same class. Transcendent definitions can be considered as an example of this, for Pirsig (1974) believes that quality is an identity, which cannot be defined, whilst Tuchman (1980) argues that quality is an achievable condition. Although Tuchman’s definition aims to make the concept of quality more understandable, it retains its abstract nature due to the fact that “reaching for the highest standard” is meaningless in absolute terms. Likewise, in the other categories, similar arguments might be put forward.

With regards to the literature drawn upon to devise the above list, it emerges that quality can be generally defined as the situation wherein a customer is satisfied or has had their needs and requirements exceeded. Moreover, in this vein, Bergman and Klefsjö (1994, p.16) defined it as follows: “The quality of a product (article or service) is its ability to satisfy the needs and expectations of the customers” (see also Ishikawa, 1985, Deming 1986, Juran 1992 and Iacobucci et al., 1995).

According to Gronroos' service quality model (1984), technical quality (received by customer) and the functional quality (channels through which service is received by customer) are two of the factors that impact upon perceived quality of service. Usually, customers are more likely to judge the latter as being better than the former. It may be appropriate to apply this model to the healthcare environment as an example. In this case, technical quality can be deemed to be the quality of clinical services (e.g. diagnosis and surgical operation accuracy, etc.) regarding which patients are least likely to be able to make judgements (Lee, et al., 2000). Functional quality corresponds to issues such as cleanliness and hygiene, waiting time, levels of care offered by medical staff, concerning which patients may have greater powers of judgement. Thus, in this instance, for patients, quality is how well the service is delivered in terms of the latter and is independent of the technical superiority of the actual service or its clinical components (Chilgren, 2008), even though these are the foremost purposes of their attendance.

Despite the concepts regarding the nature and definition of quality being problematic the assessing of quality in this study is not prevented. The relevant literature regarding the measurement of quality is reviewed in the next section.

2.2 The measurement of quality

The quality measurement literature has been focused mainly on discovering management, improvement and measurement of quality. This research work also aims to find the means to measure and improve the quality in care homes. For proper examination of such things, two types of research help in reviewing literature review: service quality and product quality.

2.2.1 Service quality vs product quality

Parasuraman et al. (1988) described products are more tangible as most services are intangible. As the nature of products and services are differing the methods of evaluating their qualities are not usually similar. Service quality commonly uses to evaluate of how well the delivered services meet the customer expectations (Gronroos, 1982; Lewis and Booms, 1983).

Several differences between services and products have described by Di Primio (1987) (1) services have intangibility character, so their results create difficulty in quality measurement, (2) perishability of services, which means stock cannot be held and it cannot be stored, (3) measures for client satisfaction are significant parts of service performance instead of product oriented firms, even though such industries trust more on satisfaction of customers, within the number of buyers who make purchase of products, and (4) the delivery process for the service industry should be time-sensitive and user friendly.

2.3 Evaluating service quality

As was mentioned before, service industries include intangible and heterogeneous activities, which make it more complex and hence, difficult to measure. Despite the difficulties, this does not prohibit the task of quality evaluation and several service quality evaluation methods have been proposed. Gronroos (1984) put forward a technical and functional quality model, for which it is assumed that in order to take advantage in the competitive market a company needs to understand customer perception of the service quality in terms of its impact on them. Under the attribute service quality model created by Haywood-Farmer (1988), it is argued that high quality in service organisation can only be said to be provided when it meets customer preferences and expectations on a consistent basis.

The SERVQUAL model, proposed by Parasuraman, Berry and Zeithaml in 1985, is a very well-known for measuring service quality, having been applied the most in the service quality field (Kang & James, 2004; Goh et al., 2013). It can be defined as a model used to evaluate the difference between expectation and performance of the quality dimensions, being based on gap analysis as follows:

Gap 1: Difference between consumer's expectations and the manager's perception

Gap 2: Difference between management's perception and the service-quality specification

Gap 3: The gap between service quality specifications and service delivery

Gap 4: The gap between service delivery and the communication to consumers

Gap 5: Difference between consumers expected service and the perceived service (Parasuraman, Zeithaml, & Berry, 1985).

2.4 Measuring product quality

The statistical platform for quality assurance in the processing of production was applied early on by Walter Shewhard in 1920s. He determined the degrees of variability within the production process, which implied that greater levels of stability in processes could enhance the quality of products. This was established as a very effective method and has remained as the standard within some quality approaches such as the Six Sigma.

The theory of variation formed the foundation of the Statistical Process Control (SPC), which “is a powerful collection of problem-solving tools useful in achieving process stability and improving capability through the reduction of variability” (Olatunde, 2009, p.88). It rests on the point that services as well as products are considered as the outcomes of production processes. If the products are required to exceed customer needs, then they should be developed by using a process operating with lower variability in terms of their salient characteristics (Montgomery, 2005). The main aim of SPC is to enhance the stability and capability of production processes through decreasing the level of variability in output.

Similar to the SPC, the Six Sigma (6σ) approach has been deployed for reducing variability in products, the production process and across entire firms. According to Elberfeld et al. (2007, p. 27) “Six Sigma is a process improvement methodology using data and statistical analyses to identify and fix problems”. The name refers to the measures of variability within the population or group of products (Pande & Holpp, 2002), for the value of sigma and variability are directly related to each other; as the value of sigma rises, the value of variability also increases (Montgomery, 2005). However, the techniques which are based on the variability, are not sufficient for guaranteeing the needs of customers. Quality function deployment (QFD) was developed by Yogi Akao in 1966 (Akao, 1990a). This scholar went on to confirm that quality function deployment is a method to develop design quality which aims to achieve customer satisfaction and translate it into measures for quality assurance during the product production stage (Akao, 1990b).

There can be numerous benefits in using the quality function deployment (QFD). However, its success may necessitate investment in human resources as well as extensive time commitment because of the need to collect information (Mitra, 2008). The lack of interest in implementing the QFD within larger organizations in the UK has been reported (Alieksiei & Aspinwall, 2001) and this may be owing to there being poor knowledge regarding the concepts underpinning the QFD.

Turning to the health sector, it has been reported that most medical errors are the consequences of having faulty systems and processes and not down to individuals' mistakes (Hughes, 2008). Several authors contend that process is crucial as this is the major factor determining the quality of the product or the process for delivering services, such as those in the healthcare industry (Yeung et al., 2004; Cox and Wyndrum, 1994). According to Paim et al. "today and in the future, the service sector will also increasingly use process management techniques and technologies for health care, banking, government and retail" (2008, p.696). Moreover, change management approaches such as TQM (total quality management) have received attention from managers working in care centres as well as care homes (Castle, 2007). This application of techniques from manufacturing processes to environments concerning services is increasing, with one result being that professionals and researchers enhance their cases by deploying such techniques in the healthcare sector.

Total Quality Management (TQM) has become a popular quality management tool in recent years. It is an organisational approach, contributed to by team working, organisational management, system thinking and processes to improve the level of flexibility and competition across the firm (Oakland, 1993). According to Mitra (2008) TQM is an organization-based method in which human resources and customers are bound through a mission and vision for the company. Leadership and the management are very important in all quality programmes and are taken as the basic framework for TQM implementation (Thiagarajan & Zairi, 1997). For, according to Godfrey & Endres (1994) in today's customer based competitive environment, a constricted view of quality with respect to products and the grading of materials are not sufficiently comprehensive and the concept needs to be extended for the purpose of fully accommodating the satisfaction of users.

Despite many advances in quality evaluation tools and techniques over recent years, nowadays, the evaluation of health care quality has been continued with little attention being paid to arithmetical rigour (Komashie et al., 2007). However, there are some examples of the application of such types of industrial methods within healthcare, such as the use of the SPC (e.g. Mohammed, 2004; Benneyan, et al., 2003; Olatunde, 2009), Six Sigma (e.g. Pocha, 2010; Dellifraime et al., 2013) and the QFD (Chaplin & Terninko, 2000; Aghlmand, et al., 2008; Kuo, et al., 2011). It is worth noting that there is no evidence of extant investigations using SPC and Six Sigma in care home settings, but two articles, one published recently, have reported on the use of the QFD in care homes in Taiwan (Chang, 2006; Yeh & Chen, 2014). Through reviewing the literature, it is apparent that research and practice that adopt quality improvement methods for application in care homes significantly lags behind that found in other areas of the health care industry. Komashie et al., (2007) have provided a comprehensive overview of techniques related to quality used within health care and in industry, as shown in the table below (Table 2-2).

Table 2-2 A comparison of quality methods in industry and health care (Komashie et al., 2007, p.363)

Period	Industry methods	Healthcare methods
Up to 1900	<ul style="list-style-type: none"> Guilds membership Inspection Standardisation Supplier certification 	<ul style="list-style-type: none"> Physician licensing Specialty societies Individual efforts (record keeping)
1900-1920	<ul style="list-style-type: none"> Systematic inspection and testing Experimental design Control charts 	<ul style="list-style-type: none"> Survey, e.g. E.W. Groves (1908) Professional certification Legislations Nursing and hospitals standardisation Follow-ups, e.g. Dr Codman (1914)
1920-1940	<ul style="list-style-type: none"> Acceptance sampling Statistical methods Professional regulation 	<ul style="list-style-type: none"> Studies on nursing conduct Health insurance legislations Government legislation and standards
1940-1960	<ul style="list-style-type: none"> Training in statistical control Quality societies Quality publications Total quality control Experimental design Top management involvement Industrial standards Awards, e.g. "Deming prize" 	<ul style="list-style-type: none"> Regulatory bodies formed Landmark publications Internal and external inspection Professional standards Performance measures Accreditation of hospitals
1960-1980	<ul style="list-style-type: none"> Quality circles SPC widespread More quality societies/publications Introduction of TQM 	<ul style="list-style-type: none"> Rapid increase in literature Focus on process and inspection oriented More surveys, e.g. Drew Supervisory and record audit Hospital accreditation Audit tools, e.g. Phaneuf's audit, rush Mediscus, qualpacs
1980-2000	<ul style="list-style-type: none"> Spread of experimental design and SPC National and international certification Six sigma QFD TQM more widespread? 	<ul style="list-style-type: none"> Increase in published standards Publications on "indicators" Focus on measurement and monitoring More regulatory bodies Government involvement raised
2000, beyond	<ul style="list-style-type: none"> New international standards, e.g. ISO 9000:2000, ISO 14000 Automation of quality Enterprise quality systems 	<ul style="list-style-type: none"> New and tighter standards Consumer societies Consumer surveys and involvement Import of industrial techniques

As illustrated in the table above, in the case of health care services, the main drivers towards monitoring quality have been grounded in legislative changes. That is, the statutory care standards as well as the methods for appraising the result of their implementation such as patient surveys remain as key elements for improvements.

According to Komashie et al., (2007) most quality improvement techniques adopted by health care service providers were originally developed in industry. As illustrated in the table above, adopting quality improvement tools in health care has lagged behind other industries, and some techniques have only just started to emerge in health care, particularly over the last 15 years. This has certainly been the case in care homes and to underline the pressing need for their adoption in this context, the Health Foundation

(2013) has stated that “there is a compelling case for applying organisational or industrial quality improvement approaches to health care”.

Obviously, cost is one of the main issues in any health care system, as Kunkel and Wellin (2006, p. 9) have put it “cost plays a central role in determining access to and interest in receiving care, and the type and duration of care received”. However, the robust application of quality improvement techniques could, in fact, reduce such costs as well as improve safety, patient outcomes, the care experience and service efficiency (Yeh, 2010; Health Foundation, 2013).

The above evidence highlights the lack of quality improvement tools and techniques in care homes and the absence of an efficient strategic approach to their implementation. This lacuna offers a novel opportunity for quality improvement methods to better deliver the services in care homes, which not only meet and fulfil residents’ needs but also reduce cost, improve residents’ outcomes and enhance their living experience. This study seeks to address this research gap in regard to adapting and applying appropriate quality improvement methods and tools for providing better services and quality in care home settings.

2.5 Quality in care home settings

Defining quality in a care home is fraught with problems as it is a complex concept to operationalise. The debates are confounded by regulations, queries about what should be measured to assess quality, salient characteristics of the institution and decisions regarding methods used for its measurement (Spilsbury et al., 2011). Furthermore, opinions about what constitutes excellent, good, or poor quality in care homes can be complicated by applying various considerations and with respect to different circumstances. In general, quality assessment in care homes can be extended to the consideration of both quality of life (QOL) and care (Wunderlich & Kohler, 2001). Quality of life can be confused with the latter relating to the manner in which the care occurs together with its relevant standards. According to Kane et al. (2003, p.240), “the distinction between quality of care and QOL is perhaps spurious because the former contributes to the latter”.

Splitting the two concepts of quality of life and quality of care with respect to care homes is far from simple bearing in mind that they are closely interlinked and coupled

with elevating the residents' level of satisfaction (Chou, et al., 2002). When it is assumed that care is correlated with high standards, it follows that it is a supporting element for quality of life. Nonetheless, quality of life may be independent from care quality as this can be high, whilst the care quality remains poor. This can be the case when people are satisfied despite the quality being poor or even absent. In addition, some people may not desire or demand these. By contrast, other people may be benefitting from high level care quality in which a number of standards are intimately observed, but they still experience a low level of QOL (Crespo, et al., 2011).

The issues related to the nature and definition of quality in care homes can be controversial and difficult to assess, but do not necessarily hinder the task of quality assessment. Nonetheless, setting up a definition considerably impinges on the measurement approach selected. To examine the concept of quality in care homes effectively it is useful to review the relevant literature pertaining to quality of life and quality of care.

2.5.1 Quality of life (QOL)

Despite many existing regulations and quality assurances regarding long-term care, quality in care homes still needs to be improved (Kerrison & Pollock, 2001). Attempts to enhance the quality of life for residents in care homes have a long history, but to date, it appears that little has been achieved (Ronch, 2004). This subsection first examines background information on dependency and common health issues, which may have an impact on quality of life before addressing quality of life.

Dependency

The residents of care homes often are the oldest and frailest members of the population. The gradient of disability and the level of dependency among the adult population will escalate significantly as they age. Most recently, studies have identified that among people aged 85 to 89 and 90 and older, only 3 percent have the capacity to perform independently all the activities of daily living (ADLs) and the instrumental activities of daily living (IADLs) (King et al., 2013). A survey of homes across 21 English local authorities indicated that the level of dependency of residents has increased dramatically since the mid-1980s (Netten, et al., 2001). Although older people living in care homes

usually have complex needs and require nursing care, residents in nursing homes are on average more dependent than those in care homes.

Physical disorders

The process of ageing is often associated with physical illness, both acute and chronic pain, as well as changes in cognitive and sensory capabilities. A large number of factors may cause disturbances in elders' health and physical abilities and several of the main factors are described below.

Pain is common among elderly people. Chronic head, neck, and back pain are the most frequently reported type of pain (Yücel & Kayihan, 2011). Cardiovascular disease, (e.g., cardiac failure, myocardial infarction, and cerebrovascular incident), is the most frequent cause of mortality in the elderly, followed by malignant neoplasm (Mozley, et al., 2004). Other common conditions among older people include sensory losses.

- **Vision:** Impaired vision is extremely common among older populations. However, the rate of visual impairment is higher in the nursing home population than for same-age people in the general population (Abdelhafiz & Austin, 2003). These authors concluded that visual impairment puts older people at greater risk of falls that result in hip fracture. Elderly people are more dependent on vision than younger people as it has been demonstrated that, as people age, colour perception changes. They also need three times as much light as younger persons due to the thickening and yellowing of the eye lens and decreased pupil size (Timlin & Rysenbry, 2010).
- **Hearing:** Hearing loss is one of the most prevalent chronic conditions in older adults (Korotky, 2012). Age-related hearing loss has been identified as a factor that is negatively associated with higher distress, depression, and loneliness (Shiovitz-Ezra & Ayalon, 2010). Age-related changes can be caused by a variety of factors. For example, the minute hair cells in the cochlea, which process sounds that are interpreted by the brain, start to die as people grow older. The result is that sounds lose their clarity. In fact, a third of those aged 60 years old suffer from some degree of hearing impairment and this problem increases to over half of those aged 80 years (Hinton, 2007).

- Sense of balance: Age-related changes in sensory capabilities include a decline in the ability to taste and smell, diminished tactile sensitivity and problems with balance and motor control. Such changes threaten older people by increasing the risk of accidents. Physical illnesses as well have negative effects on mobility and the general quality of life, for risk of falling might be increased by reduced levels of mobility. Up to one-third of people over the age of 65 years in the community fall each year, and more than half of those living in institutions fall every year. Furthermore, about half of those who fall are more likely to have repeated falls (Abdelhafiz & Austin, 2003). Callisaya et al., (2011) noted that many falls in older people are the result of complex interactions between intrinsic and extrinsic factors. Intrinsic factors are those related to the individual and his or her condition, such as decreased muscle strength and cognition, whilst extrinsic factors are environmental and include poor lighting, obstacles, and uneven floor surfaces. Of these two factors, the evidence points to intrinsic factors such as visual impairment, loss of balance, and decreased cognition contributing more to the risk of falls.

Infectious diseases are also common among residents in long-term care facilities or care homes (Weinstein, 2000) and outbreaks of infections significantly raise rates of mortality among residents (Utsumi et al., 2010). These authors also found that among residents of long-term care facilities, infections of the respiratory and gastrointestinal tracts are the most common causes of infectious disease outbreaks. It has been illustrated that influenza is a significant cause of mortality and morbidity among elderly patients as this virus can spread particularly rapidly in care homes (Hayward et al., 2006). These researchers concluded that influenza vaccination of all staff is an effective way to reduce the risk of illness and death among residents during periods of moderate influenza activity.

Patients with moderate to severe physical illness are at risk of developing psychiatric illness. When physical illness is present, psychiatric symptoms are more severe (Mozley et al., 2004) and may cause disturbances regarding patients' quality of life.

Dementia

“Dementia is a general term for a range of progressive organic brain diseases which are characterised by problems of short term memory and other cognitive deficits” (Holmes, 2008, p.467). There are different causes of dementia but Alzheimer’s is the most common form. The progression of dementia is classified into three stages: early, mid and late (Table 2-3).

Table 2-3 The three progressive stages of dementia (Bowman, 2010, p.17)

<i>Stage of dementia</i>	<i>Abilities and behaviour</i>
Early	Difficulties with recent memory and forgetfulness, anxiety and depression often occur, loss of concentration, disguising difficulties may be successful for some of the time
Mid	Impaired ability for activities of daily living such as dressing, eating or shopping, significant memory lapses such as not recognising a person they know well, challenging behaviour and social disinhibition may be experienced, sleep disorders are common.
Late	Reduced capacity to reason or make decisions, significant communication difficulties, including fragmented speech, immobility, rigidity and recurrent falls, physical deterioration and difficulties with eating result in progressive physical weakening.

In the UK, the number of older people suffering from dementia is increasing (Innes et al., 2011) and it is reported that more than half of all sufferers live in care homes (MacDonald & Cooper, 2007). Innes (2011, p.548) claimed that “care for people with dementia in care homes is not of a universally high standard with the Care Commission (2004) reporting that, when inspected, care for older adults in 45% of Scottish care homes did not meet the National Care Standards”.

2.5.1.1 Quality of life (QOL) in care homes

Providing better QOL for residents in care homes is a major concern of residential care managers from a health and social perspective (Ronnberg, 1998; Holtkamp et al., 2000; Wong et al., 2004). However, there is no single description of QOL in the literature with several other terms such as well-being, satisfaction with life or happiness being assigned to QOL (Riazi et al., 2012). Generally QOL is recognised as a multidimensional concept, which covers a range of domains (Lawton, 1991; Crespo et al., 2011). It is notable that there is widespread acceptance that quality of life is a complex notion and involves both objective and subjective elements (Woodend et al., 1997; Hass, 1999; Crespo et al., 2011).

In the first instance, objective QOL addresses the quality of conditions like nutrition, accommodation and objective functionality as well as expert-defined standards. The advantage of objective QOL data is its usefulness in detecting whether benchmark targets are met properly and the identification of areas where conditions can be altered to cope with such standards. On the other hand, subjective QOL corresponds with the quality of experience; that is, well-being, health and satisfaction with conditions. This is a criterion that can categorically be assessed against individual standards (Schenk et al., 2013). A subjective judgement is a strong function of an individual's sensation of well-being and this makes evaluation of it far more complicated. This is compounded with regard to dementia-stricken people where impairment in the patient's cognitive abilities can have adverse impacts on any attempt at an evaluation.

Collecting self-reported data from residents' QOL in care homes has been challenging for researchers. To provide better QOL for residents, researchers have employed various approaches to measure it in care homes, but there is no agreement on how to best assess the phenomenon. In addition, Bradshaw et al. (2012, p.429) claim that in the literature "Residents are often marginalised and excluded from research" and few researchers look at QOL from the residents' perspective to examine what is important to them. Usually, when a resident is not able to provide information due to cognitive or physical impairment, researchers use proxies (staff or family) in their place (Harper, 2000). Others researchers have investigated QOL from professional viewpoints, and some have focused on specific groups of residents such as those with dementia (Cordner et al.,

2010) and multiple sclerosis (Riazi et al., 2012). Raynes (1998) however, has contended that the reported needs of elders regarding their QOL differ from those stated by other groups, such as their professional carers.

2.5.1.2 Quality of life domains

Over the years, researchers have attempted to examine the quality of care with different degrees of success (Nolan et al., 2001; Davies et al., 2006). In these investigations QOL was not entirely the focus under consideration (Nolan et al., 2001; Kane, 2001), possibly owing to the fact that one individual's perception of their life is different from other people's. As mentioned before dependency and deteriorating health conditions can threaten QOL and Kane (2003) revealed that a negative relationship existed between the degree of QOL of residents in care homes and their suffering of health problems for these resulted in changes in their living environment, often with reduced levels of privacy and changes in their social interactions.

Tu et al. (2006) recognised autonomy as the main beneficial factor impacting on residents' QOL. Autonomy refers to the residents' control over everyday activities in their residence and residents who have more independence in their basic activities have better QOL (Tu et al., 2006). Dunucan-Myers & Huebner (2000) investigated the relationship between residents' QOL and frequency of choices available for them and identified that the more choices they have, the better the QOL. Further, Guse and Masesar (1999) examined factors that can influence residents' QOL and concluded that good mobility, availability of private rooms, adequate food services, and spending time with family members promote residents' QOL. Regarding other dimensions, Tester et al. (2004) reported that a sense of self, a caring environment, relationships and activities are the four crucial factors for enhancing residents' QOL. Hubbard et al. (2003) noted that enhancing QOL can be achieved by improving connectedness, social interactions with family, staff and other residents. Open visiting, a homely atmosphere, a feeling of being made welcome can also improve residents' levels of social interaction significantly. Moreover, Cooney et al. (2009) identified the key themes that can have an impact on residents' QOL as the following: ethos of care; sense of self and identity; connectedness; activities and therapies. Activities were also found vital for enhancing the QOL of residents living in care homes in other investigations (Edwards et al., 2003;

Leung et al., 2004). Oleson et al. (1994) placed an emphasis on staff listening to residents' needs and treating them as individuals for individuality was recognised by the residents in their study as the most important factor contributing to their QOL. In this instance, individuality was subcategorised as: autonomy, self-worth, private space, personal possessions and finances.

Hjaltadottir and Gustafsdottir (2007) reported the most important aspects shaping residents' QOL as: their feeling secure, privacy, feeling safe, having meaningful activities and individuality. A qualitative study was conducted by Schenk et al. (2013) in eight care homes, involving 41 residents and revealed that residents' QOL can be affected by ten core domains: "social contacts, self-determination and autonomy, privacy, peace and quiet, variety of stimuli and activities, feeling at home, security, health, being kept informed, and meaningful/enjoyable activity" (p.2932). These are presented in the figure below (Figure. 2.1).

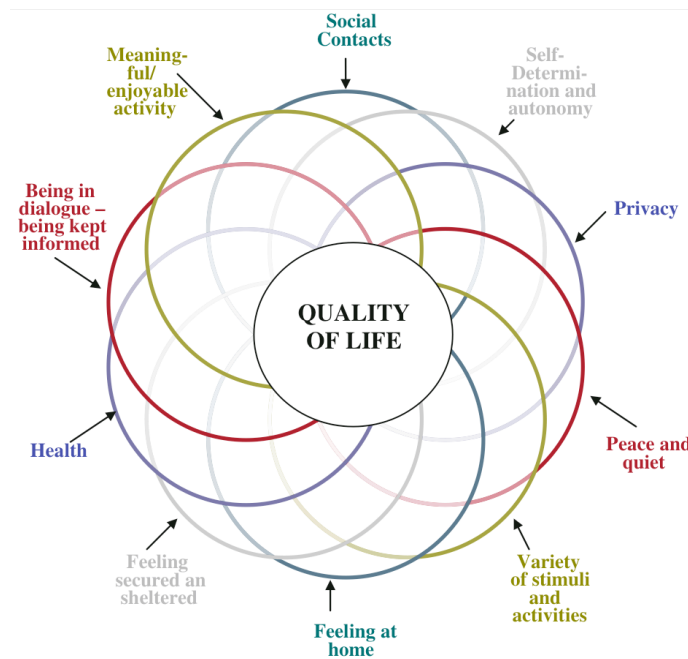


Figure 2-1 Core domains of residents' quality of life in care homes (Schenk et al., 2013, p. 2933)

Although Nijs et al. (2006) examined the effect of family style mealtimes on residents' QOL, they revealed that this did not enhance the sense of QOL but that of residents who received their usual style of institutionalised meals did decrease significantly. Some other researchers have probed the impact of living in a small-scale care home on

residents' QOL (De Rooij et al., 2012; Verbeek et al., 2012). Residing in such settings resulted in higher QOL outcomes in most domains (e.g. social relations, positive affect, having something to do, autonomy, staff attention) than for residents living in traditional homes. Furthermore, well-designed buildings can enhance residents' QOL as it is noted that "a well-designed, well-proportioned building with generous windows and high levels of daylight will not only improve the quality of life of the residents, but also improve the morale of their carers and therefore the quality of their care" (Barnes, 2002, p.781).

It can be concluded from this overview of quality of life discussions that the concept is notoriously complex, difficult to define, comprises multi-faceted domains and can be viewed from many different perspectives. It is also clear that "clinicians tend to underestimate the quality of life" (Figueira, et al., 2008, p. 170) in terms of its significance. Moreover, this overview highlights that obtaining data about its domains from residents' perspectives is not commonly undertaken. There continues to be a need to identify their perceptions and capture their experiences pertaining to QOL in care homes, more specifically, regarding the domains which, through their eyes, can influence their living for the better.

2.5.2 Quality of care (QOC) in care homes

Hughes stated that "the goals of measuring health care quality are to determine the effects of health care on desired outcomes and to assess the degree to which health care adheres to processes based on scientific evidence or agreed to by professional consensus and is consistent with patient preferences" (2008, p.3). To achieve these outcomes in care homes the quality of care (QOC) has been assessed variously by different stakeholders. These approaches invariably reflected their needs and agendas as well as standards imposed within a strong regulatory framework.

Wiener (2003) assessed eight strategies for improving QOC in nursing homes, namely: strengthening the regulatory process, improving information systems for quality monitoring, strengthening the caregiving workforce, providing consumers with more information, strengthening consumer advocacy, increasing Medicare and Medicaid reimbursement, developing and implementing practice guidelines, and changing the culture of nursing facilities. He concluded that this issue is a major concern for which

there is no simple solution. For evaluating QOC in care homes researchers from Sheffield University proposed a model, known as the 'six senses framework' (Nolan et al., 2001; Davies and Heath 2006) based on the elements of having a sense of: security, belonging, continuity, purpose, achievement and significance. The aim of developing this framework was, according to the scholars, to consider the perceptions of residents, families and staff in order to give clearer directions for stakeholders regarding the fulfilment of each of these senses to enhance the standard of care that the residents' received.

Since the 1960s, Donabedian's (1966) multi-dimensional framework has been applied because it is reported to be relevant to quality assurance and making improvement in health care settings (Kobayashi et al., 2011). It remains a dominant tool used in health care settings such as hospice programmes, public health systems, and care homes (Flores & Newcomer, 2009; Thomas et al., 2012). Donabedian's quality framework is constructed of quality indicators, which are organized in the causal sequence of: structure, process and outcome. Structure refers to the environment in which care is being delivered while the process of care concerns how care is provided and finally, the outcomes result from the aforementioned structure and process. This framework has also been used to identify categories of care (Ellis & Whittington, 1993). The overall implication arising from the framework is that good structure increases the likelihood of good processes being adopted and, in turn, there will be better outcomes (Kuo et al., 2011; Castle & Ferguson, 2010). The Donabedian framework is summarised below and the domains it includes are discussed in the following sections (Figure 2-2).

Donabedian's Framework	Structure	Process	Outcome
	Organisational Characteristics <ul style="list-style-type: none"> • Location • Size • Occupancy Rate • Cost • Ownership Type • Physical Environment 	Technical Interventions <p>Such as:</p> <ul style="list-style-type: none"> • Care Delivery • Medical Administration 	Health Status <p>Such as:</p> <ul style="list-style-type: none"> • Patient Recovery • Health Status
Staff Characteristics <ul style="list-style-type: none"> • Staffing Level • Staff Turnover 	Interpersonal Interventions <p>Such as:</p> <p>Communication and Trust</p>	Satisfaction	

Figure 2-2 Donabedian's Framework

Notwithstanding the widespread use of the framework, Donabedian (1966, p.692) contended that quality of healthcare is a “remarkably difficult notion to define”. Regarding the framework, Mularski (2006, p. S310) acknowledged that “If we had sufficient ability to understand the absolute relationships between structure, process, and outcome, we could select measures that were easy to obtain and that precisely and reliably determined the most important aspects of quality of care”.

Identification of the relationship between the quality of care in nursing homes and its influential factors has proved to be a challenging and at the same time a growing concern (Goodson, et al., 2008). Next, the factors that influence the quality in care homes are examined through adopting the Donabedian framework, for, to grasp the concept of the quality of care in this particular setting, it is necessary to distinguish between structure, process, and outcomes.

2.5.2.1 Structure

Structural components have been the most commonly used in researching care homes with regards to quality as these are easier to identify and assess than the process and outcome components (Monsfield et al., 2000; Harrington et al., 2003). Structural measures are focused on environmental aspects and organisational characteristics, such

as size, profit status, and staff characteristics such as staffing level and turnover (Sainfort et al., 1995; Harrington et al., 2003).

In sum, under Donabedian's framework, the structure is the setting in which care is provided, which includes the administrative and related processes necessary to support the provision of care. The two categorical domains of structure are organisational and staff characteristics (Campbell et al., 2000).

2.5.2.1.1 Organisational characteristics

The organisational characteristics of a care facility relate to its capability to meet a resident's physical and mental needs as well as his or her preferences. They are linked to levels of care and quality of life in such facilities, but may not necessarily determine quality.

2.5.2.1.1.1 Location

The differences in the resource levels in rural and urban areas may give rise to discrepancies in the qualities found in care homes. Lucas et al. (2007) clearly stated that there is not enough research available on the assessment of relationships between satisfaction levels of residents and the location of the care home. Likewise, Lucas et al. (2007) reported lower scores for satisfaction levels amongst residents in urban care homes compared to those residing in smaller cities or towns.

2.5.2.1.1.2 Size

An inconsistent correlation between facility size and QOL indicators as an outcome measure has been reported. In the past, researchers have identified that the level of quality is improved as institutional size increases. The reason being that larger care facilities are thought to attract more experienced or skilled personnel and to offer a broader range of services (Weihl, 1981). Nowadays, however, it seems that scholars concur on the claim that larger facilities are associated with more deficiencies, more patient restraint and lower levels of quality (Harrington et al., 2003; Goodson, 2008). Further, Timko and Moos (1991) revealed that smaller facilities can provide for more social interaction among staff and residents, which can increase residents' QOL and levels of satisfaction.

It has been identified that, although larger facilities have more resources or benefits for staff and offer a greater diversity of social opportunities and amenities among staff (Schaefer & Moos, 1996), residents may be less involved because the environment is less home-like and more bureaucratic (Curry & Ratliff, 1973). Therefore, it can be concluded on the basis of these reports that larger care homes have positive impacts on staff amenities but negative impacts on residents' levels of involvement. Further to this point regarding involvement, Chou et al. (2003) highlighted the fact that because most residents in care homes suffer from cognitive impairments and physical disabilities, larger facilities decrease the level of residents' involvement. Their study also revealed that older facilities have a negative effect on residents' satisfaction, and that newer facilities can provide more up-to-date amenities, which increase the level of satisfaction. It has also been demonstrated that in order to offer a more home-like environment, care home facilities should be smaller in size rather than larger (Regnier, 1994; Barnes, 2002). In terms of the size of care homes, the satisfaction of residents decreased when care home size exceeded 50 beds, as it led to more complex facility design and fewer opportunities to talk to staff (Barnes, 2002). In sum, it has emerged from the literature that the importance of the size of the facility and the degree of impact of this factor on residents' satisfaction levels remains ambiguous.

2.5.2.1.1.3 Occupancy rate

In terms of the relationship between rate of occupancy and QOC, the literature review has elicited mixed results. Spector and Takada (1991) revealed that lower quality is associated with higher occupancy rates. Castle's (2001) findings confirmed this statement, as the author illustrated that higher usage of restraints, more incidents of pressure sores, and greater use of psychoactive drugs are associated with higher occupancy rates in homes. In contrast, Aaronson et al. (1994) asserted that higher mortality rates are associated with lower occupancy rates for low rates can be the result of poor quality rather than the cause of poor care (Harrington et al., 2003). Studies related to the cost of care homes have indicated that there is a strong negative relationship between the rate of occupancy and a care home's average facility costs and its suffering financial difficulties (Harrington et al., 2003).

2.5.2.1.1.4 Cost

The relationship between quality and cost has been addressed by a number of researchers who claim it is a complicated matter. However, a common perception is that higher quality is associated with higher cost (Hicks et al., 2004; Rantz et al., 2004). However, no consistent trends have been established between cost and quality. Rantz et al. (2004) studied the relationship between cost and outcome in 92 care homes and indicated that providing good quality does not always result in higher cost. Moreover, Mukamel and Spector (2000) identified a 'U-shaped' relationship between quality and costs showing that higher quality levels might be associated with lower costs. Their research aligns with certain principles of the quality improvement movement, which hold that cost reductions and increases in quality are not mutually exclusive for they can be achieved in tandem by modifying care processes.

2.5.2.1.1.5 Ownership type

Attention has been paid to the role of ownership (ie for-profit institutions vs. non-profit making facilities) and the quality of care in care homes. Several comprehensive studies have examined this and shown that non-profit nursing homes are associated with higher staffing levels, better quality of services, and a lower probability of death and infection than their counterparts (Harrington & Swan, 2003). A meta-review of 39 studies published between 1972 and 1987 was conducted by Davis (1991), who concluded that the large majority of studies found that a higher quality of care was being provided by non-profit nursing homes. In particular, a literature review by Hillmer and colleagues (2005) of 38 studies published between 1990 and 2002 reported that for-profit nursing homes appeared to provide lower quality of service than non-profit nursing homes. Similarly, a comprehensive review of 82 studies published between 1962 and 2003 that focused on nursing home quality identified that it was higher in non-profit nursing homes (Comondore & Devereaux, 2009).

The literature concerning the role of hospital ownership and the QOC was reviewed by Eggleston and Shen (2008) who identified 31 studies published between 1990 and 2004. The aim of their meta-review was to examine what factors explain the diversity of findings regarding hospital ownership and quality of care. The majority of studies included in this review showed no statistically significant differences between adverse

patient outcomes and hospital ownership. It may be concluded that the diverse results reported in the extant literature might be owing to the range of data sources, time periods examined, and the geographical regions covered in all of these reviews.

2.5.2.1.1.6 Physical environment

Several areas covered under the literature concerning health care organisations have been reviewed to identify the factors that might influence patient wellbeing and the physical environment. These are described below:

Environmental factors

A large body of literature has considered how the environment affects the quality of care received by older people in care homes. In early research conducted by Lawton (1980) and Reizenstein (1981) it was revealed that the physical environment has an influence on the cognitive functioning and physical wellbeing of residents, as well as their participation in social activities. Work by Lawton and Nahemow (1973) identified that well-designed physical environments recognise important aspects of improvements that residents with dementia, shortness of breath, immobility, or visual impairments can benefit from.

The physical environment is identified as a key factor for maintaining an individual's residual mental and physical abilities (Passini et al., 2000). Furthermore, carefully designed environments can improve QOL for nursing home residents by focusing on their strengths and minimizing any demands that align with their weaknesses (Cutler et al., 2006). In a comprehensive review of 70 studies published between 1981 and 1996 focussed on the physical design of environments for people with dementia, Day et al. (2000) made a number of recommendations for dementia care units. Their suggestions included housing residents without dementia in separate units from those with dementia; moving residents, when necessary as a group, rather than individually; increasing levels of lighting; incorporating outdoor areas with access for residents when possible; and reducing barriers in the physical environment, such as bath tubs without lifts, chilly shower rooms, and inadequate installation of handrails, the absence of which can increase residents' stress during bathing. Barnes (2002) divided environmental factors into three categories: the layout of the building, the sensory environment within the building, and the privacy and autonomy of the residents.

Layout of the building

It has been demonstrated that institutions that are thoughtfully designed and include large windows for maximum natural daylight provide better QOL for residents and higher morale among caregivers and other staff, resulting in higher care quality (Barnes, 2002). Way-finding in a building is the main requirement of mobility that has an effect on the independence and personal autonomy of residents and thus spatial direction clarity and ease of way-finding contribute to quality of life (Passini et al., 2000).

Sensory environment

Sensory stimulation refers to the five senses. Confusion in people with dementia may be related to a reduction in the sensory capacities of the brain, so attention to this domain is a vital element in the care environment (Marieb, 1995). Providing a multisensory environment in care homes may have positive effects among residents and desirable outcomes such as increased contentment, more interest in the environment, relaxation, increased enjoyment and pleasure, and reduced feelings of fear and sadness (Deakin, 1995). Moreover, such an environment can increase staff and resident interaction and improve residents' QOL (McKenzie, 1995).

Privacy and autonomy

Resident autonomy and privacy have been demonstrated to be the main environmental concerns for residents in care homes. In fact, rigid policies contribute to more depression, helplessness, and physical decline among residents (Morgan & Stewart, 1998). It has been shown that residents should be allowed to make decisions as there is a positive relationship between perceived control (the feeling of being in charge of one's own life) and the psychological wellbeing of residents (Brubaker, 1996).

2.5.2.1.2 Staff Characteristics

It has been acknowledged that the issue of caregivers in long-term care settings is an essential consideration when ensuring good quality of care for residents. Although the effects of staffing levels on quality of care have been examined by a number of researchers (Castle & Engberg, 2005; Harrington & Swan, 2003), scant research has studied multiple staff characteristics and their combined impact on care quality.

Castle and Engberg (2007) examined the influence of multiple staffing characteristics (staffing levels, rate of turnover, worker stability, and use of agency staff) on the quality of care in nursing homes. They concluded that in order to measure the relationship between staffing and quality effectively, focusing on only one component of staff characteristics (e.g., staffing level) does not provide accurate results. They contended that to improve the quality of a nursing home, staffing characteristics (such as turnover, staffing levels, worker stability, and agency staff use) need to be addressed simultaneously. The pertinent staff characteristics are reviewed below.

2.5.2.1.2.1 Staffing level

Those who reside in care homes are usually dependent on staff for care for the long term and/or until death. Those residents who have been admitted from hospitals usually require a greater level of care and/or follow-up treatment than others and thus are more likely to be dependent upon licensed nursing care in order to prevent re-admittance to hospital (Thomas et al., 2010). In this situation, nursing home staff must include experienced licensed nurses who can assess the health status of residents and contact physicians in a timely manner when residents experience significant changes in their health. They also serve as medical liaisons with a resident's family members, explaining and informing them about changes in the health status of their loved one (Decker, 2006).

There is a large body of literature examining the relationship between staffing level and quality of care in care homes. Many studies have demonstrated the importance of staffing levels regarding both the process of care and the outcomes of care homes (e.g., Harrington et al., 2000; Hendrix & Foreman, 2001; Akinici & Krolikowski, 2005; Castle & Anderson, 2011).

According to the extant research, a combination of appropriately skilled staff is an important factor in maintaining the quality of care. Quality is high when staff include a proportionate number of registered nurses [RN], licensed practical nurses [LPN], certified nursing assistants [CNA], and other staff, such as activities directors, social workers, and so on. Most of the studies have indicated the significance of licensed nursing time, especially RN time (Akinici & Krolikowski, 2005; Anderson et al., 1998), while a few studies reported that unlicensed staff time was important regarding care

quality (Akinci & Krolikowski, 2005). Furthermore, other researchers found that licensed practical nurse and vocational nurse time did not correlate significantly to quality of care (Castle, 2002) or in some instances, was negatively correlated to it (Bostick, 2004; Horn et al., 2005).

In addition, the relationship between nursing home staffing levels and quality of care was examined in 106 care homes by Arling and colleagues (2007). They elicited that there is no relationship between licensed or unlicensed staff levels and quality of care, although more time was spent in direct resident care when overall staffing numbers were higher. Similarly, a comprehensive review of 70 studies of nursing home staffing levels and quality of care in these settings, published from 1991 up until 2006 carried out by Castle (2008), revealed that approximately 40 percent of the quality indicators reviewed show a correlation with staffing levels. Given these reports, it is clear that more research in this area is needed to clarify the issue of staffing levels and the quality of care delivered.

2.5.2.1.2.2 Staff turnover

Turnover of staff in care homes is defined as the intentional resignation from a job by an employee within a month of being employed (Banaszak-Holl & Hines, 1996). Care home work is inherently labour intensive, so high levels of staff turnover can be expected to have a notable impact on care (Castle & Engberg, 2005). The vulnerability and dependence of the frail elderly in care homes make them highly dependent on staff for their mental, physical, and social needs. Consequently, staff turnover is usually problematic and negative outcomes for residents' health are the most serious consequence of frequent loss of members of staff (Castle & Engberg, 2005; Harrington & Swan, 2003).

Several studies identified that high staff turnover rates, including that amongst top management, is not only deleterious to the provision of quality care for residents but also exerts a negative financial effect on care homes (Riggs & Rantz, 2001; Zimmerman et al., 2002; Anderson et al., 2003; Castle & Engberg, 2006; Horn et al., 2010). In addition, turnover at the management level has the potential to negatively influence the degree of employee commitment to the organization (Castle & Engberg, 2006). Significantly, staff turnover can break the continuity of the relationships between staff

and residents, and in turn, have a negative effect on the quality of care. As Thomas et al. (2013) revealed, several critical outcomes are linked to high levels of staff turnover, particularly among licensed practical nurses. That is, it often results in difficulties with respect to assessing residents' health status and implementing and maintaining care plans. Further, it reduces staff familiarity with residents, which can result in staff failing to notice health complications and deteriorating health status. Finally, it can lead to loss of overall quality of service delivery because of there being insufficient supervision and training of new members of the staff team (ibid).

In sum, Castle and Engberg (2005) asserted that a high level of staff turnover has the potential to affect negatively the quality of care in the following six areas of care home functioning as it can: (1) interfere with continuity of care; (2) increase the number of inexperienced workers; (3) weaken standards of care; (4) cause psychological distress for some residents; (5) be expensive for the facility; and (6) increase the workload for remaining staff.

It can be concluded that a care home that maintains a committed staff of long established personnel including skilled nurses and less-skilled nursing assistants, is much more likely to deliver high quality care to residents (Thomas et al., 2013). Further, nursing home organizational characteristics and job characteristics such as low wages, heavy workloads, and lower job satisfaction are highly associated with variations in staff turnover rates found in care homes (Parsons et al., 2003; Castle & Engberg, 2006).

2.5.2.2 Process

Process refers to activities occurring among practitioners and between practitioners and patients and may be described as the way in which care is delivered (Donabedian, 1980; Van Peurse et al., 1995). To provide a comprehensive overview, Bergman and colleagues (2010) took the healthcare system as a whole and identified five main processes: keeping healthy, detecting health problems, diagnosing diseases, treating diseases, and providing for a good end of life. Campbell et al. (2000) categorised the process of care as falling into two main groups, technical intervention and interpersonal intervention, and almost all the literature can be subcategorised under these:

2.5.2.2.1 Technical intervention

A process comprises a series of interconnected activities that are initiated with the goal of accomplishing appropriate care. Process indicators are measures of performance that evaluate the activities and tasks involved in patient care to assess not only the efficacy of the provider's treatment but also how effectively it was administered (Campbell et al., 2000). More specifically, in care homes, the process is the set of activities that are adopted by providers, residents, personnel, and family members in the course of delivering care (Flores & Newcomer, 2009). Evaluating actual services and activities, which are offered to the residents may be included in the on-going process, as well as the provision of special care and treatments to either alleviate or prevent relapses in physical and psychosocial functioning (Wunderlich & Kohler, 2001).

To give a brief overview of the process variables, one can define them as activities with embedded planning and procedures in the organisation, two outstanding examples of which are procedures for medication administration and staffing protocols (Krichbaum et al., 2005) regarding which Mularski (2006) suggested that process measures can include health assessment procedures, feeding and daily care routines. The relationship between staffing and the performance of daily care processes has been examined but it has been pointed out that insufficient staffing levels are associated with inadequate feeding assistance given during meals, poor skin care, lower activity participation, and less toileting assistance (Schnelle, 2004).

From the viewpoint of QOC in care homes, process is a direct evaluation of care delivery, planning of care, and technical interventions. Furthermore, deficiencies in the process of care in care homes can be the result of the overuse of care (care is provided when it is inappropriate), underuse of care (care is not provided when it is needed) or poor technical problems (Brook, 1994; Wunderlich & Kohler, 2001).

2.5.2.2.2 Interpersonal intervention

According to Campbell et al. (2000, p. 1613) interpersonal care is directly linked with the "management of the social and psychological interaction between client and practitioner". This form of care relies on concepts such as: communication, trust, empathy, sensitivity, and responsiveness between client and practitioner (Donabedian, 1980; Blumenthal, 1996; Carmel & Glick, 1996; Campbell et al., 2000). Further to this

type of care, well-established mutual understanding among health care professionals and residents is a determining factor in improving the relationship aspects of the QOL. The benefits of interactions are that staff will find out about residents' opinions regarding changing the home and what they want to keep unchanged. Shortcomings in the process of care can be the result of the lack of interpersonal care such as neglect or even abuse (Blumenthal, 1996; Wunderlich & Kohler, 2001).

2.5.2.3 Outcomes

Outcomes are the consequences of care, and both structure and process may influence them, directly or indirectly. However, the comparable significance of each component can vary according to the particular care home situation, and there may or may not be a direct connection between them (Campbell et al., 2000). Changes in the health status and condition of residents are considered to be the outcomes of care. Under this lens, changes can be attributed to the care that has been provided, or lack of it. The desired outcomes in care homes include: a reduction in morbidity and mortality rates, maintenance of residents' overall functioning, satisfaction, and the improvement in QOL and physical functioning (Wunderlich & Kohler, 2001).

2.5.2.3.1 Health status

In recent years, the assessment of care home quality has moved beyond consideration of organisations' structures and processes to their outcomes (Lowe, et al., 2003). In the literature, measures of structures and processes are usually applied as proxies for outcome measures because a care home's outcomes are the consequences of the applied care process (Harrington et al., 2003). Using outcomes to evaluate the quality of care is not easy because collecting data about residents' life quality and physical, mental, and emotional health status involves conceptual and practical considerations.

Outcome measures can be used as indicators of the quality of health care provision when items such as patient recovery, restoration of function, and survival are gauged (Donabedian, 1966). Furthermore, as Donabedian (1969) claimed, the assessment of outcomes actually involves the summation of the final results of care in terms of the patient's health status and satisfaction with their care experience. A total of 11 categories of residents' health status (i.e. clinical outcomes) were identified in the relevant literature and are presented in the table below (Table 2.4).

Table 2-4 Residents' outcomes domains

<i>Resident outcomes</i>	<i>Resources</i>
Weight change/loss	Bostick, 2004; Rantz, et al., 2004; Horn, et al., 2005
Urinary tract infections	Anderson, et al., 1998; Bostick, 2004; Horn, et al., 2005
Malnutrition and/or dehydration	Anderson, et al., 1998; Wan, 2003; Crogan, et al., 2004; Rantaz, et al., 2004
Use of physical restraints	Castle & Fogel, 1998; Bostick, 2004; Rantz, et al., 2004; Wan, 2003
Incidence of pressure ulcers	Anderson, et al., 1998; Wan, 2003; Bostick, 2004; Rantz, et al., 2004; Horn, et al., 2005; Dellefield, 2006
Use of catheter	Wan, 2003; Zhang & Gabrowski, 2004; Rantz, et al., 2004; Horn, et al., 2005
Medication errors	Zimmerman, et al., 2002; Rantz, et al., 2004; Weech-Maldonado, et al., 2004
Psychotic status	Wan, 2003; Weech-Maldonado, et al., 2004; Rantz, et al., 2004
Behaviour problems	Anderson, et al., 1998; Oai, et al., 1999; Weech-Maldonado, et al., 2004
Falls and fractures	Anderson, et al., 1998; Rantz, et al., 2004
Functional ability and physical activity	Bliesmer, et al., 1998; Wan, 2003; Rantz, et al., 2004; Schnelle, et al., 2004; Bostick, 2004; Horn, et al., 2005

Several studies probing care home quality have focused on organisational attributes associated with resident outcomes such as mortality rates (Cohen & Spector, 1996), functional levels (Spector & Takada, 1991), discharge rates (Bliesmer et al., 1998) and hospital admissions or rehospitalisation rates (Harrington, et al., 2001; Carter & Porell, 2003). It can be concluded that because numerous researchers have employed diverse methods in order to capture outcomes, categorizing resident outcome variables is problematic.

2.5.2.3.2 Satisfaction

Consumer satisfaction is widely accepted as a significant indicator when evaluating the quality of care (Chou et al., 2002; Castle, 2007) for it includes emotional as well as mental aspects and relates to experience levels, expectations and social values. In service organisations, service quality and customer satisfaction have been recognised as three major concerns (Caruana et al., 2000). While service quality and customer satisfaction constructs may appear to be very similar, the distinction between them has not been pinned down effectively by researchers (Iacobucci et al., 1995). For instance, Spreng & Mackoy (1996) reported on the conceptual arguments for their distinction by testing models of service quality and satisfaction. They concluded that the two constructs are distinct. Similarly Ekiinci & Riley (1998) accepted that there was a difference but that the two were related notions. By drawing on the literature, the association between customer satisfaction and service quality may be characterised as follows: (1) scores indicating resident satisfaction do not always correlate with quality ratings; (2) while quality dimensions are, by necessity, service specific, satisfaction assessments are not; (3) evaluations related to quality can be made with no actual experience, but satisfaction assessments must be based on consumers' actual experiences; (4) lower ratings of consumer satisfaction do not always correlate to substandard service quality (Applebaum et al., 2000).

More specifically, customer satisfaction is the consequence of a customer's perception of the service quality (Heskett et al., 1994). With the emphasis on the voice of the customer, service quality has been defined as the difference between customer expectations of service and the perceptions of the actual service received (Parasuraman et al., 1988; Kim, 2011). According to Kim et al. (2008) customer satisfaction is the

degree of the fulfilment of customer's expectations by a product or service, and similarly, earlier research has indicated that customer satisfaction / dissatisfaction can be caused by a disconfirmation between initial expectation and product / services performance (Oliver, 1980) with there being a strong relationship between customer satisfaction, customer behavioural intentions (e.g., switching and word-of-mouth) and profitability (Yi, 1990).

2.5.2.3.2.1 Satisfaction levels among residents of care homes

Patient satisfaction is entangled with the phenomenon of quality of care (Donabedian 1966, 1988) and has emerged as an important issue in all areas of health care. In the late 1990s, the majority of healthcare organisations' cultures and philosophies were influenced by two quality experts' work; those of Deming (1986) and Juran (1988). According to Deming, the most effective way to improve quality in an organisation is by understanding customer needs and expectations and trying to meet or exceed them. Following this stance, Straker and colleagues (2007) reported that for over 30 years health care organisations have recognised that consumers' views have enabled physicians, hospitals and other providers to make better decisions and make improvements.

Information on consumer satisfaction and measuring it in care homes, whether the consumer is taken to be the resident, or the family members are treated as the consumer, is essential for quality improvement and increasing sensitivity regarding human needs (Mansfield et al., 2000; Castle, 2007). This may be achieved through the incorporation of quality improvement approaches to health care, such as total quality management (TQM) and continuous quality improvement (CQI), which both address improving customer satisfaction levels in organisations (Castle, 2007). Nonetheless, because of the perception that most residents of care homes are frail and/or suffer from some level of cognitive impairment, the use of quality information and surveys of residents' views have lagged behind those of consumers of other health care services. For instance, the use of quality improvement techniques have developed slowly in long-term care settings and satisfaction measures have only been integrated gradually (Castle et al., 2004).

In regard to care homes, quality improvement has been gradually accepted as a vital element to ensure service quality. Patient satisfaction reporting has undergone a move

towards a central focus on health care delivery and quality assurance efforts in all aspects of care settings, with care homes being no exception (Lowe et al., 2003).

2.5.2.3.3 Measures of satisfaction

As Mansfield et al. (2000, p.1) noted, “Satisfaction surveys present a potent tool to improve long-term care services”. In detail, resident satisfaction surveys can shed light on areas that need improvement and identify areas or care processes that consumers find lacking. The results of resident satisfaction surveys can influence the sensitivity of nursing home staff to residents’ needs for quality of life (Howard et al., 2001). Mansfield et al. (2000) listed the following as the advantages of using such surveys in care home settings: (1) Satisfaction surveys are subjective evaluations and take into account the perceptions of those most affected by quality of care. By contrast, objective indicators alone, such as the number of falls among residents, may not be the most meaningful indicators of quality; (2) Nursing home residents, who are generally frail, are unlikely to register complaints or devise strategies for improvement of care as individuals or as groups. The purpose of a satisfaction survey is to solicit the input of residents and can empower these consumers. As such, it can shine a light on those most directly affected by the care-related decisions that are made; (3) Satisfaction surveys offer an opportunity to solicit the varied perspectives of all the stakeholders in long-term care facilities.

However, there are limitations to capturing residents’ satisfaction through survey tools. First, as mentioned previously, most residents in care homes are frail and suffer from cognitive impairments. In the past, researchers believed that residents who suffered from cognitive impairment would experience difficulty answering questions reliably (Davis et al., 1997). As Kunkel and Wellin (2006, p.7) have also noted “sadly, researchers and practitioners often wrongly assume that persons with cognitive impairment are unable to make care decisions for themselves. As a result there are very few model consumer-directed programs that recognise the impaired adult’s voice in decision making”. Recent research has identified that residents with moderate to severe cognitive impairment are, in fact, able to complete a questionnaire (Water et al., 2003; Kunkel & Wellin (2006); Kojetin & Stone, 2007). Notwithstanding, a large number of studies have focused on families and staff rather than residents, firstly, not only because

of the residents' perceived frailty but also because residents' answers are not easy to assess accurately. Secondly, because many residents see themselves as vulnerable to retaliation from staff, they may be reluctant to respond truthfully. In fact, a number of researchers have commented that care home residents are less likely than other kinds of consumers to express dissatisfaction because they are concerned about retribution (Castle & Engberg, 2004). Third, according to Kunkel and Wellin (2006, p.18) "both professionals and family members tend to hold negative attitudes in regard to the ability of older consumers to assess and advocate for their own care needs."

Initially, quality improvement issues were implemented from the providers' point of view and only in the last 10 to 15 years has the importance of residents' views gained recognition (Chou et al., 2002; Straker et al., 2007). This shift might have been brought about by an awareness of the consumer-centred care approach, which puts the emphasis on their preferences and is advantageous for consumers in all health care settings, including care homes (Wunderlich & Kohler, 2001). Under a consumer-centred approach, the design and content of instruments to measure satisfaction are based on the criteria that are important to the residents themselves and not those taken from a professional perspective (Lowe et al., 2003).

It has been demonstrated that taking residents' views into account can have positive effects on increasing their satisfaction levels. Numerous studies have found that family members and staff have different concerns and perspectives related to quality of care and services received by residents. Therefore, they cannot be the direct proxies for the residents' experiences because their ratings of salient features of a long-term care facility differ from those of the consumers directly affected by such features (Lowe et al., 2003; Gasquet et al., 2003; Ejaz et al., 2003). Although the viewpoints of family and staff members are important, under the consumer-centred care approach, the focus clearly should be on the views of residents, who may have their own opinions about the importance of many features (Peak & Sinclair, 2002). In sum, integrating resident views can have impact on the quality of care they receive and their outcomes (Haywood et al., 2006; Anderson, 2007).

Instruments focused on residents' satisfaction aim to measure the perceptions, emotions and expectations of their overall experiences. The tools of residential satisfaction may

effectively serve to evaluate both QOC and QOL. In the next section the satisfaction domains are outlined.

2.5.2.3.3.1 Satisfaction domains

Pinpointing the areas which, from the viewpoint of patients or residents are in need of improvement, is the key in carrying out surveys on levels of satisfaction (Castle, 2007). Frequently satisfaction instruments are developed in-house and the lack of standardization in item content, format, and overall instrument design is often reported. As a consequence this deficiency limits the ability of providers to compare themselves with other care homes (Lowe et al., 2003; Kojetin et al., 2007; Castle, 2007). There are instruments specifically intended to assess the degree of satisfaction with care in general and most of these tools encompass questions about particular features (domains) of care, based on patient/resident experience. The purpose of satisfaction questionnaires is to target different domains which carry importance for a particular target group of residents. This type of fieldwork should be coupled with conceptualising and presenting the results in the format of a report.

In the context of acute care settings, areas such as nursing care, medical care, food, pre-hospital and discharge instructions are considered as the appropriate domains for assessing patients' satisfaction. In long-term care settings, reasons may exist that explain the inappropriateness of using these for residents, as the experience of these two types of patients may be quite different. The acute care patient is urgently hospitalized and normally for a limited period of time whilst long-term care residents, in the majority of cases, reside in the institution to the end of their lives (Saliba & Schnelle, 2002). Another difference is that the medical concern for acute care patients is of the utmost importance compared to their long-stay counterparts. Alongside the nature of the medical care that may be received, one ought to bear in mind that there are other important issues that may emerge from residents concerning the experience of living in an institution. Moreover, in terms of the criteria for assessing satisfaction, different parameters may be determined by their degree of relevance in acute care settings and care homes. For example, in acute care, the physicians' skill, communication ability, and attitudes toward providing care are the salient factors (Crow et al., 2002), whilst in

care homes, other issues such as continuously treating residents with dignity and providing autonomy are highlighted.

Identifying the domains of satisfaction most salient to the customers (families and residents) in care homes can be useful for improving quality. Castle (2007) reviewed 50 studies on satisfaction surveys carried out from 1993 to 2004 in nursing homes, assisted living facilities, hospital long-term care units, and residential care homes. He concluded that the satisfaction instruments varied greatly regarding: domains, the number of questions, sample size, and response formats. To obtain robust outcomes in this thesis, the researcher examines those satisfaction domains in nursing homes, which can influence only resident satisfaction. To probe the relevant literature on extant investigations in this field a computerized search of entries on MEDLINE, CINAHL and Scopus databases were conducted for the period from 2004 to 2013. Keyword searching was undertaken for the following terms: satisfaction, customer satisfaction, resident satisfaction and resident surveys (Castle, 2007). The results are summarised in the table below.

Table 2-5 Satisfaction domains identified from extant studies

<i>Authors</i>	<i>Domains Examined</i>	<i>Response Format</i>	<i>Respondent</i>	<i>Number of respondent in the study</i>
Castle (2004)	1. Admission 2. Activities 3. Autonomy and Privacy 4. Physical environment 5. Safety and security 6. Caregivers 7. Meals and food 8. General satisfaction	Visual analogue	Family	550
Engel, S. E., Kiely, D.K., L. Mitchell, S. (2006)	1. Communication 2. Health services 3. Residents' comfort 4. Medical interventions	Likert	Resident / healthcare proxies	148
Castle, N.G., (2006)	1. The art of care 2. Technical quality 3. Efficacy 4. Amenities of the care environment 5. Global satisfaction	Questionnaire	Residents/Family	286

Straker et al (2007)	1.Activities 2.Choice 3.Administration 4.Meals and dining 5.Laundry	Survey	Residents	18,560
Richards, Uman, (2007)	1.Meals and Dining 2. Activities 3. Direct Care 4. General Satisfaction 5. Administration 6. Resident Environment 7. Choice 8. Social Services 9. Therapy 10. Laundry 11. Facility Environment	Interview/ Survey	Residents/ Family	3,057/ 4,082
Hasson, and Arnetz, (2011)	A 1.Information, 2.Staff behaviour 3.Care 4.Activity B 1.Information 2.staff professional skills 3. Care 4.Activity 5.Contact 6.Social support 7. Relative participation	Likert	Care recipients/ Family	228/ 126
Chong (2012)	1. Service performance 2. Service expectation 3. Expectancy disconfirmation 4. Perceived care need 5. Care need fulfilment	Face to face interview	Residents	405
Liu, Guarino, Lopez, (2012)	1. Communication 2. Comfort 3.Satisfaction with nurse practitioners	Open-ended question	Family	131
Crogan, Dupler, Short R. Heaton (2013)	1. Food	N/A	Residents	61

This search has revealed that research studies may vary in the approaches taken for determining the factors used to measure the satisfaction levels of residents. Researchers have adopted different ways and for each study, they have selected specific domains. As illustrated in Table (2-5) satisfaction has been assessed through a number of different dimensions, each of which may be salient to different consumers. Within care homes, the domains for satisfaction are often based on the perspectives of providers or researchers but for improving quality, the voices of key customers, as reflected in measures of satisfaction, are more relevant. These consumers are fully aware of the

services which they receive and the aspects which they find to be satisfactory. As noted by Applebaum et al. (2000), a reliable rule of thumb, when trying as a researcher to determine pertinent satisfaction domains, is to draw on the inputs of the key customers.

2.6 Conclusion and summary

It has been elicited that different definitions and viewpoints on quality will lead to different approaches to its measurement and the domains to be considered. As quality is made up of multiple elements, a variety of definitions is both possible and legitimate.

Through the review of the literature it has been identified that a care home system consists of numerous, interdependent services, the combination of which impacts upon the type of quality provided in care homes. In this complex system, the provision of care services is diverse and for this reason, the possibility of errors and faults occurring in its operation is high. In the care home system, the reduction of errors and the costs and gains in resident satisfaction levels are, however, considered crucial. As such they have become the focus of attention of care providers in recent years when seeking to address the notion of quality.

A global definition of quality refers to making a response to needs and expectations of clients. In addition, the patient satisfaction level has been considered as one of the most important criteria when gauging the quality of treatment in some health care settings. According to Azam et al. (2012, p.389), “serious deficiencies are likely to occur if there is any attempt to achieve quality without fully understanding customer requirements and expectations”. However, due to their levels of disability, complex health care needs and high levels of dependency, professionals usually do not recognise care home residents as having the capacity to make valid judgments about their daily life and the nature of their support services. In other words, residents are not offered sufficient opportunities to advance their views regarding the nature of the provision made for their life in care homes. With regards to this, the Joseph Rowntree Foundation (2009) reported that “the voices of these older people are so quiet as to be practically absent from discussions about their requirements and importantly their preferences and priorities. Professionals, relatives, commissioners, policy makers and politicians are those who most often speak on behalf of older people, and it is their voices that dominate in these debates” (p.5). Given this state of affairs, care service improvements should focus not only on clinical

evidence or the cumulative opinions of professionals, but, rather, should determine residents' needs and expectations. It has been discovered that there is a lack of effort to obtain residents' voices and preferences and to take these into consideration when designing or improving services. Furthermore, in the literature review it was identified that researchers not only failed to capture these voices, but also there is no evidence of using quality improvement techniques to fulfil residents' needs in care homes based on their expressed requirements.

3 Research Methodology

Research is defined as a process of disciplined inquiry that is usually configured by three major questions: what, why, and how (Gray & Malins, 2004). The question “what” is answered by clearly defining the research question and following a meticulous process of gathering intelligence (Phillips and Pugh, 2005). A broader context, as well as the potential value of the research, is probed by the question “why”. The third question, “how”, highlights the development of the methodology best suited to elicit and process the information. Chapters 1 and 2 have addressed the “what” and “why” questions and investigated the background of the research subject and the relevant literature, as well as the extant research gaps pertinent to this study. Subsequently, this chapter focuses, in particular, on addressing the question “how”, by establishing an appropriate methodology for this research. That is, the aim is to probe the different research approaches available in order to identify the methodology best suited for carrying out the investigation for this thesis. To this end, the nature of the research and its epistemological perspective are identified as well as the research methodology and are discussed in detail.

3.1 Research epistemology

Epistemology is the relationship between the knower and the known (Lincoln & Guba, 1985; Laverly, 2008) and sheds light on the nature and sources of our knowledge and understanding (Guarino & Giaretta, 1995). It is defined by Crotty (2004, p.3) as “the theory of knowledge embedded in the theoretical perspective and thereby in the methodology”. It is essential to define the epistemological perspective prior to carrying out research, because understanding the philosophy of the researcher is essential, to both the design of the research and for illuminating associated issues (Gray, 2004).

In the social sciences, two major approaches to obtaining knowledge are frequently discussed: positivism and interpretivism. In essence, these epistemological stances have been positioned as polar opposites in their philosophical assumptions and goals.

3.1.1 Positivism

Positivism is invariably adopted in the natural sciences as it is concerned with being objective when carrying out research (Saunders et al., 2009; Crotty, 2004; Gray, 2004).

That is, “positivists tend to take a realist position and assume that a single, objective reality exists independently of what individuals perceive” (Hudson & Ozanne, 1988, p.509). Further, under this lens it is assumed that natural and human sciences have a common logical concept of being concerned with facts and not with values. In addition, for positivists reality can be perceived through our senses and enquiry should be based on scientific observation (Gray, 2009). Consequently, quantitative research methods are favoured over qualitative forms by nearly all natural scientists (Creswell, 2014). Moreover, some social scientists, in particular economists, prefer to use the methods of natural sciences, e.g. physics and chemistry when investigating real world phenomena (Henn et al., 2006).

3.1.2 Interpretivism

By contrast, interpretivists rebuff the notion of the existence of a single real world, choosing to assume that reality is determined by mental perception and hence, they introduce subjectivity into their worldview. That is, opposite to positivists, interpretivists deem that real world phenomena have many interpretations to which they apply theories for testing or use their observations to generate theory. By way of further explanation, in support of this stance, owing to diverse perspectives of individuals or groups, the advocates of interpretivism make it clear that due to the existence of various realities (Hudson & Ozanne, 1988) the social field requires different research procedures to those pursued by the natural scientists (Bryman & Teevan, 2005). Regarding this, Gray (2009: p.21) contends that “interpretivism asserts that natural reality (and the laws of science) and social reality are different and therefore require different kinds of method”. In sum, the interpretivist approach, which is concerned with the social construction of human entities relies on subjectivism and hence, best lends itself to qualitative research methods and theory building (Hudson & Ozanne, 1988; Henn et al., 2006).

3.2 The nature of research

For research to be relevant and worthwhile, researchers must adopt the appropriate methodology. That is, the researcher has responsibility for choosing and justifying the research design according to their epistemological stance, such that the data collection

and analysis delivers the required goals in a valid and reliable manner (Sarantakos, 2005).

In chapter 1, the research questions guiding the study process were presented. In this section several methods for carrying out the research are reviewed with the aim of identifying a pertinent methodology in order to address these questions in a robust way.

3.2.1 Qualitative research, quantitative research and mixed methods

The two main types of research paradigms are qualitative and quantitative (Brannen, 2004; Creswell, 2014) and these differ significantly from each other regarding the nature of the inquiry. As explained above, the basic philosophical assumptions that researchers bring to a study determine the types of research strategies adopted as well as the specific methods employed in an investigation.

The primary goal of qualitative research is “an understanding of social processes rather than obtaining a representative sample” (Henn et al., 2009: p.183). Under this optic, the researcher aims to investigate subjective meanings of specific individuals or social groups and consequently, qualitative research starts with research questions, rather than hypotheses or objectives, because the intent is to explore a phenomenon in depth so as to reap rich contextual data (Creswell, 2014). Moreover, the nature of qualitative research is mainly theory building rather than theory testing (Bryman and Teevan, 2005; Henn et al., 2006). Qualitative research encompasses a range of techniques, including interviews, observations and focus groups as it places an emphasis on the use of language rather than quantification during the collection and the analysis of the data (Hammersley, 2013).

Quantitative research is generally about collecting numerical data and statistics and employs closed questions to examine the relationship among variables for the purpose of theory testing. As Creswell (2014) has pointed out, in contrast to qualitative research, quantitative research begins with hypotheses and/or predetermined objectives, which are tested, thereby “explaining phenomena by collecting numerical data that are analysed using mathematically based methods (in particular statistics)” (Muijs, 2011, p.1). The techniques employed in quantitative research are most typically surveys and experiments (Henn et al., 2009) for these are deployed to understand the causal relations

between two or more variables. The difference between qualitative and quantitative research as identified by Blaxter et al. (2010) is provided in table 3-1 below.

Table 3-1 The difference between qualitative and quantitative research (Source: Blaxter et al., 2010, p.65)

<i>Qualitative paradigms</i>	<i>Quantitative paradigm</i>
Concerned with understanding behaviour from actor's own frames of reference	Seeks the facts/causes of social phenomena
Naturalistic and uncontrolled observation	Obtrusive and controlled measurement
Subjective	Objective
Close to the data: the 'insider' perspective	Removed from the data: the 'outsider' perspective
Grounded, discovery oriented, exploratory, expansionist, descriptive, inductive	Grounded, discovery oriented, exploratory, expansionist, descriptive, inductive Ungrounded, verification oriented, reductionist, hypothetico-deductive
Process-oriented	Outcome-oriented
Valid: real, rich, deep data	Reliable: hard and replicable data
Ungeneralizable: single case studies	Generalizable: multiple case studies
Holistic	Particularistic
Assumes a dynamic reality	Assumes a stable reality

Mixed methods, refer to a combination of qualitative and quantitative approaches being employed within a single study. This method can provide strengths that offset the weaknesses of qualitative and quantitative research. That is, this treatment has the goal of producing results that amalgamate the strengths of both qualitative and quantitative methods (Creswell, 2009), and “for a more robust analysis, taking advantage of the strengths of each” (Ivankova et al., 2006, p.3). Several designs exist, in the mixed methods field, but three models are more common in the field of social science, as follow (Creswell, 2014).

- Convergent parallel mixed methods: occurs when both quantitative and qualitative methods are used simultaneously during the research.

- Explanatory sequential mixed methods: starts with collecting and analysing quantitative data which is then followed by the qualitative data. There are two consecutive stages in the same study.
- Exploratory sequence mixed methods: occurs by collecting and analysing qualitative data and then developing a quantitative study based on qualitative results; uses sequential timing.

3.2.1.1 Deductive or inductive approaches

Deductive research starts with the adoption of a general theory or assumption regarding a specific case, thus involving investigation as to whether this theory/assumption is supported by what is observed. In this way any hypothesis or research questions are constructed and tested on the basis of an existing theory. This approach is fundamentally linear and each step follows the other in logical sequence (Bryman, 2012). Most quantitative studies are deductive (Bryman & Teevan, 2005), with the researchers drawing certain predictions from propositions contained in theory and subsequently collecting data to see if they support these (Sim & Wright, 2000).

Inductive research is generally described as moving from small and specific facts, towards making broader generalizations, theories and hypothesis based on them. Case (2008, p.179) pointed out that this method “examines particular instances and reasons toward generalisation” and it is mainly associated with qualitative procedures (Sim & Wright, 2000; Case, 2008). According to Vaus (2001), although these two types of research approaches are frequently presented as two separate research modes, they should be considered as being part of a continuum, and Bryman & Teevan (2005) have suggested accepting them both as valid perspectives, rather than pitching one against the other. In other words, these two approaches can provide complementary data in support of each other and hence, much contemporary research entertains both.

3.2.1.2 The purpose of research

“The purpose of research may be organised into three groups based on what the researcher is trying to accomplish – explore a new topic, describe a social phenomenon, or explain why something occurs.” (Neuman, 2007, p.15). There are many ways of classifying research and one way is according to its purpose. Robson (2002) stated that a research study has to have the purpose of contributing to knowledge. Three possible

means of contributing are frequently mentioned in the literature, i.e. exploratory, descriptive and explanatory (ibid). According to Gray (2009) ‘interpretive research’ should be added as the fourth to this series. A study may just have one main focus or combine several.

- Exploratory research

Exploratory research is conducted when investigating an issue that has not yet been clearly defined. It is applied to subject matter of interest that needs to be explored, with the purpose of generating theory or hypotheses subsequent to collecting data. It can involve such techniques as literature reviewing, conducting interviews or holding focus groups (Saunders et al., 2009).

- Descriptive research

The purpose of descriptive study is “to portray an accurate profile of persons, events or situations” (Robson, 2002) in order to be able to describe the different characteristics of a particular phenomenon. Generally, this form of study tries to map the picture of a situation, person or occasion, so as to explain how things are linked to each other (Gray, 2009).

- Explanatory research

Explanatory research is carried out when the research area has already been thoroughly investigated and hence, the field can be considered as being mature. Explanatory research tries to explain a situation or a problem (Robson, 2002). The aim is to enhance understanding of concepts obtained from the exploratory research (Bryman, 2001).

- Interpretive research

Interpretive research seeks to explore peoples’ experiences and their views or perspective on these. Consequently, interpretive studies are, typically, inductive in nature and most often associated with qualitative approaches to data gathering and analysis.

The key differences of the first three purposes of research are revealed by Neuman (2007) as shown in Table 3-2.

Table 3-2 The purpose of research (Source: Neuman, 2007, p.15)

<i>Exploratory</i>	<i>Descriptive</i>	<i>Explanatory</i>
Become familiar with the basic facts, setting, and concerns	Provide a detailed, highly accurate picture	Test a theory's predictions or principle
Create a general mental picture of condition	Locate new data that contradict past data	Elaborate and enrich a theory's explanation
Formulate and focus questions for future research	Create a set of categories or classify types	Extend a theory to new issues or topic
Generate new ideas, conjectures, or hypotheses	Clarify a sequence of steps or stages	Support or refute an explanation or prediction
Determine the feasibility of conducting research	Document a casual process or mechanism	Link issues or topics with a general principle
Develop techniques for measuring and locating future data	Report on the background or context of a situation	Determine which of several explanations is best

3.3 Adopting a research strategy

As mentioned earlier, the use of a combination of qualitative and quantitative approaches does not only provide the best information, but also can result in a better understanding of the research problem than solely using one alone. This current study benefits from an exploratory sequence of mixed methods in which time is taken to understand residents' needs and requirements by first using qualitative methods with a small sample of residents (chapter 4). The data obtained from the first phase (the qualitative stage) was drawn on so as to carry out a second quantitative phase (chapter 5).

As the primary phase of this study involved in-depth interviewing of the key customers (residents), an interpretivist epistemology is deemed to best capture the theoretical approach taken by this researcher. Moreover, the investigation is inductive in orientation and moves from the particular towards being able to make broader generalizations. That is, the study started with the sounding out of customers' views to

provide data to inform the second research stage in order to make broader probabilistic generalizations whilst the needs and requirements of the customer remained fundamental to this study.

3.4 General research methodologies

This study primarily investigates residents' requirements as a construct for establishing priorities regarding their quality attributes which are then used as the basis for increasing residents' satisfaction. In order to adopt an appropriate methodological framework for this research, several research methodologies were reviewed (Howard & Sharp, 1983; Robson, 2002; Blessing & Chakrabarti, 2009; Gill & Johnson, 2010), as an appropriate one needed to be selected to address the research questions identified in the research. This also helps with "turning the research questions into projects" (Robson, 2011, p.70).

The seven step sequence proposed by Howard & Sharp (1983) and Gill & Johnson (2010) (see Figure 3-1 below) was deemed appropriate to apply, in broad terms, to this study. The steps can be subdivided into three main parts: the first pertains to deciding what to do (steps 1-2), second, how to carry it out (steps 3-4) and lastly, executing the research (steps 5-7).



Figure 3-1 The research sequence (Source: Gill & Johnson, 2010)

Robson (2002) proposed a similar outline for designing scientific research, which applies to this research, given its real world aspect and ethical implications. It states that there are five elements that social scientists and practitioner-researchers need to take into account when deciding on their methodological strategy (see Figure 3-2). In this research, these elements have been considered in order to specify the techniques and tools for data gathering and analysis.



Figure 3-2 Research methodology in social sciences (Source: Robson, 2002)

In the following sections, two more methodologies are reviewed so as to be able to adopt an appropriate strategy.

3.4.1 Design Research Methodology (DRM)

A methodology which is worthy of consideration for this research is the design research methodology (DRM), as proposed by Blessing and Chakrabati (2009). The DRM is widely accepted as a general methodology for research, which has been used in full or in a partly modified format, in various studies (Ahmed, 2000; Dong, 2004; Cardoso, 2005; Gupta, 2007; Cifter, 2011). It involves a four-stage process (see Figure. 3-3). The stages can be carried out to various degrees of intensity but they must be completed in the specified order (Blessing & Chakrabati, 2009). That is, the received knowledge within the descriptive study I has to be used within the prescriptive study with the support of design development. Afterwards, the process should be completed with an evaluation within the descriptive study II.

The four stages consist of the following:

Research Clarification: The DRM is initiated with the listing of the success criteria which form the objectives of the research (Blessing et al., 2009).

Descriptive Study I: As reported by Blessing et al. (2009), the aim of this stage is to figure out the criteria in order to help the researcher with the identification of the influencing factors and their potential impacts on the success of the project.

Prescriptive Study: Having understood these influencing factors by drawing on the results obtained in descriptive study I, a prescriptive study is conducted in an attempt to develop a methodology (or a tool) to support the definition of the problem (ibid).

Descriptive Study II: This involves testing whether support can be found for the outcomes of the prescriptive study, i.e. whether the identified factors are sufficiently comprehensive to assess whether the overall aims of the research have been achieved (ibid).

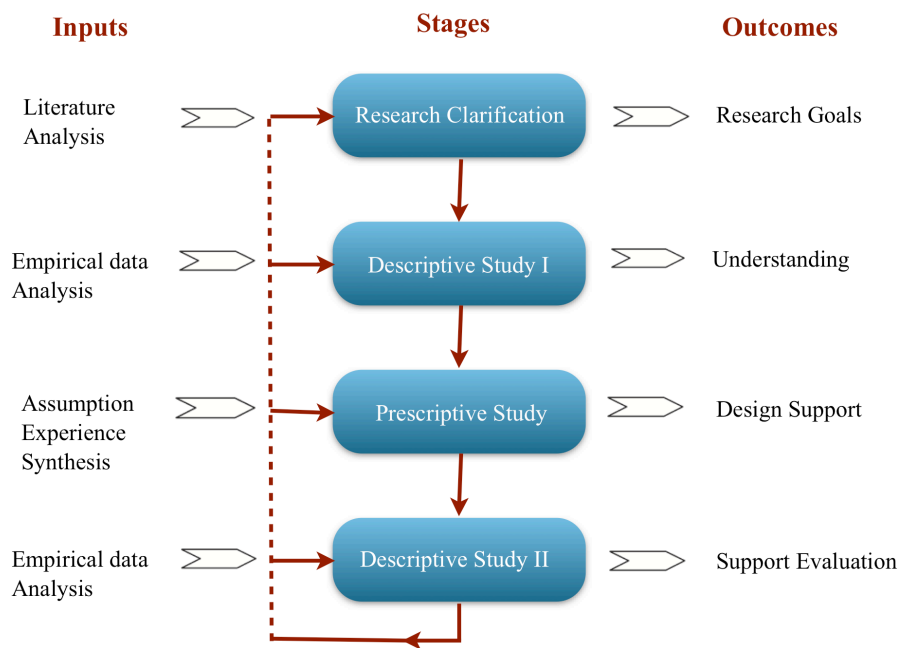


Figure 3-3 The DRM methodology framework (adapted from Blessing and Chakrabati, 2009)

The outcome understanding of descriptive study I in this research is identification of the customer needs. In order to accomplish this, the study, takes as its input the empirical data from customers. Subsequently, the prescriptive study was designated to translate the customer requirements into the appropriate service or product specification.

From the literature review, it has been established that quality function deployment (QFD) method is one of the most effective total quality management (TQM) methods in

the development of the quality of design. Therefore, QFD was decided on as the most appropriate means through which to work on customer needs as well as to translate the consumer demands into design targets.

3.4.2 The quality function deployment (QFD) method

The QFD methodology, introduced by Akoa in 1966 is “a design methodology based on customer needs” (Tontini, 2007, p. 600). The aim of applying this is to improve customer satisfaction, integrate customers’ needs in developing products or services as well as to enhance profitability (Andronikidis et al., 2009). It is widely known as one of the most useful tools in the translation of the voice of the customer (VOC) into product or service specifications (Kazemzadeh et al., 2009), and is widely used in product or services development and quality improvement (Tontini, 2007; Raharjo et al., 2011; Dror & Sukenik , 2011). Andronikidis et al. (2009, p. 320) stated that “a well-designed QFD process is able to link customer requirements, service specifications, target values and competitive performance into a visual planning matrix”. The process is shown in Figure 3-4 below, and generally begins by determining who are the key customers followed by a focus on customer needs and requirements. Next, their requirements are prioritised and measured then technical requirements need to be identified. Then a correlation matrix is developed to identify the relation between technical requirements and customer requirements as well as to measure and prioritise them. These measures are applied in order to design the process which will meet customer needs.



Figure 3-4 QFD as a process. Adopted from: Lim et al. (1999) and Zhanga & Awasthi (2014)

The QFD has been applied successfully in organisations and companies for product development, and in service industries to design and develop quality services, such as in the following sectors: hotels (Dube et al., 1999), retail (Hsu & Lin, 2006, Sher, 2006), banking (Ko & Lee, 2000, Gonzalez et al., 2004) and health care (Chaplin & Terninko, 2000; Aghlmand et al., 2008; Kuo et al., 2011). The QFD's popularity in many countries around the world and its widespread acceptance is attributed to the numerous benefits that it offers to researchers. In the extant literature, the major benefits of

utilising QFD are identified as including the following dimensions: reducing product or service development costs and time because it serves to decrease irrelevant processes and leads to fewer design variations (Bouchereau & Rowlands, 2000; Gonzalez et al., 2004; Carnevalli, et al., 2010), making sure that the voice of customers is effectively heard in the organisation and this leads to the improvement of customer satisfaction (Herrman et al., 2006); enhancing quality (Franceschini & Rossetto, 1995) and improving organisational performance (Gonzalez et al., 2004). Moreover, through the QFD process, the following can be achieved: capturing all the data for development of a good product or service by having this information organised effectively (Benner et al., 2003; Chan & Wu, 2002); setting targets for improvement through the effective use of competitive data (Akoa & Mazur, 2003); prioritising of customer needs and requirements based on customers' views (Aghlmand et al., 2010); bringing together numerous data in a compact and brief form in one diagram i.e. through the house of quality (HoQ) (Bouchereau, et al., 2000); and, improving effective communication in the organisation as well as enhancing team work (Chan & Wu, 2002).

In contrast, problems have been reported regarding the implementation of the QFD. These are briefly described. Commonly, it contains a large amount of data. This means that the HoQ could grow prohibitively large and complex (Bouchereau, et al., 2000; Kazemzadeh, et al., 2009), which suggests it can be time consuming and not easy to develop this HoQ model (Chan & Wu, 2005; Kazemzadeh et al., 2009). In addition, capturing customer requirements is not an easy task, as sometimes the voices of the customers are ambiguous as different people offer different perspectives and have divergent expectations (Bouchereau & Rowlands, 2000). These expectations can be mutually conflicting, resulting in challenges that cannot be solved easily (Kazemzadeh et al., 2009). Another difficulty is converting customer requirements into measurable service features (Chen et al., 2004) for creating the correlation between customer needs and service/product attributes is not straight-forward and can be time consuming (Bouchereau & Rowlands, 2000; Xie et al., 2003). Moreover, under this methodology it is assumed that the relationship between customer needs and service/product attributes is linear (Karsak et al., 2002). Finally, the challenge remains regarding the difficulty in prioritising customer requirements (Van de Poel, 2007).

The advantages and disadvantages of utilising the QFD reveal the need to find a new approach for improving the effectiveness of the QFD process. To mitigate the drawbacks as well as to improve on the QFD methodology, some researchers have recommended combining the QFD with other methods and tools. With regards to this, according to Abu-Assab (2011) numerous studies have utilised quantitative methods such as the analytic hierarchy process (AHP), whilst some marketing researchers have proposed combining benchmarking, regression analysis and conjoint analysis to overcome the vagueness and inaccuracy of the QFD. Fuzzy logic has also been used in the QFD process. Some researchers have tried to enhance or modify the QFD by applying some quality tools to the QFD, such as the Kano model and the Six Sigma.

In the literature and to this author's knowledge, there are just two articles that have applied the QFD approach to care home settings, and both were carried out in Taiwan (Chang, 2006; Yeh & Chen, 2014). The first one (Chang, 2006) adopts the concept of fuzzy theory into the relevant calculations. It classifies the main residents' needs into five main groups: 1) Taking care of patients' livelihood, 2) Nursing staff's personal attitude, 3) Food and environmental hygiene, 4) The hardware of the institution, and, 5) Medical treatment services. This study has some obvious deficiencies. First no specific method or a criterion was used for choosing the main customer group. The evaluation factors were chosen by residents and family members, but in fact, it is preferable that the needs and expectations of customers have to be determined without prejudgment and should be initiated by the key customers. Moreover, in this particular investigation, the residents' needs were considered as just being linear in nature.

The second article was also carried out in Taiwan (Yeh & Chen, 2014) and was published recently after the publication of the paper from this current thesis (Shamshirsaz & Dong, 2014). In this very recent study, the selection of the different customer groups was not soundly made, for, although it considered the residents as the main customers, in addition, family members and professionals were asked what was important to them. Moreover, the interviews were held with professionals instead of residents and the questionnaires for evaluating service quality were designed according to these professionals' views. The questionnaire were distributed to residents for completion, but instead of just relying on the residents' replies, family members, other relatives and friends were also asked to respond. When the data was analysed, the

responses of the residents and family members were not treated separately. Dijkstra & Van der Bij (2002) have pointed out that on many occasions the needs and expectations of different customer groups may conflict and, thus this study by Yeh & Chen (2014) has only responded to a very small part of customer needs and expectations.

Clearly, there is not much experience of using the QFD method in care home organisations. One of the main reasons for this is may be the complex nature of care processes. In general, promoting the quality of processes by employing the QFD method is more difficult in organizations providing services, as compared to organisations producing physical goods. This is because the ultimate proceeds of services in contrast to products tend to be non-tangible, used immediately and not easily measured. The administrative problems encountered in organisations providing care services such as care homes are more involved than for some other service sectors, due to the complex nature of many care processes. Many interactions in care processes invariably rely on measurement by complex and varied data collection methods and, in practice, breaking down and analysing these interactions is very difficult. Moreover, customer groups in service settings, in contrast with production processes, are not homogenous and equal in terms of their characteristics. In this current study, this researcher tries to overcome the above-mentioned deficiencies by employing additional different tools and methods to enhance the QFD, which are described in the following sections.

3.5 The research methodology applied in this study

A number of relevant methodologies were reviewed in the previous section and taking into consideration the nature of this research as well as its aims and objectives, a specific research methodology was designed. This process is outlined below.

Gill & Johnson (2010) and Robson's (2002) frameworks (see Figures 3-1 and 3-2 above) were adapted for mapping the path by which this researcher could decide what to do and how to do it for carrying out the research study. Robson's (2002) framework was also employed to guide the selection of methods (see Figure 3-2 above). For this thesis it is deemed appropriate to integrate the two approaches of the quality function deployment (QFD) methodology (Akao, 1990) and the design research methodology

(DRM) (Blessing and Chakrabati, 2009). The figure below (Figure 3.5) shows the design of the current research endeavour.

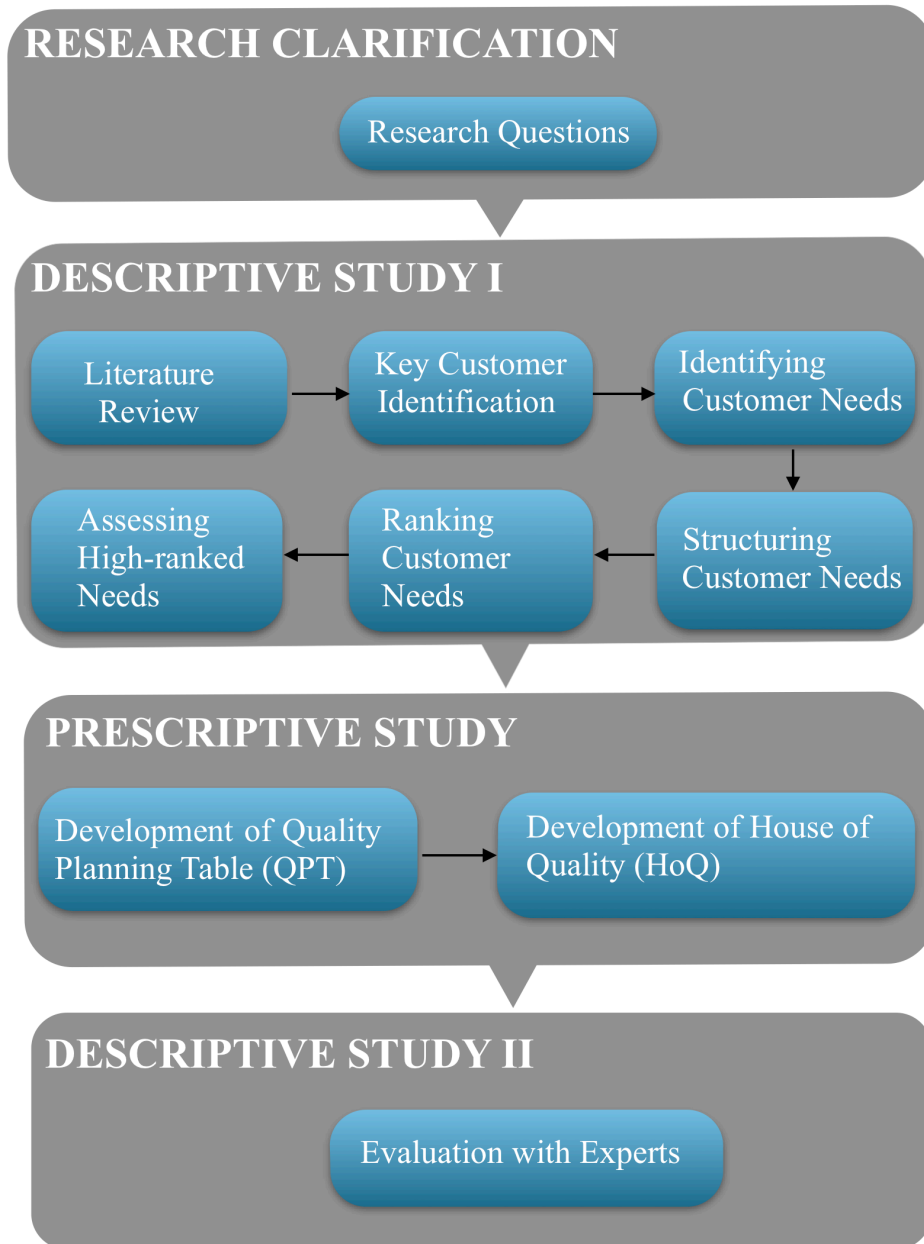


Figure 3-5 The Research Methodology for this study

Each stage is described briefly in the following section, and further detailed in their respective chapters.

3.5.1 Research Clarification

Chapters one and two have contributed to the clarification of the research process. In chapter one, the aims and objectives are clearly stated along with the exploration of the

context under which the research has been carried out. Further, chapter two explores the available literature and points out the gaps in this.

3.5.2 Descriptive Study I

The descriptive stage of the research consists of two main data collection techniques: 1) a semi-structured interview with care homes' key customers and 2) a survey regarding the main customer needs and requirements, as identified through interview.

These techniques were selected because they are well-established methods for exploring attitudes and perceptions (Robson, 2002). The following paragraphs give a brief introduction to each data collecting activity, with a summary of the results gained from these. The methods and results of each of the descriptive aspects of the data gathering are discussed further in chapters 4, 5 and 6.

3.5.2.1 Technique 1: The semi-structured interviews with care homes' key customers

Semi-structured interviewing with key customer was undertaken to gain an in depth understanding of customers' needs and requirements. Several processes were applied in order to capture, organise and prioritise customer needs and requirements.

3.5.2.2 Key customer identification

As one of the objectives of this thesis was to investigate the satisfaction of the key customer in care homes, the first step was to identify who this person was (Wagner et al., 2004). With respect to this, Cohen (1995) argues that a stakeholder can be anyone who is affected by the product or service in question.

From the wide range of customers and stakeholders, the first task was to pinpoint which customer was perceived to have the greatest influence on the decision whether to use or not to use care home services. Different customers were identified through reviewing the literature and brainstorming with a manager in a care home. It was ascertained that the different customer groups would not necessarily have the same needs and requirements and consequently, a distinction was made between internal and external clients. For identifying the key customer, several ranking scale methods were reviewed to select an appropriate one for this research. This is discussed further in section 3.5.2.5.1.

Following this review of the available ranking tools, the analytical hierarchy process (AHP) (Satty, 1995) using a pairwise comparison matrix, was utilised in order to select and define clearly the main ('key') customer of the care home through comparing the needs of the different groups of internal and external ones. The AHP is used when there are combinations of several criteria to be measured and a set of different decisions to be made. Moreover, this technique is useful for decision making in a wide variety of complex, unstructured situations.

Saaty (2008) reported that the AHP consists of three main elements: hierarchies, priorities and logical consistency. The primary advantage of the AHP is its use of pairwise comparisons to obtain ratio scale priorities or weights as opposed to arbitrarily assigning these (Liberatore & Nydick, 2008). Ratio scales among alternatives allow decision makers to measure both tangible and intangible factors (Liberatore & Nydick, 2008). Table (3-3) summarises the benefits of adopting the AHP for problem solving and decision-making.

Table 3-3 Advantages of the Analytical Hierarchy Process. Adopted from Saaty (1993)

<i>Advantages of the AHP</i>	
<i>Unity</i>	The AHP provides a single, easily understood, flexible model for a wide range of unstructured problems
<i>Complexity</i>	The AHP integrates deductive and systems approaches in solving complex problems
<i>Independence</i>	The AHP can deal with the interdependence of elements in a system and does not insist on linear thinking
<i>Hierarchic Structuring</i>	The AHP reflects the natural tendency of the mind to sort elements of a system into different levels and to group like elements in each level
<i>Measurement</i>	The AHP provides a scale for measuring intangibles and a method for establishing priorities
<i>Consistency</i>	The AHP tracks the logical consistency of judgments used in determining priorities
<i>Synthesis</i>	The AHP leads to an overall estimate of the desirability of each alternative
<i>Trade-offs</i>	The AHP takes into consideration the relative priorities of factors in a system and enable people to select the best alternative based on their goals
<i>Judgment and Consensus</i>	The AHP does not insist on consensus but synthesises a representative outcome for diverse judgments
<i>Process Repetition</i>	The AHP enables people to refine their definition of a problem and to improve their judgment and understanding through repetition

In this context the AHP was deployed for identifying the key customer. Once this process was completed, it emerged that the residents formed the primary ‘key’ customer group. This is discussed further in section 3.5.3.5.1.1.

3.5.2.3 Identifying customers’ needs

Given that a key aim of this study is to capture the expectations of residents and to improve the residents’ satisfaction and quality of care homes based on their perspectives, the next step was listening to the voice of customers (VoC) i.e. the group that had been identified as the main stakeholders (Lloyd, 2004, Aghlmand et al., 2010). The VoC data, which can be captured by direct or indirect questioning, gives the

decision makers the opportunity to identify customer requirements and preferences as well as their levels of satisfaction.

After the identification of the key customer (the resident) the VoC was applied to extract those elements of information about residents' needs and requirements, otherwise termed as demanded qualities (DQs). This part of the investigation rests on the argument that "nursing home residents are individuals with their individual background, but they also have a shared meaning of the experience of living in a nursing home. By comparing and contrasting the individual interpretations of meaning, it could be synthesized into more general accounts" (Nakrem et al., 2011, p.1359). For this stage, although the aim was to identify the full range of residents' requirements, this undertaking did not necessarily require fieldwork that met the criterion of it being statistical representative of residents' possible DQs. See chapter 4, sections 4.2.6, 4.2.7 and 4.2.8, in which the capturing of the DQs is fully set out.

3.5.2.3.1 Small- scale approaches for gathering customers' requirements

To capture VoC data a variety of methods can be used, such as brainstorming, focus groups, interviews, customer remarks and complaints (Lim et al., 1999; Duhovnik et al., 2006). The most appropriate in health care research are interviewing, focus groups and questionnaires (Ritchie & Lewis, 2003; Gerrish & Lacey, 2010). These methodological techniques are described below.

- ***Brainstorming***

The brainstorming method is widely used for gathering information on customer needs and requirements as well as to generate creative ideas in the organisation by allowing group members to share (Duhovnik et al., 2006). Dennis et al. (2013, p.140) suggested that four rules should be taken into account for improving the effectiveness of brainstorming: "(1) producing a large quantity of ideas, (2) ruling out criticism, (3) freewheeling (wild/weird ideas) must be accepted, and (4) combining and improvising ideas should be encouraged".

- ***Focus groups***

For gathering information and data collection for addressing overarching questions, the focus group has been termed a "valuable strategy for the qualitative researcher"

(Streubert & Carpenter, 2011, p.37), because it is ‘inexpensive and flexible’ (ibid) and economical (Applebaum et al., 2000). However, one disadvantage can be the influence of one member of the group in terms of excessive verbalisation (Carey & Smith , 1994). It is recommended that the number of group members should not exceed ten in general for the conversation to be heard, and be limited to five or six when working with frail elders. The session is led by a facilitator and the participants’ inputs are noted, but this process can be challenging owing to participants’ limitations (Applebaum et al., 2000).

- ***Interviews***

One of the most common methods for collecting qualitative information is the interview, through which a dialogue is conducted between the interviewer and the interviewee enabling the researcher to capture detailed information on customer needs. Open-ended questions set in face-to-face interviews held at a time and in a place that is comfortable for the interviewee and interviewer can create an atmosphere in which the participants can fully describe their experiences (Streubert & Carpenter, 2011).

Three types of interviews are frequently mentioned in the literature, i.e. fully structured, semi-structured and unstructured interviews (Robson, 2011). The fully structured interview is a quantitative research method with a fixed format that is usually applied in survey research. As Robson (2011, p. 279) emphasised ‘the use of a greater number of open-response questions is the only essential difference from an interview-based survey questionnaire’. The semi-structured interview is a flexible method, where the wording and order of questions can be changed; it also can be modified based on the flow of the interview. An unstructured interview is absolutely informal, in which the interviewer seeks to discover the interviewees’ opinions on the topic of interest.

- ***Customer remarks and complaints***

Customers often voice their discontent and bad experiences by making complaints. These are noted and gathered, usually in the form of qualitative data. Duhovnik et al. (2006, p. 72) explained a procedure for eliciting customer needs from customer complaints as being based on the following steps:

- “Step 1: random retrieval of a certain number of complaints from the database;

- Step 2: translation of complaints into positive expressions and concepts, which represent the hidden needs of the customers, as expressed by the complaint;
- Step 3: removal of duplicates;
- Step 4: marking each expression obtained from customer complaints; and,

Step 5: combining customer complaints with expressions obtained by other methods”.

- ***Interviews***

Interviews have been found to be the most useful technique when the conversations are carried out with specific objectives in mind. Robson (2002) has suggested that with the help of this technique, one can explore the factors that are related to the beliefs and actions of human beings. Various other researchers such as Saunders et al. (2009) and Easterby-Smith et al. (2002) have differentiated between semi-structured and un-structured forms of the interview.

When the sample size is not too large, then it is appropriate to use semi-structured or un-structured interview techniques for conducting qualitative research, as this approach relies on data gathered from closed and open questions and is commonly carried out face to face (Saunders et al., 2009; Fontana & Fery, 2000). However, when the data for the research is quantitative in nature and covers a large sample, then structured interviews with a standard set of questions are preferable (Bryman, 2001). Primary data collection through strictly structured interviews, that is, following a pre-determined set of questions contained in the interview schedule may result in imposing the views of the researcher rather than eliciting the perceptions of the respondents (Bryman, 2001).

Semi-structured interviewing with a small sample of customers is recommended as one of the best methods for obtaining essential data on customer needs and requirements (Mazur, 1997; Aghlmand et al., 2010). According to Abu-Assab (2011, p.53) “in the case of face to face interviews, more than 12 interviews are assumed to be enough to elicit the main relevant attributes”. Further, nearly 70% of customers’ needs and requirements (DQs) can be captured in as few as ten to twelve vocal communications (Pouliot, 1992). Some other researchers have highlighted that for garnering essential information from customers the optimal number of interviewees is between fifteen and twenty (Chaplin & Terninko, 2000; Aghlamand et al., 2010).

Additionally, semi-structured interviews may illuminate the perceptions of respondents as they give an opportunity to the researcher to further clarify any ideas raised with the respondent, forming a collection of rich data for future analysis (May, 2001). Therefore, semi-structured interviews were identified as one of the most suitable techniques for exploring the focal research questions in this study.

The data were collected through semi-structured interviews held with fifteen residents in three different care homes. In this way, the expectations, requirements and needs (DQs) of residents were identified as this technique helped the researcher to explore the opinions of these interviewees. Fourteen questions pertaining to the residents' life, expectations and preferences were included in the questions set out in the schedule for the interview (chapter 4, section 4.2.5, Table 4-2).

The semi-structured interview schedule contained open-ended questions so as to allow residents to give their opinions freely and in full. Thus, they had an opportunity to give important information, such as the reasons why some people prefer to live in care homes. Moreover, face-to-face interviews such as these entail observation of the non-verbal behaviour of respondents, which may help with interpreting the interview replies in an appropriate manner (Fontana & Fery, 2000).

During the initial steps, when refining the interview questions, pilot interviews were designed (Robson, 2002). Once the pilot interviews were completed, the need to change the interview technique was keenly felt. Thus, the experience of the pilot interviewing was beneficial since it demonstrated the need to think again about finding an appropriate strategy for carrying out the interviews, and this is described more fully in chapter 4, section 4.2.3.1 in this thesis. The data collected through the pilot interviews were not complete as no holistic view was added to the study, and so this data was excluded from the data analysis.

The researcher audiotaped each interview in turn, because writing down the interviewee's responses is not an ideal approach (Patton, 1980; Creswell, 2009) and may adversely affect the attention of respondents, as noted by Bryman (2001). However, these sessions were recorded only with the consent of the respondents. As the interviews are recorded verbatim, reviewing the records can take a lot of time, but it does allow the researcher to re-examine the responses when the need arises. The

decision was taken to hold the interviews in the residents' own environment for this is considered the best way discover their expectations and to identify opportunities for improving their customer experience (Mazur, 1997; Rings et al., 1998).

3.5.2.4 Creating Voice of Customer Table (VOCT)

Using semi-structured interviews with the residents provided a vast amount of information, such as: statements related to their problems, criticisms, complaints, ideas, solutions, wishes, and the respondents' needs. The data taken from the transcriptions obtained from the records of the interviews were entered in to the Voice of Customer table (VOCT) as this builds a useful structure for capturing essential information garnered from the customers (Chaplin & Terninko, 2000; Aghlmand et al., 2010; Shamshirsaz et al., 2012). The VOCT is a simple tool in which the information captured from the interviewee regarding the needs and requirements of customer can be noted.

3.5.2.5 Evaluating customer needs

There are several methods available for evaluating customer needs, which are discussed below.

3.5.2.5.1 Methods for evaluating customers' needs

For ranking customers' needs Chaplin & Terninko (2000) have suggested four methods that involve applying scales: five-point scales, an asymmetrical three-point scale, distribution of 100 points, and nine-point scales for pairwise comparisons. A definition of each approach based on Chaplin & Terninko's (2000) work is given as follows.

- ***Five-point scales***

This system provides ordinal data when carrying out a survey. It grades the expressed preferences according to whether an issue, for example:

The standard of service:

Does not matter/ Somewhat matters/ Matters/ Strongly matters/ Very strongly matters

The standard of service is:

Poor/ Below average/ Average/ Above average/ Excellent.

- ***Asymmetrical three-point scale***

This scale is used to correlate rows and columns in a matrix, based on the criteria, Strong/ Medium/ Weak.

- ***Distribution of one hundred points***

In a questionnaire, the customers are asked to distribute 100 points between the different elements of the needs, based on their importance.

- ***Nine-point scales for pairwise comparisons***

The pairwise comparison approach, the analytical hierarchy process (AHP) can create ratio rankings for all of the DQs and “it reduces complex decisions to a series of one by one comparison” (Van de Water & Vries, 2006, p.413).

In addition to the scaling approach, Duhovnik et al., (2006) have suggested four approaches to evaluating customer needs and requirements. These are shown in Figure (3-6), with the advantages and disadvantages of each given in detail.

Methods for evaluation of the data on customer needs			
Evaluation method	Description of the method	Advantages of the method	Disadvantages of the method
Combined method of sorting by relevance and assigning points to the needs	In this method the customers first sort the needs by relevance in descending order. Then they assign numbers from a 100-point scale to the needs, giving the highest number to the most important need and the smallest number to the least important need.	The method is easily comprehensible to the customers. They already make comparative decisions when selecting the order of needs and can easily assign values from the 100-point scale to different needs.	This method is difficult to carry out when more than ten needs have to be evaluated
Assigning 100 points among all customer needs	In this method, 100 points are distributed to the customer needs on the list.	The customers must make comparative decisions when assigning points and compare the needs relatively.	As the attention required from the interviewees is very high, a lot of time is necessary to assign the points to the needs, especially if there are more than ten needs.
Prioritization model 1-2-3	The prioritization model 1-2-3 is a method where customers first determine the needs they find most important. Then they select the second most important needs. The remaining needs are considered as the third most important. The analysts assign 5 points to the most important need of the customer, 3 points to the second most important needs and 1 point to the third most important needs. The sum of points for each need is the basis for determining the relative relevance of the needs.	The method is easy to comprehend and quick to fill in.	The method is slow when a large number of needs have to be dealt with.
Couple comparison method	In the couple comparison method, two needs are directly compared in order to determine the more important one. The need which was selected in favor of others most of the times, is ranked the highest, i.e., the most important need. The needs are sorted in matrix form and the results of comparisons are entered in the appropriate fields of the matrix.	The possibility to acquire relative relevance of needs.	The possibility of inconsistent judgments. Time-consuming when a lot of needs have to be evaluated.

Figure 3-6 Methods for evaluation of the data on customer needs. Taken from Duhovnik et al., (2006, p. 75)

After reviewing the models described above, the couple comparison method or the analytic hierarchical process (AHP), was deemed the most appropriate model for evaluating the DQs in this research owing to the variety of the criteria to be measured. That is, the AHP allows the researcher to use pairwise comparisons to enable decision making through considering many factors in complex and non-structured situations (Saaty, 1993). According to Sanjay Sarathy, (2011, p.9) this “method facilitates the incorporation of non-quantitative measures into the evaluation scheme, since it forces participants to translate all criteria into relative priority structures based on the scale. Thus, using the AHP means that non-quantitative assessments can be combined with quantitative assessments in rating a unit or an individual”.

3.5.2.5.1.1 Analytic Hierarchical Process (AHP)

The AHP developed by Thomas L. Saaty in the 1970s is used widely. It allows the decision maker to make better decisions regarding a wide variety of complex problems and unstructured situations so that s/he can structure circumstances in the form of a hierarchy or a set of integrated levels, such as: the goal, the criteria, and the alternatives (Dolan, 2008; Sarathy, 2011). Saaty (1995) reported that the AHP consists of three main elements: hierarchies, priorities and logical consistency. Under this process there is “the assignment of numerical values for subjective judgments on the relative importance of each variable, then a synthesizing of the judgments to determine which variables have the highest priority” (Sarathy, 2011, p. 9).

The primary advantage of the AHP is its use of pairwise comparisons to obtain ratio scale priorities, or weights, as opposed to the researcher arbitrarily assigning them. Put another way, “ratio scales are a natural means of comparison among alternatives and enable the measurement of both tangible and intangible factors” (Liberatore and Nydick, 2008, p.195). Dyer and Forman (1992) also recommend the AHP as a “compensatory methodology” which can connect tangible and/or intangible, individual and/or group values in group decision processes. Moreover, it can help the group to structure a group decision so that their discussion focuses on a goal, and Van de Water & Vries, (2006) commented that the AHP model is a practical option in complex decision making processes, due to its flexibility in combining qualitative and quantitative elements.

3.5.2.6 Technique 2: Preparation of the survey

According to Gray (2004), the main purpose of conducting a survey, which involves systematic data collection, is to generalise information for a population group.

3.5.2.6.1 Why use a questionnaire?

In this phase of the research a questionnaire was designed and used as the main tool of the data gathering. It is one of the most commonly used techniques of primary data collection in the field of social science and can unearth reasons for or explanations of people's opinions (Bryman, 2001; Robson, 2011). When recruiting subjects for the survey, sample participants are chosen from the target population. The outcomes from the collected data analysis are subsequently used by the researcher to comment on the opinions of the whole population based on the responses of the tested group (Robson, 2011). Data collection through the questionnaire method is quite straightforward to administer and it produces results quickly (Czaja & Blai, 1996; Fontana & Fery, 2000). Moreover, it saves research costs as compared to carrying out face-to-face interviews. On the contrary, it is possible that respondents may be confused and certain questions may not be sufficiently clear to obtain robust data with respect to specific issues (Czaja et al., 1996). Given that there are both advantages and disadvantages to this tool, the table below (Table 3-4) shows a comparison of the questionnaire and face-to-face interview approaches.

Table 3-4 Comparison of Approaches to Survey Data Collection (Source: Czaja & Blai, 1996 p.32)

<i>Aspect of survey</i>	<i>Self-completion questionnaire</i>	<i>Face-to-face interview</i>
Cost	Low	High
Length of data collection period	Long	Medium / long
Distribution of sample	May be wide	Must be clustered
Length of questionnaire	Short	May be long
Complexity of questionnaire	Must be simple	May be complex
Complexity of questions	Simple to moderate	May be complex
Control of question order	Poor	Very good
Use of open-end questions	Poor	Good
Use of visual aids	Good	Very good
Use of personal / family records	Very good	Good
Rapport	Fair	Very good
Sensitive topics	Good	Fair
Sampling frame bias	Usually low	Low
Response rate	Difficult to get high	Medium / very high
Response bias	Medium	Low
Control of response situation	Poor	Good
Quality of recorded response	Poor	Good

To achieve the objectives of the research as explained earlier, a questionnaire is deemed appropriate for assessing the high ranked DQs with the main goals being to assess:

- The residents’ preferences in relation to the high ranked DQs
- The level of satisfaction with the services provided by the organisation
- The level of basic, one dimensional and excitement needs (Kano levels).

3.5.2.6.2 What is the most appropriate questionnaire format to use in care homes?

Although Castle & Engberg (2004, p.359) stated that “no gold-standard measure of resident satisfaction exists” they carried out a comprehensive study of elders’ preferences using different response formats and identified eight of these as being commonly used for eliciting answers from elders. The eight response formats consist of: open ended ones, dichotomous ones (e.g. yes–no), Likert scales (e.g. asking the respondent whether they do not agree through to strongly agree with a statement), evaluations which are often in the form of a series of responses given in ordinal value (e.g. poor, good, very good), frequency related responses with ascending or descending values (e.g. all of the time, some of the time), satisfaction orientated responses which denote degree of satisfaction (e.g. very satisfied, satisfied), visual analogue formatted responses (also called graphic scaling) which deploy a pictorial scale that usually has an interval value applied to it (e.g. from 1 to 10) and, Chernoff faces which are pictorial

representations alongside Likert or evaluation-scale types of values (i.e. the faces have smiles and frowns to indicate the nature of the response) (ibid). Based on their reviews of experiences gained with long-term care surveys, studies of mental health care and general health care, these authors decided that five formats were appropriate and three formats should be excluded from their research: open ended, dichotomous and frequency ones. The foremost was excluded because of difficulties encountered when there was analysis of the scores, the second because of the limited information it provides and the last format was not used because it was not appropriate for use when using a large-scale survey tool to collect data.

Overall, an easily understood response format is needed for designing questionnaires for elders to complete. One of the formats advocated by Castle & Engberg (2004) is the Likert scale design and according to Mansfield et al., (2000, p.104) with the use of a Likert scale “rating and evaluations may be elicited on various aspects of long-term care, such as nursing care, physician care, physical environment, foods, activities and communication. The Likert scale elicits the degree to which respondents agree or disagree with the series of statements about care received”.

As discussed in the literature review, many of the extant studies have demonstrated that the Likert scale is commonly used by researchers to collect data from elders in care homes. Given the advantages and practicality for applying the Likert scale approach, a five item Likert-scale format (Hague, 1993; Gillham, 2000) was chosen as an appropriate one for the questionnaire in this investigation.

3.5.2.7 The survey to access and evaluate residents requirements

For assessing residents’ requirements the information obtained in the interviewing the previous phase was used to conduct a customer survey. The main purpose of this is to generalise the information to a population and involve systematic large-scale data collection (Gray, 2004). That is, data captured from applying the previous technique was tested with a larger sample of residents. The nature of the data captured from residents during the interviews, as described before, was qualitative in nature whilst the customer survey provided quantitative data from a larger sample of the population (Chaplin & Terninko, 2000). It should be noted that, as suggested by Gillham (2000), survey questionnaires are rarely adequate as a research method on their own, so using a

range of tools gives the researcher opportunities to build a more comprehensive picture of the focal issue being investigated.

As mentioned in the literature review, most residents in care homes suffer from health problems. One of the major health problems among residents is problems with vision which can make reading and answering a questionnaire more challenging. To this end, different factors that have been identified as influential factors impacting on older people responses and completeness of their questionnaire responses were taken into account in designing the questionnaires. These aimed to overcome the reading challenges and increase the questionnaire response rates, so for example, care was taken to only use white paper, black ink, large font size and a heavy grade of paper quality (Beebe et al, 2007; Taylor et al., 2008; Mallen et al., 2008).

The questionnaire designed for this part consisted of three parts, as described below.

Part 1 was designed to identify the importance of each customer need (DQs) relative to others. It gives residents the opportunity to choose one statement for each DQ, using a 5-point Likert scale (1: 'does not matter'; 5: 'very strongly matters'). The design and evaluation of part 1 of the questionnaire will be described in detail in chapter 5.

Part 2 was conducted to evaluate the level of residents' satisfaction with the given services in the care home. A 5-point scale (1 for 'poor'; 5 for 'excellent') allowed the participants to rate the services of their care home. The design and evaluation of part 1 of the questionnaire will be discussed in detail in chapter 5.

Part 3 was designed to categorise the attributes of customer needs and for this a Kano questionnaire was used. "The Kano model was first developed by Kano et al. (1984) to categorize the attributes of a product or service, based on how well they are able to satisfy customers' needs." (Shahin et al., 2013, p.342). In many studies the Kano model is integrated into the QFD to achieve more effective results regarding assessing customer satisfaction (Chaplin & Terninko, 2000; Tontini, 2007; Bayraktarog˘lu & O˘zgen, 2008; Chaudha et al., 2011). By utilising this model the particular attributes of the products/service which can have the greatest impact on customer satisfaction can be distinguished (Matzler & Hinterhuber, 1998). In the next section the Kano model and evaluation of the question are described.

3.5.2.8 The Kano model

In service industries, customer feedback is critical because it elicits the focal points for quality control and improvement (Mitra, 2008). Moreover, in a competitive market environment, providing high quality of service has been identified as a fundamental factor for achieving customer satisfaction (Carnevalli et al., 2010).

In most customer satisfaction programmes, the relationship between service attributes, performance, and customer satisfaction is determined as linear and one-dimensional (Sauerwein et al., 1996; Matzler & Hinterhuber, 1998). Meeting a customer's expectations, even at a very high level, does not always result automatically in his or her satisfaction, for other (additional) kinds of expectations that define the customer's perceived attributes of the service or product are linked to levels of customer satisfaction. Kano et al. (1984) identified that, in terms of overall customer satisfaction and dissatisfaction, the two concepts are independent, and service attributes do not contribute equally to them. With regards to customer satisfaction or dissatisfaction, the Kano model (Figure 3-7) rejects a linear representation of the relationship and distinguishes three levels of customer needs. These are: basic needs (dissatisfiers), expected or one-dimensional needs (satisfiers), and excitement needs or (delighters) (Shahin et al., 2012).

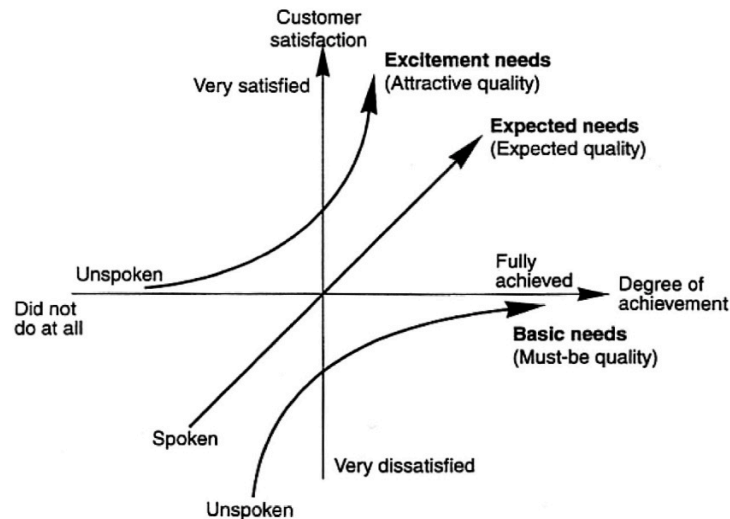


Figure 3-7 The Kano model

Source: Kvist & Bengt Klefsjo (2006), based on the original model presented by Kano et al., (1984)

Basic or must-be needs are so obvious to the customer that he or she may feel they do not warrant a mention. These remain ‘unspoken’ unless the service or product neglects to deliver them. Meeting these needs may not steeply increase customer satisfaction, however, their absence will undoubtedly provoke a strong negative customer reaction.

Performance or one-dimensional needs are related to customers’ expectations and the attributes of a product or service have a linear relationship with overall satisfaction. That is, the more effectively the product or service meets the customer’s needs, the higher his or her level of satisfaction will be.

Excitement or attractive needs refer to those needs that can surprise and delight customers. This type of quality is also described as the “wow” factor (Shahin et al., 2012). The customer is not aware of these unexpected needs (hence, they are ‘unspoken’), and thus their absence does not cause dissatisfaction. However, customer satisfaction will be increased when these attributes are presented. Service providers who realize and satisfy these create what is described as the “attractive quality”. This category of needs is not strictly limited to innovations related to technical products or services and include well-delivered or executed services that might be seen as exciting (Kvist & Bengt Klefsjo, 2006)

In order to identify these different forms of needs, customer requirements can be categorised through the use of the Kano questionnaire. A pair of questions is designed

for each requirement, regarding which the customer has the opportunity to answer in one of five different ways. The first part asks the customer how he/she feels if the feature of product or service is presented (i.e. the function form of the question), whilst the second part asks how the customer feels if the feature is not presented (i.e. the dysfunction form of the question). An example of the Kano questionnaire is show in Table 3-5.

Table 3-5 Paired questions for Kano questionnaire (Gupta & Srivastava, 2011)

Pert 3. Simply select the answer that seems most appropriate for you.		
1 a	How would you feel if X was provided? <i>(Function form of the question)</i>	1. I like it 2. I expect it 3. I feel neutral 4. I can tolerate it 5. I dislike it
1 b	How would you feel if X was not provided? <i>(Dysfunction form of the question)</i>	1. I like it 2. I expect it 3. I feel neutral 4. I can tolerate it 5. I dislike it

Customers' responses to paired Kano questionnaires fall into three levels: basic (B), one-dimensional (O), and excitement requirements (E).

3.5.2.9 Evaluating the Kano part of the questionnaire

The evaluation process for the Kano part of the questionnaire has two parts, first, classifying requirements according to frequency and second, the customer satisfaction coefficient, which are described as follows:

A. Classifying customer requirements based on frequencies

The Kano evaluation table (Table 3-6) is used to interpret the results of the Kano questionnaire.

Table 3-6 Kano evaluation table (Gupta & Srivastava, 2011)

<i>Interpretation of Kano Questions</i>		<i>How do you feel if X not provided?</i>					
		1	2	3	4	5	
		I like it.	I expect it.	I feel neutral.	I can tolerate it.	I dislike it.	
<i>How do you feel if X provided?</i>	1	I like it.	–	E	E	E	O
	2	I expect it.	R	–	I	I	B
	3	I feel neutral.	R	I	–	I	B
	4	I can tolerate it.	R	I	I	–	B
	5	I dislike it.	R	R	R	R	–

Note: E: exciting, B: basic, O: one-dimensional, I: indifferent, and R: reverse

If one customer, for instance, answers ‘I like it’ in the function form of the question and ‘I dislike it’ in the dysfunction form of the question, by combination of the questions based on the evaluation table, the need/requirement belongs to the ‘one-dimensional’ (O) category (Figure 3-8).

Pert 3. Simply select the answer that seems most appropriate for you.

1 a	How would you feel if X was provided? <i>(Function form of the question)</i>	<input checked="" type="radio"/> 1. I like it <input type="radio"/> 2. I expect it <input type="radio"/> 3. I feel neutral <input type="radio"/> 4. I can tolerate it <input type="radio"/> 5. I dislike it
1 b	How would you feel if X was not provided? <i>(Dysfunction form of the question)</i>	<input type="radio"/> 1. I like it <input type="radio"/> 2. I expect it <input type="radio"/> 3. I feel neutral <input type="radio"/> 4. I can tolerate it <input checked="" type="radio"/> 5. I dislike it

<i>Interpretation of Kano Questions</i>			Answer to dysfunctional question				
			1	2	3	4	5
			I like it	I expect it	I feel neutral	I can tolerate it	I dislike it
Answer to functional question	1	I like it		E	E	E	<input checked="" type="radio"/> O
	2	I expect it	R		I	I	B
	3	I feel neutral	R	I		I	B
	4	I can tolerate it	R	I	I		B
	5	I dislike it	R	R	R	R	

Customer requirement	A	B	O	R	I	Total	Category
1			1				O
2							
3							
...							

Figure 3-8 Classification based on frequency

After having combined all the answers based on the frequency of answers, the customer needs can be classified (Kano et al., 1984) as one of the following: B (basic), O (one-dimensional), E (excitement); I (indifferent) i.e. attributes of a product or service which have no significant impact on customer satisfaction or dissatisfaction, and, finally, R (reverse requirements) which indicate areas where the customer is less satisfied due to the presence of the product or service attributes and vice versa.

B. Customer satisfaction coefficient

The customer satisfaction coefficient was proposed by Berger et al. (1993) to express the quantitative value of satisfaction. It states the extent of customer satisfaction when the customer requirement is met or there is fulfilment of the requirement to the extent that this just prevents customer dissatisfaction. The formula for calculating the customer satisfaction coefficient is as follows:

Equation 3-1 Satisfaction Index

$$SI = \frac{f_E + f_O}{f_E + f_O + f_B + f_I}$$

Equation 3-2 Dissatisfaction Index

$$DI = -\frac{f_E + f_O}{f_E + f_O + f_B + f_I}$$

SI represents customer satisfaction and DI customer dissatisfaction. Also f_E, f_O, f_B and f_I means the frequency of E, O, B and I. A negative sign is put in front of the DI indicating customer dissatisfaction and in order to show its negative impact on customer satisfaction when the need is not fulfilled. The range of SI and DI can vary between 0 and 1. The positive SI coefficient value can fall between 0 and 1; when it approaches 1 it indicates that the influence on customer satisfaction is higher, and when closer to 0, it shows that there is very little influence. At the same time, the negative SI coefficient must also be taken into consideration, that is, the DI. When the DI value is closer to -1, it means that the effect on customer dissatisfaction is stronger when the product / service feature is not fulfilled, and when the value approaches 0, this indicates that this feature does not cause dissatisfaction if not fulfilled (Matzler & Hinterhuber, 1998; Chaudha et al., 2011).

3.5.2.10 Reliability of the customer survey

“Reliability shows the consistency and the stability of results” (Yeh & Chen, 2014, p. 179). To gauge the reliability of the three different questionnaire tools, the split-half or Cronbach’s α was applied to the data obtained from the pilot study. This evaluates the internal scale consistency measurement. This method, which splits data into two parts in every possible way, is a widely used method for reliability testing (Nunnally & Bernstein, 1994; Flynn & Percy, 2001). The method uses the following formula and calculations.

Equation 3-3 Cronbach’s α

$$\alpha = \frac{N^2 \bar{c}}{v + (N - 1) c}$$

Where:

n is the number of items

c is the average of covariance between the items

v is the average of variance within the items.

It should be noted that values between 0.7 and above of Cronbach’s α are acceptable values of consistency and any values below this can be considered as unreliable to a certain degree (Field, 2005). After reviewing the results of this testing for the pilot of the survey, the necessity for changing some aspects of the customer questionnaire was acknowledged, as is explained in full in chapter 5 (section 5.1.2). The following changes were applied. First, a bigger size of font was used for printing off the questionnaire; second, the third part of the questionnaire, which contained the Kano model related questions, was modified to having just three questions instead of five. The newly designed questionnaire was given to 102 residents in 35 care homes.

3.5.3 Prescriptive Study

The prescriptive study involves the development of the quality planning table (QPT) and the house of quality (HoQ) (as shown in Figures 3-11 and 3-12) to identify the elements for improvement in accordance with the information collected during

the ‘descriptive study I’. However, before creating the QPT and the HoQ, it is necessary to identify how we can integrate the Kano model into the QFD.

3.5.3.1 Integrating the Kano model into the QFD

Some researchers have proposed the integration of the Kano model with the QFD. To this end, Matzler & Hinterhuber (1998) suggested using the customer satisfaction coefficient as a supplementary tool in the QFD process. According to the outcome of their assertion, the features of the product should support three requirements. The basic requirements are essential; the performance requirements are optional to support competitiveness, and finally, the excitement requirements need to be outstanding. However, their work fails to describe the ways through which we can integrate the Kano model into the QFD process. By contrast, Tan & Shen (2000) proposed a method for its integration, presenting an approximate transformation function to adjust the improvement ratio of each customer attribute, worked according to the following equation.

Equation 3-4 The adjusted improvement ratio proposed by Tan & Shen (2000)

$$IR_{adj} = (IR_0)^{1/k}$$

Where IR_{adj} is the adjusted improvement ratios, IR_0 is the original improvement ratio and K is an adjustment factor; the value of K is different according to each Kano category. The authors indicated that K values could be ‘0.5’ for must be, ‘1’ for one dimensional and ‘2’ for attractive attributes. However, they noted that “the proposed approach is mainly concerned with adjusting the improvement ratio for the three basic Kano categories. Thus, the proposed transformation function is not applicable to other possible categories” (Tan & Shen, 2000, p.1147).

Tan & Shen’s (2000) proposed method increases the basic needs weight ($K=0.5$) and decreases the attractive needs weight ($K=2$). As mentioned before, these basic needs do not add any additional satisfaction to the customer, and as a result of this, the team could miss the opportunity to create attractive needs which have a stronger link to improving satisfaction.

Chaplin & Terninko (2000) proposed integrating the Kano model and QFD by identifying the Kano category for each customer requirements. However there is no

research available reporting on how the Kano category influences each customer requirement and the evaluation of the Kano categories' effects on each requirement is left open, being based on expert opinion alone.

A proposal that appears to offer more guidance is that given by Tontini (2007) for designing new products. In his study the customer satisfaction coefficients are used directly in the House of Quality (HoQ). The following equation was utilised:

Equation 3-5 Adjustment Factor

$$\text{Adjustment factor} = \text{Max}(|\text{SI}|, |\text{DI}|)$$

Where SI and DI are the satisfaction and dissatisfaction index, the adjustment factor is the higher absolute weight on SI and DI. In this case, more value is going on the requirements that bring more fulfilment when present, or that bring more dissatisfaction when absent (Tontini, 2007). Moreover, excitement, one-dimensional and basic requirements are taken into consideration based on the value of satisfaction or dissatisfaction that they may provide to the customer. According to this approach different requirements might be given the same value, which is not desirable.

Chaudha et al. (2011) proposed a function to adjust the traditional improvement ratio for each product or service feature in order to identify the importance of that feature. This will be useful “in developing a product or service in such manner that maximum customer satisfaction can be achieved” (Chaudha et al., 2011, p.689). The proposed function is as follows:

Equation 3-6 Adjusted improvement ratio proposed by Chaudha et al., (2011)

$$\text{IR}_{\text{adj}} = (1 + m)^k \times \text{IR}_0$$

Where IR_{adj} is adjusted improvement ratio, $m = \max(|\text{SI}|, |\text{DI}|)$, IR_0 is the traditional improvement ratio, and the value of K is varied based on the Kano category; values of 0, 0.5, 1, and 1.5 are assigned to the indifferent, must-be, one-dimensional and attractive requirements.

In this case, the highest value is allotted to the attractive requirements and the lowest value is assigned to the indifferent ones. This approach appears to be more logical than the other studies reviewed above. This is because in Chaudha et al.'s (2011) work more

weight is allotted to attractive requirements, as fulfilling these leads to enhancing customer satisfaction, while must-be requirements cannot raise customer satisfaction. In sum, compared with some others, this application appears to provide more discrimination between customer requirements and can find out which one has greater influence regarding their levels of satisfaction. For the current investigation, Chaudha et al.'s (2011) function is adopted to facilitate the integration of the Kano model and the QFD.

3.5.3.2 Development of the Quality Planning Table (QPT)

The integration of the survey (three parts of the questionnaire) into the quality planning table (QPT) was carried out, to verify the final relative importance weight of each DQ, by using an adjusting improvement ratio. The QPT is an effective tool for identifying how demanded quality (DQ) has been addressed by competitors, “it provides market data, facilitates strategic goal setting for the new or revised product or service, and permits comparison of customer desires and needs” (Cudney et al., 2012, p.50). The methodology adopted for this part (Figure 3-9) is based on Chaudha et al.'s (2011) proposed methodology for verifying the final relative importance weight of the DQs.

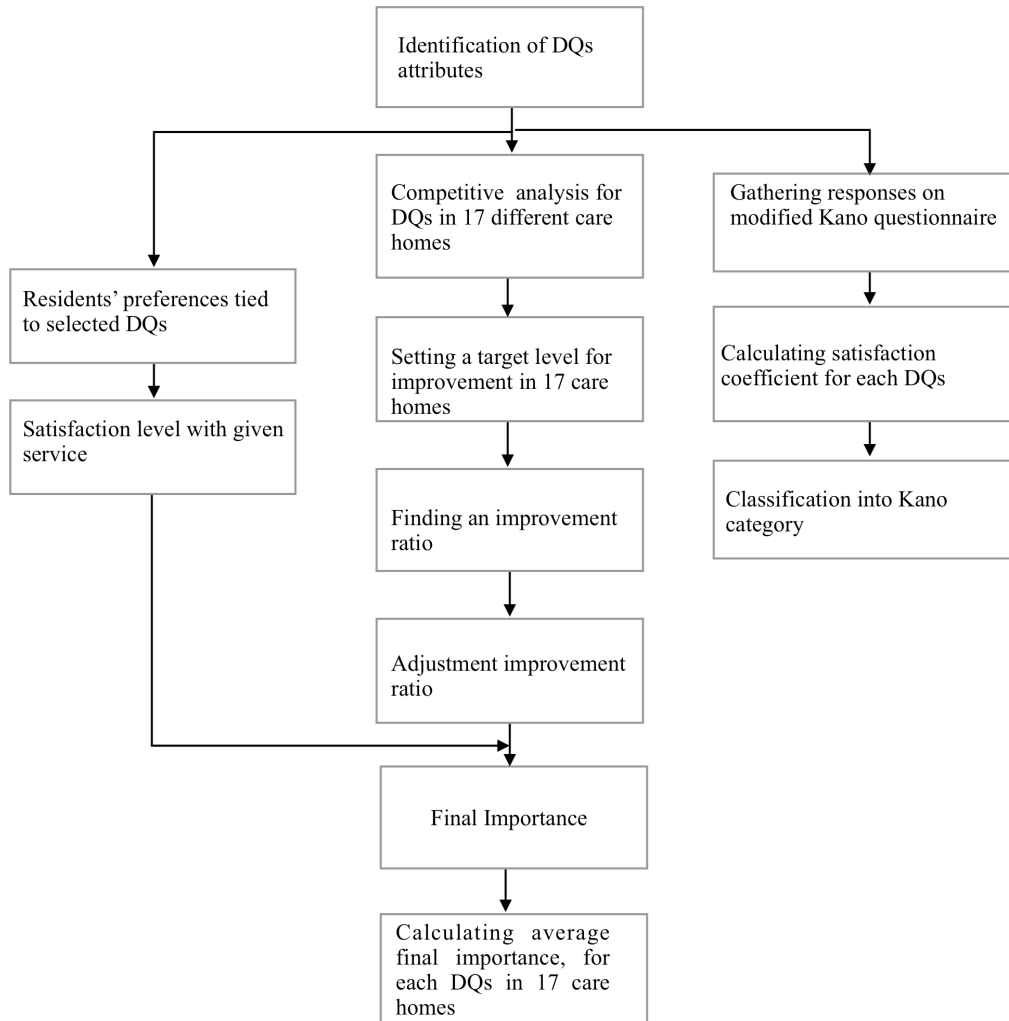


Figure 3-9 Adopted methodology to identify the final importance of DQs (adapted from Chaudha et al., 2011)

The QPT proposed by Chaudha et al. (2011) is shown in Figure (3-10). Using this template the data captured from customers is entered in the left-hand side of the table: the DQs, importance rating, competitive ranking, Kano category and the customer satisfaction coefficient. The target for improvement is listed on the right-hand side of the table along with composite data, under the team data heading.

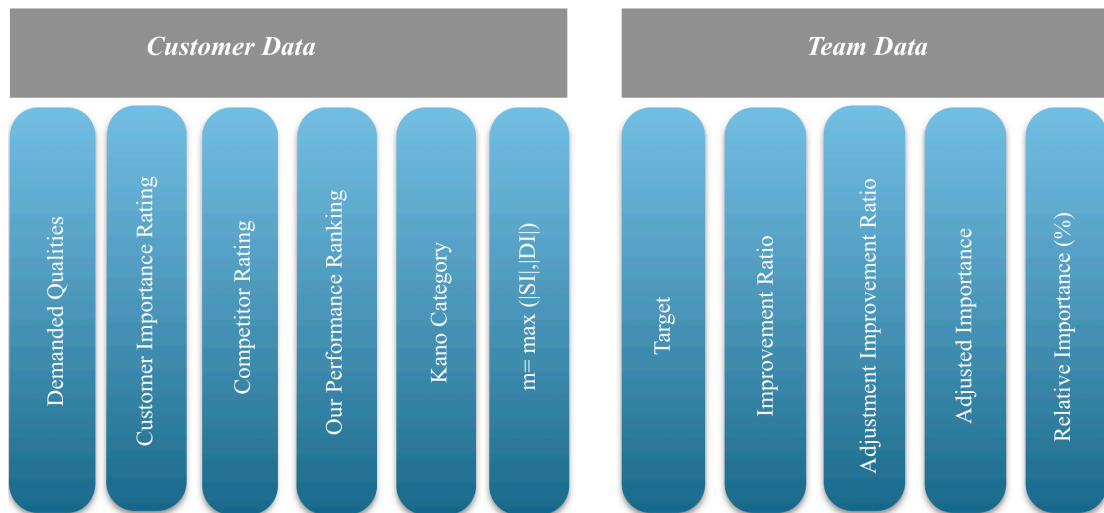


Figure 3-10 Quality Planning Table

In the last column of the care team data on the right-hand side of the table, the relative importance weight of each requirement was calculated and the investigation was completed with the assistance of the managers from the identified care homes. That is, the data from the survey carried out with the residents and the discussion sessions with care home managers, led to the weights of the needs and requirements (DQs) being calibrated, each weight representing the level of priority given to it with respect to its improvement. Brief descriptions of the column entries are given below.

- *Residents' needs and requirements or demanded qualities (DQs)*
- *Customer importance rating:* a rating of needs and requirements from the customer perspective (the data taken from the first part of the questionnaire)
- *Competitor ranking/our performance ranking:* a rating of the competitor and provider from the customer perspective (from the data collected in the second part of the questionnaire)
- *Kano level:* information garnered from the third part of the questionnaire
- *M:* is the higher absolute value of SI (satisfaction index) or DI (dissatisfaction index)
- *Target:* Based on residents' data (shown in the left side of the QPT), a target for residents' satisfaction is set for each requirement
- *Improvement ratio:* is the potential improvement for each requirement

- *Adjusted improvement ration*: Calculated by utilising the equation

$$IR_{adj} = (1 + m)^k \times IR_0$$

- *Adjusted importance*: Calculated by utilising the equation

$$\text{Adjusted importance} = IR_{adj} \times \text{Customer importance rating}$$

- *Relative Importance*: This is calculated by first summing all ‘Absolute importance’, and second, dividing each ‘adjusted importance’ weight, by the sum total and then multiplying by 100.

By constructing the QPT, the importance rating of each DQ for improvement can be identified and the organisation can set targets, while the services provided in the organisation can be compared to those of competitors. As this process was carried out for seventeen care homes, seventeen QPTs were generated and the average relative importance weight calculated, which is carried over as an input to the House of Quality that is discussed in the next section.

3.5.3.3 Developing performance measures

Next, customers’ requirements need to be converted into the quality characteristics (performance measures) that can be used to assess alternative systems for fulfilling the customers’ requirements. Through carrying out this stage the voice of the customer (VoC) can be translated into organisational measures (Chaplin & Terninko, 2000), which, when taken into account, can achieve customers’ needs. When developing performance measures (PMs) it should be kept in mind that these must be measurable (Hauser & Clausing, 1988; Haag et al., 1996), and any one PM may correspond to more than one of the many customer needs and requirements (Abu-Assab, 2011).

In this study, to identify the PMs, the cause and effect diagram (fishbone diagram) technique was deployed to explore all the potential causes that can have an effect on each DQ. This task needs an in depth knowledge of the matter at hand, so for generating the PMs an interdisciplinary team from the organisation should be formed to shed light on the topics (Abu-Assab, 2011). In this research this process was carried out in one care home with a team comprised of two staff members, two residents, the manager and the researcher. When the diagrams were completed, the PMs which can have the

greatest influence on each DQ were selected as the main performance measures. This is discussed in detail in chapter 6.

3.5.3.3.1 The Cause and Effect Diagram (fishbone diagram)

A cause and effect diagram gives the researcher the opportunity to identify key issues affecting a problem, and their linkages (Hignett & Griffiths, 2009). Therefore, it is used when identifying the causes of a specific event and/or the group of factors that can lead to quality issues. The method has been used to categorise the causes of many types of problems with which an organisation is confronted. In addition, this form of diagram is a helpful tool when brainstorming as it offers a conceptual map and structured approach for identifying the causes underlying a particular situation (Schippers, 1999; Hollowell & Mazurek, 2008).

As reported by Guo and Honglu (2011. p.438), “the value of the fishbone diagram is to assist teams in categorizing the many potential causes of problems or issues in an orderly way and in identifying root causes”. That is, its structure makes sure the team works systematically by using group knowledge of the process at hand and relevant performance measures or quality characteristics (Hekmatpanah, et al., 2011). Addressing the composition of the cause and effect diagram, it should be noted that the effect is usually a statement of the problem or symptom, which is designated as being the head of the diagram and the remaining associated issues are indicated by the vertical lines attached to the problem (i.e. the fish bones). These vertical lines, representing subcategories of the major categories of influencing issues, are labelled as cause and effect. Arrows demonstrating the influence of the cause are usually completed by the stakeholders holding brainstorming sessions (Hollowell & Mazurek, 2008; Silich et al., 2012) so that when the diagram is completed, it captures the main causes of each problem.

This researcher examined the interactive effects of the main DQs by constructing a cause and effect diagram for each one. The aim of creating the fishbone diagram in this phase is to identify the elements for each DQ and their components, and hence explain why the DQs may have occurred. For each DQ, by breaking down the information obtained and presenting it as a visual graphic, the essence of the significant elements impacting upon all the DQs was obtained.

3.5.3.4 Identification of the key performance measures (HoQ analysis)

To meet the foremost customers' demanded qualities (DQs) it is not necessary to improve on the all service areas covered by all the performance measures. According to the "general system theory" (Bertalanffy, 1950), the internal components of a system (i.e. performance measures) have internal interactions and interact externally with the environmental elements surrounding the system (i.e. these elements comprise the customer DQs). In other words, the upgrading of one performance measure (PM) can simultaneously lead to the upgrading of others with respect to meeting customer DQs. In view of this, the key PMs can be defined as the best combination of several measures which results in the highest upgrading in others. In addition, they meet the requested quality specifics of the customer. It is worth noting that this group of key PMs needs to address and encompass the whole body of the foremost DQs of the customer.

The HoQ analysis provides a unique toolbox for the detection of the key PMs and it takes the form of "the main representation for information gathered from customers" (Lai et al., 2007, p. 46). The HoQ process transforms an array of inputs into a set of outputs via the relationship and correlation matrices.

The inputs are:

- The most importance customer needs with their average importance relative weights (the outcomes of the QPTs)
- Performance measures

The outputs are:

- The main performance measures
- Absolute importance
- Relative importance

The goal of building the HoQ is to convert the customer needs and requirements into performance measures and allocate target values for the product or service (Abu-Assab, 2011). Figure (3-11) shows the HoQ.

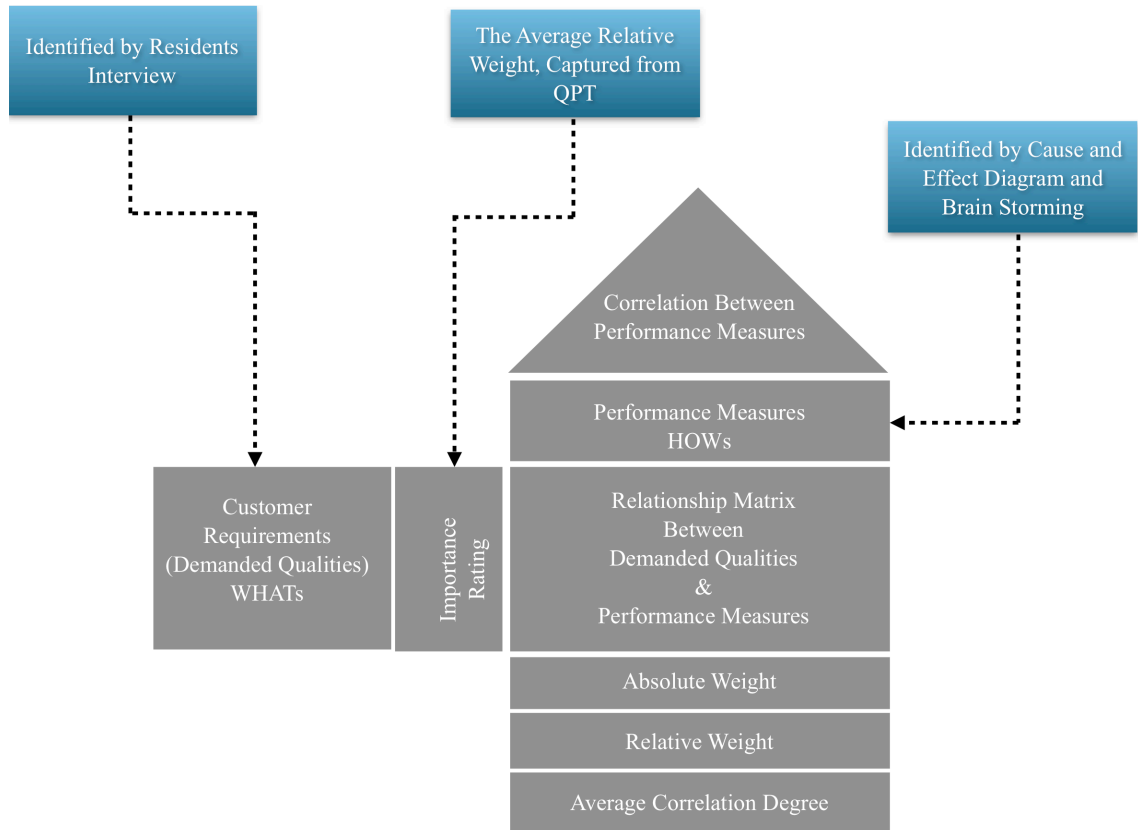


Figure 3-11 The House of Quality (HoQ)

For constructing the HoQ, the demanded qualities (DQs) i.e. “WHATs” with their average relative importance weight that were captured from the QPT are entered into the rows of the HoQ. Similarly, the performance measures (PMs) i.e. “HOWs” are listed in the columns of the matrix. Next, the strength of the relationship between each PM and each DQ is developed.

Cell-by-cell weighting was assigned based on the question: “If you know the value for the performance measure X, how well will it predict customer satisfaction for demanded quality Y?” (Chaplin & Terninko, 2000, p.147). The impact of a performance measure on providing DQs is classified as follows: strong: 9, moderate: 3, weak: 1 and none: 0.

The ‘absolute weight’ of each performance measure is calculated by utilising the equation:

Equation 3-7 Absolute Weight

$$AW_j = \sum_{i=1}^n (RW_i \times R_j)$$

Where

AW_j : absolute importance rating of PM_j

n : total number of DQs

RW_i : relative importance of the row (DQ_i)

R_{ij} : the strength of relationship between DQ_i and PM_j

The ‘relative weight’ of each performance measure is calculated by utilising the equation:

Equation 3-8 Relative Weight

$$RI_j = \frac{AW_j}{\sum_{j=0}^n AW_j}$$

The ‘roof’ of the HoQ is used to assess the impact that one PM has on another. That is, each cell of the roof is the intersection of two PMs. The relationship between each pair of these can be illustrated by asking the question ‘How does improving performance measure X cause deterioration or improvement in performance Y?’ and the impact is typically specified as ‘9: strongly positive’, ‘3: positive’, ‘-1: negative’ and ‘-3: strongly negative’. The ‘Average Correlation Degree’ of each performance measure is calculated by utilising the equation:

Equation 3-9 Average Correlation Degree

$$ACD_i = \frac{\sum_{i=1}^n C_{ij}}{n-1}$$

Where:

ACD_i : is the average correlation degree of PM_i

n : the total number of PM

C_{ij} : is the correlation between PM_i and PM_j

The overall weighting calculations lead us to identify which PMs have the greatest influence on customers’ satisfaction. A strong relationship between PMs and demanded quality shows that changing these PMs can significantly impact on customers’ needs and affect the total quality of the product (Bergquist & Abeysekera, 1996).

When the HoQ is completed, the PMs which have the highest relative weight and correlation, as well as a strong or moderate relationship with all the DQs are chosen as the key PMs. It is evident that a service providing these key PMs has the greatest impact on customer demands since through initiating a minimum number of improvements, the fulfilment of customers' requirements is achieved. It should be noted that all the above calculations were performed using QFD Designer V4.0 software. The whole HoQ process is described in chapter 6.

3.5.4 Descriptive Study II

Having completed the prescriptive study, the investigation moves into the descriptive study II which involves evaluation. Evaluation refers to “the systematic collection of descriptive and judgemental information necessary to make effective training decisions related to the selection, adoption, value and modification of various instructional activities (Mohamed & Sarlis Alias, 2012, p.1).”

In order to choose an appropriate evaluation model, a number of popular ones have been investigated, including: the decision-making approach introduced by Stufflebeam (1973) who described evaluation as a process of creating useful data for decision alternatives. The author proposed the CIPP model (context, input, process, and product) for such evaluation activities. Another approach is Patton's (1978) utilisation-focused evaluation, in which the decision makers and audiences should be clearly identified. In addition, the evaluators must be decided on all evaluation aspects, such as the evaluation questions, research design and data analysis.

However, in this phase the research draws on the Kirkpatrick model (Kirkpatrick, 1987) which introduces techniques for evaluating methods, tools and training programmes. It has been widely used in studies (Bates, 2004; Dong, 2004; Mcginley, 2012). It consists of four evaluation criteria, which correspond to four elements of training outcomes: reaction, learning, behaviour, and results (Kirkpatrick & Kirkpatrick, 2006).

Table 3-7 A conceptual framework of evaluation criteria

<i>Evaluation mode</i>	<i>Definition</i>
Reaction	The participants' reaction to the training programme (Did they like it or not?)
Learning	What the participants learnt from the session
Behaviour	To what extent can the knowledge and skills (trained) be applied on the job
Results	The scale of the impact of the training on the organisation

The evaluation was carried out with thirteen experts who were managers from care homes that had already been visited by the researcher. A pre-test questionnaire was carried out with managers to obtain a clear idea of their attitudes and knowledge related to the theme of the research. Subsequently, a training session on the research methodology was performed in which the aim, the process, the steps, the necessary tools and methods were thoroughly described. All the procedures and the materials presented by the researcher were scrutinised by both the participants and the researcher, which, led to a more in-depth question and answer session, as will be discussed in detail in chapter 7.

After the training session, the questionnaire that had been based on the Kirkpatrick model was given to the participants (care homes' managers). The open-ended questionnaire was used in order to facilitate comments and variety in the answers they were willing to give. The collected data from the questionnaire was evaluated by the researcher.

3.6 Chapter conclusion

In this chapter an account has been given of the different research strategies that were deployed in order to investigate and improve quality, based on the key customer voice. Different research approaches were discussed and subsequently the nature of the investigation and the epistemological stance justified. This study takes a theory building approach and is inductive, with the methods involving qualitative and quantitative

techniques. A number of research strategies were identified and from this the Design Research Methodology (DRM) and Quality Function Deployment (QFD) were adopted as the overall research methodology, giving four main phases for this study. For each step, the methodology has been explained with reference to different studies and methods. The ways in which these were applied for collecting data and subsequent analysis were discussed in full.

4 Study I: Identifying residents' needs and requirements in care homes

Sajid & Baig (2007) emphasised that for high quality services and care in a healthcare organisation, the ability of the provider to satisfy patient needs is of critical importance. Furthermore, Aghlmand et al. (2010) added that providers should listen carefully to their customers and look at the service provision through the patients' eyes. This chapter focuses on identifying care home customers in particular, the key customers, and subsequently eliciting and understanding their voices. For this study, which adopts a qualitative approach, a representative number of customers in the form of a statistically robust sample was not needed, as the goal is to capture in detail the range of requirements and the nature of patient experiences in the setting.

This chapter aims to address the first research question: "Who are the key customers and what are their needs and requirements?" To this end, the objectives are identified as follows:

1. Recognition of the main customers in care homes
2. Using the VoC for recording their needs and requirements
3. Identifying their main needs and requirements
4. Classifying and prioritising their requirements.

To identify the main customers the Analytic Hierarchy Process (AHP) method was applied and residents were introduced as the main customers in care homes. By using interview techniques, residents' needs and requirements were unearthed. As the voice of the customer (VoC) is usually mediated through others, such as professionals and families, the focus is put on the ways by which the main customer group, i.e. the residents, can speak out and be heard in their own voices.

Through the VoC an initial list of needs and requirements or demanded qualities (DQs) can be identified through data collection methods, such as: interviews, group discussions, and by applying recognised techniques such as the voice of customer table (VOCT), the affinity diagram, the AHP and analytical analysis. In brief, by applying a group discussion method and categorising the collected data, 28 main DQs were

identified and grouped. Subsequently, through applying methods for prioritising qualitative measurements, the list of main requirements were generated, which are elaborated on further in later chapters. These are used for improving the quality of life and enhancing residents' satisfaction in care homes.

4.1 Identifying the key customer segment

In many industries, the customers pay for the product and services, but in care homes as in some other health care organisations, who pays and who receives services are usually different parties (Lim et al., 1999), making the concept of the customer rather complex. As Kunkel and Wellin (2006, p.5) have noted, “the notion of who is the consumer in long-term care is an important policy and practice issue for those designing and testing long-term care service delivery systems”. Nonetheless, in this study it is necessary to identify the main customer in relation to the issue of improving care home quality. To do this, a focus group comprising a manger and two members of staff and this researcher was organised and a brainstorming session held during which, information from all parties was exchanged. Based on these discussions, the term customer was clarified and defined as including both external and internal individuals and organisations who use or provide services for the care homes. These are shown in Figure (4-1) below.

	Internal	External
Customers and Key Customer	Residents	Professional Services for Health & Welfare Dentist GPs District nurse Optician Psychologist Physiotherapist CPN (Community Psychiatric Nurse) Chiroprapist Hospital Ambulance Alternative Complimentary Services, Includes (Nail care and Massage)
	Family and Friends	
	Employees Admin Staff Care Home Manager Nursing Staff Volunteers Maintenance Staff Activity Staff Care Staff Auxiliary Staff	
		Regulator Responsible for Monitoring Quality (CQC)
		Referrals Agents Social Services Residents
		Payers Residents Social Services

Figure 4-1 Customers and stakeholders categorised according to their internal and/or external status

As shown above in Figure (4-1), a care home has multiple customers and more details outlining their relation to the home are listed as follows:

- *The residents:* Those *who* reside in care homes
- *The family and friends:* As many residents have cognitive impairments, their family or next of kin have a critical role regarding making decisions on their behalf and have an influence on residents' care home choices
- *The employees:* Any people who work in care homes and are paid by directly or indirectly by residents or other stakeholders
- *Professional services for health & welfare:* The organisations or individuals that provide services for the care home or support them, either through a financial contract or on a charitable basis

- *Regulator responsible for monitoring quality (CQC)*: The Care Quality Commission is responsible for all legal actions related to care homes such as: registering providers, inspecting, and ensuring compliance
- *Referral Agents*: Individuals or organisations in charge of making decisions for the elderly to move into or out of a care home
- *Payers*: Those who pay in full or part the actual cost of services in the care home.

Another significant issue is identifying who is the main customer amongst the residents, relatives, regulators and other stakeholders, for, in practice this could be deemed to be all of them. Moreover, numerous unintended consequences may result from missing any key customer in the initial stages of any product or service design (Chaplin & Terninko, 2000). Therefore, as a care home is a multi-customer facing enterprise, in any model for addressing quality one must take into consideration the expectations of the different categories of customers and note their definitions of quality with respect to the issue of care. That is, not all customers are equally important when designing products or services, and they may have different needs and requirements.

In order to understand the principal stakeholders and their priorities (Figure 4.1) in terms of their being internal and external, comparisons must be drawn. It has been found that people have difficulties when comparing more than seven items and the best outcomes are arrived at when people consider two items in direct pairwise comparison (Chaplin & Terninko, 2000). However, there are numerous methods for comparing several items and they can be used when there are combinations of criteria to be measured and sets of different decisions to be made. Duhovnik et al. (2006) described several approaches for evaluation of data and these are discussed in the next section.

The couple comparison method is frequently used in research, for it offers decision makers the opportunity to compare many factors that are seemingly complex (Saaty, 1993). This process utilises a pairwise comparison matrix and is termed the analytic hierarchy process (AHP). The AHP is used in this context to rank internal and external customers and the process will be described briefly in the following section.

Pairwise comparison matrix		Criteria to compare							Average Weight (%)
		Residents	Family and Friend	Employees	Payers	CQC	Referral Agents	Professional Services for Health/Welfare	
Criteria to compare	Residents	1	2	2	3	3	3	3	27.9
	Family and Friend	1/2	1	2	3	3	3	3	22.8
	Employees	1/2	1/2	1	2	3	3	3	17.4
	Payers	1/3	1/3	1/2	1	2	2	2	10.7
	CQC	1/3	1/3	1/3	1/2	1	2	2	8.4
	Referral Agents	1/3	1/3	1/3	1/2	1/2	1	1/2	5.6
	Professional Services for Health/Welfare	1/3	1/3	1/3	1/2	1/3	2	1	6.9

Figure 4-2 Pairwise comparison matrix created for identifying the main customers

After applying the AHP to the research, the residents were identified as the main or key customer with the highest weighting of 27.9 %, next, the family/friends were scored with an average weighting of 22.8 %, and the employees were third in the ranking with an average weighting of 17.4 %.

4.2 Voice of the Customer

“The voice of the customer (VoC) is a critical analysis procedure that provides precise information regarding customer input requirements for a product/service output” (Celestine et al., 2012, p. 10112). In order to create services, which can satisfy customer needs and requirements, listening to the voice of the customer (VoC) can serve as a useful starting point (Aghlmand et al., 2010). VoC analysis in this research is captured by direct or indirect questioning, and gives the researcher the opportunity to identify residents’ requirements, wants, perceptions, and preferences.

To better understand residents’ problems, expectations and requirements this researcher spent quite a long time in the target environment (Mazur, 1997; Rings et al., 1998). With respect to this, the Japanese coined the word *gemba*, the place in which source information can be garnered when undertaking this type of research (Akoa & Mazur,

2003). That is, gemba can be applied to the place where products or services are being used directly by the customers, such as hospital wards (Aghlmand et al., 2010) and in this place, i.e. the customer environment, we have the opportunity to deploy all five senses (sight, sound, touch, smell and taste) so as to observe the customers, recognise their requirements and thus provide ourselves with first-hand experience of whether and if so, to what extent, the products or services offered in the organisation meet their requirements.

After recognising residents as the main customers it is necessary to identify the residents' needs and requirements, so a gemba-style visit is used at this stage, usually termed a customer visit. At this point residents' problems and needs regarding the products or services can be verified. In sum, this researcher carried out gemba-style visits to care homes to understand deeply the residents' voice, their needs, requirements, expectations and also any problems they were experiencing.

4.2.1 Selecting care homes

In terms of capturing the voice of the customer (VoC), in this research three different residential care homes were chosen as sites for interviewing the identified key customer group, the residents. The care homes varied in size, number of residents, location, management, as well as with regards to the number of staff and facilities on offer.

Initially, several care homes were identified from the Care Quality Commission website and were contacted by email. They were asked to join in the project, but none of them were willing to participate in the research. Consequently, it was decided to call them and in considerably more detail, explain the aims of the research project to the managers. As a result, five out of twenty expressed an interest in the research, after having checked with their residents to see if they were willing to partake and collaborate in it. Then three out of the five were selected as the best nominees based on their ease of approach in terms of availability and population of the residents who could completely answer our questions. Two of the selected care homes were located in Peterborough, one with fifteen and the other having 35 beds. The third care home was located in west London and had 40 bed capacity.

Through the offices of the care homes, information was gathered regarding the physical and mental disabilities of the residents and it transpired that many residents had

cognitive and functional impairments, e.g. dementia, physical disabilities, hearing and sight impairments. All three care homes had residents with mixed capabilities and the age group ranged from 65 to 100 years old. The facilities were investigated and it was apparent that, in all the homes, there was a range of accommodation: shared dining rooms, gardens, living rooms, and public areas for gathering on different occasions such as for listening to concerts and partaking in exercise classes. In each care home the majority of residents lived in single rooms with en suite bathrooms, but in some cases there were single and double rooms with shared bathrooms.

4.2.2 Resident selection criteria

After negotiations with the managers and staff of the three selected care homes some residents were recommended as suitable subjects for interviewing, due to their better health conditions, sound medical records, and abilities for maintaining a logical conversation. Staff and/or the managers approached these residents and all of them who were happy to take part in the research were invited to be interviewed.

In sum, each resident was required to meet the following criteria in order to be eligible to participate in the study:

1. The ability to communicate
2. Could understand English
3. No diagnosis of Alzheimer's Disease
4. Physically able to participate in the research
5. Sufficient cognitive capabilities
6. Sufficient energy
7. To be able to focus during the interview
8. Residence in the care home for at least four weeks
9. Expressed an interest

Through following these criteria, the researcher recruited volunteers who could successfully participate in the interview process and managed to find suitable subjects across all three care homes.

4.2.3 Obtaining VoC data

After reviewing the different methods described in chapter 3 section 3.5.2.3.1, in this phase three of the possible methods were eliminated and the justification for this action is given as follows.

4.2.3.1 A pilot study focus group

In the beginning, a pilot focus group was arranged with five residents in one of the care homes in order to understand whether it was an appropriate method. The participants were asked to introduce themselves to the group by the facilitator (the researcher). They were then asked to exchange comments regarding their attitudes, likes and dislikes, criticisms and problems they faced every day in their home. Most of the residents seemed to be anxious and reluctant to open up the conversation. Some participants were quite frank and talked easily and, in fact, one was too talkative and fussy about details, which made the other participants become bored.

Table 4-1 Pilot study questions

<i>No.</i>	<i>Questions</i>
1	Please introduce yourself
2	How long have you been living here?
3	Do you like living here?
4	Do you like the services you receive?
5	Do you like the people here?
6	What activities do you like more? Why?
7	What activities do you dislike? Why?
8	Has anything bad happen to you here?
9	What services you like to receive or would you like to receive more of?
10	What are your problems here?
11	And what are your criticisms?

Sometimes one or two participants complained about being tired, being in pain or feeling impatient in the meeting. Considering the ethical principles for conducting the research, no pressure or no insisting could be applied to the residents who appeared to be spiritually and/or physically not ready for the meeting. The researcher had set the limitation of 30-45 minutes of allocated time for the session as this is a recommended time period (Quine & Cameron, 1995).

This pilot focus group revealed the fact that it was not an appropriate method for gaining an in-depth understanding of residents' needs and requirements for those residents in that particular care home. So the focus group was not applied to other residents in other care homes, mainly due to the residents' evident unhappiness during the meeting and other the problems mentioned above. This pilot also revealed that brainstorming could not be appropriate for data collection, because residents were not ready to share their ideas.

It was considered inappropriate to use customer remarks and complaints since this method could focus excessively on the dislikes of the individuals. In evaluating the quality of a phenomenon and its improvement, a researcher needs to investigate and scrutinise both its positive and negative points. Based on these arguments, the interview method was recognised as the preferred method for gathering data in this phase, because of its efficiency and appropriateness.

4.2.4 Pilot Study: interviewing

A pilot interview was conducted with three volunteer subjects (i.e. residents). After greeting and introducing herself, the researcher explained that the responses would help to improve the quality of the services in the care home. It was also emphasised that the responses would not be revealed to other people, including the home managers. At this point the participants signed the consent forms.

The open-ended questions (Table 4-1) were asked and the responses were further discussed. Each interview lasted from 60 to 120 minutes in total. Most of the participants were happy, enthusiastic and co-operative during the interview and all talked freely about their life history, their memories and regrets and they made a comparison between their previous and present life. The researcher tried to encourage them to direct their attention to the situation they were living in, the problems they faced every day, and their expectations regarding their living situation.

Once the pilot interviews had been completed the need to change some interview questions became clear. In the initial stage, the researcher found that some questions were very rigid and the elders found it difficult to respond. For example, the question: “Do you like the services you receive?” turned out to be confusing with respondents answering yes or no, without taking the opportunity to respond freely in a flexible manner. Moreover, the overall strategy of holding a formal interview needed modifying as sometimes participants appeared to be confused which was probably natural, due to their age and preoccupations. To address this, one strategy adopted was to make the questions as simple as possible to enable respondents to focus on the main concept of each question.

This pilot had no added value in terms of data collection for the study but it was a good opportunity for the researcher to roll out the research on a small scale, and to subsequently modify her strategy and the questions used in the interviews.

4.2.5 Designing the interview questions

Fourteen open-ended questions were adopted after reviewing the relevant literature and the pilot outcomes. The questions were designed based on the 5Wh1H format (who, what, when, where, why, and how questions), focusing on asking “why” and “how” residents used the services/products (Mazur, 1997; Aghlmand et al., 2010;(Mohmoud Abdel Ghani & Berggren, 2011).

The questions were designed based on a semi-structured and open-ended approach, as described in chapter 3. When designing the questions a list of objectives and related information was prepared. The questions aimed to obtain comprehensive and detailed discussions by being open-ended in format. The interview schedule gave the researcher the opportunity to follow the line of discussion by probing respondents’ answers in order to get a better perspective of their feelings and attitudes.

The sequence of interview questions followed Robson’s (2002) suggestion of: an introduction, the warm-up, the main body of the interview, the cool-off, and closure. In this way, the questions that targeted the main objectives of the research, i.e. needs and requirements, were asked in the main body of the interview (Table 4-2).

Table 4-2 The main body of questions, after the review of the pilot interview questions

<i>Questions</i>
1. What do you like most about living in this care home? Why?
2. What do you like least about living in this care home? Why?
3. What activities do you enjoy most? Why?
4. What activities do you dislike? Why?
5. What things would you like to do more in this care home?
6. Which experiences have been negative to you during your stay in the care home? Why?
7. Which experiences have been positive to you during your stay in the care home? Why?
8. Which areas in the care home are important to you? Why?
9. Who do you remember most? Why?
10. What is the most valuable moment you remember in your stay? Why?
11. What is the most horrifying moment you remember in your stay? Why?
12. Are there any other services that you would like to receive here? Why?
13. Do you recommend this home to your friends? Why?
14. Do you have any recommendations for improvement of your living conditions?

A flowchart was constructed in order to help the researcher understand clearly the interview procedure (Figure 4-3).

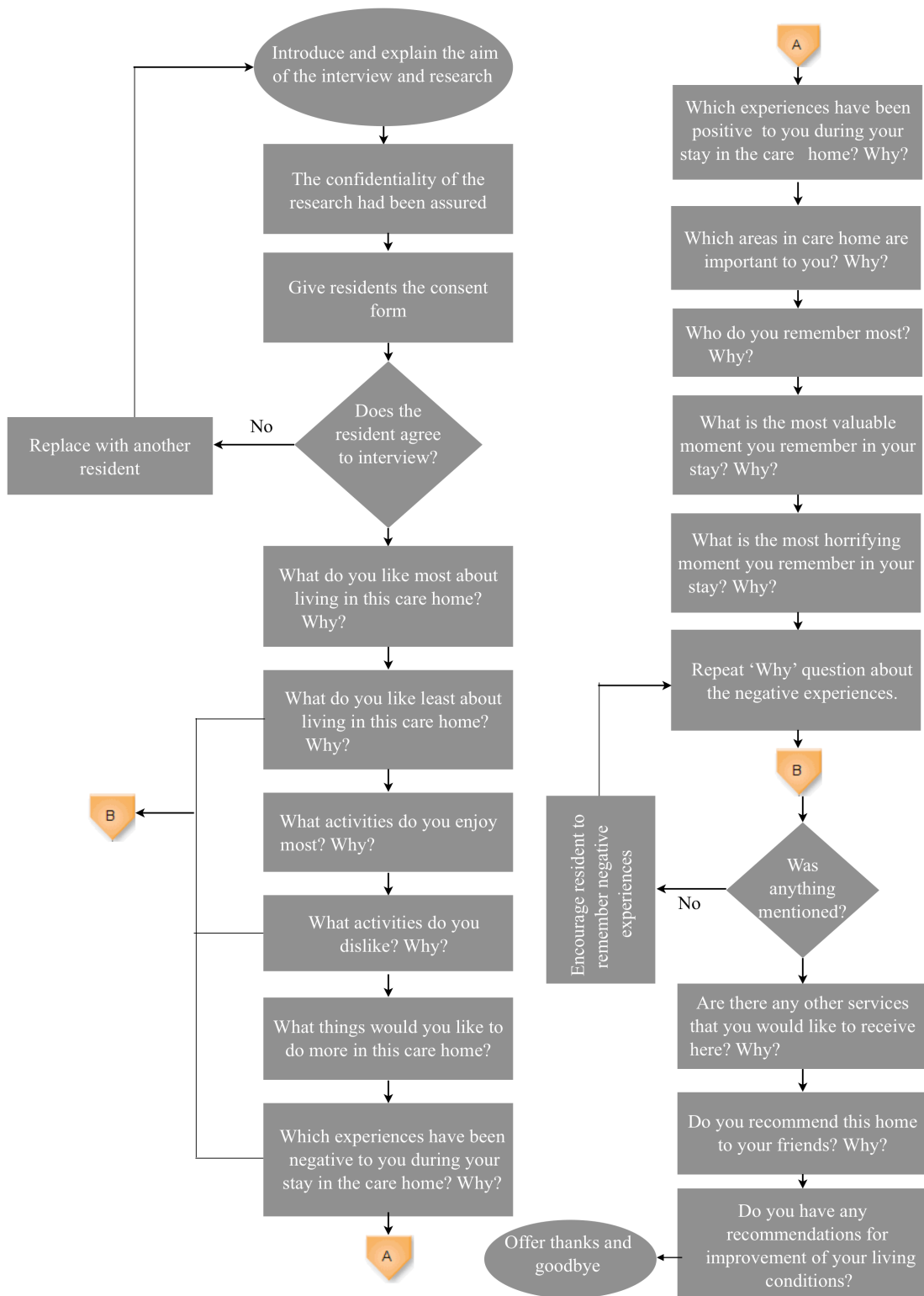


Figure 4-3 Interview flowchart

4.2.6 Conducting the interviews

Ethics approval to conduct the study was granted from the Brunel University (dated 16 August 2011) (Appendix A) and was handed to each care home manager separately. Although a consent form was designed in which all the necessary information about the research was provided to the respondents and their confidentiality assured by explaining that the data gathered from the participants and their identities would only be accessible to the researcher. It was pointed out that non-participation and not answering questions would not affect the quality of the care they were receiving in the care homes. The consent form was handed to the volunteers and they were asked to sign and confirm their agreement to cooperate in the study at the time of the interviews. It was clarified that if they felt uncomfortable with answering any questions they had the right to withdraw from the study at any stage during the research.

The interview started with the consent process as explained above. That is, the confidentiality issues and the aims of the research were explained to the volunteers, and any questions about these were answered. The researcher proceeded to start the individual interviews by reading aloud the statement concerning voluntary participation and confidentiality and these were recorded as part of the interview. The interviewees were encouraged to answer all the questions honestly and truthfully.

After the pilot, fifteen selected residents who met the criteria set out above in subsection 4.2.2 were interviewed, in the three different care home locations; the basic data of the interviewees are illustrated in Appendix B. The data gathered from the first thirteen interviews appeared to be reproducing similar requirements. However, interviews numbers 14 and 15 were also contained in the context of transcription and future evaluation.

The interviews were conducted during a period of three months between 17 August and 19 October 2011, and were performed by one researcher. The atmosphere of the interview in terms of the place and time was considered to be suitable and convenient for the residents. For example, if a participant was more relaxed in the space of their own room, the room was chosen as the place of the interview. Moreover, if a resident felt more comfortable lying down in his/her bed, this was provided for him/ her and if he/she became bored or tired, then the researcher would take a break or arrange another

appointment. Every interview lasted between 60 and 150 minutes, depending on the respondent’s enthusiasm and interest to continue with further communication.

In order to lessen the effect of variables such as: tiredness, distraction, boredom and anxiety in the elder, each resident was interviewed on a pre-arranged and separate day, far away from noise, disturbances and interruptions. All the interviews were recorded and transcribed verbatim on the same day of the interview by the researcher, in order to maintain consistency, coherence, and the order as well as the sequence of the interviews. The data also was organised in the related tables and charts, as described and illustrated in the following.

4.2.7 The Voice of the Customer table (VOCT)

The data captured through the interview were entered into the VOCT, this table has a format based on three columns (Table 4-3).

1. Column 1: Each customer is given an ID in the first column; there shouldn't be identical customers sharing one ID, (no personal information will be entered in this table, owing to reasons of confidentiality).

Table 4-3 Voice of Customer table-template

<i>Customer ID</i>	<i>Voice of Customer</i>	<i>Demanded Qualities</i>

Column 2: This is for the customer responses, taken verbatim from the transcriptions.

Column 3: In this column the customer voice summary extracted from the interview is entered in order to generate more detailed information. This column is devoted to the listing of customer needs and requirements or their demanded qualities (DQs).

Customer’s needs are usually identified by continually asking ‘why does the customer want “X”?’ . To achieve better results it is recommend that the researcher asks “why?” five times (Chaplin & Terninko, 2000).

Examples:

- Question: why did you choose this care home?

Answer: Because my friend was at this home and she was happy.

- Question. Why do you think she was happy?

Answer. Because she felt very comfortable and relaxed.

- Question. Why do you think she was relaxed?

Answer. Because here they have friendly staff.

- Question. Why do you think the staff are friendly?

Answer. Because they are caring.

During the “why” questioning, in this example four items can be identified as the resident’s major concerns:

1. Comfortable environment
2. Feeling relaxed
3. Friendly staff
4. Caring staff.

For ease of subsequent analysis, needs and requirements were extracted by modifying responses into a brief positive statement (Aghlmand et al., 2010; Shamshirsaz et al., 2012). In this process all resident’s verbatim requirements containing more than one idea, were divided into an individual statement (Table 4-4).

Table 4-4 A sample of the Voice-of-the- Customer table

<i>Customer ID</i>	<i>Voice of Customer</i>	<i>Demanded Qualities</i>
	I have chosen this care home because everyone has a very good feeling about here. And my friend has been residing here for 2 years now and she is very happy because of caring staff. When my husband died 2 years ago, I chose this home because it is very nice.	Caring staff
	(This home) is very pleasant, I am comfortable and I live in the second floor, which is cosy. The food is so delicious that I cannot lose weight. I really like the food; I have put on weight because of the food here, which I love so much. The Doctor here said you look nice but you look fat and he told me that I must lose weight.	Pleasant atmosphere Tasty food Cosy room Feeling comfortable
	I sit at the table in dining room with 3 others (2	Communication with residents

1	<p>gentlemen and another lady), and it is quite pleasant. When I don't feel good (Which frequently happens because I am 90 years of age don't forget that) I'll be served in my room. I usually prefer to come down; I prefer to do everything for myself. Because I think you have to push yourself to do things, otherwise I will lose all my incentives.</p>	Independence
	<p>Oh (I like my room) very much, I think it's very cosy, I feel safe there, it's really pleasant and I like the size of my room; I think if my room was bigger I wouldn't be comfortable. Because I am old and I cannot move very easily. When I feel down which I do often I sit there and look at the TV and that is very pleasant (I mean that I prefer quiet places). I like the colour of my room, the blue walls and the brown carpet with the white sheets on my bed. I have a TV that I have brought it from my home. It has drawer with mirror on that. So I have actually everything available in my room. I think in a bigger room I will not feel that comfortable. If I come down stairs I sit in the living room and you can usually find somebody to talk to or communicate with.</p>	<p>Room with enough space Independence Quiet room /place Feel safe Cosy room TV Having choice Communication with staff/ residents</p>
	<p>I miss my husband and, I had to sell my home, I very often think about my home, if you are quite happy here you always miss your home and your dog, and you have to leave everything behind and come here.</p>	<p>Home like environment Need for attachment</p>
	<p>I recommend this home to everybody; it has such a friendly staff.</p>	Friendly Staff
	<p>My room is on the second floor and feel very safe it is bright enough and I have 3 lights and 2 windows in my room.</p>	<p>Feel safe Enough light</p>
	<p>My room is really clean because of that I advise everybody to pick this place. Believe me it's really clean. I think everyone is happy about the cleanliness.</p>	Cleanliness
	<p>I have lots of privacy in my room; I just go and sit in there for hours. And usually look at TV before I go to bed. I sometimes sit and cry because I miss my home, I do it quietly in my privacy because I don't want to hurt the others. I really miss my husband. It is very painful and difficult when someone loses her husband. I have also lost lots of things and also my friends.</p>	Having privacy
		Homelike Environment

<p>I don't want any changes in my room. I have 3 tables and a very comfortable armchair, which has been brought from my home.</p>	<p>Daily Living Activities</p>
<p>When I finish my food I go upstairs or go for a walk. I prefer to go upstairs because my relatives call and I prefer to talk to them in private. Most of the time I am alone so I don't have many negative experiences.</p>	<p>Contact with Family</p>
<p>I think staff are really helpful and friendly if you have any problem you can go to Lidia or the lady who is in charge here and talk about the situation</p>	<p>Helpful staff</p>
<p>Everybody who comes to pay me a visit says that this is the best home for old people. For example in Christmas there is a Christmas tree in every room and we have Christmas tree on our tables as well and I get wonderful presents (like a big box of chocolate). One time I had my birthday party over there and I got presents and they sang a Polish song for me.</p>	<p>Friendly staff</p>
	<p>Events (Celebrating)</p>

4.2.8 Structuring the needs and requirements or demanded qualities (DQs)

From the 15 residents' interviews, when transcribed, 81 statements of needs and requirements were identified (Appendix C). From all these items the list of "Needs and Requirements" were extracted and listed in Table 4-5, by the researcher. The table contents were reviewed with two experts (the manager and the deputy manager) in one care home in order to get their ideas on the list of needs and requirements. This consultation was beneficial for the researcher in case she had missed some of the factors and elements involved in the extraction of the VoC. A new glossary of basic needs and requirements was drawn up and listed in the table after removing, adding or rephrasing items, following the recommendations voiced in the consultation session. In addition, this process was also an opportunity to make sure that the list of residents' requirements was complete. The experts tried to identify what was missing and they added a few items that would be beneficial for residents' living in care homes. Items numbers 82 to 86 in Table 4-5, were added by these experts.

Table 4-5 Items were captured from the VOCTs

No	Residents' needs	No	Residents' needs
1	Room with enough space	31	Enough light
2	Room with enough storage	32	Suitable light
3	Delightful view	33	Getting Out
4	Cozy room	34	Cleanliness
5	Cheerful colour	35	Contact with Family
6	Pleasant atmosphere	36	Family Visit
7	Tasty food	37	Family support
8	Special diet food	38	Daily Living Activities
9	Nutrition	39	Having privacy
10	Good quality of food	40	Wheelchair access
11	Design of the food	41	Spending time with family
12	Feel Comfortable	42	Celebrating birthday or occasions
13	Lounge Gathering	43	Involvement
14	Friendly Environment	44	Feeling Supported
15	Nice movies	45	Have responsibilities
16	Independency	46	Social Interaction
17	Existence of quiet area	47	Private Lavatories
18	Feel safe	48	Living collectively
19	TV in residents room	49	Gardening
20	Having choice	50	Entertainments
21	Feel like home	51	Spiritual activities
22	Opportunity to share emotions	52	Keep belongings safe
23	Friendly staff	53	Meaningful Activities
24	Treat residents with respect	54	Medical Care
25	Empathic staff	55	Communication with doctor
26	Helpful staff	56	Variety of food choice
27	Kind behaviour	57	Good odour
28	Respectful staff	58	Feel secure
29	Calm attitude toward residents	59	Walk in the garden
30	Communication with residents / or staff	60	Pay attention to residents (do not ignore them)

No	Residents' needs	No	Residents' needs
61	Minimising fall hazard	74	Safe environment
62	Visually comfortable	75	Easy to manoeuvre
63	Accessible environment	76	Cost
64	Accessible equipment	77	Personalised room décor
65	Safety	78	Providing usable product
66	Clean sheet	79	Need for attachment
67	Appropriate singing	80	Having control over daily activities
68	Quick response	81	Suitable temperature
69	Suitable Interior Design	82	Productive staff
70	Patient staff	83	Experienced staff
71	Flat area (without steps/ or barriers)	84	Well groomed staff
72	Understanding residents conditions & abilities	85	Staff with personal hygiene
73	Creating max independency through design	86	Existence of relaxing area

The above list could not be the final draft as some of the statements regarding expectations, requirements and needs, were repetitive or had been rephrased and expressed by others, i.e. they were similar in nature but the wording was not analogous. After removing/or adding the rephrased items, in the consultation session, some repetitive ones were combined and classified under one category such as “social interaction”. The list of demanded qualities was obtained through grouping independent statements that were closely related and difficult to analyse separately (Chaplin & Terninko, 2000). This classification was carried out by the researcher and the manager and deputy manager of one of the care homes. From the 86 items identified, 28 demanded qualities (DQs) were listed as the final needs and requirements and are presented below in Table 4-6.

Table 4-6 Demanded Qualities

<i>Separate ideas extracted from the VOCT</i>	<i>Demanded Qualities</i>
<p>Friendly Staff Respectful staff Empathic Staff Helpful staff Kind behaviour Treat residents with respect Calm attitude toward residents Patient Staff Understanding residents condition & abilities</p>	1. Caring and Sensitive staff
<p>Feel like home Feel comfortable Having privacy Pleasant atmosphere Existence of relaxing area Feel secure Keep belongings safe</p>	2. Homelike environment
<p>Room with enough space Room with enough storage Delightful view Cosy room Cheerful colour Enough light Suitable light Appropriate singing Suitable interior Design Creating max independency through design</p>	3. Suitable Design
<p>Good odour</p>	4. Good odour
<p>Cleanliness Clean sheet</p>	5. Cleanliness
<p>Suitable temperature</p>	6. Suitable Temperature
<p>Pay attention to residents (do not ignore them) Quick response</p>	7. Quick Response
<p>Gardening Walk in the garden</p>	8. Usable Garden
<p>Spiritual activities</p>	9. Religious Activities
<p>Celebrating birthday Celebrating occasions (Christmas, etc)</p>	10. Events
<p>TV in residents room Private Lavatories</p>	11. Basic Facilities

Existence of quiet area	12. Quiet Place
Well groomed staff Staff with personal hygiene	13. Well Groomed Staff
Cost	14. Cost
Friendly Environment Need for attachment Communication with residents / or staff Opportunity to share emotions Feeling Supported Social Interaction Living collectively	15. Social Interaction
Having choice Having control over daily activities Personalized room décor	16. Autonomy
Safe environment Flat area (without steps/ or barriers) Safety Feel safe Minimizing fall hazard Visually comfortable	17. Safety
Tasty food Special diet food Nutrition Good quality of food Design of the food Variety of food choice	18. Meals
Accessible environment Accessible equipment Providing usable product Wheelchair access Easy to manoeuvring	19. Accessible Equipment
Medical Care Communication with doctor	20. Accurate Medical Care
Family visit Family support Spending time with family Contact with family	21. Family Support
Independency Daily Living Activities	22. Daily Living Activities
Having responsibilities Involvement	23. Involvement
Lounge gathering	24. Lounge Gathering

Getting out	25. Outing
Nice movies Meaningful Activities Entertainment	26. Entertaining Activities
Productive staff	27. Productive Staff
Experienced staff	28. Experienced Staff

Entries in the demanded quality list usually contain a heterogeneous mixture of statements. The following techniques were then used to organize them in order of significance. This is undertaken so as to be able to decide which DQ requires more attention when considering how to increase residents' levels of satisfaction.

4.2.8.1 Organising the Demanded Qualities

4.2.8.1.1 Affinity Diagram: Organizing needs and requirements

The affinity diagram or the K-J method was developed by the Japanese anthropologist Kawakita Jiro (Martin & Panizzolo, 2009) to capture facts, opinions and ideas regarding an unknown and/or unexpected subject, found in a state of disorganization (Mizuno, 1988). That is, when collecting spoken data pertaining to a disordered and confused situation, this is used to organize it, based on emergent similarities. Yousefie et al. (2011) reported that an affinity diagram can successfully be used to arrange random data into natural and logical groups when identifying customers' needs and requirements.

In view of this, an affinity diagram was used at this stage for organising the DQs. To construct it, each item on the modified list of DQs (Table 4-6), was recorded on a separate large Post-it note and placed on a table top in a random manner. These were written in large enough script to allow participants to read them easily.

In order to organise the DQs written on the Post-it notes into an affinity diagram, the procedure for describing and classifying the items was explained to the participants (three residents). The participants were asked to form groups of no more than six demanded qualities (DQs) and to achieve this, they sat at the table and silently sorted the Post-it notes into related groups, placing similar concepts together on the basis of their having an affinity with each other.

After grouping the Post-it notes, the participants had a discussion in which their agreements and disagreements were noted and organised. When one of the participants identified an item which needed to be replaced or moved, that item was moved to another group. An atmosphere in which it was okay to disagree with other participants and express a different opinion was created and the task continued until the participants came to a consensus over grouping the DQs.

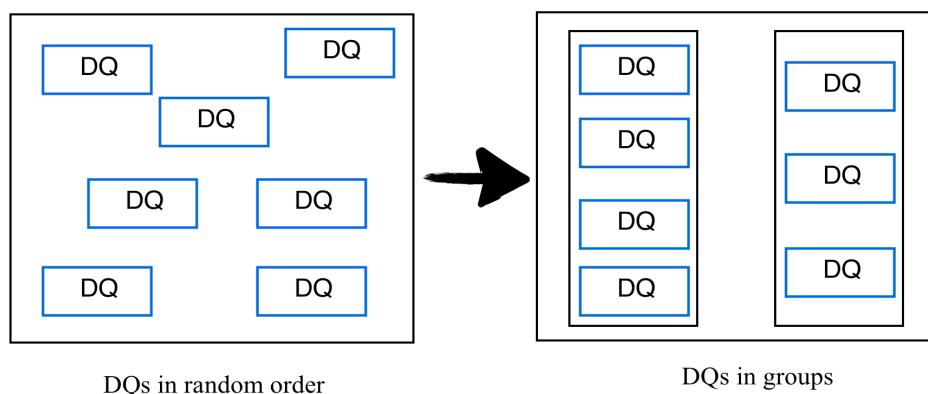


Figure 4-4 The Affinity Diagram for sorting the DQs

Furthermore, the participants developed over-arching titles for each grouping of Post-it notes by discussing and agreeing on the wording and the characteristics of each. These were written on a blank note and placed on the top of its related group. Table 4-7 presents the resultant affinity diagram.

Table 4-7 Affinity Diagram for the Demanded Qualities

<i>Caregivers</i>	<i>Environment</i>	<i>Facilities and Service</i>	<i>Residents</i>	<i>Activities</i>
Caring and Sensitive Staff	Homelike Environment	Suitable Design	Social Interaction	Entertaining Activities
Quick Response	Quiet Place	Accessible Equipment	Family Support	Lounge Gathering
Experienced Staff	Cleanliness	Meals	Cost	Spiritual Activities
Productive Staff	Good Odour	Accurate Medical Care	Involvement	Outing
Well Groomed Staff	Safety	Basic Facility	Autonomy	Events
	Suitable Temperature	Usable Garden		Daily Living Activities

The affinity diagram was shaped by the participants by giving titles to the DQs. Next the DQs had to be ranked and prioritised as not all of the data had the same importance and value (Shamshirsaz et al., 2012).

4.2.8.1.2 Applying the AHP to the task of ranking DQs

It had emerged from the residents' group activity that not all of the DQs were equally important, and as Chaplin & Terninko (2000) suggest, if the relative importance of one to another is not immediately obvious, then a formal process for ranking should be used. In the current study as the ratio data regarding DQs was not available, the data needed to be converted into this form by applying paired comparisons through the AHP process. In this context the AHP process was applied to find the relative weighting. The process begins by comparing the weight of one demand quality to another to determine which one is more important and how much more so.

A newly constituted decision making group, comprising the researcher, two residents, the care home manager and two staff members was convened. They ranked the five criteria: residents, care givers, environment, facilities and activities (Table 4-7) and then the sub criteria listed in the same table, (e.g. quick response and productivity). This process was carried out for all the DQs elements, yielding a relative ranking of all the DQs to each other.

Setting up a Pairwise Comparison Table:

Six matrices consisting of vertical and horizontal columns and cells were set up and the data containing the criterion and sub criterion were entered. The first matrix is allocated group headings, which sit orderly in the columns and rows; when 'residents' as one of the group headings is entered in the first vertical column it also comes first in the horizontal column, and the rest of the elements follow suit. Subsequently, the columns and rows were compared. For convenience, here just the first matrix and its function is described, as the others follow the same process.

<i>Comparison Matrix</i>	<i>Residents</i>	<i>Caregivers</i>	<i>Environment</i>	<i>Facilities & Services</i>	<i>Activities</i>
<i>Residents</i>	1				
<i>Caregivers</i>		1			
<i>Environment</i>			1		
<i>Facilities & services</i>				1	
<i>Activities</i>					1

Figure 4-5 A matrix table for pairwise comparison

For the pairwise comparisons, each element in the row(s) is compared to its counterpart(s) in the column. In the mathematical algorithm of nine point scales, numbers 1 to 9 are considered the scale of measurement. However, in the process of working with the participants this numeric organisation seemed to be quite difficult for the residents to grasp, as is elaborated on later. Nonetheless, as the major focus of this study is capturing a comprehensive of the residents’ views on quality and their expectations, the researcher tried her best to involve them in the process by encouraging them to answer as much as possible. The process of drawing a comparison between the components of the heading was explained to the participants in detail. Using the nine-point scale method, the numbers from 1 to 9 were written in a large font on big separate sheets so that they were highly visual and readable by the elders. The participants were asked to order and compare their preferences by applying the numbers. The researcher put forward to the residents the sixteen questions pertinent to the algorithm in matrix one in the following way. Two examples are as follows:

Question No 1: Is ‘Residents’ more important than ‘Care Givers’? if the answer is yes, then the follow up is asked: how much more important?

Question No 2: Is ‘Residents’ more important than ‘Environment’? if the answer is yes, then the follow up is asked: how much more important?

They started to number the components of the comparisons and initially the job seemed rather easy, but after doing some of the task, the elders became confused and unable to concentrate on numbering the answers. However, the other participants, the manager and the two members of staff had no difficulties. It is to be noted that different factors such as the elders' level of education, age, quality of health, attitudes as well as experiences may have had an impact on their abilities regarding coping with answering.

In order to overcome this limitation encountered by the residents in terms of working with the scoring, the researcher came up with the idea of replacing the numerical ratings with qualitative phrases through which the elders could voice their points of view, such as: "equal importance/ weak importance/ strong importance/ extreme importance. The following Table (Table 4-8) shows how the replacement of the numerical grading by qualitative phrases was achieved.

Table 4-8 The nine-point scale (Saaty, 1997)

<i>Intensity of Importance</i>	<i>Definition</i>	<i>Explanation</i>
1	Equal importance	Two activities contribute equally to the objective
3	Weak importance of one over another	Experience and judgment slightly favour one activity over another
5	Essential or strong importance	Experience and judgment strongly favour one activity over another
7	Demonstrated importance	An activity is strongly favoured and its dominance is demonstrated in practice
9	Absolute importance	The evidence favouring one activity over another is of the highest possible order of affirmation
2,4,6,8	Intermediate values between the two adjacent judgment	When compromise is needed

The qualitative phrases were used by the residents to compare the pairs of items in the matrix. Subsequently, the researcher turned their agreed comments into the numerical grading, which was put in the appropriate cells of the matrix. For ease of work, when the answer to the question "Is the row element more important than the column element?" (Chaplin & Tekninko, 2000, p.97) was negative, then a forward slash (/) was

placed in the cell, as shown below (Figure 4-6). Eventually, when the table was completed these symbols were turned to the fractional numbers.

<i>Sub Groups Comparison Matrix</i>	<i>Residents</i>	<i>Caregivers</i>	<i>Environment</i>	<i>Facilities & Services</i>	<i>Activities</i>
<i>Residents</i>	1	2	2	2	3
<i>Caregivers</i>	/	1			
<i>Environment</i>			1		
<i>Facilities & services</i>				1	
<i>Activities</i>					1

Figure 4-6 Comparison matrix continued

A session for answering the questions was arranged with participants. The process was carried out verbally, which was recorded by the researcher who simultaneously undertook the process of changing a qualitative description into the numerical grading.

To continue the process, for matrix one, the row ‘Residents’ is equal to the column item ‘Residents’ and therefore is given a rating of ‘1’, that is, a diagonal 1 to 1 relationship identifies where identical rows and columns meet. The process moves from left to right, across the row. After the group discussion reached a consensus, it was judged that ‘Residents’ is of weaker importance than ‘Care Givers’ and so a score of 2 was placed in the cell of the matrix for this choice. This process continued until all rows were compared with the rest of the cells. The group performed this procedure for the rest of elements and a package of numeric grading data was obtained and the matrix was fully completed.

<i>Comparison Matrix</i>	<i>Residents</i>	<i>Caregivers</i>	<i>Environment</i>	<i>Facilities & Services</i>	<i>Activities</i>
<i>Residents</i>	1	2	2	2	3
<i>Caregivers</i>	1/2	1	2	1/2	3
<i>Environment</i>	1/2	1/2	1	1/2	3
<i>Facilities & services</i>	1/2	2	2	1	3
<i>Activities</i>	1/3	1/3	1/3	1/3	1

Figure 4-7 Comparison matrix continued

Fractional numbers were turned into decimals, then the total of each column was calculated.

<i>Comparison Matrix</i>	<i>Residents</i>	<i>Caregivers</i>	<i>Environment</i>	<i>Facilities & Services</i>	<i>Activities</i>
<i>Residents</i>	1	2	2	2	3
<i>Caregivers</i>	0.5	1	2	0.5	3
<i>Environment</i>	0.5	0.5	1	0.5	3
<i>Facilities & services</i>	0.5	2	2	1	3
<i>Activities</i>	0.33	0.33	0.33	0.33	1
<i>Total</i>	2.83	5.83	7.33	4.33	13

Figure 4-8 Comparison matrix data converted to decimals

To continue the process of ranking the DQs, having obtained the decimal values, the value in each cell was divided by the total for the same column, and the gained values

placed in their corresponding cells (Figure 4-9). For example, the first cell (in Figure 4-9) shows resident versus resident with the value of 1. The total for the column is shown as 2.83. The calculation carried out is: $1/2.83=0.353$. These results were then entered in Figure 4.9 below.

<i>Comparison Matrix</i>	<i>Residents</i>	<i>Caregivers</i>	<i>Environment</i>	<i>Facilities & Services</i>	<i>Activities</i>
<i>Residents</i>	0.353	0.343	0.272	0.461	0.23
<i>Caregivers</i>	0.176	0.171	0.272	0.115	0.23
<i>Environment</i>	0.176	0.085	0.136	0.115	0.23
<i>Facilities & services</i>	0.176	0.343	0.272	0.23	0.23
<i>Activities</i>	0.116	0.056	0.045	0.076	0.076
<i>Total</i>	0.997=1	0.998=1	0.997=1	0.997=1	0.996=1

Figure 4-9 Comparison matrix, with calculations

The sums of each row were added and entered in the total cells. Then the sums of the all totals rows were calculated and presented in Figure 4-10.

<i>Comparison Matrix</i>	<i>Residents</i>	<i>Caregivers</i>	<i>Environment</i>	<i>Facilities & Services</i>	<i>Activities</i>	<i>Total</i>	<i>Averaged Expressed as %</i>
<i>Residents</i>	0.353	0.343	0.272	0.461	0.23	1.659	33.4739
<i>Caregivers</i>	0.176	0.171	0.272	0.115	0.23	0.964	19.2257
<i>Environment</i>	0.176	0.085	0.136	0.115	0.23	0.742	14.5704
<i>Facilities & services</i>	0.176	0.343	0.272	0.23	0.23	1.251	25.3685
<i>Activities</i>	0.116	0.056	0.045	0.076	0.076	0.369	7.36152
<i>Total</i>	0.997=1	0.998=1	0.997=1	0.997=1	0.996=1	5	100

Figure 4-10 Comparison matrix: normalising data and calculating weight

Chaplin & Terninko (2000, p.99) reported that “if the calculations are correct and consistent, the figure for the sum of the rows in each column equals the number of segments”. It emerges that, in keeping with this, in this work the figure for the sum of the rows in each column equals the number of segments. That is, 5 in the total column introduces the five headings (5=5). The total shown in each column, which is approximately 1, represents the number of each heading 1 (1=1). Next, the average of each row is divided by the total of the column (5). The obtained number is multiplied by 100 to give the percentage of the relative weight.

All the DQs were ranked by applying the above method and the calculations for these are shown in Appendix D.

4.2.9 Comparing all the DQ subgroup Elements

The findings and DQs, which were weighted by applying the AHP in the previous section, have solely the potential for comparison in their own categories, while a broader comparison of all the DQs on different scales, and in different categories, is needed to prioritise each of them. To achieve this, the weights of each DQ, which were

calculated above by applying the pairwise comparison method (AHP), were entered in to a diagram similar to the one shown below for residents.

The weights of all the DQs sub-group items need to be inverted to the weight of the category to which they belong. Referring to Figure 4-11 below, the relative weight percentage of each DQ is calculated by multiplying its weight by the weight of the heading group, divided by 100 (Shamshirsaz et al., 2012). For example, the weight of ‘social interaction’ calculated and shown in the AHP matrix is 33.4%, and the weight of residents is reported as 33.5% therefore, the position of ‘social interaction’ in terms of ranking the priorities is obtained by the calculation $(33.4 \times 33.5)/100 = 11.18$ (Figure 4-11).

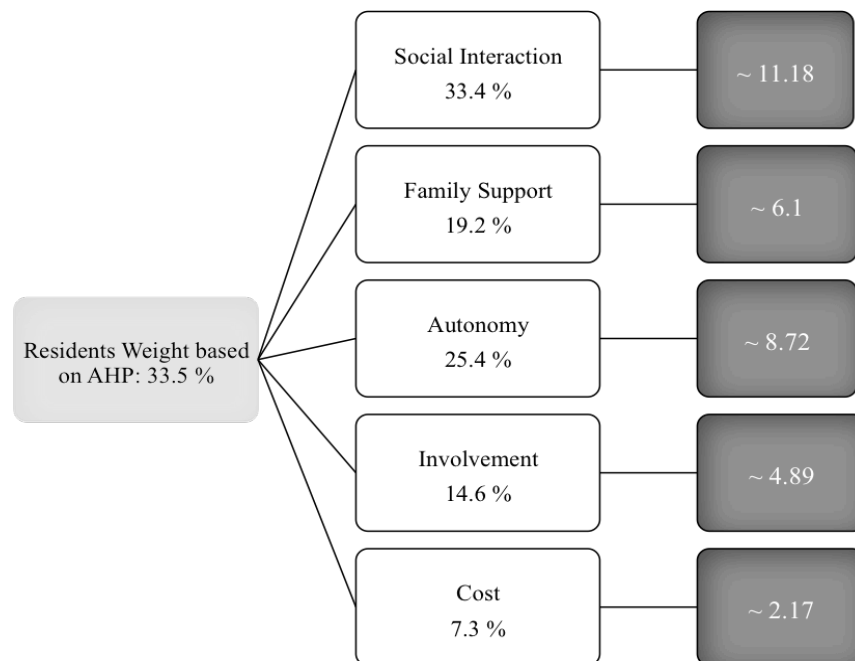


Figure 4-11 Ranking demanded qualities

The very same process was carried out for all the DQs for each group, and these are shown in Appendix E. By completing all the diagrams (trees) all the sub-categories were compared and the percentages indicating the ranking, or, in other words, the priority accorded to all of them, became clear. These are reported in Table 4-9 below.

Table 4-9 The percentage of ranking

<i>No</i>	<i>Demanded Qualities</i>	<i>% Relative Weight</i>
1	Caring and Sensitive Staff	11.4
2	Social Interaction	11.2
3	Autonomy	8.5
4	Accessible Equipment	8
5	Family Support	6.4
6	Safety	6.3
7	Meals	6.3
8	Accurate Medical Care	5
9	Involvement	4.9
10	Homelike Environment	4
11	Daily Living Activities	3.8
12	Suitable Design	2.8
13	Quick Response	2.8
14	Experienced Staff	2.3
15	Usable Garden	2.2
16	Cost	2.2
17	Cleanliness & Hygiene	2
18	Productive Staff	1.8
19	Suitable Temperature	1.2
20	Outing	1.2
21	Well Groomed Staff	1.2
22	Basic Facilities	1
23	Entertaining Activities	0.9
24	Lounge Gathering	0.8
25	Quiet Place	0.8
26	Good Odour	0.4
27	Celebrating	0.4
28	Spiritual Activities	0.2

It is evident that focusing on all the DQs may require heavy investment of resources, in terms of expenditure on budgets, financial burdens as well as time and energy, which make the practicality of implementing such research outcomes rather difficult and/or sometimes impossible. Additional steps of evaluation were clearly needed to strengthen the robustness and practical applicability of these research outcomes. Regarding this, Pareto suggested in his theory that 80% of wealth is held by 20% of the population and “since then many other sociological, economic and natural phenomena have been observed to follow a similar pattern” (Chen et al., 2001, p.2). According to this 80/20 rule, customer satisfaction may be improved considerably by providing the DQs ranked within the top 20% of requirements and this was confirmed in a study carried out by Jin & Juan (2008) who revealed that satisfying the main service level (the first 20% of DQs) leads to an improvement in most customers’ satisfaction levels.

Table 4-10 Prioritised Demanded Qualities

<i>No</i>	<i>Demanded Qualities</i>	<i>% Relative Weight</i>	<i>% Cumulative Weight</i>
1	Caring and Sensitive Staff	11.4	11.4*
2	Social Interaction	11.2	22.6*
3	Autonomy	8.5	31.1*
4	Accessible Equipment	8	39.1*
5	Family Support	6.4	45.5*
6	Safety	6.3	51.8*
7	Meals	6.3	58.1*
8	Accurate Medical Care	5	63.1*
9	Involvement	4.9	68*
10	Homelike Environment	4	72*
11	Daily Living Activities	3.8	75.8*
12	Suitable Design	2.8	78.6 *
13	Quick Response	2.8	81.4
14	Experienced Staff	2.3	83.7
15	Usable Garden	2.2	85.9
16	Cost	2.2	88.1
17	Cleanliness & Hygiene	2	90.1
18	Productive Staff	1.8	91.9
19	Suitable Temperature	1.2	93.1
20	Outing	1.2	94.3
21	Well Groomed Staff	1.2	95.5
22	Basic Facilities	1	96.5
23	Entertaining Activities	0.9	97.4
24	Lounge Gathering	0.8	98.2
25	Quiet Place	0.8	99
26	Good Odour	0.4	99.4
27	Celebrating	0.4	99.8
28	Spiritual Activities	0.2	100

* Entry in bold indicate that 43% of the most important needs and requirements (12 of 28) address about 80% of residents values and preferences.

Cumulative weights of the 28 DQs were calculated by drawing on the accumulation weight order shown above in Table 4-10. Then the higher ranked DQs were calculated,

which covered the twelve first-listed DQs (Table 4-10). Based on the Pareto principal if we were able to satisfy 20% of the high ranked DQs, that is, the twelve DQs at the top of the list in this study, we would be able to gain an 80% improvement in the levels of resident satisfaction. This does not mean that the rest of the DQs are not of great importance, but as mentioned, for reasons of practicality, the attention of the investigation needs to be targeted on those aspects of needs which have most potential regarding boosting resident satisfaction. Therefore, the remaining procedures outlined in this thesis address these twelve priority items and consider ways through which they may be improved. The following chapters scrutinize the methods and tools by which this goal may be achieved.

4.3 Chapter conclusion

To identify residents' needs and requirements, capturing and organising the voice of the customer (VoC) has been demonstrated as a useful method in this chapter. In order to efficiently increase residents' satisfaction, the focus needs to be placed on the prioritised DQs extracted from the VoC evidence. To achieve this, the organization and classification of the DQs required application of various techniques that have been acknowledged as being appropriate in this field of investigation. In total 28 DQs were extracted from the initial 86 statements captured, which helped identify the most significant needs and requirements of the residents. Using the Pareto principle twelve DQs were pinpointed as the most significant ones and those which should be focused on to achieve care quality improvement.

5 Study II: Assessing high-ranked DQs

Customer satisfaction is the outcome of the customer perception of service quality (Heskett, et al., 1994). While a consumer's satisfaction with a service may be used as an indicator of its quality, it is not the only indicator, for the quality of that service is another crucial factor that must be included in any assessment. The information gathered on consumer satisfaction is essential for quality improvement in care homes and the most effective way to improve quality in an organisation is by having a comprehensive understanding of customers' needs and expectations which the organisation should try to meet or exceed (Deming, 1986). In the previous chapter (chapter 4), 15 residents in three different care homes were interviewed, and 28 primary needs and requirements were identified, i.e. demanded qualities (DQs), of which 12 (Table 5-1) were further determined to be the most significant ones (Shamshirsaz et al., 2012).

Table 5-1 High ranked Demanded Qualities

<i>No.</i>	<i>Demanded Qualities</i>	<i>No.</i>	<i>Demanded Qualities</i>
1	Caring and Sensitive Staff	7	Family Support
2	Social Interaction	8	Accurate Medical Care
3	Autonomy	9	Involvement
4	Accessible Equipment	10	Homelike Environment
5	Meals	11	Daily Living Activities
6	Safety	12	Suitable Design

The aim of this chapter is three fold; first to examine the importance of the 12 most important needs or demanded qualities (DQs) with a larger group of residents. Secondly the aim is to identify residents' satisfaction with provided services in selected care homes, and finally the third is to verify the DQs Kano model attributes (basic, one-dimensional, and excitement), in order to establish priorities for improving residents' satisfaction in care homes. The lattermost can help managers when deciding which DQ needs should receive attention to satisfy residents' requirements. The fulfilment of

residents' requirements is related to the availability and performance of services/products and the Kano model, which is deployed in this chapter, helps to illuminate the different attributes of each DQ for enhancing resident satisfaction.

5.1 Questionnaire Design

In designing the questionnaire for use in this study the focus was on the heading groups (12 main DQs) and not the sub groups. This was because the huge number of sub-groups items would make answering the whole battery of questions rather impossible in practical terms and also would probably make respondents confused. With respect to this, it is of note that Newell et al. (2004) highlighted excessive length of the questionnaire as one of the main reasons for a low response rate. For increasing the response rate for surveys held with older people in order to overcome low vision difficulties and reduce eye fatigue, the survey documents were provided in bold black text, printed in either font 12 or 14 in Arial style. A heavy weight thick white paper was used and answers placed in front of each question (Beebe et al, 2007; Taylor et al., 2008; Mallen et al., 2008).

The questionnaire in this study consists of three parts.

- **Part 1**

Part one is designed specifically to assess quantitatively the importance of the first 12 DQs. In the design of the questionnaire the scoring is based on a five-point Likert scale with 1 being 'does not matter', 2 being 'somewhat matters', 3 being 'matters', 4 being 'strongly matters', and 5 being 'very strongly matters' (Figure 5-1). A rating of '1' indicates the expectation is at the lowest level of importance and '5' indicates that the expectation is at the highest. The questions were written in the format of 'How important is the certain item ('DQ') to you?' and all the probes followed this style.

Part 1: Please read all of these needs and requirements; then use a 1 to 5 rating scale (1=Does not matter and 5 = Very strongly matters), to rank them accurately. Please rate how the following factors are important to you.

(1) How important is “Caring and sensitive staff” to you?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) How important is “Social Interaction” to you?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) How important is “Autonomy or (Having choice)” to you?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) How important is “Accessible equipment” to you?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(5) How important is “Meal experience” for you?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(6) How important is “Safety” for you?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(7) How important is “Family support” to you?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(8) How important is “Accurate medical care” for you?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(9) How important is your “involvement of decision-making in care home”?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(10) How important is “Homelike environment” to you?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(11) How important is “your ability to carry out daily living activities (bathing, dressing, grooming and etc)”?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(12) How important is “Suitable design (Physical environment)” for you?	Does not Matter (1)	Somewhat Matter (2)	Matters (3)	Strongly Matters (4)	Very Strongly Matters (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 5-1 Questionnaire for part 1

- **Part 2**

The questionnaire used for Part 2 measures the level of residents’ satisfaction with the given services, in the form of a comparison with those provided by competitors. The probe took the format of ‘How a certain ‘DQ’ service is provided to the residents?’, which made 12 questions in total, one for each DQ.

Part 2: Based on your experiences from care home's services, please use the following scale to rate the services quality for each item. (1= Poor and 5=Excellent)

(1) How the staff show they are “caring and sensitive” toward you?	Poor (1)	Below Average (2)	Average (3)	Above Average (4)	Excellent (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) How “social interaction” is provided for you?	Poor (1)	Below Average (2)	Average (3)	Above Average (4)	Excellent (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) How the resident’s “autonomy” is preserved by the care home?	Poor (1)	Below Average (2)	Average (3)	Above Average (4)	Excellent (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) How “Accessible Equipments” are offered by the care home?	Poor (1)	Below Average (2)	Average (3)	Above Average (4)	Excellent (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(5) How a delightful “meal” experience is created?	Poor (1)	Below Average (2)	Average (3)	Above Average (4)	Excellent (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(6) How the “safety” is provided by the care home?	Poor (1)	Below Average (2)	Average (3)	Above Average (4)	Excellent (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(7)How “family support” is available to you?	Poor (1)	Below Average (2)	Average (3)	Above Average (4)	Excellent (5)
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

(8) How “accurate medical care” is delivered?	Poor (1) <input type="checkbox"/>	Below Average (2) <input type="checkbox"/>	Average (3) <input type="checkbox"/>	Above Average (4) <input type="checkbox"/>	Excellent (5) <input type="checkbox"/>
(9) How resident's “involvement” is supported by the care home?	Poor (1) <input type="checkbox"/>	Below Average (2) <input type="checkbox"/>	Average (3) <input type="checkbox"/>	Above Average (4) <input type="checkbox"/>	Excellent (5) <input type="checkbox"/>
(10) How a “homelike environment” is created for you?	Poor (1) <input type="checkbox"/>	Below Average (2) <input type="checkbox"/>	Average (3) <input type="checkbox"/>	Above Average (4) <input type="checkbox"/>	Excellent (5) <input type="checkbox"/>
(11) How the situation, that resident to be better able to carry out “daily living activities” (bathing, dressing, grooming and etc) is provided for you?	Poor (1) <input type="checkbox"/>	Below Average (2) <input type="checkbox"/>	Average (3) <input type="checkbox"/>	Above Average (4) <input type="checkbox"/>	Excellent (5) <input type="checkbox"/>
(12) How the “suitable design” (physical environment) is considered?	Poor (1) <input type="checkbox"/>	Below Average (2) <input type="checkbox"/>	Average (3) <input type="checkbox"/>	Above Average (4) <input type="checkbox"/>	Excellent (5) <input type="checkbox"/>

Figure 5-2 Questionnaire for part 2

- **Part 3**

Part 3 classifies residents’ requirements. By utilising the Kano model by offering pairs of multiple-choice ‘Kano Model’ prompts, knowledge about the residents’ needs can be enhanced, which can lead to the organisation providing better products or services for them. These paired questions increase understanding regarding the importance of various features (needs) for a service/product. As the Kano questionnaire is paired, 24 questions for the 12 DQs were devised with the multiple-choice answers being classified from low to high, by respondents selecting one statement from: I like it/ I expect it/ I feel neutral/ I can tolerate it/ I dislike it.

Part 3: Simply select the answer that seems most appropriate for you.

1a How would you feel if X was provided?	1. I like it. 2. I expect it. 3. I feel neutral. 4. I can tolerate it. 5. I dislike it.
1b How would you feel if X was not provided?	1. I like it. 2. I expect it. 3. I feel neutral. 4. I can tolerate it. 5. I dislike it.

Figure 5-3 Questionnaire for part 3, Kano model

Residents' responses to paired Kano questions are grouped into different levels and subsequently the Kano evaluation table (Table 5-3) is used to interpret the results. In the table, based on the frequency of answers, the residents' needs can be classified (Kano et al., 1984), as being: B (basic), O (one-dimensional), E (excitement). Moreover, for a product or service which has no significant impact on customer satisfaction or dissatisfaction is termed as having indifferent attributes (I) and where the customer is less satisfied due to the presence of the product or service the label reverse requirements (R) is applied. As shown in Table (5-2), there could be 25 possible combinations for paired questions.

Table 5-2 Kano evaluation table

(E: Exciting, B: Basic, O: One-dimensional, I: Indifferent, and R: Reverse)

<i>Interpretation of Kano Questions</i>		<i>How do you feel if X not provided?</i>				
		1	2	3	4	5
		I like it.	I expect it.	I feel neutral.	I can tolerate it.	I dislike it.
<i>How do you feel if X provided?</i>	1	I like it.	–	E	E	O
	2	I expect it.	R	–	I	B
	3	I feel neutral.	R	I	–	B
	4	I can tolerate it.	R	I	I	–
	5	I dislike it	R	R	R	R

5.1.1 Pilot Survey

After designing the three parts of the questionnaire, it was applied to 15 residents in a pilot in order to identify any mistakes. The learning gained from the experience of the pilot study at this stage was critical in terms of making accurate questions through which the residents’ preferences, their satisfaction level, service or product attribute (Kano Level) could be identified and measured. Moreover, Robson (2002) is one scholar who has emphasised the importance of applying a pilot study for identifying the any corrections that have to be made to the questionnaire tool and for testing its reliability.

5.1.2 Testing the reliability

The Cronbach’s α was applied separately for each part, using SPSS (Statistical Package for the Social Sciences) and it was found that the reliability for the first part is 0.803 which means that the 12 questions are all measuring the same thing, that is, residents’ importance attributed to the DQs (Table 5-3).

Table 5-3 Reliability Statistic (Part 1)

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.803	.812	12

The Cronbach's α for the second part is 0.738 which confirms the reliability of the questions. That is, the questions are all assessing the residents' satisfaction with the services provided with respect to the DQs (Table 5-4).

Table 5-4 Reliability Statistics (Part 2)

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.738	.677	12

Cronbach's α was used for evaluating the reliability of the last element. It was mentioned previously that the Kano questionnaire has two parts. The first concerns the response of the residents when the product/service is provided and the second part addresses their responses were the product/service is not provided. In this instance for measuring the Cronbach's α , the data that were entered in the SPSS software, were divided in to two groups with the first part including positive answers and the second, negative ones. The reliability for the positive part of the Kano questionnaire was reported as 0.542 (Table 5-5) and for the negative part, 0.594 (Table 5-6). These outcomes indicated that both parts of the Kano questionnaire (positive and negative part) are unreliable.

Table 5-5 Reliability Statistics (positive part of the Kano questionnaire)

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.542	.733	12

Table 5-6 Reliability Statistics (negative part of the Kano questionnaire)

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.594	.553	12

To achieve a reliable Kano questionnaire, the researcher attempted to modify the Kano tool to be as simple as possible. That is, although the Kano questionnaire is usually conducted with five choices for each question, the choice of responses in this study was modified to offer a triple-choice (Figure 5-5) (Aghlmand et al., 2010; Shamshirsaz et al., 2013).

<i>Part 3: Simply select the answer that seems most appropriate for you.</i>	
<p>1a How would you feel if X was provided?</p>	<p>1. I like it 2. I expect it. 3. I feel neutral</p>
<p>1b How would you feel if X was not provided?</p>	<p>1. I feel neutral 2. I can tolerate it 3. I dislike it</p>

Figure 5-4 The modified Kano questionnaire

The amended Kano evaluation table is presented in Table 5-7. As the modified Kano questionnaire was used, there are 9 possible combinations for the paired questions instead of 25.

**Table 5-7 Modified Kano Evaluation Table
(E: Exciting, B: Basic, O: One-dimensional, and I: Indifferent)**

<i>Interpretation of Kano Questions</i>		<i>How do you feel if X not provided?</i>		
		1	2	3
		I feel neutral	I can tolerate it	I dislike it
<i>How do you feel is X provided?</i>	1 I like it.	E	E	O
	2 I expect it	I	I	B
	3 I feel neutral	I	I	B

When the Kano questions were modified to ‘triple-choice’, the questionnaire was again piloted with 15 residents. The triple choice question option also appeared easier for the residents to fill out. Here, the Cronbach’s α was again utilised to test the measure of internal scale consistency. In the re-testing, the overall Cronbach’s α for the modified Kano survey was reported at 0.738 (Table 5-8) for the positive part, and 0.738 for the negative part (Table 5-9). That is, the results are between 0.7 and 0.8 and are acceptable values regarding the consistency and the reliability of the questionnaire.

Table 5-8 Reliability Statistic (positive part of the modified Kano questionnaire)

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.738	.677	12

Table 5-9 Reliability Statistics (negative part of the modified Kano questionnaire)

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.738	.721	12

The outcomes of this process of checking the reliability applied to the three elements shows that the questionnaire, overall, is reliable. As such the questionnaire tool can be applied with confidence to a larger sample of the residents for achieving the objectives of the research. More specifically, the following questions can be probed through the tool.

- What are the most important customers' needs in the larger sample?
- How satisfied are residents with provided services/products in the care home where they reside?
- What are customer requirements' attributes?
- What is the organisation's priority to respond to customers' needs?

The next step in carrying out the investigation was to locate a number of care homes, involving both their staff and residents, which were willing to cooperate and contribute to the project.

5.1.3 Care homes selection and collecting the residents' responses

A. Recruiting the care homes

To estimate the number of existing care homes in the UK, an e-mail was sent to the Care Quality Commission (CQC). The organisation responded in February 2012 with information about care homes: organisation names, telephone numbers, numbers of beds, local authorities, addresses, and the types of care homes that were included, i.e. care homes with nursing care and those without. Based on the CQC data, the number of care homes in the London region in 2011 was approximately 1,862 and the number of care-home beds was 39,635. The CQC noted that this data was representative of the numbers of existing beds and not necessarily the number of residents residing in the care homes.

As a first step, 250 care homes out of 1,862 in London were selected from the CQC list, 30 care home managers out of these targeted 250 were invited by e-mail to participate in the study. Unfortunately, only three of them responded to the e-mail and all declined the offer to participate while the other 27 managers didn't respond. As a result of this poor response, it was decided to call and talk to the care home managers directly to ask for

their co-operation. At this point, the researcher contacted 60 care homes by phone and five of them were interested in participating in the research, so questionnaires were mailed to these care homes. The remaining 55 declined to participate. When they were asked why they were not willing to participate, 42 managers claimed the main reason was their high workload, lack of time and some further mentioned that their residents were not interested in any research. The others did not give any appropriate reason, just that they were not interested participating in the research.

Then it was decided to hand the questionnaires to the selected care homes in person, and to this end, 200 care homes out of 250 were selected. The criteria that this researcher considered for selecting care home was based on: type of care homes, CQC check list (i.e. providing care, management, staffing, treating residents with dignity and providing safety), and the location.

Surprisingly, when the questionnaires were handed in by the researcher, some managers and/or staff welcomed the project and contributed to it. The process of distribution of the questionnaires to the 200 care homes, took about four months (14 April to 9 Aug 2012).

141 care homes out of the 200 selected ones refused to participate, and 59-care homes agreed to participate in the research. In total, 520 questionnaires were distributed in 59 care homes, but only 35 out of the 59 care homes actually answered the questionnaires. During the distribution of the data collection questionnaire, nine care homes allowed the researcher to distribute them amongst the residents and collect them. To achieve an adequate response rate and to ensure correct completion, the researcher visited residents and described each of the three parts of the questionnaire.

In the remainder of the care homes; 26 out of the 35, staff distributed the questionnaires among the residents; which was supported by holding a discussion meeting for those staff who wanted to administer the questionnaires. The questionnaire details were discussed and explained in detail by the researcher in order for staff to get a clear idea of all points of the questions. By arranging this awareness raising session the likelihood of staff making mistakes or misunderstanding an issue was reduced to a minimal. Generally speaking, the staff developed a good command of administering the questionnaire and gained the ability to answer their residents' questions concerning the

data collection. The respondents were asked to make their responses within three months and when completed the questionnaires were collected by the researcher. Ultimately, out of the 520 questionnaire documents, which were distributed in 59 care homes, only 102 were filled out and handed back.

B. Criteria for the selection of the care homes as competitors

Usually in a tough market where the marketplace is fierce in terms of providing quality services/products, there are numerous competitors. For, in the UK, as long as there is a place available for the resident, the social services confirm the suitability of the place, and it does not cost extra; a resident can have the opportunity to move to any care home that they want. This opportunity has fuelled fierce competition among care home organisations. It is reasonable to assume that the survival of a care home in such competitive market relies heavily on its ability to fulfil residents' requirements, efficiently and effectively.

Regarding part 2 of the questionnaire, this evaluates the residents' satisfaction with the services/products provided for the DQs. The data gathered through this part compares selected care homes to others (competitors), and helps managers understand which DQs in a certain care home need to be improved, as Paryani et al. (2010) noted "customer competitive evaluation can identify opportunities for improvement". Indeed, health care providers should continuously improve patient satisfaction (Sajid & Baig, 2007), and Harrington (1991) reported that satisfaction information can be used by providers through comparing the quality of their facilities with those of others and for quality-improvement initiatives. As discussed in chapter 2, (section 2.4.2.3.3.1) in most research studies the satisfaction domains of the recipients of services (residents) have been ignored. However, in this investigation the researcher tries to overcome this deficiency by identifying residents' satisfaction based on their needs and requirements.

In this research, to reach a more holistic view towards improving quality, not only were the residents' views gathered, prioritised and analysed but also the providers' (managers) evaluations based on their residents' responses, were taken into account. That is, by getting involved in the evaluation of the residents' responses, budget and care home's strategies, the providers could target improving the level of satisfaction. Considering the relative importance weight of each of the DQs in the QPT, managers

can identify which DQs are more essential to improve, which can lead to increased resident satisfaction, and perhaps help a certain care home overtake some of its competitors in the care market.

In this study, the 35 care homes are considered as competitors to each other, and thus are compared one against another. That is, by comparing the residents' responses collected in part 2, managers have the opportunity to bench mark their residents' satisfaction with the provided services/products and strategically set targets for improving these in light of the responses reported in other care homes. To compare care homes one against another an attempt was made to select care homes which were similar to each other. The criteria considered for selecting competitors between the care homes concerned:

1. Type of care home,
2. Number of beds,
3. Number of residents,
4. The ratio of staff to residents,
5. The premises,
6. The commissioner (CQC) rating of care homes

The researcher sought out similarities among care homes for those identified as competitors. For example, a residential care home with 20 to 30 beds, 15 to 30 residents, a ratio of 4 to 6 residents to a member of staff, renovated and modern buildings, and similar CQC ratings, was compared to another care home with criteria that aligned with these. The questionnaires had been distributed among the 35 participating care homes, but only 17 managers expressed their interest in participating in organising the QPT.

5.2 Analysis of the Data

The medians of the answers for parts 1 and 2 of the questionnaire were calculated by listing in numerical order and the 'middle' value through the ordinal scale obtained. The median is utilised as the questionnaire results were ordinal data (Likert scale) and, in this situation, the median is more suitable than the mean (Aghlmand et al., 2010) for this purpose.

5.2.1 Analysis of Part 1

Part 1 was designed to identify the importance of each DQ amongst the larger sample of residents. It was designed to offer residents the opportunity to choose one statement for each DQ, using a 5-point Likert scale. As reported in Table 5-10, out of the 12 DQs, four (i.e. Caring and Sensitive Staff, Social Interaction, Safety, and Homelike Environment) were rated ‘5’ i.e. the highest and thus can be considered the most important requirements in the list. The DQ involvement rated at ‘3’ was the least important, and the remaining DQs were rated in between these. Table 5-10 below summarises the median resulting for all these DQs.

Table 5-10 Part 1 statistics: median value for each DQ

<i>No</i>	<i>Demanded Qualities</i>	<i>Median</i>
1	Caring and Sensitive Staff	5
2	Social Interaction	5
3	Autonomy	4
4	Accessible Equipment	4
5	Meals	4
6	Safety	5
7	Family Support	4
8	Accurate Medical Care	4
9	Involvement	3
10	Homelike Environment	5
11	Daily Living Activities	4
12	Suitable Design	4

Next, for ease of analysis and explanation of the results in a coherent form, the researcher first addresses the outcome of part 3 prior to the analysis of the outcome of part 2.

5.2.2 Part Three (Kano model)

In this part, for each DQ, the resident answered a pair of questions. By combining the two answers, the resident’s requirements were classified into 4 different categories: “Basic Needs,” “One-dimensional Needs”, “Excitement Needs” and “Indifferent”. A

brief explanation of each category is given below and more details have been explained in the methodology chapter (Chapter 3). The needs categories are described as follows:

One-dimensional: residents' satisfaction is proportional to how fully functional the demanded quality is, for these needs, the customer is more satisfied when performance is better and vice versa.

Basic needs: the need is so fundamental that it may not even be verbalized by the resident. A resident is unhappy if the need is unsatisfied but is not more satisfied if the need's function is improved.

Excitement needs: these needs are also not verbalized. They, however, provide the opportunity of creating immediate resident happiness and enthusiasm.

Indifference: this factor does not have any impact on resident satisfaction and dissatisfaction.

5.2.2.1 Analysis of Kano questionnaire data

The Kano questionnaires were evaluated in two stages, according to frequencies and a customer satisfaction coefficient. At the first stage, based on resident responses to a pair of questions (contained in the Kano questionnaire) which are combined in the Kano evaluation table (Table 5-7), the residents' needs were classified. For example, a resident answers "I like it", as regards "How do you feel if the staff team being 'caring and sensitive' toward you?" – (the function form of the question), and answered "I dislike it" with regards to "How do you feel if the staff team are not being 'caring and sensitive' toward you?" – (the dysfunction form of the question). The combination of the answers based on the evaluation table (see Table 5-8) the 'caring and sensitive staff' element is categorised as an O. This indicates that 'caring and sensitive staff' is a one-dimensional need from this resident's point of view.

At the second stage, after combining all the residents' responses to a pair of questions, in the evaluation table (Table 5-7), the result for each DQ was entered in the table of results (Table 5-11). Through this process the frequency of residents' needs (DQs) categories were gained and the residents' satisfaction coefficient SI (satisfaction index) and DI (dissatisfaction index) were calculated, as shown in Table 5-11.

Table 5-11 The results of the analysis of the Kano questionnaire data

<i>Demanded Qualities</i>	<i>E</i>	<i>O</i>	<i>B</i>	<i>I</i>	<i>Total Responses</i>	<i>Percentage of Responses</i>	<i>SI= (E+O)/ (E+O+B+I)</i>	<i>DI= -(O+B)/ (E+O+B+I)</i>	<i>Grade</i>
Caring and Sensitive Staff	10	50	37	3	100	98 %	0.6	- 0.87	O
Social Interaction	9	47	35	8	99	97 %	0.56	- 0.82	O
Autonomy	8	49	33	12	102	100 %	0.57	- 0.80	O
Accessible Equipment	41	33	12	4	90	88.2 %	0.82	- 0.5	E
Meals	5	36	50	3	94	92%	0.43	- 0.91	B
Safety	5	39	51	2	96	95	0.46	- 0.92	B
Family Support	7	38	26	22	93	91 %	0.48	- 0.68	O
Accurate Medical Care	11	32	45	8	96	94 %	0.44	- 0.80	B
Involvement	28	25	5	35	93	91 %	0.56	- 0.32	I
Homelike Environment	39	29	16	5	89	87 %	0.76	- 0.5	E
Daily Living Activities	9	47	33	13	102	100 %	0.54	- 0.78	O
Suitable Design	39	28	12	9	88	86 %	0.76	- 0.45	E

As presented in Table 5-11, residents' requirements are categorised on the basis of how their fulfilment or non-fulfilment can make residents satisfied or dissatisfied. The average impacts of DQs' features on residents' satisfaction levels were calculated by using the SI (satisfaction index) and the DI (dissatisfaction index). The result of these two parameters in the table show how strongly the fulfilment of features can affect residents' satisfaction, or impact on their dissatisfaction, if the feature is not fulfilled. For example, according to the data listed in Table 5-11, caring and sensitive staff with a negative customer satisfaction (CS) coefficient of -0.87 leads to more than proportional

dissatisfaction; caring and sensitive with a positive CS coefficient of 0.6 can only slightly increase satisfaction.

In sum, within the 12 DQs, three were identified as excitement attributes, i.e. “Accessible Equipment”, “Homelike Environment”, “Suitable Design”; a further six were reported as one-dimensional requirements, i.e. “Caring and Sensitive Staff”, “Social Interaction”, “Autonomy”, “Daily Living Activities” and “Family Support”; the next three were basic requirements, i.e. “Meal”, “Safety”, and “Accurate Medical Care”; and finally, one emerged as being an indifferent attribute, i.e. “Involvement”.

5.2.3 Analysis of Part 2

Part 2 was conducted to evaluate the level of residents’ satisfaction with the given services in their care home as well as market competitiveness, with the objective of targeting the quality improvement of certain DQs. In other words, it was probed how the DQs were provided by using the five-point Likert scale. The median value for each care home was taken, which is shown in the column D of the QPTs, in Table (5-13) and Appendix F.

The outcome of this part provided the opportunity for the care home managers and team to identify the level of the care home’s performance to decide and set the target for improvement the performance of certain DQ. The combination of a target goal with current residents’ rating for provided services, can be used to calculate the improvement ratio.

5.2.4 Analysing residents requirements using quality planning table (QPT)

In this section the results gathered from parts 1, 2 and 3 of the questionnaire are placed, combined and analysed in the QPT in order to prioritise needs and requirements (DQs) and subsequently to produce observational and measurable data for calculation of their final relative weight.

After analysis of the three parts of the questionnaire; the importance of DQs amongst the larger group of residents, residents’ satisfaction with provided services, and the category of need (Kano level), the researcher sought to encourage the manager in each care home to engage with the competitive analysis and set targets regarding residents’

satisfaction with respect to each DQ. The care home managers can be the key figures in deciding and setting targets for improvements, particularly when they can use residents' survey responses regarding service ratings, and they have the opportunity to compare their own organisation with their competitors. In addition, competitive evaluation can provide opportunities for managers to improve their care home's services.

In this section, the QPT is structured based on a method proposed by Chaudha et al (2011). All the calculations and the designed QPT (Tables 5-12) for a specific care home are presented here as an example to show how the survey data can be used in the QPT for prioritising items for improvements. The selected exemplar care home is located in west London (with 20 beds) and 8 residents from the care home answered the questionnaire. Another care home, also in west London, (with 25 beds) and from which 10 residents answered the questionnaire, was taken as its competitor.

In Table 5-12, based on Chaudha et al., (2011) the six columns on the left present data captured from the residents' survey. That is, column A: demanded qualities B: customer importance rating (taken from part 1 calculations of the median value from all respondents); C: competitor ranking (taken from part 2 calculations of the median values from the 10 participants located in the 25 bed care home); D; our performance ranking (using part 2 data giving the median values calculated from the responses given by the 8 participants resident in the 20 bed care home); E: Kano category (taken from part 3 data based on all respondents' questionnaire replies) and F: is the adjustment factor or 'm' (the higher absolute value of SI or DI, part 3).

The eighth column (i.e. column G) contains specific information discussed and agreed by the care home managers. In this stage, based on the budget, care homes managers' viewpoint and strategies, the levels of desired performance goal were assigned. These are targets for improvement, which, using based on residents' data, means that a target for residents' satisfaction is set for each demanded quality (column G). The improvement ratio (column H) demonstrates the potential improvement for each DQ calculated by dividing the target value (column G) by the customer perception (column D) obtained from the survey.

In addition, column I presents the adjusted importance ratio calculated by the formula of $(1+m)^k \times IR_0$. By applying this formula a higher value is placed on those requirements

that can bring more satisfaction when present, or vice versa. Column J, for achieving the desired customer satisfaction performance, the adjusted importance ratio outcome (see the entries in column I), was then multiplied by customer importance rating (column B). and finally, the relative importance for each DQ (see column K values) was calculated.

Table 5-12 QPT according to Chaudha et al. (2011) for a specific care home

Quality Planning Table (QPT.1)	B. Customer Importance Rating	C. Care Home (No.1) Performance Rating	D. Our Performance Rating.Care Home (No.2)	E. Kano Category	Value of K	F. $m = \max (SI, DI)$	G. Target	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4	4.5	O	1	0.86	5	1.11	2.07	10.33	10.51
2. Social Interaction	5	3	3.5	O	1	0.82	4	1.14	2.08	10.4	10.58
3. Autonomy	4	2.5	3.5	O	1	0.8	4	1.14	2.06	8.229	8.373
4. Accessible Equipment	4	3.5	3	F	1.5	0.82	3	1	2.46	9.821	9.994
5. Meal	4.5	4.5	5	B	0.5	0.91	5	1	1.38	6.219	6.328
6. Safety	5	4	4	B	0.5	0.92	5	1.25	1.73	8.66	8.812
7. Family Support	4	4	5	O	1	0.68	5	1	1.68	6.72	6.838
8. Accurate Medical Care	4	4	4.5	B	0.5	0.8	4.5	1	1.34	5.367	5.461
9. Involvement	3	2.5	3	I	0	0.56	3.5	1.17	1.17	3.5	3.561
10. Homelike Environment	5	2	4	E	1.5	0.76	4	1	2.33	11.67	11.88
11. Daily Living Activities	4	4	4	O	1	0.78	4.5	1.13	2	8.01	8.151
12. Suitable Design	4	2.5	4	E	1.5	0.76	4	1	2.33	9.34	9.504

As shown in Table 5-12, the assigned scores indicated that the competitor (No.1) has the same or lower performance rating across all resident needs (column C) when compared to care home No. 2. However, in this case study, the manager of care home No.2 revealed that, based on their strategies, they potentially are ready to improve on some resident requirements to a standard that is higher than that offered by their competitors and will satisfy residents better. She reported that she was concerned with improving issues such as: caring and sensitive staff, social interaction, autonomy, safety, involvement and daily living activities. To this end, she had set some targets for improvement. When the target was set, based on the calculation mentioned above, the improvement ratio, adjustment improvement ratio, adjustment importance and percentage of relative importance were also calculated.

According to the quality planning table (Table 5-12), the priority improvement sequence is as follows: homelike environment, social interaction, caring and sensitive staff, accessible equipment, suitable design, safety, autonomy, daily living activities, family support, meal, accurate medical care and involvement. Based on the QPT (Table 5-13), in this specific care home (No.2), setting targets for increasing residents' satisfaction as well as improving their competitiveness, could be achieved by focusing on the DQs with the highest relative weight.

Using this procedure as set out above, 16 other QPTs for other care homes were drawn up, through which, one by one, they were compared and the relative weight of each DQ was identified for all the cases (Appendix F). The relative weight of all 12 demanded qualities, which were calculated in 17 QPTs have been illustrated in Table 5-13.

Table 5-13 Average of relative weight

<i>Relative Importance (%)</i>																		
No. of QPT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	<i>Average</i>
Caring and Sensitive Staff	10.5	8.74	9.59	10.2	10.1	10.6	9.39	10.2	10.4	8.71	10.6	9.78	11.1	10.6	10.07	10.3	10.51	10.1
Social Interaction	10.5	8.87	10.56	9.03	10.1	9.25	9.33	8.93	9.08	9.74	9.23	8.61	8.46	10.6	10.01	8.85	10.44	9.52
Autonomy	8.37	9.63	7.42	8.04	8.05	7.32	8.31	9.09	9.58	7.59	7.30	6.81	7.53	8.28	7.92	6.75	8.13	8.01
Accessible Equipment	9.99	8.21	10.13	9.75	11.2	9.98	8.82	11.0	9.80	10.5	9.96	10.6	9.13	10.0	11.03	9.35	9.86	9.97
Meals	6.32	5.77	7.12	7.72	6.08	7.02	6.38	6.10	6.98	6.55	6.31	6.72	5.78	6.35	5.98	5.1	6.24	6.39
Safety	8.81	7.2	8.93	7.64	7.62	7.04	6.99	7.77	7.68	6.49	7.81	7.49	7.24	8.09	6.67	5.77	7.83	7.48
Family Support	6.83	6.31	6.93	6.67	6.57	6.83	6.70	7.33	6.70	6.29	7.67	7.15	6.24	6.87	7.27	5.60	6.75	6.75
Accurate Medical Care	5.46	5.04	5.53	5.99	5.25	5.45	5.42	5.27	5.35	5.03	6.12	5.71	4.98	5.48	5.74	4.97	6.06	5.46
Involvement	3.56	3	3.53	3.04	3.91	3.05	2.69	2.94	3.42	2.81	3.04	2.83	3.48	3.06	3.46	3.12	3.01	3.20
Homelike Environment	11.8	19.5	12.04	12.8	12.8	13.3	18.3	13.7	13.3	16.4	13.8	14.7	16.2	13.6	13.48	19.4	13.40	14.66
Daily Living Activities	8.15	6.69	7.34	7.95	7.83	8.14	6.39	6.99	7.10	6.67	7.22	7.70	7.56	7.27	7.83	6.92	7.15	7.35
Suitable Design	9.50	10.9	10.83	10.6	10.2	11.8	11.1	10.4	10.4	13.1	10.8	11.7	12.1	9.54	10.49	13.6	10.55	11.07

Demanded Qualities

Customers usually tend to give a higher weight to basic needs and as discussed before, meeting these needs does not increase customer satisfaction but still should be fulfilled. The approach recommended by Chaudha et al. (2011) assigns higher importance to those DQs which can potentially give more satisfaction to residents (categorised as excitement and one-dimensional). As shown in Table 5-13, the DQs that are basic needs have lower weighting compared to the DQs that are excitement and one-dimensional needs, the latter two being those which can lead to competitive advantage when fulfilled by organisations. With regards to this, it can be seen in Table 5-13 that homelike environment with the average relative importance weighting of (14.66); suitable design with the weighting of (11.07); caring and sensitive staff (10.1) and accessible equipment (9.97) are the most important DQs, while involvement, with the weighting of (3.2) is the least important. Moreover, the excitement requirements comparatively have the highest weights and providing these can increase residents' levels of satisfaction significantly.

It should be mentioned that the application of this procedure is the first time it has been used in health care as well as care home organisations. For evaluating competitors' performance, researchers usually consider between one and three competitors against a certain specified organisation. In this study the researcher has applied these techniques in order to show a more holistic view regarding this process, so for analysing care home performance seventeen care homes were selected and compared.

5.3 Chapter conclusion

Assessment of quality can become more reliable and legitimate by integrating residents' views, experience and perception as well as professional and other stakeholder opinion. In published survey studies of residents and families, different dimensions of requirements are theoretically identified. However, no previous study has prioritised residents' expressed needs or assessed the level of requirements from the perspective of residents in care homes. This study has utilised different tools, in combination with the Kano model, to identify the relative importance of the identified requirements (i.e. demanded qualities). In fact, by applying the Kano model, it was possible to identify which requirements should fulfil basic needs, those which fulfil one-dimensional needs and those which produce superior satisfaction (excitement needs).

Based on the data collected from 102 residents, three delighters were identified, i.e. accessible equipment, homelike environment, and suitable design. It is believed that the improvement of any of these factors will significantly increase residents' satisfaction. Moreover, the quality planning table (QPT) tool has been deployed to demonstrate how to manipulate the survey data in combination with specific quality targets in order to prioritise items for improvement. This study has the potential to assist care homes managers in deciding on the most important factors to address when aiming to improve residents' satisfaction.

6 Identifying the priority of quality indicators used for improvements

In the previous chapter, through the reporting of the results of the survey the importance of residents' demanded qualities (DQs), the level of their satisfaction with the provided services and the nature of their DQs (using the Kano model: basic, one-dimensional, and excitement) were identified. Then, based on the results of this survey, the weight of each DQ was calculated using a Quality Planning Table (QPT).

In order to improve quality and hence, residents' satisfaction, based on the assessment of their needs and requirements, this chapter aims to identify the actions that need to be carried out to achieve this. To this end, their stated requirements are modified into measurable components (performance measures). By determination of these performance measures, the relevant organisation will be able to identify what action needs to be taken in order to increase residents' satisfaction.

To create the performance measures, cause and effect diagrams (fishbone diagrams) are used to stimulate awareness and creative thinking concerning these factors. This identification, particularly in terms of the impacts of the factors, helps ensure their comprehensive collection and thereby facilitates efforts to improve quality. In order to do this the factors which could impact on the delivery of the needs were investigated. That is, by means of brainstorming the causes and effects that were deemed to play the greatest role regarding the DQs were elicited.

In the next stage, after all the DQs had been addressed, the elements recognised as having the greatest effect on each were turned into a measurable factor: the performance measure. That is, the performance measure is a statement indicating how an element should be measured in order to assess performance regarding a DQ. The final stage involved creating the House of Quality (HOQ) to identify which performance measure should be optimised to guarantee residents' satisfaction.

6.1 Creating a Fishbone Diagram

Drawing on the literature review (see chapter 2) and the experience gained through the research process, the researcher drew the fishbone diagrams, one for each DQ, in order to identify the relationship between the DQ and its contributing factors. The procedure for creating each fishbone diagram is summarised below:

Step 1. The DQs, representing the head of the fish, were written as descriptively as possible on the right-hand side of a large blank page, following the axis of the diagram.

Step 2: The major causes were identified and categorised as the main influencing factors of the DQ. In this case, the headings of the branches representing contributing causes, were grouped into six specific categories: environment, procedures, facilities, residents, staff and other. The major categories of variables were drawn in along diagonal lines, crossing the horizontal line to the left of the arrowhead. These lines were then labelled.

Step 3. The researcher tried to identify the causes regarding each category. The sub-branches were depicted with small arrowheads as lines horizontal to the fishbone lines.

The sample of the fishbone diagram is shown below (Figure 6.1):

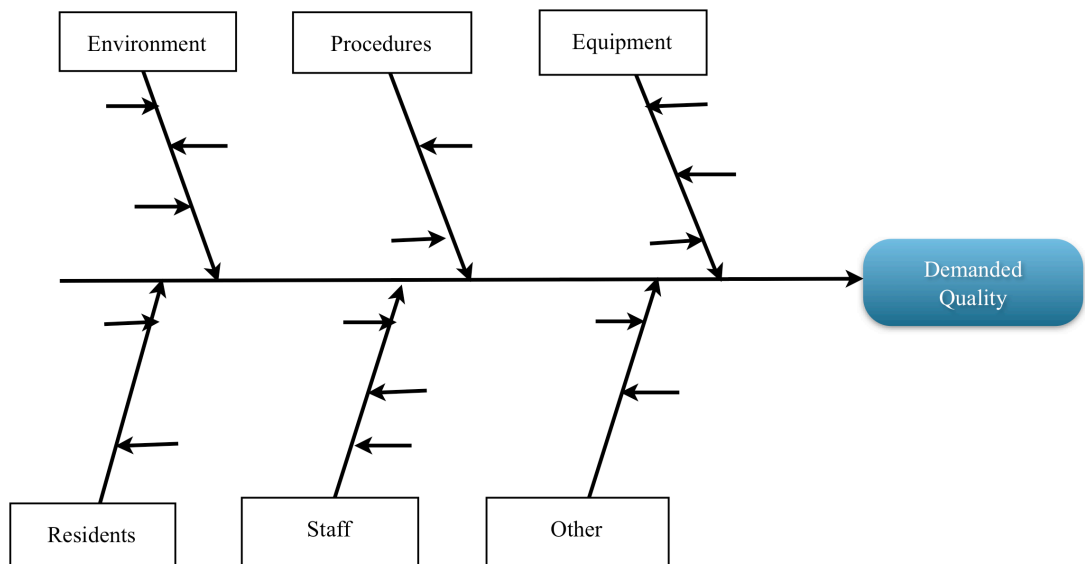


Figure 6-1: Fishbone diagram template

The initial diagram for each DQ was created by the researcher based on her interpretations of the potentially significant factors. Each fishbone diagram was drawn on a large separate blank page, using a large enough font so that it would be clear to the participants in the group. A care home in Peterborough was the site of the brainstorming

exercise as the manager, staff and residents had expressed a willingness for participating in this part of the study. The first criterion regarding selecting the team members was their experience of living or running the care home. This is a particular experience which could not be elicited through any means other than by asking these individuals. In addition, regarding the residents, their physical and mental readiness and degree of interest were other aspects taken into account whereas for selecting the staff, the focus was on gaining the participation of the more experienced staff. The group included two staff members, two residents and the manager of the care home.

Each of the initial diagrams that had been drawn up by the researcher was then integrated with the care home informants' views, involving customers (residents) and providers (staff), in order to benefit from the opinions of those who had experienced working at or living in the care home. This approach to revealing the 'care home experience' was considered crucial in determining the effective elements for each DQ. To ensure that the fishbone diagram was used to promote participants' understanding of the causes and effects regarding the DQs, the data collection began with an introduction given by the researcher. This started with a session aimed at teaching participants how to complete the diagram. Next, complex terms, such as "define the problem"; "identify the problem categories/causes/solutions (Sue-Chen & Wood, 2009) were explained by the researcher, who emphasised the significance of improving care home outcomes. It should be noted that the rules for completing the diagrams were easy to teach during the session. When these technical issues had been explained to the participants, each initial pre-constructed fishbone diagram was placed on the table. The participants were then asked to review each of the initial diagrams, adding or removing the cause(s). Finally, each diagram was completed by asking the participants "What causes did the group miss? Are there any other causes that the group could generate?" These questions had the aim of directing the participants to reflect on the quality of the completed diagrams.

The process for organising a diagram is summarised below:

Step 1. The team members were assembled around the table to start the process. The group included two professional staff, two residents who were completely aware and who did not have any cognitive impairments, the manager of the care home and the researcher.

Step 2: The initial fishbone diagrams that had been completed by the researcher were placed one by one on the table. For each diagram, the team members were asked to identify the causes for each category (main categories), namely: environment, procedure, facilities, residents, staff and other.

Step 3: The main categories were taken one at a time, and the team members were asked to brainstorm all the variables in each category that could have an effect on the DQ outcome. Causes were recorded in a different colour to the main outline as lines with small arrowheads, horizontal to the fishbone lines.

Step 4: More causes were added to the bones of the diagram by posing the question “What causes did the group miss?” The responses to this prompt were added as additional branches.

Step 5: The team identified the main variables or causes for each DQ as, in their view, the major causes.

In the following section the fishbone diagram related to each DQ is shown and discussed.

6.1.1 Caring and Sensitive Staff

‘Caring and Sensitive Staff’ is one of the major issues regarding the quality of care homes and residents’ satisfaction, and is the DQ addressed in the first fishbone diagram discussion. Below, the diagram that was initially drawn by the researcher and based on the information gained through the study, contains the possible causes which relate to this DQ of caring and sensitive staff (Figure 6-2).

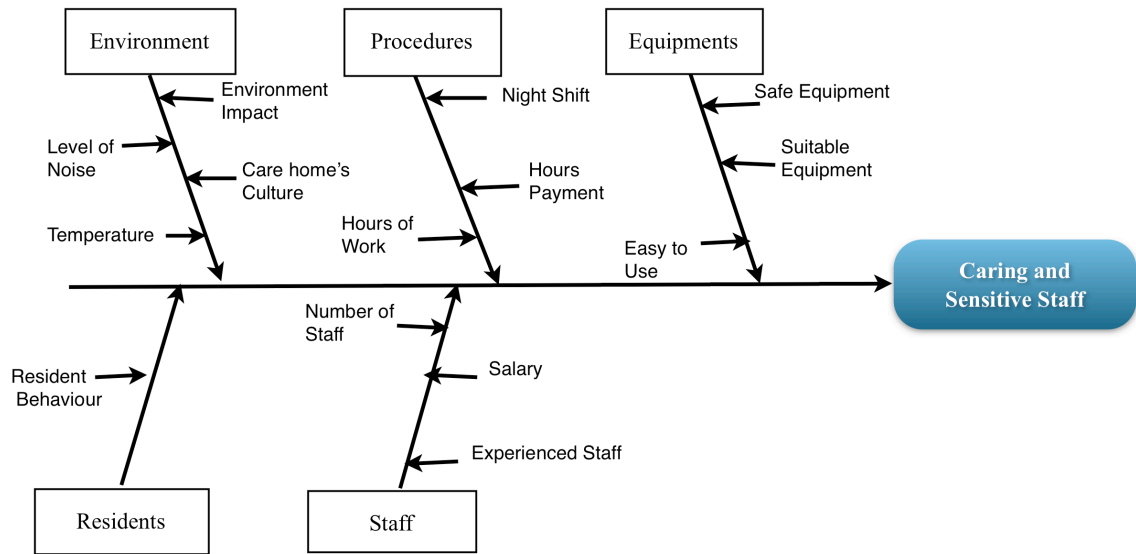


Figure 6-2 Initial fishbone diagram with respect to the DQ caring and sensitive staff (drawn by the researcher)

Working on this diagram the participants decided which elements needed to be changed and figure 6-3 illustrates which causes were reconsidered. The red dotted lines surround these items).

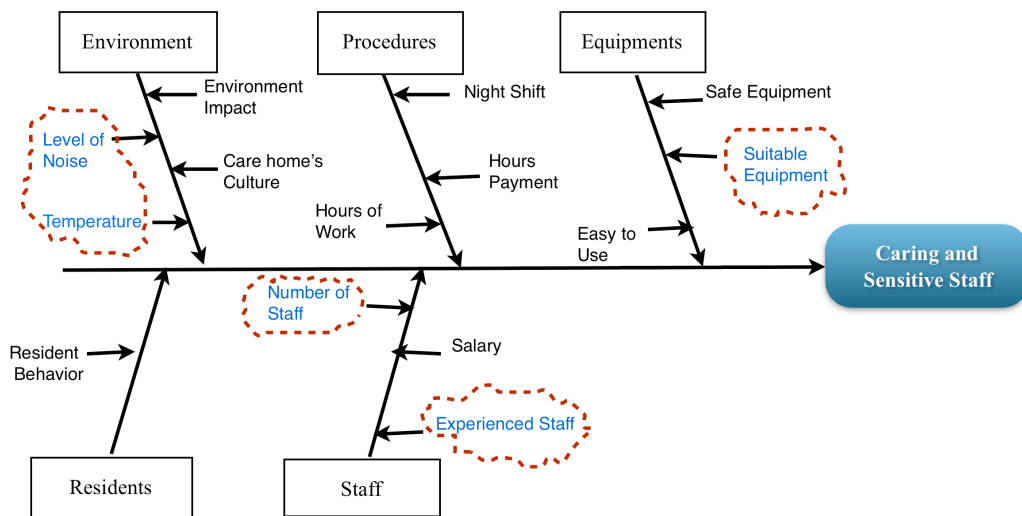


Figure 6-3 Fishbone diagram with respect to the DQ caring and sensitive staff with the items which were reconsidered, following on from Fig 6-2

As shown above in the diagram (Figure 6-3) five items have been reconsidered, as the discussants decided to remove the ‘level of noise’ and ‘temperature’ as they were not considered as main factors regarding this DQ.

Turning to the other factors, the number of staff and experience of staff were identified as important but only to the extent that staff were doing their job well. In the group discussion it was explained by the manager and staff that, usually, care homes do not need more staff, so long as the existing employees are productive and efficient. So the participants agreed to remove both the 'number of staff' and 'experience staff' factors and replace them with the term 'productive and sufficient staff', i.e. those that do their job effectively. As commented by the manager in the discussion, if the quantity of staff is too great, then there is the possibility of staff wasting time, gossiping, hanging around and passing on their own duties to others. Moreover, the residents pointed out that novice and inexperienced members of staff are sometimes more productive than experienced ones as they are fresh and do their best to prove their ability, diligence and enthusiasm.

The next item removed from the diagram was 'suitable equipment'; it was identified that if the equipment is 'safe' and 'easy' to use, it could be considered as suitable equipment. Subsequently, the item 'ergonomic design' was added to the 'equipment' category, to reflect the various capabilities of individuals. It was voiced that this ergonomic equipment could not only reduce the potential for accidents, but also improve productivity and performance of the staff. When the number and severity of accidents is reduced through better design, this can have significant implications for efficiency, productivity, safety, health, and comfort in the care home environment.

In the above diagram 'night shift' has modified to 'shift work' which includes both day and night shifts. The staff working in the home recommended, if possible, that a 'three shift' work pattern would be more effective, because they believed that they would work more effectively and feel less exhausted in this regime. 'Teamworking' and 'management culture' were two new factors added to the diagram. According to the consensus gained through the discussion, teamwork is of great importance in terms of the productivity it can create by boosting team spirit, which in turn, can make the care home a well organised place. Moreover, depending on there being a positive 'management culture', staff may be constantly encouraged and, if necessary given constructive criticism. This approach there may create better motivation in the workplace through which the staff may find satisfaction in their work.

The finalised fishbone diagram of the DQ ‘Caring and Sensitive Staff’ is shown below:

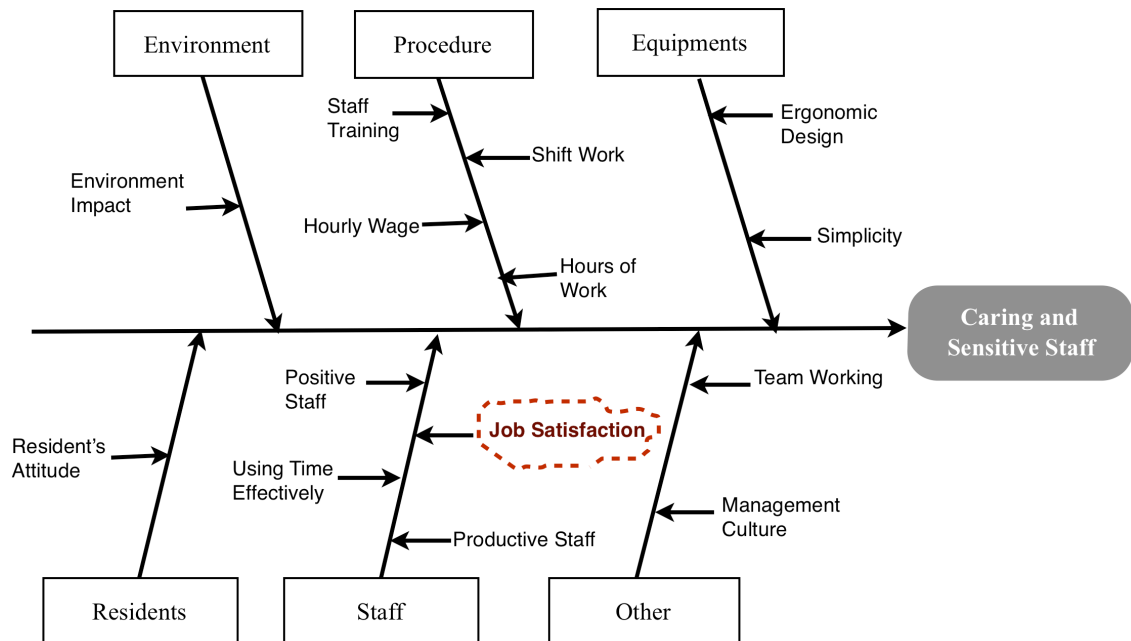


Figure 6-4 Fishbone diagram with respect to the DQ caring and sensitive staff (drawn up during the brainstorming group work)

During the group meeting, numerous reasons that may lead to ‘caring and sensitive staff’ were illustrated, such as: high stress, limited opportunity for growth, sometimes staff having to leave their families, lack of communication with the manager, less motivation, and poor money being paid for the job. From the discussions, ‘job satisfaction’ was determined as being the crucial factor for enhancing this DQ. This emerged as the main factor increasing employees’ efforts towards their being caring and sensitive. By offering them better satisfaction levels, the staff could relate to the residents with a positive attitude and provide better quality of care, which leads to satisfaction amongst the residents. Keeping members of staff satisfied with their careers should be a major priority for the care home manager.

6.1.2 Social Interaction

Residents in this research repeatedly emphasised that interaction as a necessity for their daily living as it saved them from boredom and a monotonous life. This is similar to the comment that “The relationship between social support and health has been recognized for many years... In the absence of stressful events, a broad social network may promote health” (Leung et al., 2007, p.204). Therefore, social interaction among

residents can be a weapon against isolation and loneliness and enhance their spirit and life expectancy. Various causes that influence the quality of the interaction between residents are demonstrated in the diagrams below. The procedure undertaken for drawing up the different stages of the created fishbone diagrams for this DQ, and for all the following DQs, was the same as for the first DQ explained above.

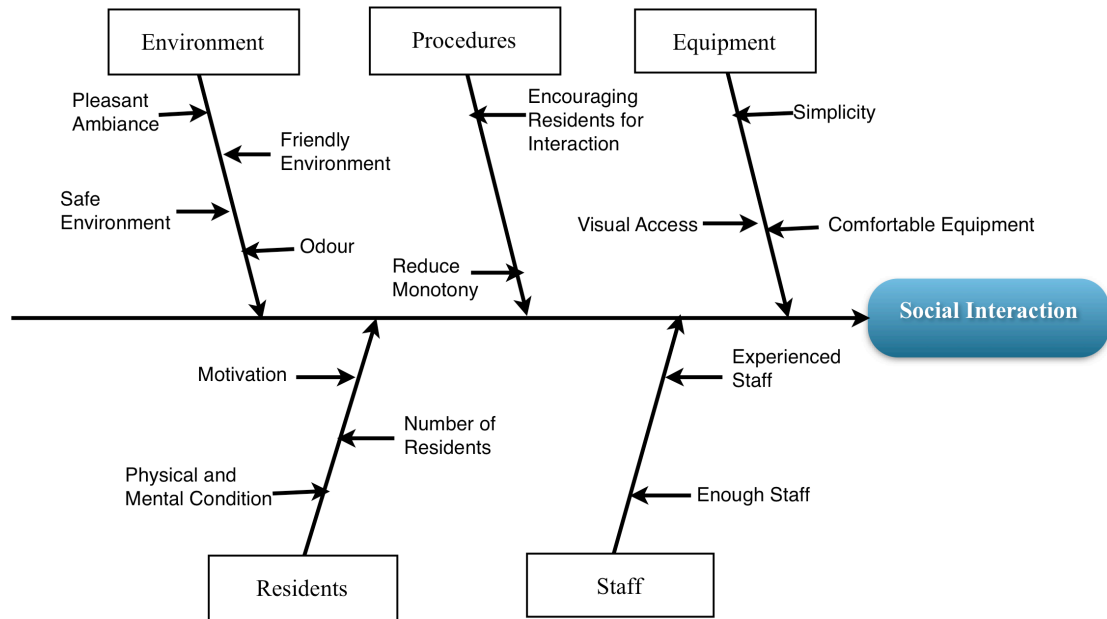


Figure 6-5 Initial fishbone diagram with respect to the DQ social interaction (drawn by the researcher)

Since ‘odour’ was not recognized as a factor that can influence social interaction, it was omitted after discussions. Likewise ‘enough staff’, was replaced with the term ‘productive and sufficient staff’.

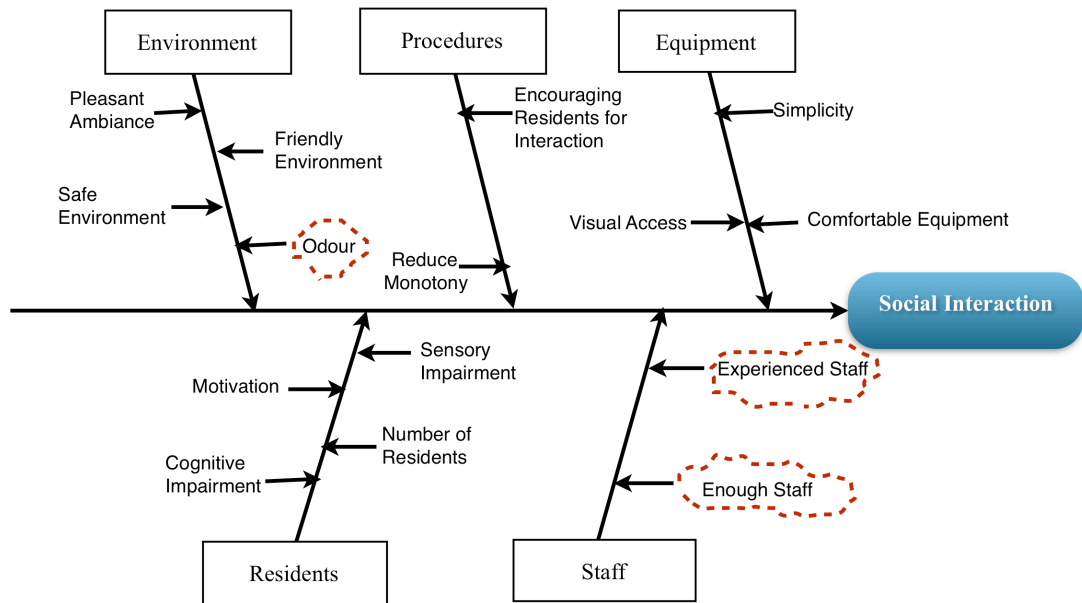


Figure 6-6 Fishbone diagram with respect to the DQ social interaction with the items which were reconsidered, following on from Fig 6.5

Then the group members added as a factor ‘uplifting environment’ as they argued that creating an uplifting environment could encourage residents to interact more with others. From their points of view, several factors can influence the nature of the environment and make it uplifting, such as: residents’ behaviour, personal attitudes, cleanliness, interior design and entertainment.

Subsequently, ‘layout and interior design’ was added to the environmental factors. As many residents living in care homes usually have high levels of disability, such as sensory and cognitive impairment and sight loss and/or dementia, they commonly prefer to stay in their rooms and thus do not interact. It may be that appropriate design and layout of the care home building could encourage residents to come out of their rooms and start to interact freely.

Lastly, the term ‘give resident’s choice’ was added to the diagram by the group to the residents related dimension. This was interpreted as the staff knowing residents’ likes and dislikes and respecting residents’ rights when making choices, as well as giving them a chance to decide on when and how to socialize. The final diagram is shown below in Figure 6-7.

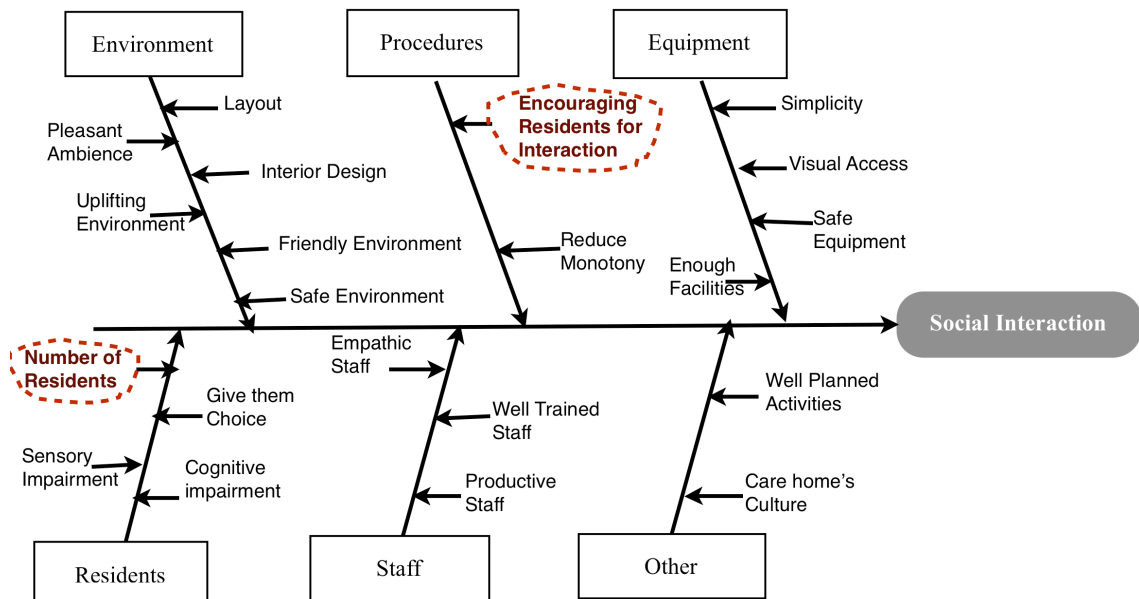


Figure 6-7 Fishbone diagram with respect to the DQ social interaction (drawn up during the brainstorming group work)

As is indicated above, in the final version of this diagram, ‘encouraging residents for interaction’ and ‘number of residents’ were recognized as being very significant by the group. The residents and manager reported that the role of the staff as a mentor in promoting discussion and debate between the residents is vital. It does not mean that the staff have to spend a specific time on creating such an atmosphere necessarily, but it can be conducted through their daily activities when doing their tasks in a normal manner. One resident mentioned that, for example, encouraging the residents to engage in social interaction by staff sharing a current topic from the news can help to kick off a good discussion (sic) among them.

The residents and staff believed that the smaller the population of the care home, the more interaction occurs. One reason referred to was that when there are few residents they can find opportunities for getting to know each other, mingling and establishing relationships.

6.1.3 Autonomy

Respecting a resident’s autonomy is one of the vital elements in care homes and it is usually interpreted as residents having as much control as possible over their own care and life. Moving to a care home is often associated with a series of new challenges for the individual concerned. Thus, providing good life conditions with satisfactory levels

of autonomy and independence can increase both a resident's satisfaction with the home and generally raise the quality of life.

The fact that residents are autonomous and as independent as possible, is very much tied to the factors shown in Figure 6-8. It should be noted that, for the 'autonomy' diagram drawn up by the researcher, no changes were made in the meeting and all the elements were agreed upon. The factors affecting the DQ resident autonomy are shown in the figure below.

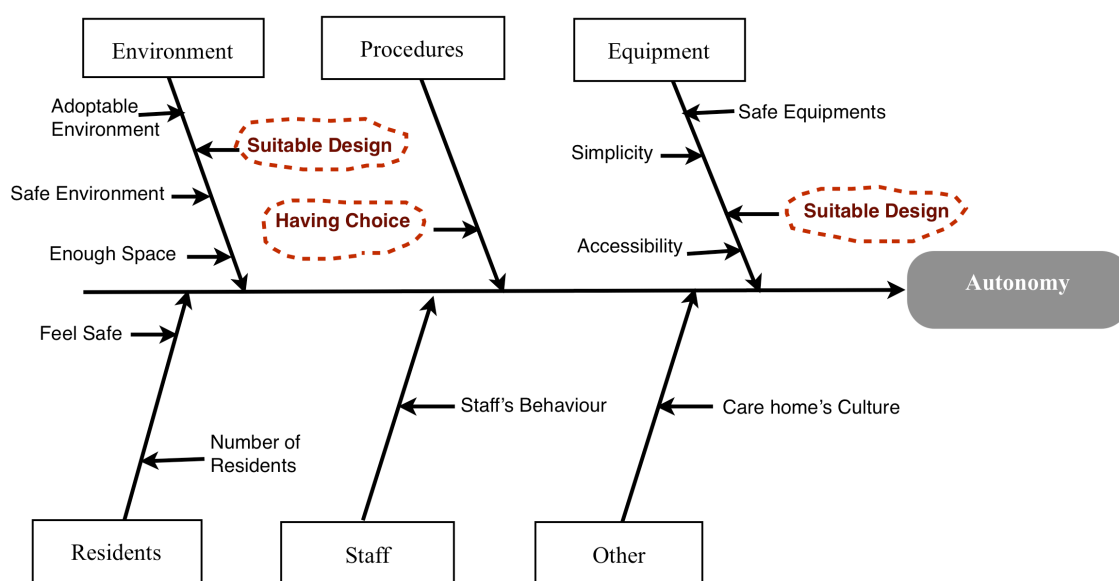


Figure 6-8 Fishbone diagram with respect to the DQ autonomy (drawn up by the researcher and approved by the group)

'Suitable design' and 'having choice' were chosen as the two main factors for providing autonomy for residents. The group members said that the former means encouraging and supporting residents when carrying out their basic tasks and activities. At the same time this requires staff to refrain from being over protective and allow for as much independence as possible.

The residents believed that it is important that staff recognise how to give autonomy to residents. They also mentioned that staff should understand residents' levels of ability and involve them in any decision that might impact on their life and care. They noted that 'having choice' is the best way for promoting autonomy in care homes and the best way is giving this as much as possible. This will ensure they have control over what happens to them in their life, and regarding any wider decisions about the home such as recruiting new staff or changing the menus.

6.1.4 Meals

Malnutrition has been identified as a component that can challenge the quality of life and the general health of residents living in nursing homes (Crogan et al., 2004). In addition, mealtimes can give residents opportunities not only to enjoy good food but also to socialise with staff and other residents, which according to Nijs et al. (2006, p.1) can add a “sense of security, meaning, order, and structure to the day and improve satisfaction with life.” The factors that the researcher determined as possibly influencing the DQ meals are shown below in Figure 6-9.

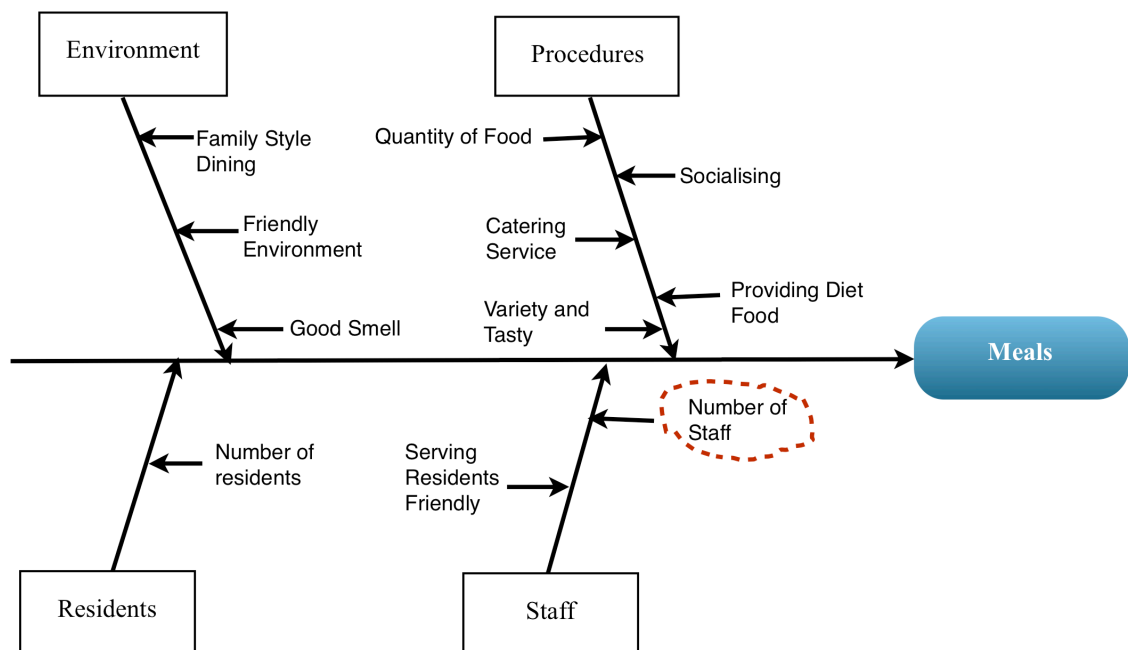


Figure 6-9 Initial fishbone diagram with respect to the DQ meals (drawn by the researcher)

In the group discussion, several factors were raised and then added to the diagram. To start, ‘pleasant ambience’ was added, as the group confirmed that this could create a friendly environment and enhance social networks among the residents. They voiced the opinion that emotional feelings could be exchanged effectively within a pleasant ambience centred on mealtimes.

Through the brainstorming session, ‘having choices’ was arrived at as one factor that could also influence the DQ meals. ‘Having choices’ cannot only influence residents’ food intake but may also increase their overall satisfaction with their food. It was suggested that staff members can play a key role in improving resident satisfaction

during mealtimes. The term ‘number of staff’ was thus changed in favour of ‘productive and sufficient staff’ because, as participants explained, staff interventions during meals should be effective in ensuring that every resident received enough assistance during the time periods allocated for eating. In sum, the group agreed that ‘productive and sufficient staff’ and ‘variety of and tasty food’ were the two main factors comprising the DQ regarding meals. The participants believed these two factors could increase significantly the residents’ satisfaction in terms of choices and appetite regarding meals.

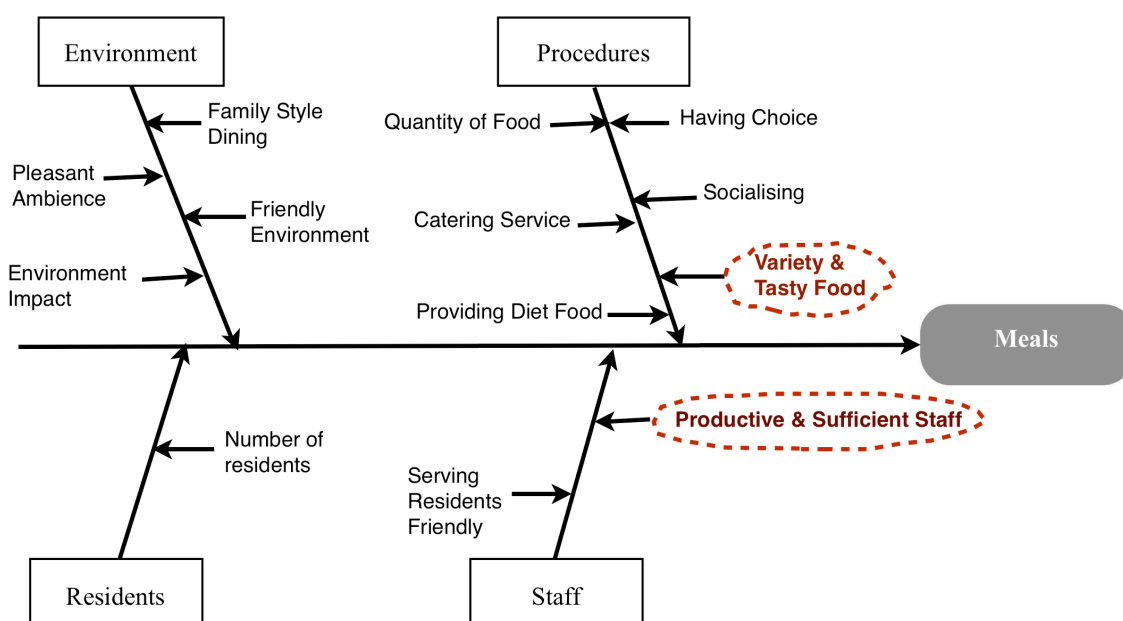


Figure 6-10 Fishbone diagram with respect to the DQ meals (drawn up during the brainstorming group work)

6.1.5 Accessible Equipment

Older people who move to care homes usually have some disability that makes it difficult for them to live independently at home. It is important to identify the most effective ways of ensuring that the care home environment and its equipment are designed to be as accessible as possible to improve the residents’ quality of life (QOL). Accessibility in this study refers to residents having the maximum access to a range of services, facilities and environments. Providing accessible equipment not only increases residents’ independence but can improve their quality of life. Factors affecting the DQ ‘accessible equipment’ are illustrated in the follow diagram (Figure 6-11).

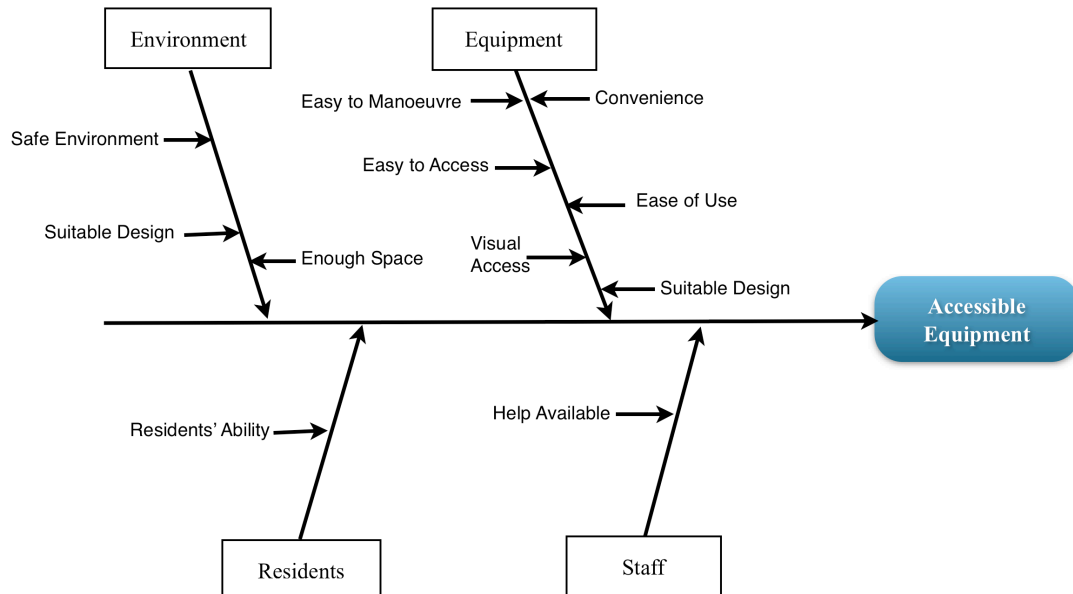


Figure 6-11 Initial fishbone diagram with respect to the DQ accessible equipment (drawn by the researcher)

Through the brainstorming discussions, the terms ‘ergonomic design’ and ‘orthopaedic equipment’ were added to this diagram. Ergonomic characteristics are important, for if they are not considered, these can cause muscular problems or nerve injury. Elders need to use specific types of equipment that do not hurt their bodies and ‘orthopaedic equipment’ is important for those who suffer from bone problems or weakness, so using a clutch, or walker is a necessity for certain disabilities. Moreover, the efficient use of equipment by the residents can promote their sense of independence.

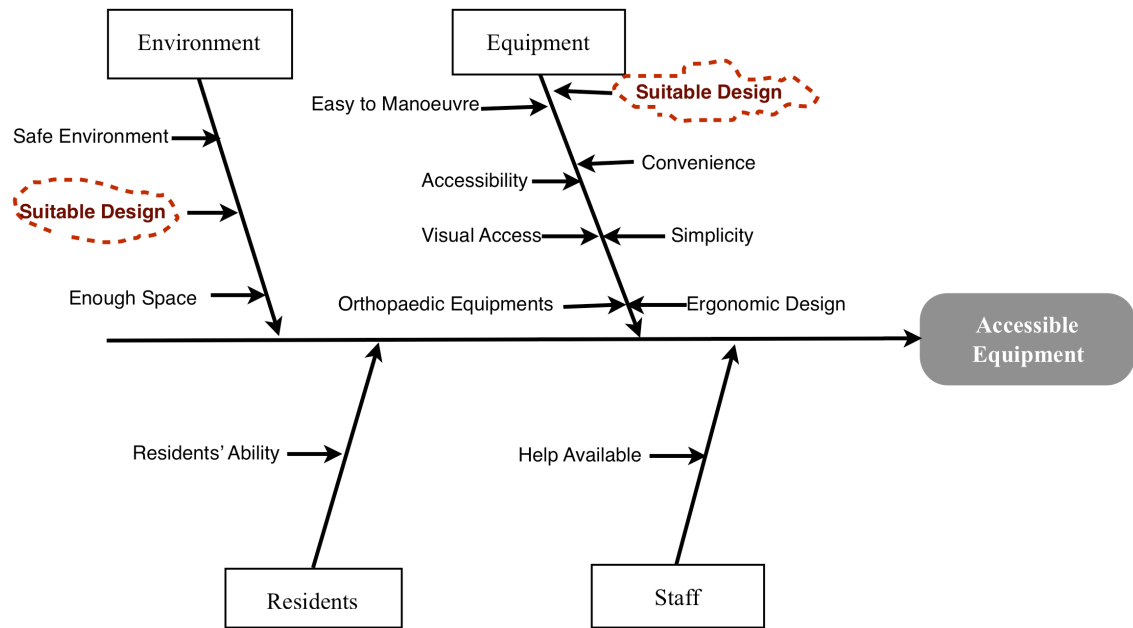


Figure 6-12 Fishbone diagram with respect to the DQ accessible equipment (drawn up during the brainstorming group work)

In order to create or provide an environment in which the residents could perform many tasks as independently as possible, the issue ‘suitable design’ was selected as the most influential element of this DQ. Regarding this, one major problem identified by the participants in their care home, and can be found in many other homes, was the existence of steps instead of flat surfaces around the buildings.

Having a suitable design also can lessen the level of help needed from assistants. When residents can take help from equipment instead of staff, it has a direct impact on staff in terms of them finding more free time and not being called for constantly. This may encourage better quality of social interaction between the less stressed staff and the residents, and moreover, this may increase residents’ feelings of self-reliance.

6.1.6 Safety

In complex systems such as those that deliver care, many factors can influence the safety of the patients or residents. Safety is a crucial concern in care homes and the identification of hazards is a priority. Recent US research noted that falls are the most common event influencing safety among residents in care homes (Thomas et al., 2012). Falls may lead to fractures, hospitalization, decreased quality of life (QOL) and possibly, death.

The researcher investigated factors affecting the DQ safety. These are illustrated in Figure 6-13. The figure shown below was designed by the researcher and subsequently approved by the group. It is recognized as the final ‘safety’ fishbone diagram.

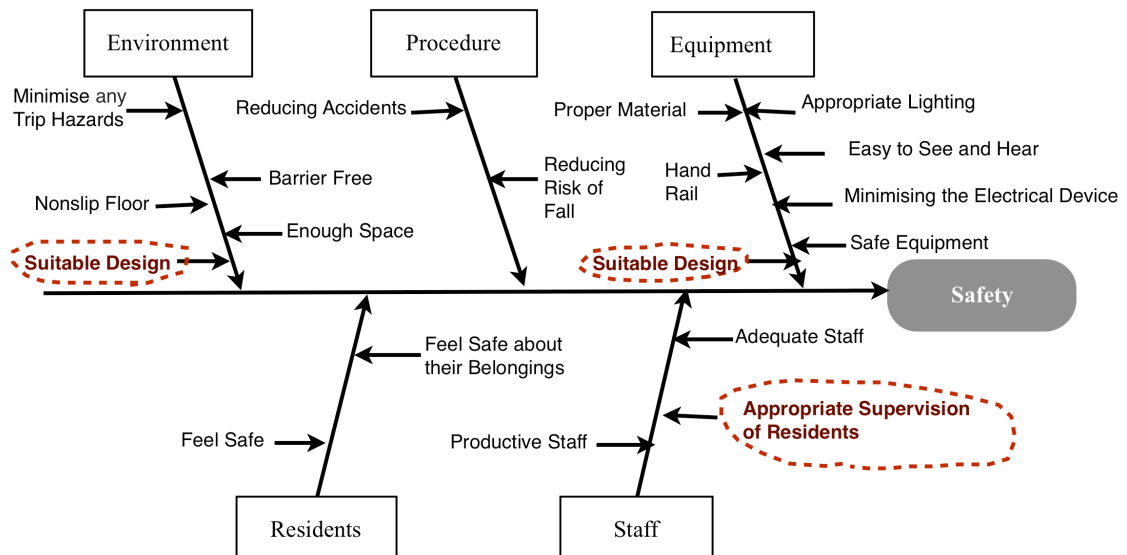


Figure 6-13 Fishbone diagram with respect to the DQ safety (drawn up by the researcher and approved by the group)

As illustrated in the above diagram, there are numerous safety issues in care homes. Among them the ‘appropriate supervision of residents’ was identified as the primary factor related to residents’ safety. The brainstorming team agreed that errors and accidents in care homes cannot be reduced to zero. However, ‘appropriate supervision of residents’ could be the primary issue that may increase residents’ safety. Actions by committed members of staff and an effective manager can apply adequate supervision. They can monitor all the residents but in a way that does not violate their privacy. By treating this issue seriously, staff can help to create and maintain a safe environment as well as provide a robust monitoring system thus preventing accidents from causing harm to those living and working in care homes.

The group consensus was focused on ‘suitable design’ as a major factor in providing safety. It was defined as giving proper and sufficient light, having a simple lay out which gives familiarity, and reducing risk, so that any hazard is minimized to the lowest level. Also participants pointed out that using soft materials instead of hard ones can

reduce the risk of injuries when residents do, unfortunately, bump into surfaces or equipment.

6.1.7 Family Support

Family involvement is identified as a multidimensional construct containing: visiting, socio-emotional care, advocacy, and the provision of personal care (Gaugler, 2005). It has been claimed that QOL for those who are living in care homes tends to improve when family involvement is higher and that their involvement could improve residents' outcomes (Woods et al., 2008). In addition, the impact of family support on psychological symptoms in the elderly has been shown to be positive: 'elderly people with poor mental function and more chronic medical diseases benefited more from family involvement.' (Leung et al., 2007, p.212). The factors concerning the DQ 'family support' are shown in Figure 6-14.

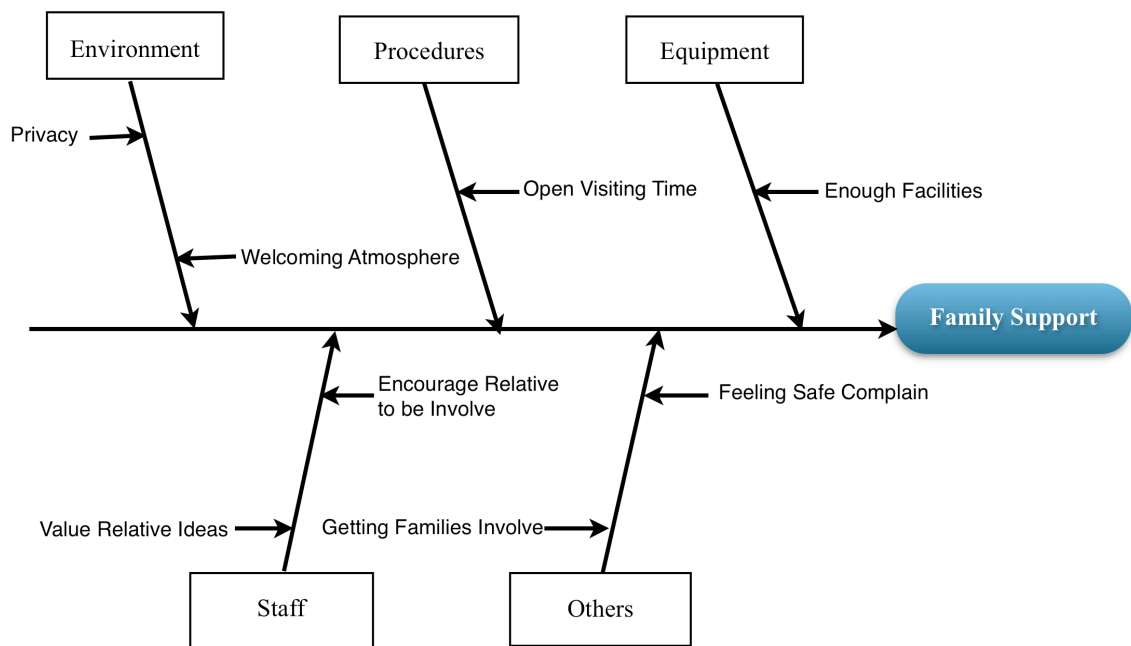


Figure 6-14 Initial fishbone diagram with respect to the DQ family support (drawn by the researcher)

Based on the outcomes of the group discussion, 'regular meeting with family' and 'hospitality' were added to the diagram, as illustrated in Figure 6-15.

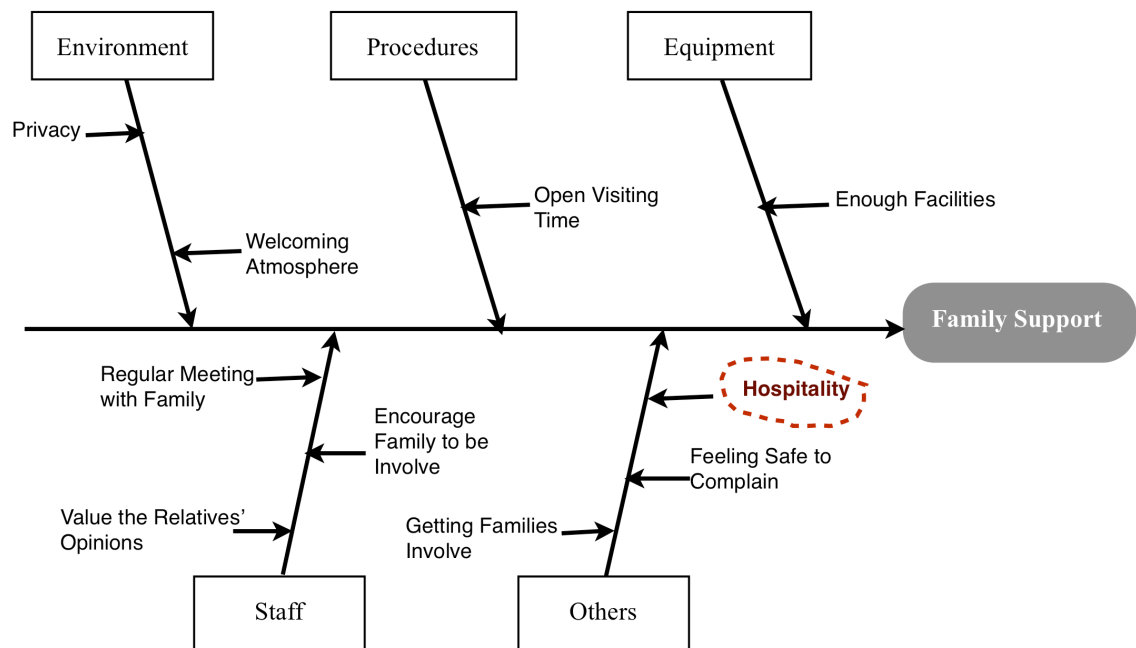


Figure 6-15 Fishbone diagram with respect to the DQ family support (drawn up during the brainstorming group work)

The group were of the opinion that ‘regular meetings’ not only improved the relationship between family members and staff, but also led to staff obtaining more information about residents as unique individuals. In addition, the participants decided that hospitality needed as much attention as other factors. Involving family members in the care home could create a friendly environment and they noted that a resident’s family and friends are usually the linkage to life of outside of the care home. By providing hospitality in care homes for the relatives and family members, they may be encouraged to participate more in each individual’s care and spend time making regular visits.

6.1.8 Accurate Medical Care

One of the major reasons for residents being transferred to the care home is their medical condition. Therefore, the care home should address their wellbeing, as well as maintaining their health and independence as much as possible. Although hospitals and care homes cannot be compared in terms of providing facilities and medical care for ill people, at least a minimal range of equipment is needed for treating the residents in the care homes. Factors affecting the DQ ‘accurate medical care’ are shown in Figure 6-16. The diagram, which was initially draw up by the researcher was approved by the group.

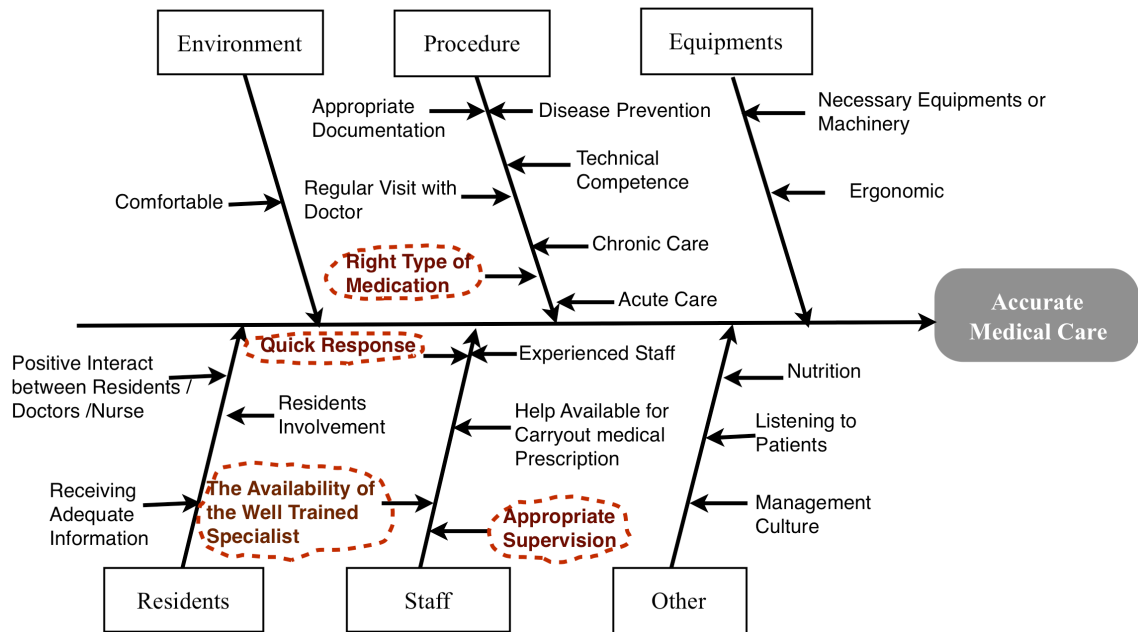


Figure 6-16 Fishbone diagram with respect to the DQ accurate medical care (drawn up by the researcher and approved by the group)

Among those factors surrounding ‘accurate medical care’, issues such as: ‘right type of medication’, ‘quick response’, ‘the availability of the well trained specialist’ and ‘appropriate supervision’ have a major impact.

The group reported that the ‘right type of medication’ is one of the main factors affecting accurate medical care. They mentioned that, as almost all the residents in care homes have multi medical conditions, their combination of complex medical conditions, can lead to staff using different medications that increases the risk of medication errors, incorrect timing, wrong dose, failures in prescribing, monitoring medication etc. So, the right type of medication is crucial for residents in care homes.

They also selected ‘appropriate supervision of residents’ as an influential factor. They noted that as the majority of residents in care homes are frail and vulnerable, they are usually at risk of a medical or emergency situation. Therefore, direct or indirect monitoring of residents can reduce the hazards. The residents mentioned that in the case of an emergency or any failure in their health condition, they need the help of staff as soon as possible, that is, ‘quick responses’, because the staff should investigate residents’ situations or problems as soon as possible.

The staff mentioned that the presence of a well-trained nurse or specialist could reduce the pressure of staff in the care home. They noted that some residents in care homes

need higher levels of care, and well-trained nurses or specialists are more expert in assessing such health issues.

6.1.9 Homelike Environment

Traditionally, institutional care for the elderly was based on a medical model (Verbeek et al., 2009). However, in the past several decades the model has shifted from providing institutional to more homelike care. Currently, the importance of creating a homelike environment for residents in care homes is well recognised and continues to evolve so that a home is more similar to a family home, as opposed to a hotel or hospital. The hotel-style environment might impress visitors at first, but for long term living, it is not suitable (Steenwinlek et al., 2012). The factors affecting the DQ “homelike environment” were determined by the researcher and illustrated in Figure 6-17.

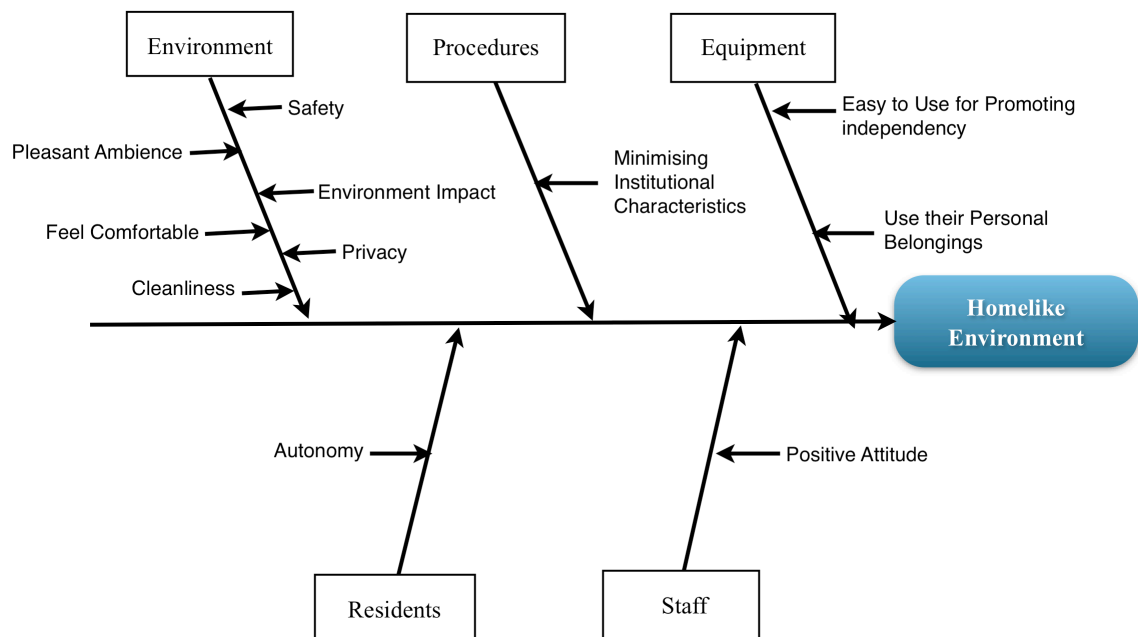


Figure 6-17 Initial fishbone diagram with respect to the DQ homelike environment (drawn by the researcher)

During their discussion, the group decided to add two factors, ‘number of residents’ and the ‘relationship between residents and staff’ and they decided to change the term ‘minimizing institutional characteristics’ to that of ‘domestic characteristics’. The group debate the issue ‘institutional characteristics’ and noted the fact that these characteristics are associated with hospital features for them, which they find unpleasant. They claimed that they were very happy when surrounded with the small details of the home, in

addition, they can be involved and feel that they are actually a part of the ‘on-goings’. The resident participants said they were looking for a cosy and warm atmosphere and want a homelike place where they can freely mingle and enjoy life. This is in contrast to the disciplined observation regimes experienced in hospitals.

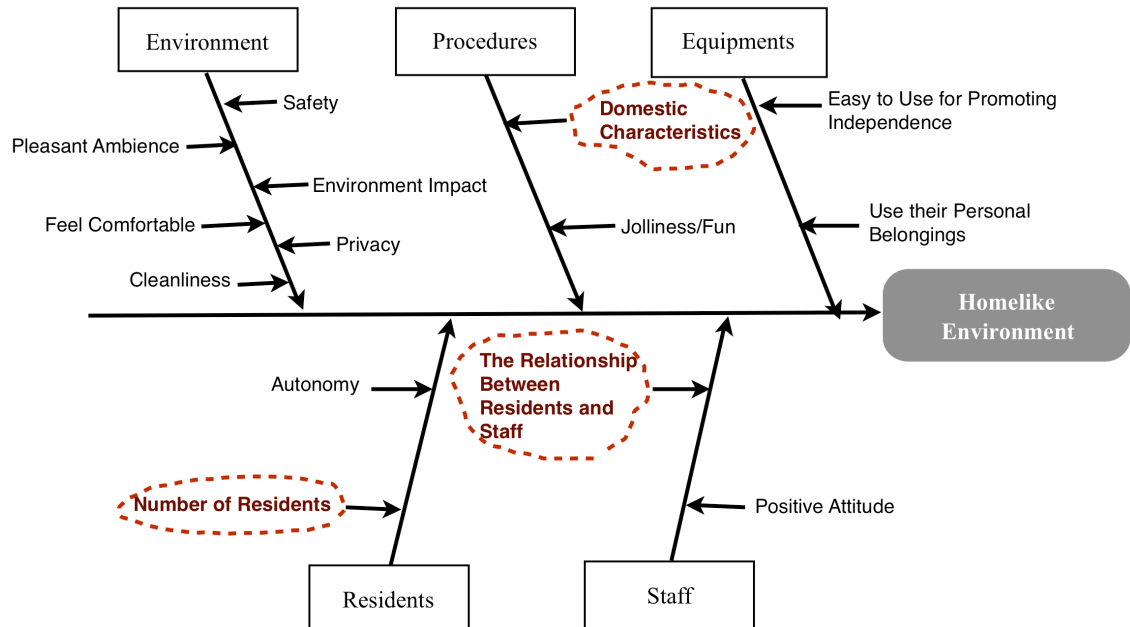


Figure 6-18 Fishbone diagram with respect to the DQ homelike environment (drawn up during the brainstorming group work)

Three factors were distinguished as the major elements of the DQ ‘homelike environment’. These are: ‘number of residents’, ‘the relationship between residents and staff’ and ‘domestic characteristics’.

The group commented that having fewer residents is not only better for creating an environment resembling a family, but is also better for improving social interactions and activities. The participants also expressed the view that a small group of residents in a care home provides the opportunity for staff and residents to become more familiar with each other and thereby allow closer contact and communication. The participants explained that the meaning of ‘home’ was not limited to physical characteristics but also embedded in family, friends, and in social relationships. The relationship between residents and staff is critical because residents usually associate the sense of home with their family and social activities, as well as conveying to them the possession of a certain degree of autonomy.

Through the discussion, they came up with the idea that the physical environment can have an influence. That is, in order to create a ‘homelike environment’ there must be some degree of ‘domestic characteristic’ to the place. By this they meant having some freedom to decorate their own rooms and having their opinions about making small changes in the home taken into account. Residents claimed that they would like to live in a setting that is homelike and have the opportunity to make decisions they typically would make for themselves in their own home. Staff also claimed that domestic design can enhance a sense of familiarity and the enjoyment of residents.

6.1.10 Daily Living Activities

Aging is associated with bodily changes and disability increases rapidly with age. Older people are more likely to experience multiple impairments associated with aging. For example, the aged tend to have a loss of skeletal muscle and strength, reduced bone mass, hearing loss, and decreased visual acuity. All of these factors contribute to decreased functional ability and loss of independence (Claver et al., 2013). Moreover, residents in care homes usually suffer from one or more chronic diseases, which affect their independent functioning.

Most care home residents require assistance in activities of daily living (ADLs), which include eating, walking, transferring, and personal hygiene (Claver et al., 2013). In such cases, they are unlikely to be able to do their daily routines, let alone complex tasks. Thus, the attention of carers should be drawn toward managing medication or any difficult tasks facing the resident. Factors affecting residents’ activities of daily living (ADLs) were determined by the researcher and are shown in Figure 6-19.

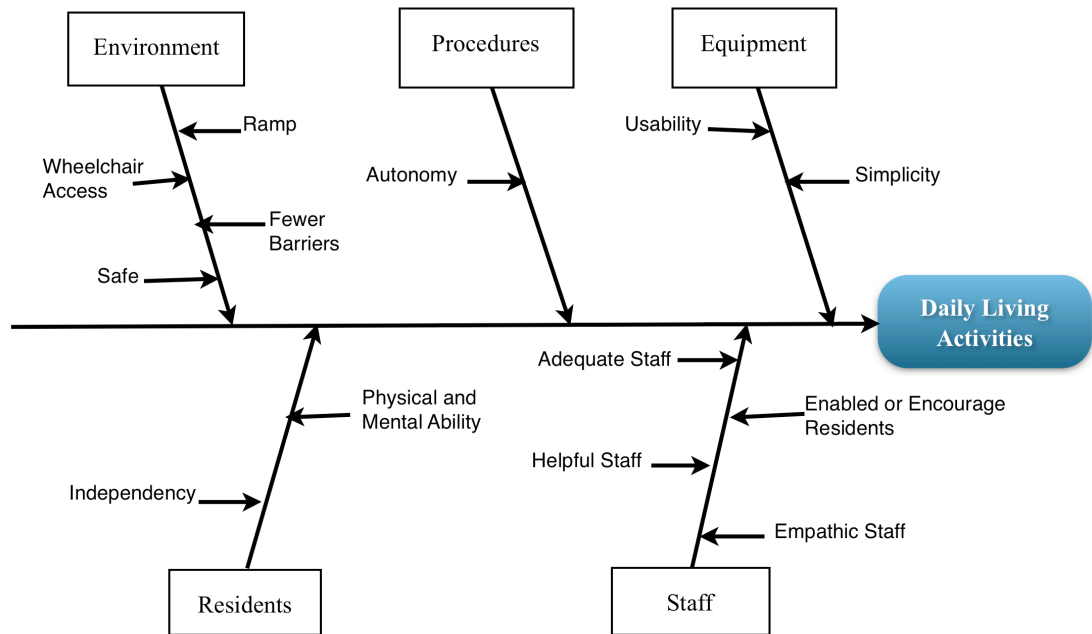


Figure 6-19 Initial fishbone diagram with respect to the DQ daily living activities (drawn by the researcher)

Similar to the previous DQs, brainstorming was performed for this diagram as well. The group decided to add ‘suitable design’ for improving the care home environment as this can have an influence on maintaining and improving residents’ functional ability. Improving the care home environment can be associated with a ‘reduction of environmental barriers’ and ‘reducing risk’ such as reducing home hazards. It is also associated with ‘enhancing supportive function’ which could be installing improvements, such as grabs bars. Through such measures it is possible to promote residents’ confidence so that they can do their daily activities as independently as possible.

Another issue mentioned was ‘increasing sensory abilities’ which was added to the equipment factor. The participants expressed the view that since sensory abilities are usually impaired in the aged, there may be a decreased ability to carry out ADLs. They concluded that enhancing the usage of the impaired sensory abilities of residents through better design could not only enhance residents’ ability to perform their ADLs as independently as possible but could also help them utilize their physical and mental capabilities. In this diagram ‘help available’ from staff and ‘suitable design’ were added. The group stated these were the main factors for enhancing residents’ performance of their activities of daily life.

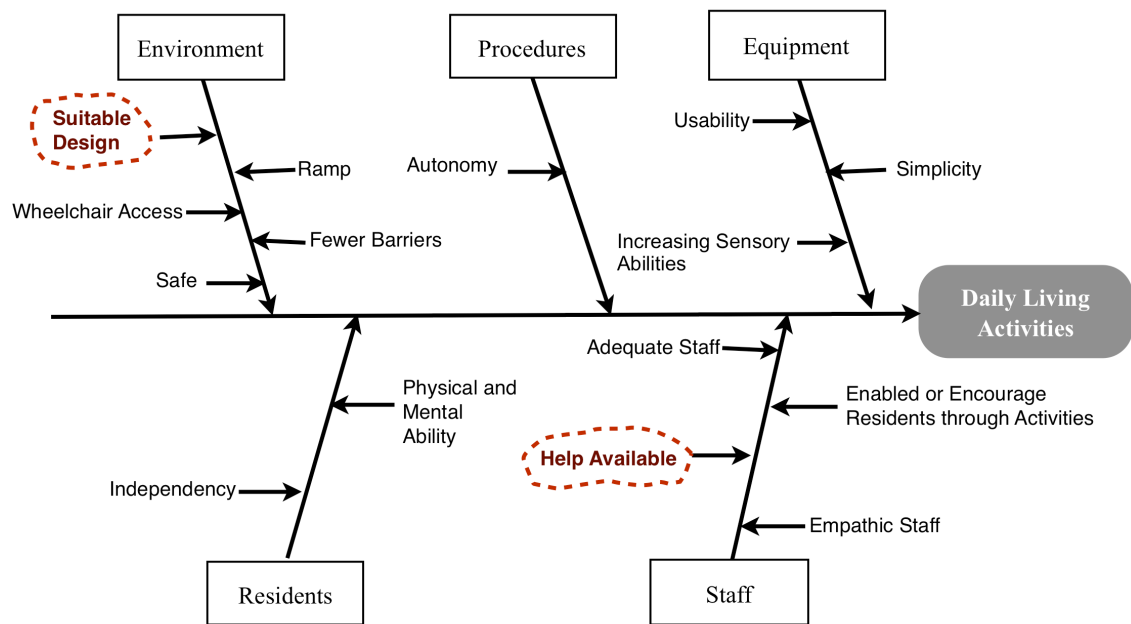


Figure 6-20 Fishbone diagram with respect to the DQ daily living activities (drawn up during the brainstorming group work)

The factor ‘suitable design’ in one aspect can be defined as simplicity of design, that is, the simpler the objects are, the easier the work is. Suitable design facilitates mobility in activities, which leads to boosting residents’ sense of independence. By using suitable equipment even the most vulnerable and fragile with high levels of disability can partake in daily routines. From the good feeling gained in these activities many residents may become motivated and encouraged to do more challenging tasks, as independently as possible, which again frees up more time for staff to attend to other duties.

‘Help available’ was important from the residents’ points of view. In the group the residents mentioned that when they need immediate help, it should be provided. Sometimes they have to rush to the bathroom, and when they call out, they expect an immediate response. Likewise, when they are eating or doing their daily activities. There were many examples discussed, for instance, some residents have problems swallowing, eating, walking etc, and if help is not provided they become fearful, which can have a negative psychological impact on them. This then needs to be addressed if they are to recover from the impact, so residents need constant supervision at those times when help is most needed.

6.1.11 Involvement

The significance of involvement has been recognised as follows: “Residents will experience quality care and support when they are fully informed and involved in all decisions affecting their life and care, and they can contribute to the planning and evaluation of services.” (DOH, 2006, p.6). According to Simmons (2006) through involving the residents in care planning, the staff can gain a better understanding of residents’ likes and dislikes, allowing them to be able to meet residents’ needs and preferences. In the diagram shown below, the potential factors affecting residents’ involvement were noted and presented by the researcher and then approved by the participants in the brainstorming session.

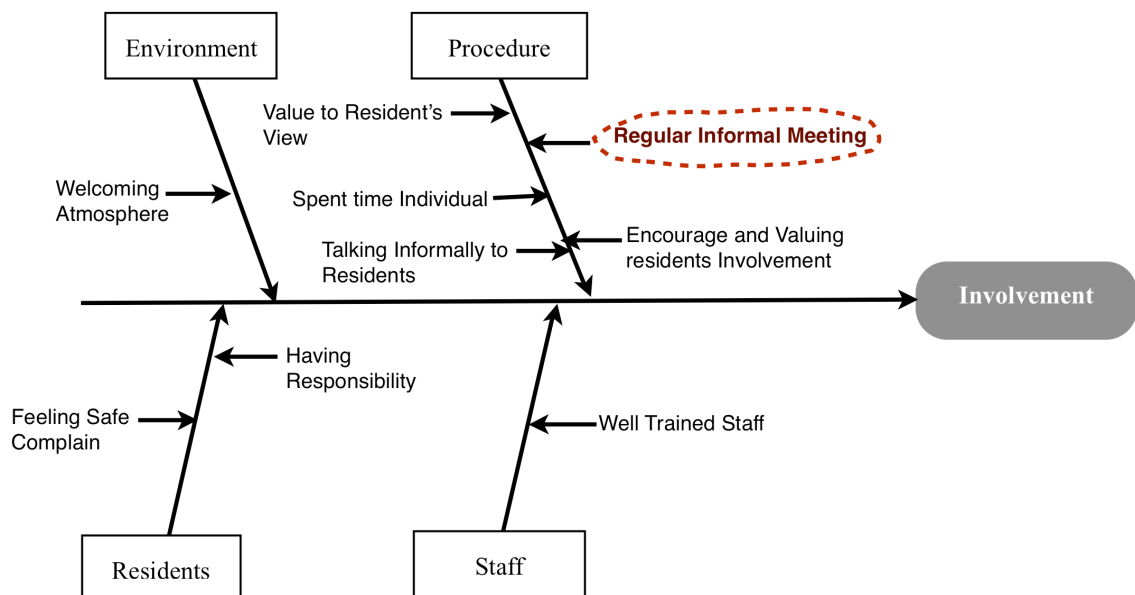


Figure 6-21 Fishbone diagram with respect to the DQ accurate involvement (drawn up by the researcher and approved by the group)

The participants suggested that it is the responsibility of the care providers to discover flexible ways of involving residents and arranging ‘regular informal meetings’, which they considered to be the best way to involve residents in care home decision-making. It was decided in the group that resident involvement is about giving residents real opportunities and choices to determine what is important for the residents, rather than all decisions being taken solely from professional perspectives. By arranging ‘regular informal meetings’ residents could be involved in decisions that affect them directly, while the providers could listen to residents’ views, complaints, suggestions, and

feedback. Moreover, the fact that residents' views are taken into account and respected, may help reinforce their self-esteem.

6.1.12 Suitable Design

The aging process is associated with decreased functionality. Older people usually have difficulties in walking and getting moving. They typically also have difficulty walking backwards, sitting, standing, acyclic movements, and moving over uneven ground. Thus, it has been posited that providing an ergonomic environment is of fundamental importance for maintaining a good quality of life (Reis, et al., 2012).

The role of the environmental impact for maintaining and improving elderly residents' functioning has been widely recognised (Wahl, et al., 2009). How a building is designed, its architecture, how it has been built and fitted out with equipment has a significant impact in terms of using and working with the facilities and residents benefiting from the environment they are living in. In sum, this is a matter of enabling or disabling people. Appropriate design helps the disabled residents to promote their remaining strength; this could make help them to be more independent. Additionally, suitable design can provide spaces in which residents and staff social interaction can be increased. The factors identified by the researcher as affecting the DQ suitable design are shown in Figure 6-22.

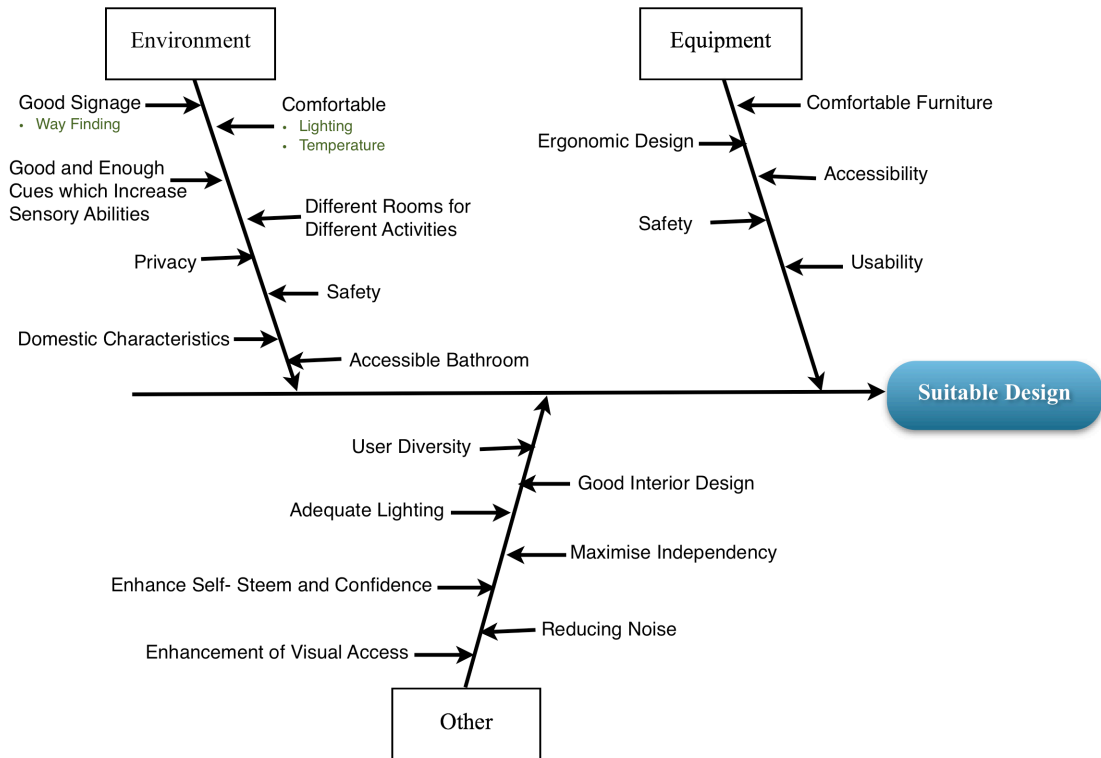


Figure 6-22 Initial fishbone diagram with respect to the DQ daily suitable design (drawn by the researcher)

The group discussions resulted in the item tableware being added as an element to the DQ suitable design since well designed items can increase residents’ efficiency in using the utensils, especially for those people who need help with eating and feeding themselves.

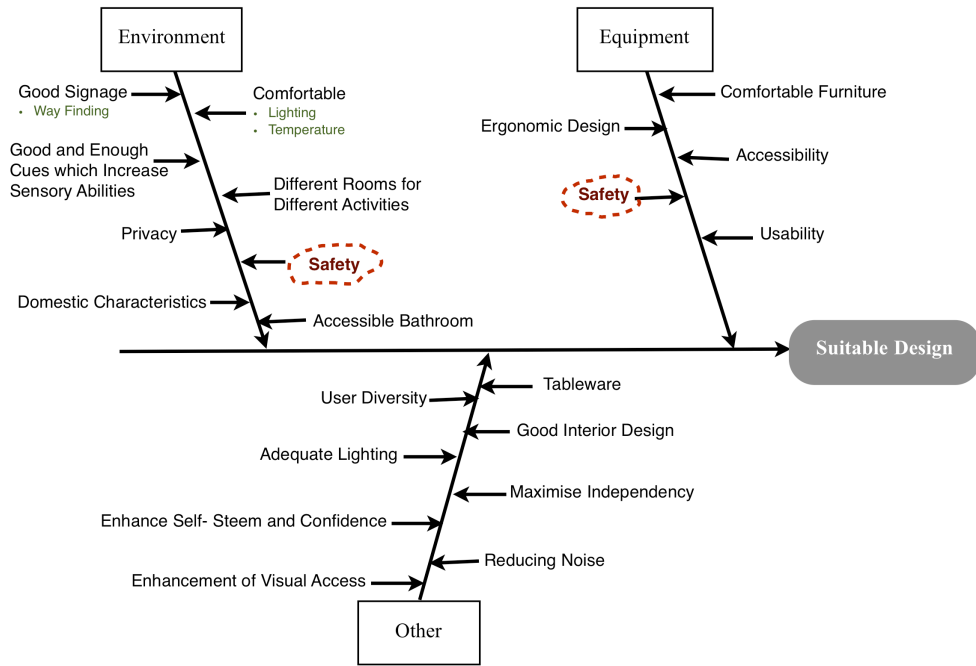


Figure 6-23 Fishbone diagram with respect to the DQ suitable design (drawn up during the brainstorming group work)

For this DQ ‘safety’ was determined as being a fundamental factor and in any case, when creating any designed item or service in the care home, consideration of safety is vital. However, the participants suggested that improving factors such as signage, ergonomic designs, and having sufficient cues can have a positive effect on increasing safety for residents.

6.2 Selecting main factors affected in DQs

So far in this chapter the fishbone diagrams have been constructed for identifying all the factors that could have affected each DQ. These were arrived at through brainstorming sessions held with a group of participants, comprising: two residents, two members of staff, the care home manager and the researcher. Throughout the analysis, it became evident that the majority of elements effecting the separate DQs are interlocked and some are repeated across some of the DQs. For instance, ‘barrier free’ as a factor has been noted as an influential element on a number of different DQs, i.e. DQs of: safety, suitable design, accessible equipment and daily living activities. Some DQs are interrelated and influential on other DQs, for example ‘suitable design’ refers across to ‘safety’. All elements which could have affected the 12 DQs are summarised in Table 6-1.

Table 6-1 All factors could have influence on the 12 main DQs

<i>All factors which can influence on the 12 main demanded qualities of residents' in care homes</i>			
1. Ergonomic design	37. Suitable design	72. Feeling safe	98. Domestic characteristics
2. Simplicity	38. Giving residents choice	73. Disease prevention	99. Tableware
3. Staff training	39. Adoptable environment	74. Chronic care	100. Feel comfortable
4. Shift of work	40. Enough space	74. Getting family involve	101. Cleanliness
5. Hourly rate of payment	41. Staff behaviour	75. Encourage family to be involved	102. Positive attitude toward residents
6. Hours of work	42. Feel safe	76. Regular meeting with family	103. The relationship between residents and staff
7. Environment impact	43. Quality of food	77. Necessary equipment or machinery	104. Usability
8. Team working	44. Catering service	78. Appropriate documentation	105. Increasing sensory abilities
9. Management culture	45. Socialising	79. Technical competence	106. Ramps
10. Positive staff	46. Variety & tasty food	80. Acute care	107. Wheelchair access
11. Job satisfaction	47. Providing diet food	81. Regular visit with doctor	108. Enable or encourage residents through activities
12. Using time effectively	48. Family style dining	82. Right type of medication	109. Physical and mental ability
13. Productive staff	49. Serving residents friendly	83. Comfortable environment	110. Increasing independency
14. Residents' behaviour	50. Easy to manoeuvre	84. Nutrition	111. Value resident's views
15. Visual access	51. Convenience equipment	85. Listening to patients	112. Spending time individually with residents
16. Safe equipment	52. Orthopaedic equipment	86. Experienced staff	113. Talking informally to residents
17. Enough facilities	53. Help available	87. Help available for carrying out medical prescription	114. Regular informal meeting
18. Encouraging for interaction	54. Residents' ability	88. Quick responses	115. Encourage and valuing residents involvement
19. Reduce monotony	55. Appropriate lighting	89. Residents involvement	116. Giving residents responsibility
20. Layout	57. Easy to see and hear	90. The availability of well trained nurses	117. Comfortable furniture
21. Pleasant ambience	58. Minimising electrical device	91. Receiving adequate information	118. Good signage
22. Interior design	59. Proper material	92. Positive interacting between residents/ doctor and nurse	119. Accessible bathroom
23. Uplifting environment	60. Hand rails	93. Ergonomic equipment	120. Good cues which can increase residents' sensory abilities
24. Friendly environment	61. Reducing risk of fall	94. Value the relatives' opinion	121. Different rooms for different activities
25. Safe environment	62. Reducing accident	96. Easy to use for promoting independency	121. User diversity
26. Well planned activities	63. Reducing any trip hazards	97. Use their personal belongings	122. Good interior design
27. Care home's culture	64. Barriers free environment		123. Enhance self-esteem and confidence
29. Empathic staff	65. Nonslip floors		124. Reducing noise
30. Well trained staff	66. Appropriate supervision of residents		
31. Productive and sufficient staff	67. Feel safe about their belongings		
32. Number of residents	68. Open visiting times		
33. Having Choice	69. Welcoming atmosphere		
34. Sensory impairment	70. Privacy		
35. Cognitive impairment	71. Hospitality		
36. Accessibility			

In total, 124 factors that could have an influence on the 12 DQs were identified by the participants when the reformed fishbone diagrams were being drawn up. Through the brainstorming session, the most crucial factors according to the participants that could possibly have the most impact on each DQ, were ascertained (Table 6-2).

Table 6-2 Main factors affecting DQs

<i>DQs</i>	<i>The main factors affecting the DQs</i>
Caring and Sensitive Staff	Job Satisfaction
Social Interaction	Encouraging Interaction
Autonomy	Giving Residents Choice Suitable Design
Accessible Equipment	Suitable Design
Meal	Variety and tasty Food Productive & Sufficient Number of Staff
Safety	Appropriate Supervision Suitable Design
Family Support	Hospitality
Accurate Medical Care	Immediate Response Appropriate Supervision Right type of Medications Well-trained Nurse
Involvement	Regular Informal Meeting

Homelike Environment	Domestic Characteristics
	Number of Residents
	The Relationship between Residents & Staff
Daily Living Activities	Help Available
	Suitable Design
Suitable Design	Safety

As illustrated in Table 6-2 (above), for each DQ at least one factor was identified. In total 17 main factors were selected for the next stage.

6.3 Developing performance measures

The main purpose of this study has been finding the ways in which the quality of service offered to the residents could be significantly improved which, in turn, leads to the raising of resident satisfaction. In this part of the chapter, the focus is on identifying quality characteristics or performance measures (PMs) in order to ascertain which element, if provided, can meet residents' satisfaction in care homes. Recall that, as defined earlier in chapter 3, "a performance measure is a statement of what will be measured to evaluate the service's performance for a specific demanded quality." (Chaplin & Terninko, 2000, p144).

In the previous stage, the main factors, which can have the greatest impact on DQs were selected. The goal here is to create a comprehensive list of PMs by converting the main causes into the measurable factors. At this step, the main question is how, in a measurable sense, would the care home be able to deliver the required services to its residents (Paryani et al., 2010). To this end, a meeting with a care home manager, a deputy manager and two staff was organised, as the task needed to draw on their intensive knowledge of expertise regarding care home procedures.

When generating a PM, if the selected causes were still fuzzy, the causes were broken down again and the main factor defined as a measurable item by this expert group. For example, regarding the fishbone diagram relating to 'social interaction', the item 'encouraging interaction' was identified as the main factor that can have most effect on

the ‘social interaction’. Encouraging residents to engage in interaction is still a fuzzy notion, so in order to convert it to a measurable factor, the team members were asked ‘what should be measured to see what has the greatest effect on encouraging residents to engage in interaction?’ and the team reached a consensus on measuring ‘total pleasant interaction time between staff and residents or resident to resident’. This factor is measurable and serves as PM for the DQ of ‘Social Interaction’. The team agreed that each PM should relate to at least one DQ. The performance measures are listed in Table 6-3.

Table 6-3 Performance measures

<i>DQs</i>	<i>The main factors affecting the DQs</i>	<i>Performance measure</i>
1. Caring and Sensitive Staff	1.1. Job Satisfaction	1.1.1. % Degree of job Satisfaction
	2. Social Interaction	2.1 Encouraging Interaction
3. Autonomy		3.1. Giving Residents Choice
	3.2. Suitable Design	3.2.1. Percentage of equipment that residents can use without help

4. Accessible Equipment	4.1. Suitable Design	4.1.1. Number of barriers identified
		4.1.2. Percentage of equipment that residents can use without help
		4.1.3. Percentage of equipment that are designed ergonomically
		4.1.4. Percentage of space that allows for manoeuvrability
5. Meals	5.1. Variety and tasty food	5.1.1. Type of foods served per week
	5.2. Productive & Sufficient Number of Staff	5.1.2. Percentage of residents who need help to be fed
		5.2.1. The ratio of productive staff to residents
		6.1.1. The ratio of productive staff to residents
6. Safety	6.1. Appropriate Supervision	6.1.2. Total time residents receive direct or indirect supervision per day
	6.2. Suitable Design	6.1.3. Time interval between residents' request and staff response
		Quick responses
		6.1.4. The availability of well-trained specialist staff
		6.2.1. Number of barriers identified
		6.2.2. Percentage of visually comfortable environment (Bright)
		6.2.3. Percentage of equipment in soft material

7. Family Support	7.1. Hospitality	7.1.1. Percentage of visitors/ families satisfied with staff behaviour
		7.2.2 Percentage of visitors/ families satisfied with the cheerful environment
8. Accurate Medical Care		8.1.1. Time interval between residents' request and staff response (Quick responses)
	8.1. Immediate Response	8.2.1. The ratio of productive staff to residents
	8.2. Appropriate Supervision	8.1.2. Time residents receive direct or indirect supervision per week
	8.3. Right type of medications	8.3.1. Percentage of accurate medicine given
	8.4. Well trained nurse	8.4.1. The availability of well-trained nurse/s
9. Involvement		9.1.1. Number of regular informal meetings with residents per week
	9.1. Regular Informal Meeting	9.1.2. Percentage of residents satisfied with staff behaviour

10. Homelike Environment	10.1. Domestic Characteristics	10.1.1. Number of non-domestic Staff/ design	
		10.1.2. Number of letting residents personalise their bedroom	
	10.2. Number of Residents	10.2.1. Number of Residents	
	10.3. The Relationship between Residents & Staff	10.3.1. Percentage of pleasant interaction time between resident / or staff	
		10.3.2. Percentage of resident satisfied with staff behaviour	
	11. Daily Living Activities	11.1. Help Available	11.1.1. The ratio of productive staff to residents
			11.1.2. Time interval between residents' request and staff response (Quick response)
		11.2. Suitable Design	11.2.1. Percentage of equipment that residents can use without help (Usability of the equipment)
11.2.2. Percentage of equipment designed ergonomically			
12. Suitable Design		12.1. Safety	12.1.1. Percentage of equipment designed ergonomically
	12.1.2. Number of barriers identified		
	12.1.3. Percentage of the environment that is visually comfortable (bright)		
	12.1.4. Percentage of equipment in soft material		

In this stage, the members of the expert team identified from one to four PMs for each DQ. As can be seen from the above, in total, 24 PMs were allotted to the 12 DQs (see Table 6.3).

Through this process the DQs, which were verified as the voice of the customer (chapter 4), were translated into organisational measures that can be used as the alternative approach to satisfying residents' requirements. Moreover, through following this process we have depicted a clear picture of the identified factors affecting quality, and from this, can develop a path towards meeting or even exceeding residents' satisfaction.

6.4 Establishing relationship between DQs and PMs

In the previous section, a set of PMs pertaining to the DQs were ascertained. In this stage the relationship between the demanded qualities and the performance measured were identified based on the experts' judgment. To gain an accurate picture of the relationship between DQs and their associated PMs, the House of Quality (HoQ) was constructed. For the HoQ device, the 12 main DQs and their '% Average Relative Weight' from chapter 5, (Table 5-14) were placed on the left side in the rows. The 24 PMs specified from the previous stage and listed in Table 6-3 were entered in the columns. This is all drawn together in Figure 6-24, which follows below.

House of Quality (HoQ)		HOWs (Performance Measures)																							
		DQ % Average Relative Weight																							
		1. % Degree of Job satisfaction	2. Number of time residents make their own choice, per month	3. Number of consulting with residents about their life, per month	4. Percentage of equipments that residents can use without help	5. Percentage of equipments that are designed ergonomically	6. Percentage of space that allows for manoeuvrability	7. Type of food served per week	8. The ratio of productive staff to residents	9. Percentage of residents who need help to be fed	10. Total time residents receive direct or indirect supervision per day	11. Number of barriers identified	12. Percentage of visually comfortable environment	13. Percentage of equipment in soft material	14. Time interval between residents' request and staff response	15. Percentage of visitors/ families satisfaction with the cheerful environment	16. Percentage of visitors/ families satisfaction with behaviour of staff	17. Percentage of accurate medical given	18. The availability of well trained nurses	19. Number of regular informal meeting with residents per week	20. Percentage of residents satisfied with staff behaviour	21. Number of non - domestic stuff/ design	22. Number of letting residents to personalise their bedroom	23. Number of residents	24. Percentage pleasant interaction time between residents or staff
Direction of Improvement																									
WHATs (Demanded Qualities)	1. Caring and Sensitive staff																								
	2. Social Interaction																								
	3. Autonomy																								
	4. Accessible Equipments																								
	5. Meal																								
	6. Safety																								
	7. Family Support																								
	8. Accurate Medical Care																								
	9. Involvement																								
	10. Homelike Environment																								
	11. Daily Living Activities																								
	12. Suitable Design																								
Absolute Weight		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Relative Weight																									
Relative Weight % (Chart)																									

Figure 6-24 Demanded Qualities and Performance Measures Matrix

When the HoQ was drawn, the team of two managers, two staff and the researcher, started comparing the DQs and PMs. For this cell by cell comparison, the team assessed the strengths of the relationship between each PM given in the column and the DQ given in the row. For this, scaling was used where 0 indicated no relationship, 1 a weak relation, 3 a medium relation and 9 showed a strong relationship. If there was no

consensus reached among most of the team members, then the researcher put x and after further discussion, this was replaced by an appropriate symbol, as indicated below. To make it easier to understand and immediately visible, symbols are used instead of numbers to show the relationship (see Table 6-4).

Table 6-4 Degree of relationship between DQ and PM

<i>Degree of relationship</i>	<i>Graphic symbol</i>	<i>Numbers</i>
Strong	●	9
Medium	◐	3
Weak	○	1
None		0

Also, the team evaluated the relationship of each performance measure versus the other performance measure; five symbols were used:

Table 6-5 Degree of relationship between PM and PM

<i>Degree of relationship</i>	<i>Graphic symbol</i>	<i>Numbers</i>
Strong positive	⊙	9
Positive	●	3
Negative	#	-1
Strong negative	×	-3
None		0

6.5 Prioritises of performance measures and relative weightings

After identifying which PMs have influenced the 12 main DQs the overall weighting was calculated. As described in chapter 3, the aim of identifying the overall weighting is to recognise those PMs which have the greatest influence on fulfilling residents' requirements, termed 'key performance measures'.

The absolute weighting of each PM (in the columns) was calculated by multiplying the strength of relationship of each cell (scaled: 0-1-3-9) into the average relative weight of the row, then summing the column, representing the weight of that PM. The calculations were carried out by deploying the QFD Designer V4.0 software and the results are shown below in Figure 6-25.

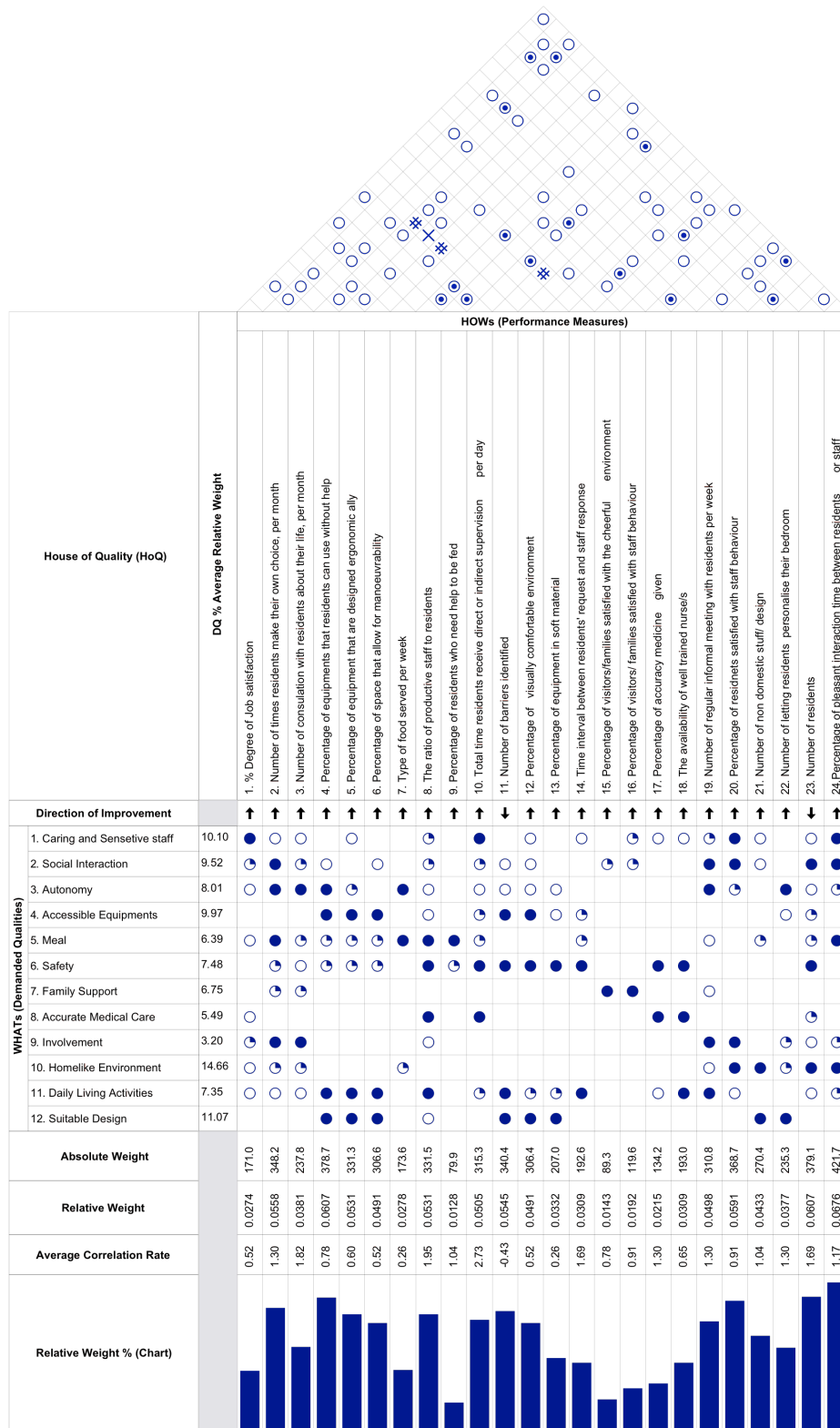


Figure 6-25 House of Quality

Based on the created HoQ (Figure 6-25), the relationship between demanded qualities and performance measures are summarised below (Table 6-6).

Table 6-6 Performance measures with a strong relationship

<i>Performance measures</i>	<i>The relationship to the DQs</i>	<i>Relative weight (%)</i>
1. % Degree of job satisfaction	1,2,3,5,8,9,10,11	2.74
2. Number of times residents make their own choices, per month	1,2,3,5,6,7,9,10,11	5.58
3. Number of consultations with residents about their life, per month	1,2,3,5,6,7,9,10,11	3.81
4. Percentage of equipment that residents can use without help	2,3,4,5,6,11,12	6.07
5. Percentage of equipment that are designed ergonomically	1,3,4,5,6,11,12	5.31
6. Percentage of space that allows for manoeuvrability	2,4,5,6,11,12	4.91
7. Type of foods served per week	3, 5, 9	2.78
8. The ratio of productive staff to residents	1,2,3,4,5,6,8,9,11,12	5.31
9. Percentage of residents who need help to be fed	5,6	1.28
10. Total time residents receive direct or indirect supervision per day	1,2,3,4,5,6,8,11	5.05
11. Number of barriers identified	2,3,4,6,11, 12	5.45
12. Percentage of visually comfortable environment	1,2,3,4,6,11,12	4.91
13. Percentage of equipment in soft material	3,4,6,11,12	3.32

14. Time interval between residents' request and staff response (quick responses)	1,4,5,6,11	3.09
15. Percentage of visitors/ families satisfied with the cheerful environment	2,7	1.43
16. Percentage of visitors/ families satisfied with staff behaviour	1,2,7	1.92
17. Percentage of accurate medicine given	1,6,8,11	2.15
18. The availability of well-trained nurse/s	1,6,8,11	3.09
19. Number of regular informal meetings with residents per week	1,2,3,5,7,9,10,11	4.98
20. Percentage of residents satisfied with staff behaviour	1,2,3,9,10,11	5.91
21. Number of non-domestic staff / design	1,2,5,10,12	4.33
22. Number of letting residents personalise their bedroom	3,4,9,10,12	3.77
23. Number of residents	1,2,3,4,5,6,8,9,10,11	6.07
24. Percentage of pleasant interaction time between resident / or staff	1,2,3,5,9,10,11	6.78

Through this process the five PMs with the highest relationship scores, encompassing all 12 DQs, were chosen as the 'Key PMs' (see Table 6-7). The results show that the 'percentage of pleasant interaction time between residents to residents/ or staff' has the highest ranked relative weight, reported at 6.78%. Second, 'percentage of equipment that residents can use without help' was ranked with a value of 6.07%. This was followed by the 'number of residents, with the score of 6.07%. Closely after this, 'percentage of residents satisfied with staff behaviour' was ranked in the fourth position

with a score of 5.91% and the ‘number of times residents make their own choices per month’ ranked in the fifth with a value of 5.58%.

Table 6-7 Key performance measures

<i>Performance measures</i>	<i>The relationship to the DQs</i>	<i>Relative weight (%)</i>
1. Percentage of pleasant interaction time between residents to residents/ or staff	1,2,3,5,9,10,11	6.78
2. Percentage of equipment that residents can use without help	2,3,4,5,6,11,12	6.07
3. Number of residents	1,2,3,4,5,6,8,9,10,11	6.07
4. Percentage of residents satisfied with staff behaviour	1,2,3,9,10,11	5.91
5. Number of times residents make their own choices per month	1,2,3,5,6,7,9,10,11	5.58

As shown in Table 6-8, high overall weighting is allotted for these five PMs. In addition, the selected five key PMs collectively show a strong relationship with all 12 DQs. It is reasonable to surmise that providing all the key PMs is fundamental to improving all the resident requirements.

As mentioned before the tools commonly deployed for evaluating care home quality and their services are customer surveys, and usually the data is collected from relatives or professional rather than from the residents. The methodology applied in this investigation has provided a way to systematically identify the voice of residents, and apply their voice. That is, by identifying and providing the most influential performance measures pertaining to the demanded qualities, the residents’ voice is used for creating better services to fulfil resident satisfaction in care homes.

This methodology is also beneficial for care homes’ managers when seeking to create customer- and quality- oriented organisations run with lower costs but with a higher chance of market success for residents’ needs and requirements are precisely identified

facilitating their fulfilment. In this case, it has been demonstrate that to effectively and efficiently promote resident satisfaction it is not necessary to improve on all 24 performance measures. In fact, improving just the five highly ranked performance measures could significantly improve residents' levels of satisfaction because those PMs with the highest relative weight have a correlation with all the DQs and thus, serve to improve all of them.

6.6 Chapter conclusion

In this chapter, by examining the interactive effects of the 12 main DQs within the cause and effect diagrams (fishbone diagrams) robust awareness concerning the factors was generated. Then, the factors with the greatest impact on DQs were turned into measurable factors, the so called performance measures. Finally, by building the House of Quality (HoQ), an accurate picture of the relationship between the DQs and their associated PMs, was gained.

Through the whole process the five 'key' PMs with the highest relationship scores, encompassing all 12 DQs, were recognised to be the following;

1. Percentage of pleasant interaction time between residents to residents/ or staff,
2. Percentage of equipment that residents can use without help
3. Number of residents
4. Percentage of residents satisfied with staff behaviour
5. Number of times residents make their own choices per month.

These key PMs confirm the reports covered in the literature review that have asserted that: social interaction, independence, autonomy, have a high impact on the satisfaction of residents.

When considering the key PMs alongside the PMs with the lowest rankings, it is worth noting that our findings do not imply that these lower ranked PMs are not important, only that they are related to fewer of the DQs and consequently have less impact. Therefore, it is sensible to recommend prioritising the improvement of the key PMs in situations where the care home faces limited resources.

7 Evaluation with experts

The main purpose of this research has been improving the quality of care homes based on the residents' demands, needs and expectations, and thereby increasing the levels of satisfaction of the residents. In order to assess and verify the most significant elements affecting the DQs in this research, and to validate the accuracy and appropriateness of the methodology, an evaluation study was conducted with the service providers. That is, the aim was to elicit the valuable, constructive and professional views of those experts involved in the process of establishing, providing and running the care homes; those who are the key figures in the promotion of the care homes' quality.

When undertaking evaluation during the process of a research study or any other programme, it is important to investigate whether there are alternative ways that could improve the effectiveness and standards of the research findings. As Robson (2002) puts it, such evaluation allows for an assessment of the effectiveness of an action, a process or service as well as providing valuable information for the researcher regarding why and how they are being carried out. Thus, this evaluation procedure can uncover ways for making improvements to areas the research addresses.

One of the most widely used evaluation models is the Kirkpatrick model, which includes four evaluation levels: Reaction, Learning, Behaviour, and Results. It is an established model for evaluating new methods, tools and training programmes (Ahmed, 2000) and is adopted in this chapter as a conceptual framework. It indicates to the researcher what data needs to be gathered and how to evaluate them. With regards to this, the fieldwork questionnaire was designed for the managers to evaluate the research process, and follow-up discussion meetings were subsequently arranged. The results concerning both are discussed in this chapter.

7.1 Evaluation Framework

The definitions pertaining to the framework taken from the Kirkpatrick model for evaluating the research methods and procedure, in terms of the aforementioned 'reaction', learning', 'behaviour' and 'results', are presented in the table below.

Table 7-1 Kirkpatrick Model

<i>Evaluation mode</i>	<i>Definition</i>
Reaction	Assessment of participants’ reaction to the programme
Learning	What the participants learnt from the session, quantifiably.
Behaviour	To what extent the knowledge and skills (trained) can be applied to their organisation.
Results	The scale of the impact of the session on the organisation’s improvement

The participants, the care home managers, were asked to respond to the questions and evaluate the methods so as to ascertain whether a particular action would be suitable for their own care homes.

7.2 Designing the questionnaire

Building on the above described Kirkpatrick model, the evaluation questionnaire was designed and consisted of four parts plus a ‘pre-test’ (Appendix G), which aimed to assess the managers’ knowledge about the focal topic of the research.

1. Pre-testing questionnaire

The pre-testing questionnaire consisted of seven questions, three of which required ‘yes/no’ answers, and the managers were asked to give extra explanatory information regarding these particular questions. Of the others, one question was closed, and the remaining three open-ended, so as to provide an opportunity for the participants to give extra explanatory comment, thus making their responses clearer. The pre-testing questions are shown in Table 7-2.

Table 7-2 Pre-testing questions

<i>Pre-testing Questions</i>
Q1. Do you have knowledge of how quality of care can be improved based on residents' needs and requirements?
Q2. Who do you involve for improving quality in care homes? Why?
Q3. Do you know what are residents' most important needs and requirements?
Q4. How do you try to improve quality in your care home?
Q5. Do you use any tools or methods to improve quality in your care home?
Q6. Do you know your organisation's priorities for improving resident satisfaction?
Q7. How do you prioritise the factor(s) which can improve resident satisfaction?

2. Reaction questionnaire

Next, in order to observe the participants' reaction towards the programme, six questions were designed (Q8-Q13), five requiring responses on a Likert scale and one was open-ended. Additional space was added beneath the answers in order for them to write extra explanations and comments in terms of their own experiences, opinions and insights. Moreover, the questions were designed to seek their reactions to the data provided in the programme or the provided resources, regarding their relevance, usefulness and applicability. The questions are shown in Table 7-3.

Table 7-3 Reaction questions

Reaction Questions
Q8. This session was relevant to my work.
Q9. How would you rate the session overall?
Q10. How much of the session's content could you relate back to your work?
Q11. How valuable was this session for improving residents' satisfaction in the care home?
Q12. Please rate the usefulness of the resource.
Q13. What stage (s) of this procedure did you find more useful?

3. Learning (Q14, Q15, Q16, Q17, Q18)

This part aims to measure how much learning has taken place during the programme. Based on Kirkpatrick's model (1996) the focus should be on the knowledge acquired and skills improved during the learning period. Five questions were designed out of which three required Likert scale responses, one was a yes/no statement and one open-ended. The questions were designed in order to investigate whether there was any change in their views after applying the methodology. That is, they gauged the degree of improvement of their knowledge after running the programme in comparison to that at the time of the pre-test. This battery of questions also evaluated the programme's usefulness, that is, whether the participants valued the new methods introduced and also whether and when they had acquired new skills through the procedure (Table 7.4).

Table 7-4 Learning questions

Learning Questions
Q14. Can the programme help you answer the questions you wrote down in the pre-task?
Q15. Does the session help raise your awareness of the value of new methods for improving quality in care homes? How?
Q16. I have gained new skills and knowledge that will improve my effectiveness.
Q17. What was the most valuable piece of new learning you received in this session?
Q18. To what extent will the methodology be useful for improving residents' satisfaction in your care home?

4. Behaviour (Q19, Q20, Q21, Q22)

This part of the questionnaire according to Kirkpatrick (1996) is a “measure of the extent to which participants change their on-the-job behaviour because of training”. In this part the focus was on the level of transferring of the knowledge gained through the programme to its implementation on the job. Three questions were designed, based on yes/no statements, and one Likert scaled probe with extra space being provided for further comments and explanations. This part was also geared at probing their readiness to make changes and to what extent they intended to so do.

Table 7-5 Behaviour questions

Behaviour Questions
Q19. Did the programme help you answer any questions you had not thought of pre-task?
Q20. To what extent will the residents' satisfaction be improved as a result of the session?
Q21. Will you apply what you learned from the session to your work/ organisation?
Q22. Will you change your behaviour based on what was learnt?

5. Result (Q23, Q24)

The result cohort of questions has the purpose of assessing the scale of the impact of the session on organisational improvement and Kirkpatrick (1960) identifies the components that contribute towards optimal results as being: lower cost, higher quality, increased productivity and turnover. One Likert scale and one open-ended question were designed in order to measure the contribution of the programme to enhancing their care home's quality and the ways in which the managers felt they could apply the methods. Extra space was provided for them to be able to elaborate upon their responses.

Table 7-6 Result questions

Result Questions
Q23. How has the programme contributed to accomplishing care home quality improvement goals?
Q24. How would you apply what you learnt?

7.3 Sampling of expertise

Robson's (2002) purposive sampling method, which is constructed to serve a particular purpose when the research has a specific group in mind, was adopted. The criteria for selection here were that the participants had at least five years' experience and were interested in following up the programme. Thirty three managers/staff who had already

contributed to the project in the descriptive study I were contacted to be invited for participation in the evaluation part of the study, of which 16 declined. Four managers who did not meet the requirements were removed from the list and hence, 13 candidates remained as qualified participants.

First, they were asked to take part in a focus group at Brunel University, where they could exchange their work experiences in detail, however, this could not be arranged due to their busy schedules. Therefore, the evaluation meetings were arranged individually and the 'pre-test' questionnaires were handed out, which each was asked to complete. After that, the aim, purpose, procedure, methods and results of 'residents needs', 'priorities' and the 'House of Quality' were explained to them in detail. A powerpoint showing these items, prepared by the researcher, was shown at the meeting. During the meeting if any questions were brought up by the participants they were answered by the researcher. Then, the second part of the questionnaire (Kirkpatrick's model) were handed out and filled in by them.

Before the sampling of participants, a small-scale pilot study with two managers was conducted, with the aim being to remove any fuzziness in the questions as well to verify their accuracy and appropriateness. From this pilot, questions 20 and 23 in the behaviour and result section, respectively, were reported as being fuzzy by both pilot study participants and therefore modified appropriately. Question 20: 'To what extent will the residents' satisfaction be improved as a result of the session?' was subsequently modified to 'Are you ready to make changes to improve residents' satisfaction as a result of the session?' and question 23: 'How has the programme contributed to accomplishing care home quality improvement goals?' was changed to 'Do you think that the programme will contribute to accomplishing care home quality improvement goals?' In addition, question 18: 'To what extent will the methodology be useful for improving residents' satisfaction in your care home?' was omitted owing to the pilot participants' claims that they could not predict the extent to which the process could be beneficial when they put it into practice. Question 22: 'Will you change your behaviour based on what was learnt?' was omitted for two reasons. Firstly, because the participants found 'behaviour' unclear, in terms of Kirkpatrick's definition, and secondly, because question 21 addressed the same issue in a more explicit format.

The final questions are shown in table below.

Table 7-7 Final evaluation questions based on Kirkpatrick's Model

Pre-testing Questions
Q1. Do you have knowledge of how quality of care can be improved based on residents' needs and requirements?
Q2. Who do you involve for improving quality in care homes? Why?
Q3. Do you know what are residents' most important needs and requirements?
Q4. How do you try to improve quality in your care home?
Q5. Do you use any tools or methods to improve quality in your care home?
Q6. Do you know your organisation's priorities for improving resident satisfaction?
Q7. How do you prioritise the factor(s), which can improve resident satisfaction?
Reaction Questions
Q8. This session was relevant to my work
Q9. How would you rate the session overall?
Q10. How much of the session's content could you relate back to your work?
Q11. How valuable was this session for improving residents' satisfaction in the care home?
Q12. Please rate the usefulness of the resource.
Q13. What stage(s) of this procedure did you find more useful?
Learning Questions
Q14. Can the programme help answer the questions you wrote down in the pre-task?

Q15. Does the session help raise your awareness of the value of new methods for improving quality in care homes? How?

Q16. I have gained new skills and knowledge that will improve my effectiveness.

Q17. What was the most valuable piece of new learning you received in this session?

Behaviour Questions

Q18. Did the programme help you answer any questions you had not thought of pre-task?

Q19. Are you ready to make changes to improve residents' satisfaction as a result of the session?

Q20. Will you apply what you learned from the session to your work/organisation?

Result Questions

Q21. Do you think that the programme will contribute to accomplishing care home quality improvement goals?

Q22. How would you apply what you learnt?

7.4 Analysis of the Data

The four levels of the questionnaire (based on Kirkpatrick's model) as answered by the experts, were analysed separately as follows.

7.4.1 Reaction (Q8, Q9, Q10, Q11, Q12, Q13)

In general, the responses to the suggested methodology were very positive. This section explored the participants' attitudes towards the explanatory session, its usefulness and their willingness to apply any aspect of it. Q8 and Q10 enquired about the relevancy of the session to their work, whilst Q9, Q12 and Q13 focused on their rating of the session in terms of its usefulness and the appropriateness of the methods employed. Q11 pertained to whether they perceived it as valuable for improving residents' satisfaction.

Responding to Q8, 100% of participants agreed that the session was strongly relevant to their work. In terms of rating the session, in response to Q9, 53.9% answered that the session was outstanding, 38.5% answered it was good and 7.6 % replied that they were indifferent about it. One respondent described the overall session as follows:

‘The explanation was in full detail and simple to follow, mostly very useful tool.’
Participant 2.

Responding to Q10, 75% of the participants indicated that the session ‘very much’ related back to their work and 25% reported that they could ‘somewhat’ relate it. In terms of how much of the session content they could relate back to their work, one participant explained:

‘The session provided very useful data, which made me consider adopting the approach in the future.’ Participant 10.

Responding to Q11, 23 % answered that the session was very valuable, 54% responded that it was somewhat valuable, 15.4 % assessed it as average and a small number 7.6% reported it as being of no use at all. The negative answer regarding how valuable the session was for improving resident satisfaction, is shown in the box as follows:

The negative answer by participant 13 was ‘...there is not clear evidence that it can be useful or practical.’

Q12 asked for rating of the usefulness of the resources and session. In response 23.07% rated the session as very high, while 46.1% rated it as high, 23.07% as average and only 7.6% as very low. Some participants reported.

‘Fresh ideas, really impressed and hoping to put it in to practice.’ Participant 11.

‘This resource is very useful. All my years of working in care homes I have been looking for an objective tool for improving the quality, so far it has been based on auditing and experience.’ Participant 9

Q13 probed which stage of the procedure was useful and generally got positive answers. These were very varied, mostly highlighting the: ‘Survey’, ‘Prioritising’ and ‘House of Quality’. One manager said.

‘The stage where we prioritised the needs of residents could be the most useful part that will help us address and meet the residents’ needs.’ Participant 12

7.4.2 Learning (Q14, Q15, Q16, Q17)

This part measured whether the process had any impact on the participants’ learning regarding the tools and methods.

Q14: Regarding answering the pre-task responses, the participants reported as follows. 30.7% said that they had improved very much, 46.15 % somewhat, 15% remained undecided and 7.6% reported that there had not been any change. These responses suggest that the majority of the participants thought it was positive and somewhat added value in terms of their learning.

Q 15: When asked if the process helped raise their awareness about the value of new methods for improving quality in care homes, 100% of the participants said ‘yes’. Brief summaries of comments made to this question are shown in Table 7-8 where the key themes in their learning are listed along with a relevant quotation.

Table 7-8 Response to the evaluation question 15

<i>Themes</i>	<i>What has been learned?</i>
“Refresher and different”	“So far we have been evaluating the quality with questionnaire but this tool offers new technique to the field”
“Aid for monitoring”	“It is capable of recognising and measuring the residents’ demands”
“Practical and useable tool”	“It opens up the debate around quality improvement and it can give a clear and specific prospective of the demands to us”
“Awareness raise”	“I think by gaining the awareness we can focus on how our services can solve the residents problems. Knowing the problem is the first step to solving it.”
“How to fulfils the customer needs”	“It is a strategy which identifies, prioritises the elements need to be improved, which can make our tasks easier as the owners of the industry.”
“Following the demands changes”	“Due to the changes of needs over time this tool can be used to follow and distinguish the new demands of the residents, it also can make us receptive”

Q16. When asked about whether they had acquired new skills and knowledge that would improve their effectiveness, 30.7% of participants strongly agreed, 61.5% agreed and 7.6% disagreed. This may indicate that the majority of the participants agreed that due to increased knowledge, their effectiveness could improve.

Q17. The most valuable piece of new learning gained by participants was reported on as follows:

Participant 2 answered: ‘the most valuable piece I learned was recognising the residents’ needs and how those needs can be met’.

Participant 11 said: ‘to me HoQ gives a very practical tool to prioritise the elements need to improve most. It can reduce the costs’.

Participant 5 commented: ‘the whole session was useful but where it showed by which methods and how, we can find the gaps to improve service by taking action, was the most practical aspect of the session’.

7.4.3 Behaviour (Q18, Q19, Q20)

This stage investigated job performance after the learning process and aimed to measure whether there had been any changes in behaviour.

Q18: This question addressed whether the programme helped them answer any questions they had not thought of in the pre-task. 69.24% of participants responded negatively, which compared with 30.76% positive answers indicates that the majority of the managers were already aware of needs and requirements. However, they stated in their comments that they had no idea of how to prioritise and classify exactly the list of demands, and which factors could have more impact on those needs. They confirmed that the whole process could be useful for this.

Q19. Asked whether the participants were ready to make changes to improve residents’ satisfaction as a result of the session, to which 84.6 % answered yes, and 15.3% answered no. These responses may indicate that the methodology is generally accepted as useful when aiming to increase residents’ satisfaction.

Q20: In response to this, 84.6 % answered yes, and 15.3% no, which possibly suggests that the vast majority of the participants considered the programme as being practical and confirmed that they would apply it.

‘I will probably apply what I learnt, I think the session was useful in terms of finding a practical method for finding the points that we are lagging at, by which we can put ourselves in residents place to understand their needs.’ Participant 12

‘I prefer to use my 25 years of experience I have gained, and not to resort to any new methods. It is really difficult to adopt new techniques in the places which have been run conventionally’. Participant 13

7.4.3.1 Result (Q21, Q22)

This stage focuses on how we can relate the results of the methods to care home quality improvement.

Q21: When asked whether the programme would contribute to accomplishing care home quality improvement goals, the participants answered as follows. 15.38% of respondents rated it as very high, 46.15% as high, with 23.07% considering it as average, and 7.6% very low as well as 7.6% who did not answer. It appears that most participants agreed that the programme could contribute positively.

‘So far my evaluation for quality improvement has been rather subjective based on my observation, monitoring and common sense. I think applying a new method which has been shown to be effective in many fields of business and industries can give us an opportunity to measure the needs more objectively, by which the quality could improve and a better understanding of customer satisfaction can be achieved.’ Participant 5

‘I don't feel the sufficiency of the session for making changes or applying the new method to my organisation.’ Participant 13

Q22: Participants’ opinions on the ways that they would apply their learning were generally positive towards the methods, showing their interest in applying the methodology. However, some mentioned that additional instruction sessions and meetings were needed for them to be able to apply it in their organisations.

<p>‘I believe we need more training or instructive sessions in order to learn how to work with “house of quality”.’ Participant 10</p>
<p>‘I will definitely apply HoQ to identify the services which need more improvement to satisfy my residents’ needs and expectations, I think it was a practical tool to use and gives us a clear picture.’ Participant 7</p>
<p>‘I assume that in the present situation where financial crises is going on around the world, and with reference to our budget limitation we have to identify which demands are exactly prior to the other, those on which our limited budget can be spend. I think this process can design a map by which we can identify those demands.’ Participant 5</p>
<p>‘I would like to have instructive sessions to find a command of the techniques introduced in this session with my staff, in order to be able to put it in practice from time to time, since the demands and needs might differ over time.’ Participant 2</p>
<p>‘I prefer to stick to my own approach based on the long experienced I have gained throughout years of working and running care homes, which I think is responsive enough’. Participant 13</p>

7.5 Chapter conclusion

The results of the data analysis, using expert evaluations, indicates that the majority of the expert participants, who numbered 13 in total, gave positive feedback about the research methodology. The research process and methods were rated as very good and the content could be related to their work.

The respondents rated the procedure as valuable and practical, in terms of the ‘survey’, ‘HoQ’ and ‘Prioritising’. It appears that they were of the opinion that the QFD process could be influential in raising their awareness towards applying methodology or methods for enhancing quality in their care homes. In addition, they expressed the view that data gained through the HoQ was reasonable and, hence, could be used as essential data when implementing change, as the process gave them new skills and knowledge as well as valuable information. Overall, there was not a great difference between the views of the experts, however, a small number mentioned the difficult appearance of

HoQ as well as their having difficulty regarding its application. Generally, the process made them think about some issues that they had not thought of before.

Given that many of the expert participants held the view that the programme could contribute significantly to accomplishing care home quality improvement goals, it may be reasonable to argue that providing the programme in care homes can help managers obtain a better understanding of the voice of their customers, and that this will lead to the fulfilment of customer needs and satisfaction.

8 Conclusion

Quality issues in the care sector are of vital importance due to the nature of this provision, but the question remains, how can we talk about improving quality without paying attention to the discussion of demands and needs? Although quality, customer-oriented as well as patient-centred care and meeting the satisfaction of residents have all been at the centre of academic discussions for a considerable length of time, little work has been achieved that clarifies the demands and expectations of the service consumers themselves. In practice, what is most remarkable is that, with respect to improving quality in care homes, the focus is often on the expectations and opinions of service providers rather than those of residents and the voices of residents are usually absent or so faint, that they cannot be heard.

Commonly, professionals believe that residents are not aware of their needs and requirements. This perspective has contributed to quality improvement methods and the development of suitable tools in health care services lagging behind the progress made in other sectors, and this situation is even more pronounced for the case of care homes. Although the reasons why the professionals do not recognise residents as capable or entitled when passing judgment on services is outside the scope of this research, it is worth mentioning two main reasons cited in the extant research that are thought to underpin this attitude. One explanation may be the misinformed assumption that patients and care home residents are not aware of their own needs. To counter this, an analogy can be used to propose that an aircraft passenger who knows nothing about flight engineering can still expect a secure and comfort flight with no delays to his/her journey. Secondly, with particular relevance to care homes, it may be that service providers hold that the majority of old residents have cognitive impairments, hence they cannot decide on their own life style nor can they express their ideas or even their likes and dislikes which are fundamental attributes of a human being. As mentioned in the literature review for the current study, in recent years researchers have identified that residents with moderate to severe cognitive impairments are able to answer with a degree of reliability certain forms of customer surveys. Notwithstanding these explanations, managers seeking to improve quality still have to identify their key customers in care homes and obtain information regarding their needs and requirements

as the starting point for any such undertaking (Carey & Lloyd, 2001). Therefore, we have to face up to the challenge of understanding the residents' views, their expectations and the factors affecting their satisfaction levels. When we can address this, we are in the position of being able to assist care home managers in providing resident-focused services. Known as the "voice of the customer analysis" this strategy is deployed in this thesis and forms a platform for reinforcing the methods that can be used for achieving improvement in quality.

The review of the pertinent literature for this thesis revealed that in care home organisations, the use of robust and reliable methods for capturing and identifying residents' needs and requirements is not widespread with many such investigations relying on satisfaction surveys, the domains for which are based invariably on the prejudgments of providers or researchers. For this reason the QFD methodology provides a unique opportunity for us to elicit residents' needs and requirements and thus enhance quality. This particular approach has been widely adopted throughout industry since the 1970s and has enabled organisations to reduce costs while raising profitability and gaining competitive advantages through increasing customer satisfaction. Although its application has improved over the last few decades, the method still suffers from some deficiencies, which this researcher has tried to mitigate by integrating other tools and techniques and so produce a comprehensive method for improving quality and the levels of residents' satisfaction in care homes. In this thesis, the needs, attributes of these needs as well as their importance were identified through the resident voice. To this end, the percentage of relative importance and residents' needs weight of each demanded quality (DQ) were identified and subsequently the voice of the customer was translated into the voice of the organisation. The methodology deployed in this study was then validated by experts in the field of care services. The following section presents the overall conclusions emerging from the descriptive study, prescriptive study I and descriptive study II.

8.1 Conclusion: descriptive study I

As explained in chapter four, the care home system, as with other organisations, comprises a chain of customers, each of which might have different needs and requirements. In the chain of customers, the key customer may determine whether the organisation meets with success or failure and so key customer requirements can have a

powerful impact on the whole system. It can be assumed that identifying the key customer through an accurate method is crucial for improving or redesigning the organisation's processes, taking into account these customer requirements.

It has emerged that in most extant scholarship the method for determining the key customers in care homes is ambiguous for the customer and is usually identified from the researchers' or professionals' stand point. However, in this research study care was taken to identify the resident as the key customer in care homes through the use of brainstorming activities and the application of the analytical hierarchical process (AHP) which provided this researcher with a robust and accurate method for carrying out the work.

Identifying key customer (i.e. resident) needs and requirements and understanding the importance of these, are two essential and specific steps. In this regard, for this investigation the semi-structured interview was selected as the best technique for identifying residents' needs and requirements. At this stage, the aim is just capturing residents' needs and requirements and a statistically sound sample of informants is not required. It is worthwhile noting that only while determining the importance of customers' needs and requirements is it necessary to obtain a statistically robust sample.

The set of interview questions was designed and revised after a pilot study carried out with a limited number of three residents. The finalised questions were then put to 15 residents in three different care homes and in the interviews held with the first 13 residents very similar information was elicited regarding the nature of their requirements. From the interviewees' comments, 91 statements were extracted and grouped into 28 DQs. Next, these 28 DQs were grouped into five dimensions by using an affinity diagram and then ranked using the analytical high-ranking process (AHP). By the application of the Pareto principle, 80/20, 12 DQs were pinpointed as the most significant ones. The remaining workflow for this study took these into account.

A three-stage questionnaire on the 12 most important DQs was designed and executed in order to evaluate three aspects. All three stages of the questionnaire were first given to 15 residents in order to test for reliability. Subsequently, the third part was revised and tested again to make sure of its reliability and then the three-stage questionnaire was given to 102 residents in 35 care homes.

In the first stage of the questionnaire, the importance of the DQs was evaluated based on the responses given by the cohort of residents to probes that were designed with a five-point Likert scale scoring scheme. For the second, the level of residents' satisfaction with the provided services was measured. As with the first, the scoring scheme of the second stage of the questionnaire was based on a five-point Likert scale. Regarding the third, the Kano model was applied to the 102 residents' responses in order to identify the attributes of the 12 DQs, (basic, one-dimensional and excitement), as well as to calculate the customer satisfaction coefficient. As a result of this, safety, meals and accurate medical care were identified as basic needs while caring and sensitive staff, social interaction, autonomy and family support were recognized as one-dimensional needs. Moreover, three excitement needs were identified: accessible equipment, a homelike environment, and suitable design. The summary of descriptive study I is shown in Table (8-1) below.

Table 8-1 Summary of descriptive study I

<i>Stage</i>	<i>Descriptive study I</i>	<i>Method</i>	<i>Main contents</i>
1	Key customer identification	Brainstorming AHP	Residents
2	Identifying residents' needs and requirements	Interview with 15 residents in 3 different care homes	28 needs and requirements/ or demanded qualities (DQs): as below
	1. Caring and Sensitive Staff	15. Experienced Staff	
	2. Social Interaction	16. Cost	
	3. Autonomy	17. Cleanliness & Hygiene	
	4. Accessible Equipment	18. Productive Staff	
	5. Family Support	19. Suitable Temperature	
	6. Safety	20. Outing	
	7. Meal	21. Well groomed staff	
	8. Accurate Medical Care	22. Basic Facilities	
	9. Involvement	23. Entertaining Activities	
	10. Homelike Environment	24. Lounge Gathering	
	11. Daily living Activities	25. Quiet Place	
	12. Suitable Design	26. Good Odour	

13. Quick Response

27. Celebrating

14. Usable Garden

28. Spiritual Activities

3 Grouping residents DQs

Affinity Diagram

Residents
Caregivers
Environment
Facility and
Services
Activities

5 Identifying 20% of most important DQs

AHP

12 DQs: as below

Pareto Principle

1. Caring and Sensitive Staff

7. Meal

2. Social Interaction

8. Accurate Medical Care

3. Autonomy

9. Involvement

4. Accessible Equipment

10. Homelike Environment

5. Family Support

11. Daily living Activities

6. Safety

12. Suitable Design

7 Identifying the importance of DQs with larger group of residents

Questionnaire/ Likert Scale Results as below:

Highest Score: 5

Score: 4

Caring and Sensitive Staff

Autonomy

Social Interaction

Accessible Equipment

Safety

Family Support

Homelike Environment

Accurate Medical Care

Daily living Activities

Suitable Design

Score: 4.5

Lowest Score: 3

Meal

Involvement

8 Identifying the level of satisfaction with provided services

Questionnaire/ Likert Scale

9	Identifying the attributes of 12 most importance DQs	Questionnaire/ Model	Kano	Result as below:
	Basic			Excitement
	Meal			Accessible Equipment
	Safety			Homelike Environment
	Accurate Medical Care			Suitable Design
	One-Dimensional			
	Caring and Sensitive Staff			
	Social Interaction			
	Autonomy			
	Family Support			
	Daily living Activities			

This study indicates that residents who are capable in terms of cognitive abilities are well aware of their needs and they can express their requirements regarding care services. In sum, the capturing of the voice of residents, eliciting their needs and requirements, organising them, and conducting a residents’ survey to gauge the importance of these identified needs have all been shown to be part of an appropriate and worthwhile methodological strategy for obtaining a complete and accurate account of residents’ requirements.

8.2 Conclusion: the prescriptive study

The results of the three-stage questionnaire were integrated into the quality planning table (QPT). At this point, by deploying the QPT, it is possible to figure out how to replace randomly undertaken improvements with addressing what matters most to the customer by aligning efforts appropriately. The first product of the prescriptive study was the generated list of prioritised DQs along with their relative weights. Thus, the prioritizing of DQs is a unique opportunity for service providers to focus their human and financial resources on delivering maximum value to care home residents. With regards to this, the highest calculated average of the relative weights belonged to homelike environment, suitable design, caring and sensitive and social interaction while the lowest calculated average of the relative weights belonged to involvement.

Next, the performance measures (quality characteristics) were developed. The goal at this point was to identify through which means, in a measurable sense, would the care home providers be able to furnish the DQs. For creating these performance measures, first the cause and effect diagrams (i.e. the fishbone diagrams) for each DQ were structured and the factors that had an effect on each were determined. From the brainstorming sessions, in total 124 factors were identified that could have an influence on all 12 main DQs. This process was followed by identifying the factor(s) which might have the greatest impact on each DQ and, in total, 17 factors were identified. When the most influential factors were identified the team of informants (two managers, two members of staff and the researcher) converted them into measurable factors. In total, 24 factors were identified as the performance measures.

The house of quality (HoQ) was organised so as to capture the relationship between the DQs and the performance measures. For creating the HoQ, the performance measures, DQs and the calculated average of the relative weights were entered into the HoQ matrix and the relationships between the DQs and performance measures were determined, based on the experts' judgments. When the matrix was completed, the absolute weight of each performance measure was calculated. Based on the highest relative weight score and covering all 12 DQs, five performance measures were identified as key: percentage of pleasant interaction time between residents/or staff; percentage of equipment that residents can use without help; number of residents; percentage of residents satisfied with staff behaviour; number of times residents make their own choices per month. As it has been established that these five key performance measures have a relationship with all the 12 main DQs, it can be asserted that improving these specific DQs, instead of trying to cover all the performance measures could improve the 12 DQs and hence increase residents' satisfaction levels regarding all 12 DQs. Based on this, in order to effectively promote resident satisfaction in care homes, it can be claimed that the key performance measures with the higher values should receive priority in terms of making improvements to services.

The evaluation of quality can be a more beneficial and reliable endeavour when it draws on residents' views and perceptions. Regarding this, this study has shown the effectiveness of assessing care home services through asking their key customers about their satisfaction with the services provided. Moreover, the quality planning table (QPT)

has been successfully applied and demonstrated as a feasible and accurate method for utilising survey data in combination with quality targets to rank items for improvement and upgrading.

This research has underlined the applicability of the house of quality (HoQ) to the task of translating residents' needs into the shape of new services. More specifically, the HoQ has been demonstrated as an effective tool in the care home context as it assigns higher values to those needs that can provide more satisfaction in residents. In light of the robust methodological approaches that have been undertaken for this investigation, this study is potentially valuable to care home managers when they are deciding which quality characteristics, if provided, could have the greatest impact on residents' satisfaction.

8.3 Main conclusion from descriptive study II

The procedures followed in descriptive study I and the prescriptive study were evaluated by 13 experts (care home managers) whose judgements were relied upon to identify the appropriateness of the research methodology. This evaluation was based on Kirkpatrick's four part model which covered: reaction, learning, behaviour and results. The twenty-two questionnaires were designed in order to evaluate the research study's methodology by service providers in care homes.

The overall conclusion is that this study is beneficial in showing that care home organisations are ready to adopt reliable quality improvement methods and there is great potential for using this research methodology in such settings. The QFD methodology used in conjunction with other management process methods may significantly change the organisational culture. In particular, to respond to the needs and expectations of residents and augment efficiency in care homes, this method can serve to encourage participation by management and institutionalise cooperation, teamwork, and empowerment of creativity and innovation.

8.4 Contribution to knowledge

The main contributions of this research to knowledge are summarised as follows.

1. The study was one of the very first to get the service users (care home residents) to actively participate in identify, prioritise and translate requirements into unambiguous quality measurement targets
2. The study was one of the very first to provide insights into requirements and quality measurements in the context of UK care home from the user perspective
3. The study was one of the very first to apply QFD methodology to capture ‘unheard’ voices of UK care home residents and translate them into unambiguous quality measurement targets for future improvement

8.4.1 Prioritising residents’ requirements

Despite the availability of a wealth of research reported in the literature addressing quality in care homes, there has been a lack of research scrutinizing the issue from the residents’ viewpoints. Using the voice of customer analysis (VoC), i.e. focusing on residents only, is a characteristic of this research which makes it novel. This is the first research of this nature carried out in care homes in the UK. Moreover, there has not been any research that has prioritised residents’ needs in care homes, by utilising accurate methods for this ranking, with consequent potential increase in residents’ satisfaction.

8.4.2 Residents requirements’ attributes

In the extant literature, the relationship between residents’ requirements and service performance is treated as linear. Many researchers have applied the Kano model to identify customers’ needs as well as the influence of the features of the provided services on customer satisfaction. This research sheds light on identifying resident needs’ attributes and using a satisfaction coefficient that can assist managers to prioritise according to importance the service quality features that should be addressed for fulfilling residents’ satisfaction.

8.4.3 Applying QFD methodology in care homes

Enhancing the quality is an important requirement in many care homes. Nowadays, care home managers and/or professionals are struggling to find ways to reduce the costs and improve quality and customers' satisfaction. Some quality improvement methods which are adopted in other industries could be appropriate for care home providers to improve quality, efficiency and residents' satisfaction as well as to reduce cost. However, to date, there has been no evidence available regarding the suitability of deploying quality improvement tools in care home settings. It is reasonable to propose that the QFD methodology proposed and subsequently tested in this study can thus be considered as truly appropriate for adoption by those care home managers or service providers who are seeking to increase quality and fulfil their residents' satisfaction.

8.5 Limitations

To accomplish this dissertation, the researcher faced a number of limitations some of which were discussed as they arose in the relevant chapter. In this section the researcher considers the overall limitations to the study. Key issues are discussed below.

- The residents of the studied care homes, were in a rather healthy cognitive state. Naturally, they could express their feelings and expectations freely and comfortably, whereas for the majority of patients residing in care homes suffer from various cognitive impairments. Carrying out research with such residents, given their difficulties might lead to considerably different findings than those obtained in this study. Understanding the needs and requirements of residents with cognitive impairments would most probably demand applying different techniques and methods to allow for informed decision-making and improving the nature of life for them in care homes.
- To obtain residents' demanded qualities, the interviews were conducted in three different care homes. Overall, most residents' needs and expectations were found to be similar to those introduced in the extant literatures. Given this, several strategies were applied in order to try and elicit any potentially missing demanded qualities. However, it might be possible that some residents in other care homes have a wider range of or greater or fewer needs and different expectations to those captured in the current study.

- The other significant limitation is the small size of the sample. The quantitative data were collected randomly from a small number of care homes, which may not have been a true representation of the community. Therefore, the outcomes could be slightly different to a similar investigation conducted with a larger sample. It should be noted though, that the applicability of the methodology remains sound and functional for gaining and measuring the quality of the services provided in care homes.
- One of the most challenging situations and restrictions the researcher faced was lack of accessibility to existing care homes in London. The majority of staff and managers did not appear to be cooperative or interested in participating in this research.

8.6 Future work

Based on the research methodology a number of propositions that offer additional avenues for future research are put forward.

- Future research could be conducted on a larger scale for implementing the proposed research methodology so as to analyse the applicability of the proposed tools and thus to create a resident-oriented care home.
- This research was conducted at one point in time. Future research could also be employed to evaluate residents' expectations and views of quality over time to examine how this may change over the period in question.
- This PhD research methodology and proposed tools can be expanded to other service industries. It could provide a unique opportunity for service industries to improve service design, based on their customers' needs.

9 References

- Aaronson, W., Zinn, J. & Rosko, M., 1994. Do for-profit and not-for-profit nursing facilities behave differently?. *The Gerontologist*, Volume 34, pp. 775-786.
- Abbott, L., 1955. *Quality and Competieion*. New York: Columboa University Press.
- Abdelhafiz, A. & Austin, C., 2003. Visual factors should be assessed in older people presenting with falls or hip fracture. *Age and Ageing*, 32(1), pp. 26-30.
- Abu-Assab, S., 2011. *Integration of Preference Analysis Methods into Quality Function Deployment*. Germany: Springer Gabler.
- Age UK, 2013. *Care homes: finding the right care home*. [Online] Available at: http://www.ageuk.org.uk/Documents/EN-GB/Information-guides/AgeUKIG06_Care_homes_inf.pdf?dtrk=true [Accessed 4 Jun 2013].
- Aghlmand, S. et al., 2008. Developing evidence-base maternity care in Iran: a quality improvement study. *BMC Pregnancy and Childbirth* , 8(20), pp. 1-8.
- Aghlmand, S., Lameei, A. & Rhonda, S., 2010. A hands-on experience of the voice of customer analysis in maternity care from Iran. *International Journal of Health Care*, 23(2), pp. 153-179.
- Ahmed, S., 2000. *PhD Thesis: Understanding the Use and Reuse of Experience in Engineering Design*. Cambridge: Cambridge University Engineering Department.
- Akao, Y., 1990a. *Quality Function Deployment: Integrating Customer Requirments into Product Design*. Cambridge: Productive Press.
- Akao, Y., 1990b. History of Quality Function Deployment, in: International Academy for Quality (Eds): *The Best on Quality*, IAQ book Series, 3, 183-196.
- Akao, Y. & Mazur, G., 2003. The Leading Edge in QFD: Past, Present and Future. *International Journal of Qulity & Reliability Management*, 20(1), pp. 20-35.
- Akinci, F. & Krolkowski, D., 2005. Nurse staffing levels and quality of care in northeastern Pennsylvania nursing homes. *Applied Nursing Research*, 18(3), pp. 130-137.

- Alieksiei, M. & Aspinwall, E., 2001. Quality function deployment: An empirical study in the UK. *Total Quality Management*, 12(5), pp. 575-588.
- Anderson , R., Isse, L. & McDaniel Jr, . R. R., 2003. Nursing homes as complex adaptive systems: relationship between management practice and resident outcomes.. *Nursing research*, 52(1), pp. 12-21.
- Anderson, B., 2007. Collaborative care and motivational interviewing: improving depression outcomes through patient empowerment interventions. *Am J Manag Care* , 13(4 Suppl), pp. S103-6.
- Anderson, R., Hsich, P. & Su, H., 1998. Resource allocation and resident outcomes in nursing homes: Comparisons between the best and worst. *Research in Nursing and Health*, Volume 21, pp. 297-313.
- Andronikidis, A., Georgiou , A. C., Gotzamani, K. & Kamvysi, K., 2009. The application of quality function deployment in service quality management. *The TQM Journal*, 21(4), pp. 319-333.
- Applebaum, R., Straker, J. & Geron, S., 2000. *Assessing satisfaction in health and long term care: practical approaches to hearing the voice of consumers*. New York: Springer.
- Arling, G. et al., 2007. Nursing effort and quality of care for nursing home residents. *The Gerontologist*, 47(5), pp. 672-682.
- Azam, M., Rahman, Z. & Talib, F., 2012. A critical study of quality parameters in health care establishment: Developing an integrated quality model. *International Journal of Health Care Quality Assurance* , 25(5), pp. 387-402.
- Banaszak-Holl, J. & Hines, M. A., 1996. Factors Associated with Nursing Home Staff Turnover. *The Gerontologist* , 36(4), pp. 512-517.
- Banks, L., Haynes, P., Balloch, S. and Hill, M., 2006. *Changes in communal provision for adult social care 1991-2001*. York: Joseph Rowntree Foundation.
- Barnes, S., 2002. The design of caring environments and the quality of life of older people. *Ageing & Society*, Volume 22, pp. 775-789.
- Bates, R., 2004. A critical analysis of evaluation practice: the Kirkpatrick model and the principle of beneficence. *Evaluation and Program Planning*, Volume 27, pp. 341-347.

- Bayraktarog ̇ lu , G. & O ̇ zgen, . O ̇ ., 2008. Integrating the Kano model, AHP and planning matrix: QFD application in library services. *Library Management*, 29(4), pp. 327-51.
- BBC, 2011. *Experts warn of care home demand*. [Online] Available at: <http://www.bbc.co.uk/news/uk-england-tyne-13353792> [Accessed 5 May 2013].
- Bebbington, A., Darton, R. & Netton, A., 2001. *Care Homes for older people: Volume 2 admissions, needs and outcomes*. The 1995/96 National Longitudinal Survey of Publicly-Funded Admissions. Canterbury: PSSRU, University of Kent.
- Beebe, T., Stoner, S., Anderson, K. & Williams, A., 2007. Selected questionnaire size and colour combinations were significantly related to mailed survey response rates. *Journal of Clinical Epidemiology*, 60(11), pp. 1184-1189.
- Benner, M., Linnemann, A., Jongen, W. & Folstar, P., 2003. Quality Function Deployment (QFD)—can it be used to develop food products?. *Food Quality and Preference*, 14(4), pp. 327-339.
- Benneyan, J., Lioyd, R. & Plsek, P., 2003. Statistical process control as a tool for research and healthcare improvement. *Quality and Safety in Healthcare*, Volume 13, pp. 458-64.
- Berger, C. et al., 1993. Kano's method for understanding customer-defined quality. *Center for Quality Management Journal*, Volume 2, pp. 3-34.
- Bergman, B., Neuhauser, D. & Provost. , L., 2010. Five main process in healthcare: a citizen perspective. *BMJ*, 20(1), pp. i41-i42.
- Bergman, B. & Klefsjö, B., 1994. *Quality from customer needs to customer satisfaction*. London: McGraw-Hill.
- Bergquist, K. & Abeysekera, J., 1996. Quality Function Deployment (QFD)- A means for developing usable products. *International Journal of Industrial Ergonomics*, Volume 18, pp. P269-275.
- Bertalanffy, L., 1950. An Outline of General System Theory. *Br J Philos Sci*, 1(2), pp. 134-65.

- Blaxter, . L., Hughes, C. & Tight, M., 2010. *How to research*. 4th ed. Berkshire: McGraw-Hill/Open University Press.
- Blessing, . L. T. M. & Chakrabarti, A., 2009. *DRM, a design research methodology*. London: Springer.
- Bliesmer, M., Smayling, M., Kane, R. & Shannon, I., 1998. The relationship between nursing staffing levels and nursing home outcomes. *Journal of Aging & Health*, 10(3), pp. 351-71.
- Blumenthal, D., 1996. Quality of care- what is it?. *N. Engl. J. Med*, Volume 335, pp. 891-894.
- Bostick, J., 2004. Relationship of nursing personnel and nursing home care quality. *Journal of Nursing Care Quality*, 19(2), pp. 130-136.
- Bouchereau, V. & Rowlands, H., 2000.) Methods and techniques to help quality function deployment (QFD). *Benchmarking: An International Journal*, 7(1), pp. 8-16.
- Bowman, C., 2010. *Design for Dementia: Improving dining and bedroom environments in care homes*, London: Helen Hamlyn Centre, Royal College of Art.
- Bradshaw, S. A., Playford, E. D. & Riazi, A., 2012. Living wll in care homes: a systematic review of qualitative studies. *Age and Ageing*, Volume 41, pp. 429-440.
- Brannen, J., 2004. Working Qualitatively and Quantitatively. In C. Seale, G. Gobo, J. F. Gubrium, & D. Silverman, *Qualitative Research Practice* (pp. 312- 326). London: Sage Publications.
- Broh, R., 1982. *Mannaging Quality for Higher Profits*. New York : McGraw-Hill.
- Brook, R. H., 1994. The RAND/UCLA Appropriateness Method. In K. A. McCormick, S. R. Moore, & R. A. Siegel, *Methodology perspectives* (pp. 59-70). Rockville, MD: AHCPR.
- Brubaker, B., 1996. Self-care in nursing home residents'. *Journal of Gerontological*, Volume 22, pp. 22-30.
- Bryman, A., 2001. *Social Research Methods*. New York: Oxford University Press.
- Bryman, A., 2012. *Social Research Methods*. New York: Oxford University Press.

Bryman, A. & Teevan, J., 2005. *Social Research Methods*. Ontario: Oxford University Press.

Callisaya, M. L. et al., 2011. Gait, gait variability and the risk of multiple incident falls in older people: a population-based study. *Age Ageing*, 40(4), pp. 481-487.

Campbell, S., Roland, . M. & Buetow, S., 2000. Defining quality of care. *Social Science & Medicine*, 51(11), p. 1611–1625.

Care Quality Commission (CQC), 2010. *Guidance about compliance: Essential standards of quality and safety*. [Online] Available at: http://www.cqc.org.uk/sites/default/files/documents/gac_-_dec_2011_update.pdf [Accessed 4 Jun 2014].

Carey, M. A. & Smith , M. W., 1994. Capturing the group effect in focus groups: A special concern in analysis. *Qualitative Health Research*, 4(1), pp. 123-127.

Carey, R. & Liloyd, R., 2001. *Measuring Quality Improvement in Healthcare: A Guide to Statistical Process Control Applications*. Milwaukee: WI: ASQ Quality Press.

Cardoso, C., 2005. *PhD Thesis: Design for Inclusivity: Assessing the Accessibility of Everyday Products*. Cambridge: Cambridge University, the Department of Engineering and Design.

Carmel, S. & Glick, . S. M., 1996. Compassionate-empathic physicians: Personality traits and social-organizational factors that enhance or inhibit this behavior pattern. *Social Science & Medicine*, 43(8), p. 1253–1261.

Carnevalli, J. A., Cauchick Miguel, P. A. & Calarge, . F. A., 2010. Axiomatic design application for minimising the difficulties of QFD usage. *International Journal of Production Economics*, 125(1), pp. 1-12.

Carter , M. & Porell, F., 2003. Variations in hospitalization rates among nursing home residents: the role of facility and market attributes. *The Gerontologist*, 43(2), pp. 175-91.

Caruana, A., Money, A. & Berthon, P., 2000. Service Quality and Satisfaction – The Moderating Role of Value. *European Journal of Marketing*, 34(11/12), pp. 1338-1352.

Case, D., 2008. *Looking for information: A survey of research on information seeking, needs and behavior*. Amsterdam: Academic Press.

Castle, N. G. & Engberg, J., 2007. The Influence of Staffing Characteristics on Quality of Care in Nursing Homes. *Health Serv Res*, 42(5), p. 1822–1847.

Castle, B. & Engberg, J., 2005. Staff turnover and quality of care in nursing homes. *Medical Care*, 43(6), pp. 616-626.

Castle, N. G., 2008. Nursing Home Caregiver Staffing Levels and Quality of Care A Literature Review. *Journal of Applied Gerontology*, 27(4), pp. 375-405.

Castle, N. & Anderson, R. A., 2011. Caregiver staffing in nursing homes and their influence on quality of care: Using dynamic panel estimation methods. *Medical Care*, Volume 49, pp. 545-552.

Castle, N. et al., 2004. Use of Resident Satisfaction Surveys in New Jersey Nursing Homes and Assisted Living Facilities. *Journal of Applied Gerontology*, 23(2), pp. 156-171.

Castle, N., 2001. Administrative turnover and quality of care in nursing homes. *The Gerontologist/Social Sciences*, Volume 41, pp. 757-767.

Castle, N. & Engberg, J., 2004. Response Formats and Satisfaction Surveys for Elders. *The Gerontological Society of America*, 44(3), pp. 358-367.

Castle, N. & Engberg, J., 2005. Staff Turnover and Quality of Care in Nursing Homes. *Medical Care*, 43(6), pp. 616-26.

Castle, N. & Engberg, J., 2006. Organizational characteristics associated with staff turnover in nursing homes. *Gerontologist*, 46(1), pp. 62-73.

Castle, N. & Fogel, B., 1998. Characteristics of nursing homes that are restraint free. *The Gerontologist*, 38(2), pp. 181-8.

Castle, N. G., 2007. A review of satisfaction instruments used in long-term care setting. *Journal of Aging & Social Policy*, 19(2), pp. 9-41.

Castle, N. G. & Ferguson, J., 2010. What Is Nursing Home Quality and How Is It Measured?. *The Gerontologist*, 50(4), pp. 426-442.

- Celestine, C., Monplaisir, L. & Turgut, O., 2012. Voice of the customer: Customer satisfaction ratio based analysis. *Expert Systems with Applications*, Volume 39, pp. 10112-10119.
- Chang, C.-L., 2006. Application of quality function deployment launches to enhancing nursing home service quality. *Total Quality Management & Business Excellence*, 17(3), pp. 287-302.
- Chan, L.-K. & Wu, M.-L., 2002. Quality function deployment: A literature review. *European Journal of Operational Research*, Volume 143, p. 463–497.
- Chan, L.-K. & Wu, M.-L., 2005. A systematic approach to quality function deployment with a full illustrative example. *The International Journal of Management Science*, Volume 33, p. 119 – 139.
- Chaplin, E. & Terninko, J., 2000. *Customer Driven Healthcare*. Milwaukee, WI: ASQ Quality Press.
- Chaudha, A., Jain, R., Singh, A. & Mishra, P., 2011. Integration of Kano's Model into quality function deployment (QFD). *Int J Adv Manuf Technol*, Volume 53, pp. 689-698.
- Chen, J., Chong, P. & Chen, Y., 2001. Decision Criteria Consolidation: A Theoretical Foundation of Pareto Principle to Porter's Competitive Forces. *Journal of Organizational Computing and Electronic Commerce*, 11(1), pp. 1-14.
- Chilgren, A., 2008. Managers and the New Definition of Quality. *Journal of Healthcare Management*, 53(4), pp. 222-229.
- Chilgren, A., 2008. Measuring and the New Definition of Quality. *Journal of Healthcare Management*, 53(4), pp. 222-229.
- Chou, S-C., Boldy, D. P. & Lee, A. H., 2002. Staff satisfaction and its components in residential aged care. *International Journal of Quality in Health Care*, 14(3), pp. 207-217.
- Chou, S-C., Boldy, D. P. & Lee, A. H., 2003. Factors Influencing Residents' Satisfaction in Residential Age Care. *The Gerontologist*, 43(4), pp. 459-472.

- Cifter, A. S., 2011. *PhD Thesis: An Inclusive Approach Towards Designing Medical Devices for Use in the Home Environment*, London: Brunel University School of Engineering and Design.
- Claver , M. et al., 2013. Comprehensive care for vulnerable elderly veterans during disasters. *Arch Gerontol Geriatr*, 56(1), pp. 205-13.
- Cohen, L., 1995. *Quality Function Deployment: How to Make, QFD Work for*. Massachusetts: Addison-Wesley.
- Comondore, V. & Devereaux, P., 2009. Quality of care in for-profit and not- for-profit nursing homes: systematic review and meta-analysis. *British Medical Journal*, 339(b2732), pp. 1-15.
- Cooney, A., Murphy, K. & O'Shea, E., 2009. Resident perspectives of the determinants of quality of life in residential care in Ireland. *Journal of Advanced Nursing*, 65(5), pp. 1029-1038.
- Cordner, Z., Blass, D., Rabins, P. & Black, B., 2010. Quality of Life in Nursing Home Residents with Advanced Dementia. *JAGS*, 58(12), pp. 2394-2400.
- Cox, J. & Wyndrum, R.W, 1994. IEEE total quality management. *IEEE Communications Magazine*, October, pp. 42-45.
- Crespo, M., Bernaldo de Quirós, M., Gomez, M. & Hornillos, C., 2011. Quality of Life of Nursing Home Residents with Dementia: A Comparison of Perspective of Residents, Family, and Staff. *The Gerontologist*, 52(1), pp. 56-65.
- Creswell, J., 2009. *Research design: qualitative, quantitative, and mixed method approaches*. 3rd ed. s.l.:SAGE.
- Creswell, J. & Plano Clark, V., 2007. *Designing and conducting mixed methods research*. California: SAGE Publications.
- Creswell, . J. W., 2014. *Research design : qualitative, quantitative, and mixed methods approaches*. 4th ed. s.l.:SAGE.
- Crogan, N., Evans, B. & Velasquez, D., 2004. Measuring Nursing Home Resident Satisfaction With Food and Food Service: Initial Testing of the FoodEx-LTC. *The Gerontological Society of America*, 59A(4), pp. 370-377.

- Crosby, P., 1976. *Quality is free: the art of making quality certain*. New York: Penguin Books.
- Crotty, M., 2004. *The Foundations of Social Research*. Wiltshire: Sage Publications.
- Crow, R. et al., 2002. The measurement of satisfaction with healthcare: implications for practice from a systematic review of the literature. *Health Technol Assess*, 6(32), pp. 1-244..
- Cudney, E., Elrod, C. & Uppalanchi, A., 2012. Analyzing Customer Requirements for the American Society of Engineering Management Using Quality Function Deployment. *Engineering Management Journal*, 24(1), pp. 47-57.
- Curry, T. & Ratliff, B., 1973. The Effects of Nursing Home Size on Resident Isolation and Life Satisfaction. *The Gerontologist*, 13(3), pp. 295-298.
- Cutler, L. et al., 2006. Assessing and comparing physical environments for nursing home residents: Using new tools for greater research specificity. *The Gerontologist*, Volume 46, pp. 42-51.
- Czaja, R. & Blai, J., 1996. *Designing Surveys: A Guide to Decisions and Procedures*. Pine Forge: Thousand Oak.
- Davis, M. A., 1991. On Nursing Home Quality: A Review and Analysis. *Med Care Res Rev*, 48(2), pp. 129-166.
- Davies, S & Heath, H., 2006. Quality of care. In NCHR & D Forum (ed) *My Home Life: quality of life in care homes. A review of the evidence*. Help the Aged: London, pp. 35-44.
- Davies, S. et al., 2011. A systematic review of integrated working between care homes and health care services. *BMC Health Services Research*, 11(1), pp. 320-340.
- Davis, M., Sebastian, J. & Tschetter, J., 1997. Measuring quality of nursing home service: Residents' perspective. *Psychological Reports*, 81(2), pp. 531-542.
- Day, K., Carreon, D. & Stump, C., 2000. The therapeutic design of environments for people with dementia a review of the empirical research. *The Gerontologist*, 40(4), pp. 397-416.

- De Rooij, A. H. et al., 2012. QUality of life of residents with dementia in traditional versus small-scale long-term care setting: A quasi-experimental study. *International Journal od Nursing Studies*, Volume 49, pp. 931-940.
- Deakin, M., 1995. Using relaxation techniques to manage disruptive behavior. *Nursing Times*, Volume 91, pp. 40-41.
- Decker, F., 2006. Nursing staff and the outcomes of nursing. *Medical Care*, Volume 44, pp. 812-821.
- Dellefield, M., 2006. Organizational correlates of the risk-adjusted pressure ulcer prevalence and subsequent survey deficiency citation in California nursing homes. *Research in Nursing & Health* , 29(4), pp. 345-58.
- Dellifraire, J.L., Wang, Z., McCaughey, D., Langabeer, J.R. & Erwin, C.O., 2013. The use of six sigma in health care management: Are we using it to its full potential? *Quality Management in Health Care*, 22(3), pp. 210-223.
- Deming, W., 1986. *Out of the crisis*. USA: MIT.
- Dennis, A., Minas, R. & Bhagwatwar, A., 2013. Sparking Creativity: Improving Electronic Brainstorming with Individual Cognitive Priming. *Journal of Management Information System*, 29(4), pp. 195-215.
- Department of Health (DOH)., 2006. *The Quality Standards for Health and Social Care: Supporting good governance and best practice in the HPSS*. [Online] Available at: http://www.dhsspsni.gov.uk/qpi_quality_standards_for_health_social_care.pdf
- [Accessed 10 Jun 2014].
- Dijkstra, L. & Van der Bij, H., 2002. Quality function deployment in healthcare: methods for meeting customer requirements in redesign and renewal. *International Journal of Quality & Reliability Management*, 19(1), pp. 67-89.
- Di Primio, A.,1987. *Quality Assurance in Service Organisations*, Chilton, Radnor.
- Dolan, J., 2008. Shared decision-making – transferring research into practice: The Analytic Hierarchy Process (AHP). *Journal of Patient Education and Counseling*, Volume 73, pp. 418-425.

- Donabedian, A., 1966. Evaluating the quality of medical care. *The Milbank Memorial Fund Quarterly*, 44(3), pp. 166-203.
- Donabedian, A., 1969. Some Issues in Evaluating the Quality of Nursing Care. *Measuring and Evaluating Nursing Care*, 59(10), pp. 1833-1836.
- Donabedian, A., 1980. *The definition of quality and approaches to its management. Volume 1: Explorations in quality assessment and monitoring*. Ann Arbor, MI: Health Administration Press.
- Donabedian, A., 1988. The quality of care: How can it be assessed?. *Journall of the American Medical Association*, 260(12), pp. 1743-1748.
- Dong, H., 2004. *Barriers to Inclusive Design in the UK*. Department of Engineering, University of Cambridge
- Dror , S. & Sukenik , Y., 2011. A strategic service quality framework using QFD. *Total Quality Management & Business Excellence*, 22(10), pp. 1057-1070.
- Dube, L., Johnson, M. & Renaghan, L., 1999. Adapting the QFD approach to extended service transactions. *Production and Operations Management*, 8(3), pp. 301-317.
- Dudman, J., 2007. 'Contect.' In T. Owen and NCHRDF (eds) *My Home Life: Quality of Life in Care Homes- Review of the Literature*. London: Help the Aged
- Duhovnik, J., Kusar, J., Tomazevi, R. & Starbek, M., 2006. Development process with regard to customer requirments. *Concurrent Enginnering*, 14(1), pp. 67-82.
- Dunucan-Myers, A. & Huebner, R., 2000.) Relationship between choice and quality of life among residents in long-term-care facilities. *American Journal of Occupational Therapy*, Volume 54, pp. 504-508.
- Dyer , R. F. & Forman, E. H., 1992. Group decision support with the Analytic Hierarchy Process. *Decision Support Systems*, Volume 8, pp. 99-124.
- Easterby-Smith, M., Thorpe, R. & Lowe, A., 2002. *Management Research: An Introduction*. 2nd ed. London: SAGE Publications Ltd.
- Edward, C.D., 1968. The meaning of quality. *Quality Progress*, Oct. 1968, pp.37

- Edwards, H., Courtney, M. & O'Reilly, M., 2003. Involving older people in research to examine quality of life in residential aged care. *Quality in Ageing - Policy Practice and Research*, 4(4), pp. 38-43.
- Eggleston, K. & Shen, Y., 2008. Hospital ownership and quality of care: what explains the different results in the literature?. *Health Economics*, 17(12), pp. 1345-1362.
- Ejaz, F., Straker, J., Fox, K. & Swami, S., 2003. Developing a satisfaction survey for families of Ohio's nursing home residents. *The Gerontologist*, 43(4), pp. 447-458.
- Ekiinci, Y. & Riley, M., 1998. A critique of the issues and theoretical assumptions in service quality measurement in the lodging industry: Time to move the goal-posts?. *Hospitality Management*, Volume 17, pp. 349-362.
- Elberfeld, A., Bennis, S., Ritzus, J. & Yhlen, D., 2007. The innovative use of six sigma in home care Home. *Healthcare Nurse*, 25 (1), pp. 25-33.
- Ellis, R. & Whittington, D., 1993. *Quality Assurance in Health Care: A Handbook*. London: Edward Arnold.
- Feigenbaum, A., 1961. *Total Quality Control*. New York: McGraw-Hill.
- Figueira, H., Figueira, J., Mello, D. & Dantas, E., 2008. Quality of life throughout ageing. *Acta Medical Lituanica*, 15(3), pp. 169-172.
- Flores, C. & Newcomer, R., 2009. Monitoring Quality of Care in Residential Care for the Elderly: The Information Challenge. *Journal of Aging & Social Policy*, 21(3), pp. 225-242.
- Flynn, L. & Percy, D., 2001. Four subtle sins in scale sevelopment: some suggestions for strengthening the current paradigm. *International Journal of Mrket Research* , 43(4), pp. 409-423.
- Fontana, A., & Fery, J. H. 2000. The interview: From structured questions to negotiated text. In N. K. Denzin, & Y. S. Lincoln (Eds.), *Handbook of Qualitative Research*, 2nd ed. (pp.645 – 672). Thousand Oaks, CA: Sage Publications.
- Franceschini, F. & Rossetto, S., 1995. QFD: The problem of comparing technical/engineering design requirements. *Research in Engineering Design*, 7(4), pp. 270-278.

- Froggatt, K., Davies, S. & Meyer, J., 2009. *Understanding Care Homes: A Research Development Perspective*. London: Jessica Kingsley Publishers.
- Garvin, D., 1984. What does "product quality" really mean?. *Sloan Management Review*, 26(1), pp. 25-43.
- Garvin, D., 1988. *Managing Quality*. London: Macmillan Publishers.
- Gasquet, I., Dehe, S., Gaudebout, P. & Falissard, B., 2003. Regular visitors are not good substitutes for assessment of elderly patient satisfaction with nursing home care and services. *The Journal of Gerontology: Biological Sciences and Medical Sciences*, Volume 58, pp. 1036-1041.
- Gaugler, J., 2005. Family involvement in residential long-term care: A synthesis and critical review. *Aging & Mental Health*, 9(2), pp. 105-118.
- Genet, N., Kroneman, M. & Boerma, W. G., 2013. Explaining governmental involvement in home care across Europe: An international comparative study. *Health Policy*, 110(1), p. 84–93.
- Gerrish, K. & Lacey, A., 2010. *The research process in nursing*. Chichester, West Sussex: Blackwell.
- Gillham, B., 2000. *Developing A Questionnaire*. New York: Continuum.
- Gill, J. & Johnson, P., 2010. *Research Methods for Managers*. 4th ed. London: SAGE.
- Gilmore, H. L., 1974. Product Conformance Cost. *Quality Progress*, June, pp.16.
- Godfrey, A.B. & Endres, C.A., 1994. The Evolution of Quality Management within Telecommunications. *IEEE Communications Magazine*, October 1994, pp. 26-34.
- Goh, B.K, Garcia, M., Joung, H.W & Fowler., D., 2013. Residents' Satisfaction with Foodservice at a Continuing Care Retirement Community: A Pilot Study. *Journal of Quality Assurance in Hospitality & Tourism*, Volume14, pp.185–199.
- Gonzalez, M., Quesada, G., Picado, F. & Eckelman, C., 2004. Customer satisfaction using QFD: an e-banking case. *Managing Serv. Qual*, 14(4), pp. 317-330.
- Goodson, J. J., Jang, W. & Rantz, M., 2008. Nursing Home Care Quality: Insights From a Bayesian Network Approach. *The Gerontologist*, 48(3), pp. 338-348.

- Gray, C. & Malins, J., 2004. *Visualizing Research: A Guide to the Research Process in Art and Design*.. Hants: Ashgate Publishing Ltd.
- Gray, D., 2004. *Doing Research in the Real World*. London: Sage Publications.
- Gray, D. E., 2009. *Doing Research in the Real World*. London: SAGE.
- Grewal, D., 1995. Product quality expectations: Towards and understanding of their antecedent and consequences. *Journal of Business and Psychology*, 9(3), pp. 225-240.
- Gro ¨nroos, C., 1982. *Strategic Management and Marketing in the Service Sector*. Helsingfors: Swedish School of Economics and Business Administration.
- Gro ¨nroos, C., 1984. A service quality model and its marketing implications. *European Journal of Marketing*, Volume 18, No. 4, pp. 36-44.
- Guarino, N. & Giaretta, P., 1995. *Ontologies and knowledge bases towards a terminological clarification. Towards very large knowledge bases*, pp.25-32. Amsterdam: IOS press.
- Guo, W. & Lue, H., 2011. Using Fishbone Diagrams in Inquiry-Based Teaching and Learning for Engineering Education. *Communication in Computer and Information Science*, Volume 235, pp. 435-442.
- Gupta, S., 2007. *Design and Delivery of Medical Devices for Home- Use:Drivers and Challenges*. Cambridge: Department of Engineering
- Gupta, P. & Srivastava, R., 2011. Customer Satisfaction for Designing Attractive Qualities of Healthcare Service in India using Kano Model and Quality Function Deployment. *MIT International Journal of Mechanical Engineering*, 1(2), pp. 101-107.
- Guse, L. & Masesar, M., 1999. Quality of life and successful aging in long-term care: perceptions of residents. *Issues in Mental Health Nursing* , Volume 20, pp. 527-539.
- Haag, S., Raja, M. & Schkade, L., 1996. Quality function deployment usage in software development. *Comminications of the ACM*, Volume 39, pp. 41-49.
- Hague, P., 1993. *Questionnaire design*. London: Kogan Page.
- Hammersley, M., 2013. *What is qualitative research?*. London: Bloomsbury.

- Hardie, N. & Walsh, P., 1994. Toward a better understanding of quality. *International Journal of Quality & Reliability Management*, 11(4), pp. 53-63.
- Harper, G.J., 2000. Assessing older adults who cannot communicate. In: Kane RL, Kane RA, eds. *Assessing older persons: measures, Meaning, and Practical Applications* (pp. 483-515). New York: Oxford University Press.
- Harrington, C., 1991. Developing public information on nursing home quality. *J Aging Soc Policy*, 3(1-2), pp. 127-46.
- Harrington, C. et al., 2003. Designing a Report Card for Nursing Facilities: What Information Is Needed and Why. *The Gerontological Society of America*, 43(2), p. 47-57.
- Harrington, C. & Swan, J., 2003. Nursing Home Staffing, Turnover, and Case Mix. *Medical Care Research and Review*, 60(3), pp. 366-92.
- Harrington, C. et al., 2001. Does investor ownership of nursing homes compromise the quality of care?. *American Journal of Public Health*, 91(9), pp. 1452-5.
- Harrington, C. et al., 2000. Nursing home staffing and its relationship to deficiencies. *Journal of Gerontology: Social Sciences*. *Journal of Gerontology*, 55(B), pp. S278-S287.
- Harteloh, P. P. M., 2003. The meaning of quality in healthcare: A conceptual analysis. *Health Care Analysis*, 11(3), pp. 259-26.
- Hass, B., 1999. Clarification and integration of similar quality of life concepts. *Image: the Journal of Nursing Scholarship*, 31(3), pp. 215-220.
- Hauser, J. & Clausing, D., 1988. The House of Quality. *Harvard Business Review*, 3(May/June), pp. 63-73.
- Hayward, A. et al., 2006. Effectiveness of an influenza vaccine programme for care home staff to prevent death, morbidity, and health service use among residents: cluster randomised controlled trial. *BMJ*, 333(7581), pp. 1241-4.
- Haywood-Farmer, J., 1988. A conceptual model of service quality. *International Journal of Operations & Production Management*, Volume 8, No. 6, pp. 19-29.

Haywood, K., Marshall, S. & Fitzpatrick, P., 2006. Patient participation in the consultation process: a structured review of intervention strategies. *Patient Educ Couns*, 63(1-2), pp. 12-23.

Health Foundation., 2013. *Quality improvement made simple*. [Online] Available at: <http://www.health.org.uk/public/cms/75/76/313/594/Quality%20improvement%20made%20simple%202013.pdf?realName=rskqP0.pdf> [Accessed 7 Aug 2014].

Hekmatpanah, M., Shahin, A. & Ravichandran, N., 2011. The application of FMEA in the oil industry in Iran: The case of four litre oil canning process of Sepahan Oil Company. *African Journal of Business Management*, 5(8), pp. 3019-3027.

Hendrix , T. & Foreman , S. E., 2001. Optimal long-term care nurse-staffing levels. *Nursing Economics*, 19(4), pp. 164-175.

Henn, M., Weinstein, M. & Foard, N., 2009. *A Critical Introduction to Social Research*. 2nd ed. Wiltshire: SAGE Publications.

Herrman, A., Huber, F., Algesheime, R. & Tomczak, T., 2006. An empirical study of quality function deployment on company performance. *International Journal of Quality and Reliability Management*, 23(4), pp. 345-366.

Heskett, J.L., Jones, T.O., Loveman, G., Sasser Jr., W.E. & Schlesinger, L.A., 1994. *Putting the service-profit chain to work*, Harvard Business Review.

Hicks, L., Rantz, M., Petroski, G. & Mukamel, D., 2004. Nursing Home Costs and Quality Of Care Outcomes. *Nursing Economic*, 22(4), pp. 178-192.

Hignett, S. & Griffiths, P., 2009. Manual handling risks in the bariatric (obese) patient pathway in acute sector, community and ambulance care and treatment. *Work*, 33(2), pp. 175-180.

Hillmer, M. et al., 2005. Nursing home profit status and quality of care: is there any evidence of an association?. *Medical Care Research and Review*, 62(2), pp. 139-166.

Hinton, C., 2007. *Coping with hearing loss*. London: Sheldon.

- Hjaltadottir, I. & Gustafsdottir, M., 2007. Quality of life in nursing homes: perception of physically frail elderly residents. *Scandinavian Journal of Caring Sciences*, Volume 21, pp. 48-55.
- Hollowell, J. & Mazurek, V., 2008. Static analytical models: Applications within a military domain. *Journal of Performance Improvement*, 47(3), pp. 8-18.
- Holmes, C., 2008. Dementia. *Medicine*, 36(9), pp. 467-470.
- Holtkamp, C. et al., 2000. The relation between quality of co-ordination of nursing care and quality of life in Dutch nursing homes. *Journal of Advanced Nursing*, Volume 32, pp. 1364-1373.
- Horn, S., Buerhaus, P., Bergstrom, N. & Smout, R., 2005. RN staffing time and outcomes of long-stay nursing home residents: Pressure ulcers and other adverse outcomes are less likely as RNs spend more time on direct patient care. *American Journal of Nursing*, 105(11), pp. 58-70.
- Horn, S. et al., 2010. Beyond CMS quality measure adjustments: Identifying key resident and nursing home facility factors associated with quality measures. *Journal of the American Medical Director Association*, 11(7), pp. 500-505.
- Hough, A., 2011. *The Telegraph*. [Online] Available at: <http://www.telegraph.co.uk/health/elderhealth/8351342/Nursing-homes-face-more-scrutiny-in-drive-to-lift-care-standards.html> [Accessed 5 May 2013].
- Howard, K. & Sharp, J., 1983. *The Management of a Student Research Project*. Aldershot: Gower.
- Howard, P. et al., 2001. Consumer satisfaction with services in a regional psychiatric hospital: A collaborative research project in Kentucky. *Archives of Psychiatric Nursing*, Volume 15, pp. 10-23.
- Hsu, T. & Lin, L., 2006. QFD with fuzzy and entropy weight for evaluating retail customer values. *TQM Bus Excell*, 17(7), pp. 1-23.
- Hubbard, G., Tester, S. & Downs, M., 2003. Meaningful social interactions between older people in institutional care settings. *Ageing and Society*, 23(1), pp. 99-114.

- Hudson, L. & Ozanne, J., 1988. Alternative ways of seeking knowledge in consumer research. *The Journal of Consumer Research*, 14(4), pp. 508-521.
- Hughes, R., 2008. Tools and Strategies for Quality Improvement and Patient Safety. *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*, Volume 3, pp. 3-39.
- Iacobucci, D., Ostrom, A. & Grayson, K., 1995. Distinguishing Service Quality and Customer Satisfaction. *Journal of Consumer Psychology*, 4(3), pp. 277-303.
- Idvall, E., Rooke, L. & Hamrin, E., 1997. Quality indicators in clinical nursing: a review of the literature. *Journal of Advanced Nursing*, 25(1), pp. 6-17.
- Innes, A., Kelly, F. & Dincarslan, O., 2011. Care home design for people with dementia: What do people with dementia and their family carers value?. *Aging & Mental Health*, 15(5), pp. 548-556.
- Ishikawa, . K., 1985. *What is Total Quality Management? The Japanese Way*. New Jersey: Prentice-Hall, Englewood Cliffs.
- Ivankova, N. V., Creswell , . J. W. & Stick , S. L., 2006. Using Mixed-Methods Sequential Explanatory Design: From Theory to Practice. *Field Methods*, 18(3), pp. 3-20.
- Jüni, P., Altman, D. & Egger, M., 2001. Assessing the quality of controlled clinical trials. *BMJ*, 323(7303), pp. 42-46.
- Juran, J., 1974. *Quality Control Handbook*. 3rd ed. New York: McGraw-Hill.
- Juran, J., 1988. *Juran on planning for quality*. New York: Free Press.
- Juran, J., 1992. *Juran on Quality by Design*. New York: McGraw.
- Kalisch, T. et al., 2011. Questionnaire-based evaluation of everyday competence in older adults. *Clinical Interventions in Aging*, Volume 6, pp. 37-46.
- Kane, R., 2001. Long-term care and a good quality of life: Bringing them closer together. *The Gerontologist*, 41(3), pp. 293-305.
- Kane, R., 2003. Definition, measurement and correlates of quality of life in nursing homes: toward a reasonable practice, research, and policy agenda. *The Gerontologist*, 43(Special issue 2), pp. 28-36.

- Kane, R. et al., 2003. Quality of Life Measures for Nursing Home Residents. *J Gerontol A Biol Sci Med Sci*, 58(3), pp. M240-M248.
- Kang, G.D. & James, J., 2004. Service quality dimensions: an examination of Gronroos's service quality model. *Managing Service Quality*, Volume 14, pp. 266–277.
- Kano, N., Seraku, N., Takahashi, F. & Tsuji, S., 1984. Attractive quality and must-be quality. *Journal of Japanese Society for Quality Control*, 14(2), pp. 39-48..
- Karsak, E., Sozer, S. & Alpteki, S., 2002. Product planning in quality function deployment using a combined analytic network process and goal programming approach. *Computers & Industrial Engineering*, Volume 44, pp. 171-90.
- Kazemzadeh, R., Behzadian, M., Aghdasi, M. & Albadvi, A., 2009. Integration of marketing research techniques into house of quality and product family design. *Int J Adv Manuf Technol*, 41(9-10), pp. 1019-1033.
- Kerrison, S. H. & Pollock , A. M., 2001. Careing for older people in the private sector in England. *BMJ*, Volume 323, pp. 566-569.
- Kim, H., 2011. Service Orientation, Service Quality, Customer Satisfaction, and Customer Loyalty: Testing a Structural Model. *Journal of Hospitality Marketing & Management*, 20(6), pp. 619-637.
- Kim, Y. et al., 2008. A study on medical services quality and its influence upon value of care and patient satisfaction Focusing upon outpatients in a large-sized hospital. *Total Quality Management & Business Excellence*, 19(11), pp. 1155-1171.
- Kirkpatrick, D., 1960. Techniques for evaluating training programs. *Journal for the American Society of Training Directors*, Volume 14, pp. 28-32.
- Kirkpatrick, D., 1987. *Training & Development Handbook*. New York: McGraw-Hill.
- Kirkpatrick, D. & Kirkpatrick, J., 2006. *Evaluating Training Programs: The Four Levels*. 3rd ed. San Francisco: Berrett-Koehler.
- Ko, A. & Lee, S., 2000. Implementing the strategic formulation framework for the banking industry of Hong Kong. *Managerial Auditing Journal* , 15(9), pp. 469-477.

- Kobayashi, H., Takemura, H. & Kanda, K., 2011. Patient perception of nursing service quality; an applied model of Donabedian's structure-process-outcome approach theory. *Scandinavian Journal of Caring Sciences*, 25(3), pp. 419-425.
- Kojetin, H. & Stone, R., 2007. The role of consumer satisfaction in ensuring quality long-term care: Opportunities and challenges. *Journal of Aging & Social Policy*, 19(2), pp. 43-61.
- Komashie, A., Mousavi, A. & Gore, J., 2007. Quality management in healthcare and industry: A comparative review and emergine themes. *Journal of Management History*, 13(4), pp. 359-370.
- Korotky, H., 2012. Age-Related Hearing Loss: Quality of Care for Quality of Life. *The Gerontologist*, 52(2), pp. 265-271.
- Krichbaum, K., Pearson, V., Savik , . K. & Mueller, C., 2005. Improving Resident Outcomes With GAPN Organization Level Interventions. *Western Journal of Nursing Research*, 27(3), pp. 322-37.
- Kunkel, R. & Wellin, V., 2006. *Consumer Voice and Choice in Long-Term Care*. New York: Springer Publishing Company.
- Kuehn, A.A. & Day, R.L., 1962. Strategy of product Quality. *Harvard Business Review*, 40(6), pp. 1962-110.
- Kunkel, R. & Wellin, V., 2006. *Consumer Voice and Choice in Long-Term Care*. New York: Springer Publishing Company
- Ku, L.-J. . E., Liu, . L.-F. & Wen, . M.-J., 2013. Trends and determinants of informal and formal caregiving in the community for disabled elderly people in Taiwan. *Archives of Gerontology and Geriatrics*, 56(2), pp. 370-376.
- Kuo, J., Wu, Y., Hsu, T. & Chen, L., 2011. Improving outpatient services for elderly patients in Taiwan: A qualitative study. *Archives of Gerontology and Geriatrics*, Volume 53, pp. e209-e217.
- Kvist, A. & Bengt Klefsjo, B., 2006. Which service quality dimensions are important in inbound tourism? A case study in a peripheral location. *Managing Service Quality*, 16(5), pp. 520-537.

- Laing, W. 2011. *Care of Elderly People: Uk Market Survey 2011-2012*. 24th edn. London: Laing and Buisson Ltd.
- Laverty, S., 2008. Hermeneutic phenomenology and phenomenology: A comparison of historical and methodological considerations. *International Journal of Qualitative Methods*, 2(3), pp. 21-35.
- Lawton, M., 1980. *Environment and aging*. CA: Brooks/Cole.
- Lawton, M. P., & Nahemow, L., 1973. Ecology and the aging process. In C. Eisdorfer & M. P. Lawton (Eds.), *Psychology of adult development and aging* (pp. 619–674). Washington, DC: American Psychological Association.
- Lawton, M., 1991. A multidimensional view of quality of life in frail elders. In J. E. Birren, J. E. Lubben, J. C. Rowe, & D. E. Deutchmann (Eds.), *The concept and measurement of quality of life in the frail elderly* (pp. 3–23). San Diego: Academic Press.
- Lee, H., Delene, L., Bunda, M. & Kim, C., 2000. Method for MEasuring Health -Care Service Quality. *Journal of Business Research*, Volume 48, pp. 233-246.
- Lee, K-M., 2004. Living Arrangements and Informal Support for the Elderly. *Journal of Intergenerational Relationships*, 2(2), pp. 27-49.
- Leffer, K.B., 1982. Ambiguous Changes in Product Quality. *American Economic Review*, 72(5), pp.956.
- Leung, K., Chen, C., Lue, B. & Hsu, S., 2007. Social support and family functioning on psychological symptoms in elderly Chinese. *Archives of Gerontology and Geriatrics*, Volume 44, pp. 203-213.
- Leung, K., Wu, E., Lue, B. & Tang, L., 2004. The use of focus groups in evaluating quality of life components among elderly Chinese people. *Quality of Life Research*, 13(1), pp. 179-190.
- Lewis, R.C. & Booms, B.H., 1983. The marketing aspects of service quality, in Berry, L., Shostack, G. & Upah, G. (Eds), *Emerging Perspectives on Service Marketing*, American Marketing, Chicago, IL, pp. 99-107.

- Liberatore, M. J. & Nydick, R. L., 2008. The analytic hierarchy process in medical and health care decision making: A literature review. *European Journal of Operational Research*, 189(1), p. 194–207.
- Lim, P. C., Tang, N. K. & Peter, J., 1999. An innovative framework for health care performance measurement. *Managing Service Quality*, 9(6), pp. 423-433.
- Lincoln, Y. & Guba, E., 1985. *Naturalistic inquiry*. Newbury Prk, CA: Sage.
- Lloyd, R., 2004. *Quality Health Care: A Guide to Developing and Using Indicators*. Sudbury: Jones and Bartlett Publishers.
- Looy, B., Gemmel, P. & Dierdonck, R., 2003. *Services Management: an integrated approach*. 2nd ed. Essex: Prentice Hall.
- López-Valcárcel, B. G. & Pinilla, J., 2008. The Impact of Medical Technology on Health: A Longitudinal Analysis of Ischemic Heart Disease. *Value in Health*, 11(1), pp. 88-96.
- Lowe, T. et al., 2003. Consumer Satisfaction in Long-Term Care: State Initiatives in Nursing Homes and Assisted Living Facilities. *The Gerontological Society of America*, 43(6), pp. 883-896.
- Lucas, J. et al., 2007. The Relationship Between Organizational Factors and Resident Satisfaction with Nursing Home Care and Life. *Journal of Aging & Social Policy*, 19(2), pp. 125-151.
- MacDonald, A. & Cooper, B., 2007. Long term care and dementia services: An impending crisis. *Age and Ageing*, Volume 36, pp. 16-22.
- McGinley, CH., 2012. *Supporting people-centred design through information and empathy*, London: Brunel University School of Engineering and Design.
- Mallen, C.D, Dunn, K.M, Thomas, E. & Peat, G., 2008. Thicker paper and larger font increased response and completeness in a postal survey. *Journal of Clinical Epidemiology*, 61(12), pp. 1296-1300.
- Mansfield, J. C., Ejaz, F. K. & Werner, P., 2000. *Satisfaction Surveys Long-Term Care*. New York: Springer.

- Marieb, E., 1995. *Human Anatomy and Physiology*. 3rd ed. California: Benjamin' Cummings.
- Martin, D. & Panizzolo, R., 2009. Identifying business priorities through quality function deployment. *Marketing Intelligence & Planning*, 27(5), pp. 714-728.
- Matzler, K. & Hinterhuber, H., 1998. How to make product development project more successful by integrating Kano's model of customer satisfaction into quality function deployment. *Technovation*, Volume 18, pp. 25-38.
- Mazur, G.H., 1997. Voice of customer analysis: a modern system of front-end QFD tools, with case studies. *Proceedings of the ASQC's 51st Annual Quality Congress*, May 5-7, ASQ Quality Press, Milwaukee, WI.
- McKenzie, C., 1995. Brightening the lives of elderly residents through Snoezelen. *Elderly Care*, 7(5), pp. 11-13.
- Lin, M.C., Wang, C.C., & Chen, T.C., 2006. A strategy for managing customer-oriented product design. *Concurrent Engineering*, 14(3), pp. 231-44.
- Yeh, T.M., 2010. Determining medical service improvement priority by integrating the refined Kano model, Quality function deployment and Fuzzy integrals. *African Journal of Business Management*, 4(12), pp. 2534-2545.
- Mitra, A., 2008. *Fundamentals of quality control and improvement*. 3rd ed. New Jersey: John Welley & Sons.
- Mizuno, S., 1988. *Management for quality improvement: The seven new QC tools*. s.l.:Productivity Press.
- Mohamed, R. & Sarlis Alias, A.A., 2012. Evaluating the Effectiveness of a Training Program Using the Four Level Kirkpatrick Model in the Banking Sector in Malaysia. In: 3rd International Conference on Business and Economic Research Proceeding.
- Mohammed, M.A., 2004. Using statistical process control to improve the quality of health care. *Quality & Safety in Health Care* , 13(4), pp. 243-5.
- Mohmoud Abdel Ghani, R. & Berggren, V., 2011. Parturient Needs during Labor: Egyptian Women's Perspective toward Childbirth Experience, a Step toward an

- Excellence in Clinical Practice. *Journal of Basic and Applied Scientific Research*, 1(12), pp. 2935-2943.
- Monsfield, J. C., Ejaz, F. K. & Perla, W., 2000. *Satisfaction surveys in long-term care*. New York: Springer.
- Montgomery, D., 2005. *Introduction to statistical quality control*. 5th ed. Hoboken, New Jersey: John Wiley.
- Morgan, D. & Stewart, N., 1998. Multiple occupancy versus private rooms on dementia care units. *Environment and Behaviour*, 30(4), pp. 478-503.
- Mozley, C. et al., 2004. *Towards Quality Care: Outcomes for Older People in Care Homea*. Aldershot: Ashgate.
- Muijs, D., 2011. *Doing quantitative research in education with SPSS*. London: SAGE.
- Mukamel, D. B. & Spector, W. D., 2000. Nursing Home Costs and Risk-Adjusted Outcome Measures of Quality. *Medical Care*, 38(1), pp. 78-89.
- Mularski, R. . A., 2006. Defining and measuring quality palliative and end-of-life care in. *Critical Care Medicine*, 34(11), pp. S309-S316.
- Nakrem, S., Gurrormsen, V. & Seim, A., 2011. Residents' experience of interpersonal factors in nursing home care: A qualitative study. *International Journal of Nursing Studies*, Volume 48, pp. 1357-1366.
- Netten, A. et al., 2001. Residential and nursing home care of elderly people with cognitive impairment: Prevalence, mortality and costs. *Aging & Mental Health*, 5(1), pp. 14-22.
- Neuman, W., 2007. *Basics of Social research: qualitative and quantitative approaches*. 2nd ed. London: Pearson Education, Inc.
- Newell, C., Rosenfeld, P., Harris, R. & Hindelang, R., 2004. Reasons for nonresponse on U.S. Navy surveys: A closer look. *Military Psychology*, 16(4), pp. 265-276.
- Nijs, K., De Graaf, C., Kok, F. & Van Staveren, W., 2006. Effect of family style mealtimes on quality of life, physical performance, and body weight of nursing home residents: cluster randomized controlled trial. *British Medical Journal*, Volume 332, pp. 1180-1183.

- Nolan, M.R., Davies, S. & Grant, G., 2001. Integrating perspectives. *In working with older people and their families: key issues in policy and practice*. Nolan, M., Davis, S. & Grant, G (eds). Buckinghamshire, Philadelphia: Open University Press, pp. 4-18.
- Nunnally, J. & Bernstein, I., 1994. *Psychometric Theory*. New York: McGraw-Hill.
- Oai, W. et al., 1999. Nursing home characteristics and the development of pressure sores and disruptive behaviour. *Age & Ageing*, 28(1), pp. 45-52.
- Oakland, J., 1993. *Total Quality Management*. Oxford: Butterworth-Heinemann.
- Office for National Statistics, 2011. *Office for National Statistics*. [Online] Available at: http://www.ons.gov.uk/ons/dcp29904_240697.pdf [Accessed 5 May 2014].
- Office of Fair Trading (OFT), 2005. *Care Home for older people: A Market Study*, London: Office of Fair Trading.
- Olatunde, A., 2009. On the Importance of Statistical Process Control in Health Care. *Research Journal of Medical Sciences*, 3(2), pp. 87-90.
- Oleson, M., Heading, C., Shadick, K. & Bistodeau, J., 1994. Quality of life in long-stay institutions in England: Nurse and resident perceptions. *Journal of Advanced Nursing* , Volume 20, pp. 23-32.
- Oliver, R., 1980. A cognitive model of antecedents and consequences of satisfaction decisions. *Journal of Marketing Research*, 17(November), pp. 460-469.
- Oliver, R., 1997. *Satisfaction: A Behavioural Perspective on the Customer*. Boston, MA: McGraw-Hill.
- Paim, R., Caulliraux, H. M. & Cardoso, R., 2008. Process management tasks: a conceptual and practical view. *Business Process Management Journal*, 14(5), pp. 694-723.
- Pande, P. & Holpp, L., 2002. *What is Six Sigma?*. New York: McGraw-Hill.
- Parasuraman, A., Zeithaml, V.A. & Berry, L.L., 1985. A conceptual model of service quality and its implications for future research. *Journal of Marketing*, Volume 49, No. 3, pp. 41-50.

- Parasuraman, A., Zeithaml, V. & Leonard, L., 1988. SERVQUAL: a multiple-item scale for measuring consumer perception of service quality. *Journal of Retailing*, 64(Spring), pp. 12-40.
- Parasuraman, A., Zeithaml, V. & Leonard, L., 1988. SERVQUAL: a multiple-item scale for measuring consumer perception of service quality. *Journal of Retailing*, 64(Spring), pp. 12-40.
- Parsons, S., Simmons, W., Penn, K. & Furlou, M., 2003. Determinants of satisfaction and turnover among nursing assistants. The results of a statewide survey. *Journal of Gerontological Nursing*, 29(3), pp. 51-58.
- Paryani, K., Masoudi, A. & Cudney, E., 2010. QFD Application in the Hospitality Industry: A Hotel Case Study. *The Quality Management Journal*, 17(1), pp. 7-28.
- Passini, R., Pigot, H., Rainville, C. & Tetreault, M., 2000. Wayfinding in a nursing home for advanced dementia of the Alzheimer's type. *Environment and Behavior*, 32(5), pp. 684-710.
- Patterson, M. et al., 2011. *From Metrics to Meaning: Culture Change and Quality of Acute Hospital Care for Older People: Report for the National Institute for Health Research Service Delivery and Organisation programme*. [Online] Available at: http://www.nets.nihr.ac.uk/_data/assets/pdf_file/0003/64497/FR-08-1501-93.pdf [Accessed 5 May 2014].
- Patton, M. Q., 1978. *Utilization-Focused Evaluation*. Beverly Hills, CA: SAGE.
- Patton, M., 1980. *Qualitative evaluation methods*. London: Sage Publications.
- Peak, T. & Sinclair, S., 2002. Using customer satisfaction surveys to improve quality of care in nursing homes. *Health & Social Work*, 27(1), pp. 75-79.
- Penneys, N. & Missouri, L., 1997. Quality: Its definition, measurement, and applications in dermatology. *Journal of the American Academy of Dermatology*, Volume 37, pp. 503-507.
- Philips, J., 1990. *Handbook of Training Evaluation and Measurement Method*. Texas, USA, Gulf Publishing Company.

- Pirsing, R., 1974. *Zen and the art of Motorcycle Maintenance*. New York: Bantam Books.
- Pocha, CH., 2010. Lean Six Sigma in Health Care and the Challenge of Implementation of Six Sigma Methodologies at a Veterans Affairs Medical Centre. *Quality Management in Health Care*, 19(4), pp. 312–318.
- Pouliot, F., 1992. Capturing the voice of the customer. *In Proceeding from the GOAL/QPC Ninth Annual Conference, Advanced QFD Session*. Merhuen, MA: Goal/QPC.
- Quine, S. & Cameron, I., 1995. The use of focus groups with the disabled elderly. *Qualitative Health Research*, 5(4), pp. 454-462.
- Raharjo , H., Xie, M. & Brombacher , . A. C., 2011. A systematic methodology to deal with the dynamics of customer needs in Quality Function Deployment. *Expert Systems with Applications*, 38(4), pp. 3653-3662.
- Rantz, M. et al., 2004. Nursing home quality, cost, staffing, and staff mix. *Gerontologist*, 44(1), pp. 24-38.
- Raynes, N., 1998. Involving residents in quality specification. *Ageing and Society*, 18(1), pp. 65-78.
- Reeds, J., Klein, B., Cook, G. & Stanley, D., 2003. Quality improvement in German and UK care homes. *International Journal of Health Care Quality Assurance*, 16(5), pp. 248-256.
- Reeves, C. & Bendnar, D., 1994. Defining quality: Alternatives and implications. *Academy of Management Review*, 19(3), pp. 419-455.
- Regnier, V., 1994. *Assisted living housing for the elderly: Design innovation from the United States and Europe*. New York: Van Nostrand Reinhold.
- Reis, P. et al., 2012. Universal design and accessibility: an approach of the influence of muscle strength loss in the risk of falls in the elderly. *Universal Design and Accessibility*, Volume 41, pp. 374-379.

- Reizenstein, J. E., 1981. Hospital design and human behavior: A review of the recent literature. In A. Baum & J. E. Singer (eds.), *Advances in environmental psychology: Environmental health* (Vol. 4, pp. 137–169). Hillsdale, NJ: Lawrence Erlbaum.
- Riazi, A., Bradshaw, S. & Playford, E., 2012. Quality of life in the care home: a qualitative study of the perspectives of residents with multiple sclerosis. *Disability & Rehabilitation*, 34(24), pp. 2095-102.
- Riggs, C. & Rantz, M., 2001. A model of staff support to improve retention in long-term care. *Nursing Administration Quality*, 25(2), pp. 43-54.
- Rings, C. M., Barton, B. W., Mazur, G., 1998. Consumer Encounters: Improving Idea Development and Concept Optimization. 10th Symposium on QFD, QFD Institute.
- Ritchie, J. & Lewis, J., 2003. *Qualitative research practice: a guide for social science students and researchers*. London: Sage Publications.
- Robinson, J., 2004. *Care Services Inquiry: Concernes About Care for Older Londoners*, London: King's Fund.
- Robson, C., 2002. *Real World Research. A Resource for Social Scientists and Practitioner-Researchers*. 2nd ed. Oxford: Blackwell.
- Robson, C., 2011. *Real world research : a resource for users of social research methods in applied settings*. Sussex: John Wiley & Sons.
- Ronch, J., 2004. Changing Institutional Culture: Can We Re-Value the Nursing Home?. *Journal of Gerontological Social Work*, 43(1), pp. 61-82.
- Ronnberg, L., 1998. Quality of life in nursing-home residents: an intervention study of the effect of mental stimulation through an audiovisual programme. *Age and Ageing*, Volume 27, pp. 393-397.
- Saaty, T., 1993. *Decision Making for Leaders: The Analytical Hierarchy Process of Decision in a Complex World*. Pittsburg, Penn: RWS Publications.
- Saaty, T., 1995. *The Analytic Hierachy Process*. Pittsburgh: RWS Publications.
- Saaty, T. L., 2008. Decision making with the analytic hierarchy process. *Int J. Services Sciences*, 1(1), pp. 83-98.

- Sainfort, F., Ramsay, J. & Manato, H., 1995. Conceptual and Methodological Sources of Variation in the Measurement of Nursing Facility Quality: An Evaluation of 24 Models and an Empirical Study. *Medical Care Research and Review*, 52(1), pp. 60-87.
- Sajid, M. & Baig, M., 2007. Quality of healthcare: An absolute necessity for public satisfaction. *International Journal of Health Care Quality Assurance*, 20(6), pp. 545-548.
- Saliba, D. & Schnelle, J., 2002. Indicators of the Quality of Nursing Home Residential Care. *Journal of the American Geriatrics Society*, 50(8), pp. 1421-1430.
- Sanjay Sarathy, P., 2011. Organizational innovations in the real-estate industry using AHP. *The international Journal of Organizational Innovation*, 4(1), pp. 5-26.
- Sarantakos, S., 2005. *Social Research*. New York: Palgrave Macmillan.
- Satty, T., 1995. *Decision Making for Leaders*. 3rd ed. Pennsylvania: Pittsburgh.
- Sauerwein, E., Bailom, F., Matzler, K. & Hinterhube, H., 1996. The Kano model: how to delight your customers. *International Working Seminal on Production Economics*, 19(23), pp. 313-327.
- Saunders, M., Lewis, P. & Thornhill, A., 2009. *Research methods for business students*. 5th ed. Essex: Financial Times Prentice Hall.
- Schaefer, J. & Moos, R., 1996. Effects of work stressors and work climate on long-term care staff's job morale and functioning. *Research in Nursing and Health*, 19(1), pp. 63-73.
- Schenk, L. et al., 2013. Quality of life in nursing homes: results of a qualitative resident survey. *Quality of Life Research*, 22(10), pp. 2929-2938.
- Schippers, W., 1999. The process matrix, a simple tool to analyse and describe production processes. *Quality and Reliability Engineering International*, Volume 15, pp. 469-473.
- Schnelle, J., 2004. Determining the relationship between staffing and quality. *Gerontologist*, 44(1), pp. 10-12.

- Shahin, A., Pourhamidi, M., Antony, J. & Hyun Park, S., 2013. Typology of Kano models: a critical review of literature and proposition of a revised mode. *International Journal of Quality & Reliability Management*, Volume 30, pp. 341-358.
- Shamshirsaz, S.A. & Dong, H., 2014. Improving residents' satisfaction in care homes: what to prioritise?. In: Langdon, P.M., Lazar, J., Heylighen, A. & Dong, H. *Inclusive Design: Joining Usability, Accessibility, and Inclusion*, pp.119-129. Switzerland: Springer.
- Shamshirsaz, S.A., Dong, H. & Aghlmand, S., 2012. Using Voice of Customer (VoC) techniques to explore residents' satisfaction in care homes in the UK. *The 4th International Conference for Universal Design (UD2012)*. Fukuoka.
- Sher, S., 2006. The application of quality function deployment (QFD) in product development – the case of Taiwan hypermarket building. *Journal of American Academy of Business*, 8(2), pp. 292-5.
- Shewhard, W., 1931. *Economic Control of Quality of Manufactured Product*. New York: Van Nostrand Company.
- Shiovitz-Ezra, S. & Ayalon, L., 2010. Situational versus chronic loneliness as risk factors for all-cause mortality. *International Psychogeriatrics*, 22(3), pp. 455-462.
- Silich, S. et al., 2012. Using Six Sigma Methodology to Reduce Patient Transfer Times from Floor to Critical-Care Beds. *Journal for Healthcare Quality*, 34(1), pp. 44-54.
- Sim, J. & Wright, C., 2000. *Research in Health Care: Concepts, Designs and Methods*. Cheltenham: Stanley Thornes.
- Sousa, R. & Voss, C. A., 2002. Quality management re-visited: a reflective review and agenda for future research. *Journam of Operations Management*, 20(1), pp. 91-109.
- Spector, W. & Takada, H., 1991. Characteristics of nursing homes that affect resident outcomes. *Journal of Aginf and Health*, Volume 3, pp. 427-454.
- Spiers, h., 2011. *Caring for the elderly: an expert answers your questions*. [Online] Available at: <http://www.bbc.co.uk/news/business-14076394> [Accessed 5 May 2014].

- Spilsbury, K., Hewitt, C., Stirk, L. & Bowman, C., 2011. The relationship between nurse staffing and quality of care in nursing homes: A systematic review. *International Journal of Nursing Studies*, 48(6), pp. 732-750.
- Spreng, R. & Mackoy, R., 1996. An Empirical Examination of a Model of Perceived Service Quality and Satisfaction. *Journal of Retailing*, 72(2), pp. 201-214.
- Steenwinlek, V., Baumers, I. & Heylighen, A., 2012. Home in Later Life: A Framework for the Architecture of Home Environments. *Home Cultures*, 9(23), pp. 195-217.
- Straker, J., Ejaz, F., McCarthy, C. & Jones, J., 2007. Developing and testing a satisfaction survey for home residents. *Journal of Aging and Social Policy*, 19(2), pp. 83-105.
- Streubert, H. J. & Carpenter, D. R., 2011. *Qualitative research in nursing : advancing the humanistic imperative*. 5th ed. China: Wolters Kluwer Health/Lippincott Williams & Wilkins.
- Stufflebeam, D. L., 1973. An introduction to the PDK book: educational evaluation and decision-making. In *Educational Evaluation: Theory and Practice*, edited by B. L. Worthern and J. R. Sanders, pp. 128–142. Belmont, CA: Wadsworth
- Chan, C. & Wood, R., 2009. The Moderating Effect of Trainee Implicit Beliefs on the Relationship between Cognitive Modeling Orientation and Training Outcomes. *Applies Psychology: An International Review*, 58(2), pp. 304-335.
- Szczepura, A. et al., 2009. *Models for providing improved care in residential care homes: A thematic literature review*, York: Joseph Rowntree Foundation.
- Tan, K. & Shen, X., 2000. Integrating Kano's model in the planning matrix of Quality Function Deployment. *Total Quality Manage*, 11(8), pp. 1141-1151.
- Taylor, K., Counsell, C., Harris, C., Goron, J., Fonseca, S. & Lee, A., 2006. In a randomised study of envelope and ink color, colored ink was found the response rate to a postal questionnaire. *Journal of Clinical Epidemiology*, 59(12), pp. 1326-1330.
- Terninko, J., 1997. *Step-by step QFD. Customer-Driven Product Design*. Florida: St. Lucie Press.

- Tester S., Hubbard G., Downs M., MacDonald C. & Murphy J., 2004. Frailty and institutional life. In Walker A. & Hennessy Hagan C. (ed) *Growing Older Quality of Life in Old Age*. Open University Press: Berkshire, pp. 209–224.
- Thiagarajan, T. & Zairi, M., 1997. A review of total quality management in practice: understanding the fundamentals through examples of best practice applications-Part I. *The YQM Magazine*, 9(4), pp. 270-286.
- Thiébaut, S. P., Barnay, . T. & Ventelou, B., 2013. Ageing, chronic conditions and the evolution of future drugs expenditure: a five-year micro-simulation from 2004 to 2029. *Applied Economics*, 45(13), pp. 1663-1672.
- Thomas, K. S., Mor, V., Tyler, D. A. & Hyer, K., 2010. The Relationships Among Licensed Nurse Turnover, Retention, and Rehospitalization of Nursing Home Residents. *The Gerontologist*, 53(2), pp. 211-221.
- Thomas, K. et al., 2012. Patient Safety Culture and the Association with Safe Resident Care in Nursing Homes. *The Gerontologist*, 52(6), pp. 802-811.
- Thomas, K. et al., 2013. The Relationships Among Licensed Nurse Turnover, Retention, and Rehospitalization of Nursing Home Residents. *The Gerontologist*, 53(2), pp. 211-221.
- Timko, C. & Moos, R., 1991. Atypology of social climate in group residential facilities for older people. *Journal of Gerontology*, 43(3), pp. S160-S169.
- Timlin, G. & Rysenbry, N., 2010. *Design for Dementia: Improving dining and bedroom environment in care homes*, London: Helen Hamlyn Centre, Royal College of Art.
- Tontini, G., 2007. Integrating the Kano Model and QFD for Designing New Products. *Total Quality Management & Business Excellence*, 18(6), pp. 599-612.
- Tuchman, B., 1980. *The Decline of Quality*. New York: New York Times Magazine.
- Tune, P. & Bowie, P., 2000. The quality of residential and nursing home care for people with dementia. *Age and Ageing*, 29(4), pp. 325-328.
- Tu, YC., Wang, RH. & Yeh, SH., 2006. Relationship between perceived empowerment care and quality of life among elderly residents within nursing homes in Taiwan: a

questionnaire survey. *International Journal of Nursing Studies*, Volume 43, pp. 673-680.

Utsumi, M., Makimoto, K., Quroshi, N. & Ashida, N., 2010. Types of infectious outbreaks and their impact in elderly care facilities: a review of the literature. *Age and Ageing*, 39(3), pp. 299-305.

Van de Poel, I., 2007. Methodological problems in QFD and Directions for future development. *Research in Engineering Design*, 18(1), pp. 21-36.

Van de Water, H. & Vries, J., 2006. Choosing a quality improvement project using the analytic hierarchy process. *International Journal of Quality and Reliability Management*, 23(4), pp. 409-425.

Van Peurse, . K. A., Pratt , M. & Lawrence, S., 1995. Health management performance: a review of measures and indicators. *Accounting, Auditing and Accountability*, 8(5), pp. 34-70.

Vaus, D., 2001. *Research Design in Social Research*. Surrey: Sage Publications.

Venables, D., Reilly, S., Challis, D. & Hughes, J., 2006. Standards of care in home care services: A comparison of generic and specialist services for older people with dementia. *Aging & Mental Health*, 10(2), pp. 187-194.

Verbeek, H. et al., 2012. Small-scale, homelike facilities in dementia care: A process evaluation into the experiences of family caregivers and nursing staff? *International Journal of Nursing Studies*, Volume 49, pp. 21-29.

Wagner, W., Hansen, E. N. & Hansen, E., 2004. A method for identifying and assessing key customer group needs. *Industrial Marketing Management*, 33(7), pp. 643-655.

Wahl, H. et al., 2009. The Home Environment and Disability-Related Outcomes in Aging Individuals: What Is the Empirical Evidence?. *The Gerontologist*, 49(3), pp. 355-367.

Wan, T., 2003. Nursing care quality in nursing homes: cross-sectional versus longitudinal analysis. *Journal of Medical Systems*, 27(3), pp. 283-95.

- Water , V. M., Kutner, M., Parmalee , P. & Johnso, T., 2003. Which long-term care residents should be asked to complete a customer satisfaction survey?. *Journal of the American Medical Directors Association*, 4(5), pp. 257-263.
- Weech-Maldonado, R., Meret-Hanke, L., Neff, M. & Mor, V., 2004. Nurse staffing patterns and quality of care in nursing homes. *Health Care Management Review*, 29(2), pp. 107-16.
- Weihl, H., 1981. On the relationship between the size of residential institutions and the well-being of residents. *The Gerontologist*, Volume 21, pp. 247-250.
- Weinstein, R., 2000. Infection Control in Long-Term Care Facilities. *Clinical Infectious Diseases*, 31(3), pp. 752-6.
- Wiener, J., 2003. An assessment of strategies for improving quality of care in. *The Gerontologist*, Volume 43, pp. 19-27.
- Wittenberg, R. et al., 2008. *Future Demand for Social Care, 2005 to 2041: Projections of Demand for Social Care for Older People in England*, Canterbury: Personal Social Services Research Unit.
- Wong, E., Woo, J., Hui, E. & Ho, S., 2004. Examination of the Philadelphia geriatric morale scale as a subject quality-of-life measure in elderly Hong Kong Chinese. *The Gerontologist*, Volume 44, pp. 408-417.
- Woodend, A., Nair, R. & Tang, A., 1997. Definition of life quality from a patient versus health care professional perspective. *International Journal of Rehabilitation Research*, 20(1), pp. 71-80.
- Woods, B., Keady, J. & Seddon, D., 2008. *Involving Families in Care Homes: A Relationship-centred Approach to Dementia Care*. London: Jessica Kingsley Publisher.
- Wunderlich, G. S. & Kohler, . P. O., 2001. *Improving Quality in Long-Term Care*. Washington, DC: National Academy Press.
- Xie, M., Tan, K. & Goh, T., 2003. *Advanced QFD Applications*, American Society for Quality. Milwaukee, WI: Quality Press.
- Yayan, J., 2012. Trends in intensive care in patients over 90 years of age. *Interventions in Aging*, Volume 7, pp. 339-347.

- Yeh, T.-M. & Chen, S.-H., 2014. Integrating Refined Kano Model, Quality Function Deployment, and Grey Relational Analysis to Improve Service Quality of Nursing Homes. *Human Factor and Ergonomics in Manufacturing & Service Industries*, 24(2), pp. 172-191.
- Yeung, A. C. L., Cheng, T. C. E. & Chan, L.-Y., 2004. From Customer Orientation to Customer Satisfaction: The Gap Between Theory and Practice. *IEEE Transactions on Engineering Management*, 51(1), pp. 85-97.
- Yi, Y., 1990. *A critical review of consumer satisfaction*. Chicago: American Marketing Association.
- Yousefie, S., Mohammadi, M. & Monfared, J. H., 2011. Selection effective management tools on setting Eurooean Foundation for Quality Management (EFQM) model by a quality function Deployment (QFD) approach. *Expert System with Applications*, Volume 38, pp. 9633-9647.
- Yücel, H. & Kayihan, H., 2011. Pain, physical performance and balance in the elderly at hospital. *Archives of Gerontology and Geriatrics*, 52(3), pp. 1241-1244.
- Zhang, X. & Gabrowski, D., 2004. Nursing home staffing and quality under the Nursing Home Reform Act. *The Gerontologist*, Volume 44, pp. 13-23.
- Zhanga, Z. & Awasthi, A., 2014. Modelling customer and technical requirements for sustainable supply chain planning. *International Journal of Production Research*, pp. 1-24.
- Zimmerman, S. et al., 2002. Nursing home facility risk factors for infection and hospitalization: importance of registered nurse turnover, administration, and social factors. *Journal of the American Geriatrics Society*, 50(12), p. 1987–1995.

Appendix A Ethics approval

School of Engineering and Design
Head of School: Professor Savvas Tassou
BSc, PhD, MBA, CEng, MIMechE, MASHRAE, MIIR, MInstR

Brunel
UNIVERSITY
WEST LONDON

16 August 2011

Brunel University, Uxbridge,
Middlesex, UB8 3PH, UK
Telephone +44 (0)1895 266865
Fax +44 (0)1895 269803
E-mail savvas.tassou@brunel.ac.uk
Web www.brunel.ac.uk

Ms Sanaz Abdollah Shamshirsaz
School of Engineering and Design
Brunel University

Title of Study: Using Quality Function Deployment (QFD) to improve the experience of the elderly in care homes.

Your application for ethics approval has now been considered by the School of Engineering and Design Ethics Committee and I can confirm that approval has been given for the project to go forward.

If there are any changes in protocol then the Ethics Committee needs to be informed and may require further documentation to continue approving this project.

Yours sincerely



Paul Worthington, School Manager
Secretary to SED Ethics Committee

Appendix B Basic data on the interviewees

<i>Basic data on the interviewees</i>	
	N
Total	15
Gender	
Male	7
Female	9
Age	
Up to 80 years	12
>80 years	3
Length of residence in home	
1–6 months	6
>6 months–1 year	5
>1–4 years	3
>4 years	1
Education	
None/elementary school	12
Non-academic track	2
Academic track	1

Appendix C Voice of Customers Table

<i>Code of Customer</i>	<i>Voice of Customer (VoC)</i>	<i>Needs and Requirements</i>
2	<p>I lost my husband 8 years ago and we really loved each other we were together for years. I have been diagnosed diabetic and used to do all my injections by myself. It got my daughter worried, she is a nurse. So she made me move into a care home but I didn't like it. I didn't want to go there because it was far from my own neighborhood. The next day this room was prepared and I came here but at first six month I was really depressed but the friendly caretakers involved me with the daily routine works (They said...do this and do that). I used to prepare breakfast and do other stuff; it kept me busy to forget about all bad things.</p> <p>I have made many friends here, I became 80 last Friday and they throw me a party, it was lovely, I think this is the best place in Peter Borough.</p> <p>You know what I like about here is that I feel home and when my daughter comes over I think she has come to my own home, I never think it's a care home</p> <p>I was in another room for 6 month till this room came empty then they asked me if I liked it I could have it. I chose this room because it has got nice toilet. My previous room was all right but it wasn't quite as big as this one.</p> <p>About the size I think it's nice and cozy. I think when you get old and on your own you like these kind of things. I like the light of my room I have my own flower that I look after and I think it's lovely. I brought my own bed and 2 chairs in, I also brought all my beautiful things, all together its like a home like environment</p> <p>I have no sight on one part of my left eye, I had bleeding through this eye once. If I want to go out, because of my blurred eye the staff will help me out.</p> <p>I cannot read so I have some talking books from the library and I spend lots of time listening them in my room.</p> <p>If I wanted to live in my own home I think I was very lonely because my daughter and my son were at work. They are married. Here you can either be alone or be in touch with the others</p> <p>Last Friday I turned 80 and had a really good party I got very nice flower and plants.</p> <p>My daughter comes every Tuesday afternoon and I also go out with my family on weekends, on Sunday my children took me out for dinner with my grand children.</p> <p>I am quite happy with my view and I can go out in the garden, it (the garden) is lovely on summer, I also do</p>	<p>Involvement Feeling Supported Friendly Staff Have responsibilities</p> <p>Social Interaction Events (Celebrating)</p> <p>Home like environment</p> <p>Private Lavatories (Private toilet) Size of room Having Choice</p> <p>Cozy room Homelike Environment Suitable light</p> <p>Helpful staff</p> <p>Leisure activities</p> <p>Living collectively Social Interaction</p> <p>Events</p> <p>Family support</p> <p>Gardening</p>

	<p>gardening that I enjoy a lot.</p> <p>I clean my room by myself; I do my washings, but put the sheets in the washing machine. Nobody comes in to clean my room, if you keep sitting down for ages with no move your body gets deteriorated</p> <p>When I get to my room I make sure every doors are closed, but otherwise I feel very safe.</p> <p>I care about the other people as well the lovely staff call me MUM, I really like Pam has been working here for 7 years we are like a family.</p> <p>Here the girls cook the meals they do not do a lot for me I really like meals its lovely, I am diabetic so I have to be careful.</p> <p>Jack plays the piano and we all sit and sing with him, play dominos, some of us just sit and don't do anything. If you ask Jack when his daughter is coming to see him he cannot remember but if you ask him to play the piano he will perform wonderfully.</p> <p>We also play with ball, and I like singing and talking books (Tapes) they are really nice. They brought me 4 talking books from the library. In the afternoon I stay in my room and listen to my talking book. Sometimes I go to lounge, sit and watch the TV. I have also got a TV in my room but I prefer to go down and watch TV with the other guys and talk with others. We can do what ever we want to do (in this home).</p> <p>We have church service they come every Saturday, they are really nice and I really enjoy that.</p>	<p>Independency Daily living Activities</p> <p>Feeling safe</p> <p>Friendly staff</p> <p>Special diet food Nutrition</p> <p>Social interaction Entertainments</p> <p>Communication with residents Spend time with residents Autonomy Having Choices</p> <p>Spiritual activities</p>
3	<p>I didn't choose this home myself; my friends did it for me. They thought it was nice however I don't think it is just as nice.</p> <p>It is a mix of awful and good things. When I came here first I thought it was a wonderful place. But I didn't find it suitable for me. I don't like my room, I am going to move to another room, because this one is tiny and small. This room looks like a corridor from the door to the window, I like my chair facing to the window and there is no space to relocate it and anything. I have been in this room about 2 years and I hope they don't give it to someone else. My doctor said what a depressing room I have got. I am going to have a nice room with big window facing to the garden and plenty of space. It is a quiet room and they are going to put new carpet in and soon I will move in. Here (In this room) I have no view unless I stand up to be able to see the garden, which is difficult for me. The new one has big double window so I am quite happy to move in. I don't like the color of my room it is cream I like lemon for walls because it is sunny and for the kitchen I like blue, because my home's kitchen was blue.</p> <p>One thing that I don't like is that I don't have key for my room, but nobody has it. I used to have keys for the front door and my room, when I was staying at retired home. I like to keep my room locked sometimes.</p> <p>I don't like the food here very much (MEAL), I am not</p>	<p>Having choice</p> <p>Room with enough space Room with enough storage Having nice view Big window Quiet room Room's colour</p> <p>Association with colour</p> <p>Keep belongings safe</p> <p>Design of the food</p>

	<p>fussy about food but I lose my appetite when I see the food.</p> <p>We have a good cleaner and the rooms and the home are clean.</p> <p>I never go to anybody else's room without invitation.</p> <p>Some of the staff are helpful and some not, if they are all were good that would be lovely.</p> <p>When I first came here I asked if we could have a general monthly meeting in which we can discuss our problems and they agreed, but it has never happened you know we pay a lot here so our expectations are high.</p> <p>The staff and the manager should ask about situation and changes but they never do. Just a few of the staff sometimes talk to us but the others ignore the residents. I think some staff don't understand old people. Some of them don't have empathy toward old people but not all of them; and some of them are too bossy some times.</p> <p>This is nice home but I cannot say it's really like my own home because It doesn't have the home environment at all. I don't have a family, and I felt like a fish out of the pond when I first came here. It took me a little while to get used to people. Everybody is nice here but I cannot say it is like a home.</p> <p>I don't have enough outdoor activities. I came from a retired home where all were friendly, we had coffee in the morning in the sitting room and we had tea in the afternoon and sometimes went out together. I communicate with people here but they are not really my friends I have not made any friends here. I am used to have friendly people around but here residents are all in their rooms just one or 2 have friends.</p> <p>Helen (staff) is very good at arranging things, when I came here I asked for the morning exercises or getting together for coffee and tea but it never happened. We have coffee and tea in the morning but not all to gather. We used to have coffee and tea together when I was living in retirement home and we had chat and everything but not here I think here is so strange.</p> <p>I like Sharon (Staff), she sometimes come to my room and spends time with me, I think she loves her job.</p>	<p>Cleanliness</p> <p>Feeling friendly with residents</p> <p>Helpfulness of staff</p> <p>Receiving adequate information Involvement</p> <p>Understanding residents conditions Empathic Staff</p> <p>Home like environment Communicating with other residents</p> <p>Lounge Gathering Friendly Environment</p> <p>Communication with other residents</p> <p>Staff who like their jobs</p>
4	<p>I chose this home because it is a Christian home. I just checked out one other care home and the smell of urine vaporized in the air was disgusting.</p> <p>I like my room, but the bad point is that it is small; the good point though is that I am far away from the call bell, which is so annoying and bothering. I need peace and quiet. My room is at the end of corridor, way far from the daily noises and stuff. So I am happy here (my room).</p> <p>I can see the garden through my window, only when I stand up, so normally I don't have any views in my room to enjoy it.</p>	<p>Good smell</p> <p>Room with enough space Quite Place Privacy</p> <p>Nice view</p>

	<p>I have enough independency and now I have got used to doing my daily routines. I am allowed to self medicate, I can have my own pills. If I want to leave the bed I can, I am not allowed to bath myself I have to be bathed, which I don't like but never mind, I have to put up with those horrible things, I have signed for walking up stairs, walking down stairs alone, going out for the walk alone and etc...</p> <p>I have toilet in my room, but for bath or taking a shower I have to walk down the corridor, and I have to have somebody with me.</p> <p>I don't feel like home here because it is too noisy. I used to live on my own but here always something is going on which disturbs me. I lived alone for 40 years. I have always lived alone and I liked my privacy but living with others in the care homes (this one or any other care home) is like being backed to the boarding school.</p> <p>I think this is very important that (manager), care about the staff they are employing. We need those who are communicative and could talk properly to understand our needs be a cleaner or a nurse. The care takers sometimes have difficulties in English and understanding us as well this makes the job even more difficult for themselves.</p> <p>It is very difficult for the staff to organize the activities; because we can't do all the same thing they do the best they can. They take some residents out to shopping centers, and they pay 3 pounds sharing the taxis. At the shopping center sometimes the staff, push us to walk, but they have to pay attention that we ware not as strong as they are.</p> <p>Tuesday's nights are the most enjoyable time for me. We sit in the lounge and we have the quiz, sometimes they have people over to come and give us a talk or a speech or show a film about Peter Borough. They do their best for us but some weeks we don't have anything except the quiz. I like it when I can answer the questions</p> <p>I don't believe in doctors these days because they cannot do anything for my back ache, once a week my GP walks around, and he ask are you alright? And then passes.</p> <p>They try to be helpful. Sometimes they think that they are being helpful but they are not. When you cannot do things by yourself they don't realize you have got more brains than they have. Staff are all respectful. Respect is all around. I get bath by the man but I don't mind because he is really respectful.</p> <p>When I came two and a half years ago we had two people who were on the wheelchair now they are six and that is extra work, so I think we need more staff. For the people we've got here this place is not the nursing home it is the care home.</p> <p>I go out to walk around the garden once a week and go to the church. I enjoy going to church because I like to see my friends over there</p> <p>Among the female staff I like Marry Ann she is from south African she is very kind and talkative.</p>	<p>Independency Daily living activities</p> <p>Private lavatory Daily living activities</p> <p>Privacy Quite place</p> <p>Communicate with residents Understanding residents Staff job satisfaction</p> <p>Understanding residents' abilities</p> <p>Meaningful Activities</p> <p>Medical Care Communication with Dr</p> <p>Helpful staff Respectful staff Understanding residents' abilities</p> <p>Sufficient staff</p> <p>Social interaction</p> <p>Speaking to residents Kind Staff</p>
--	---	---

5	<p>I chose this house because I knew one of the members of the house. I was very sick and first I went to hospital for some treatment and after that I came here. I haven't had much to do I used to help other residents, like making their beds now I cannot help other residents because I don't have enough energy and I am very sick.</p> <p>Before I came here I went to Canada in Toronto at that time my children were there and I enjoyed being with them.</p> <p>I really like my room it is nice and bigger than other rooms and my room advantage is that it is in the first floor because I don't like to use lift it is really frightening. My room is quiet because the other room, which are in front of the main road won't let the residents to sleep very well. I don't have such kind of problem but I don't have the view of the garden.</p> <p>The door in front of the corridor is open all day and night so I don't feel very safe. This door should be left open all day because it is only accessible door for fire exit.</p> <p>I am quite independent I can make my own tea or coffee. Unfortunately I occasionally have headache. I don't have enough ability to do all my routine like before; sometimes I cannot pick up things and put it in the cupboard so I am going to ask someone to help me.</p> <p>I cannot easily put my cloths in the wardrobe because it is very narrow, and I am fat so I cannot get to that very easily also I cannot put my clothes in the top shelf it is very high for me and I cannot stand straight.</p> <p>I have to ask staff to change my bed's sheet if I do not ask them nobody change it. If I ask nurses they usually say it is not their job to change it (CLEAN SHEET) I think sometimes they want to ignore me. I don't know how long I will live so I don't mind any changes in my room.</p> <p>I think here services for elderly people are sufficient. I think in this home foods are delicious; I like it sometimes I hadn't made it by myself before.</p> <p>I enjoy simple exercise with a ball, which is once a week. We have bingo, which I didn't like it at first and now I enjoy it and now I teach it to the other residents as well. I used to do English puzzle but now it is a little hard for me.</p> <p>If I ask staff to do something for me sometimes it takes time but finally they will do it. Sometimes I am angry and I raise my voice that is not very good because it makes staff angry and then they shut at me.</p> <p>Staff talk to me very little and I really need the staff become closer to me for example I don't want they just put the glass of water on my desk and go.</p> <p>When my children come to London they come and visit me. I love my grand son; he is so cute you have to see him.</p> <p>The positive experience that I have is good (medical) care.</p>	<p>Have some responsibility in home (opportunities to work) Involvement</p> <p>Spending time with family</p> <p>Room with enough space Accessible environment Safety Quiet room Room with good view</p> <p>Feeling safe</p> <p>Daily living activities Independency Accessible equipment</p> <p>Accessible Environment Suitable Design</p> <p>Clean sheet Pay attention to residents</p> <p>Tasty food</p> <p>Activities Opportunities to have fun</p> <p>Helpful staff Calm attitude toward residents Respectful staff Understanding resident situations</p> <p>Staff become closer to residents Friendly Staff</p> <p>Visiting family</p> <p>Medical care</p>
---	--	---

6	<p>I didn't choose this home actually my daughter decided to bring me here. I used to live in Canada and my daughter brought me here because she lives in London.</p> <p>I think people who live here are not normal. Some of them are deaf or blind. Only there are two ladies who scream a lot, they are losing their ability of walking and they are screaming all the time and that really bothers me. Thanks god my room is not close to them but when I sit in living room and want to relax their voice picks me off.</p> <p>I like my room but I cannot open the window it is very heavy for me. I love my independency I can change my dress and I can eat by myself. I like my room because it has enough space and it is always clean. In my room I have big window but it is close all day because it is very difficult for me to open and close it and because I have to lift the heavy handle up and then close it.</p> <p>I don't like the food very much because it is not hearty and lots of different soups are served.</p> <p>I enjoy the concerts being performed by the ladies who come from outside and they sing in Polish or Russian, play guitar, my father was a teacher he sang most of this songs so I like and I enjoy it very much it because I remember all of my good memories. We play Bingo on Thursdays and I enjoy that one as well.</p> <p>I am very old so I cannot go out. Every day when I wake up in the morning I think I cannot walk and I will be stuck in my bed.</p> <p>When the ladies shout and need help sometimes staff ignore them and do not help them and they wait till they become calm and quiet. Sometimes when I call the staff they don't answer, and after a while they come from kitchen and help me (because most of them stay in the kitchen).</p> <p>We have nurses for the day and for the night. One of the nurses called Sofi I like her very much, she works very hard and she is very nice to me</p> <p>My daughter and my grand children usually (Once a month) come and visit me I really enjoy spending time with them, they give me hope and motivation to live</p> <p>It is very bad that I usually cannot talk to other residents because most of them cannot talk and walk.</p>	<p>Having choice Autonomy</p> <p>Quiet place</p> <p>Usability of product Independency Daily living Activities Cleanliness Room with enough space</p> <p>Meal</p> <p>Singing Remember good past memories Entertaining activities</p> <p>Independency Daily Living Activities</p> <p>Quick respond Helpful staff Pay attention to residents (do not ignore them)</p> <p>Kind behaviour with residents Productive staff</p> <p>Family Support Family Visit</p> <p>Communication with residents</p>
7	<p>I think this home is beautiful, very clean and nurses are very good. They help me as much as they can.</p> <p>I fell down twice. Once I was in hurry because the nurse had asked me to hurry up for breakfast. I hadn't sleep the night before because I have got problem sleeping during the night and I was so tired the day after. So when she called me many times in hurry I fell down and my head hit to the edge of the bed and was broken. I think she shouldn't have rushed me, I am old and need more time to get ready.</p> <p>I like my room because it is not noisy it is very quiet. In the house there is a gentleman who walks all day and all</p>	<p>Cleanliness Helpful staff Good physical appearance in building</p> <p>Understanding residents situation Patient attitude toward residents Helpful staff Autonomy Having choice Staff who don't make residents rushed</p> <p>Quiet room Privacy</p>

	<p>night sometimes the sound of his walker disturbs me.</p> <p>Sometimes Mr. Daniel plays the piano and sings and I enjoy it very much, it reminds me the old good days.</p> <p>If I don't like anything about my room I cannot do anything because the manger has to decide for us what to do, if I want to make a change in my room I have to take her permission.</p> <p>Sometimes when I need to go to the toilet I ask the staff to help me but sometimes they do not come quickly, and I have to keep repeating this very simple want. Sometime I have to get my self to the toilet fast but I wet my self, it is out of my control. I think they should be more responsive</p> <p>I cannot put on my dress because I have bad pain in my shoulder but sometimes the staff cannot understand. I am totally dependent on them. If staff do not come I will fall down again. I think they should be more understanding about our disabilities.</p>	<p>Music Remembering good past memories</p> <p>Autonomy Having Choice</p> <p>Quick respond</p> <p>Understanding residents situation Independency Daily living activities</p>
8	<p>I was alone in my house and my daughter was in London so she told me to sell my house and come to live in London in the house that they had been living at the time. ohhh I pay by myself you don't know how expensive this care home is, Once I got ill I went to hospital, when I was released we decided the best thing to do for me was to go into a care home, , where there are professionals to help me with my medicine and I am not alone. Here I have nothing to do so I have enough time to write this book</p> <p>I like this home because I can be with other people but staying here is very sad because here the majority of people are very ill. It is sad because one day you get up and say hello to your fellow resident you chat, you smile and you make an image form his face in your mind and the next day when you call him there is no response. He is gone and has left you a bunch of good memories you had made during a long time together. This a depressing because I can see my own story that sooner or later is going to happen to me too.</p> <p>We have got lots of services here. I still can look after myself in the morning I shave, dress, wash my face, I can walk around but I need help for shower.</p> <p>I like my room it is cozy I think big room is not good because most of the people here cannot walk, but the toilet is far from my room. Sometimes I cannot manage to get there I have to go up the stairs and reach the toilet. Then when I get there it is too narrow and I cannot take my walker in with me, and this causes so many difficulties. Its not convenient for me at all.</p> <p>When my daughter comes to London she comes to visit me sometimes she brings her sons, which makes me happy. Do you like my room? Its white, very nice and bright, I really like it.</p> <p>I don't want any changes in my room because changes need lots of energy and effort, that I lack and it is hard for the staff either. Many residents want to move to my room because of the view but they cannot manage it because</p>	<p>Independency Medical Care Professional care Cost</p> <p>Interaction with other people</p> <p>Daily living activities</p> <p>Cozy room Accessible Environment Room with the Toilet Suitable Design Design for older people</p> <p>Visiting family Bright room Colour of the room</p> <p>Nice view Flat area (without steps) Accessible Environment</p>

	<p>you have to go up the stairs (3 stairs) to reach this room.</p> <p>Here Food is not bad; but I cannot change it because I do not have any other choice. For example I love to have bacon and egg for breakfast but here I haven't had it for two years.</p> <p>I like sports or watching television.</p> <p>About staff behavior sometimes they have some misunderstanding. I often try to speak to the staff and connect to them. For example I ask them where are they from or I ask them to talk about their families. Not that I am very talkative what I want is establishing a good relationship with the staff which never happens because they are usually tired or impatient.</p> <p>One day I tripped over something and fell on the chair near the bookshelf in my room and I suffered from the rips pain for a long time, it was a bad accident and a bad memory I cannot forget.</p>	<p>Food Autonomy Variety of food choice</p> <p>TV program</p> <p>Talking to residents Communication Social Interaction</p> <p>Safe environment Safety</p>
9	<p>I couldn't live on my own if I wanted to. I was completely dependent on my son for everything, that is why I moved here, now I have enough confidence to do (everything).</p> <p>The staff are always present and very helpful. They try to do their best, they work hard all day, and they help every one, if they need help. Once, when I was in the toilet I got a back spasm, which wouldn't let me move, I called somebody to help and I couldn't reach the ring. I felt as I was trapped there. However (the staff) showed up after a while for me in that condition was seemed long. You make good memories here as well when you are sick and you need accompany and care and attention, people come and it is very good feeling to know that you are not alone. Because in our age loneliness is a terrible thing to cope with. Once I was not very well, staff and some residents came up and visited me, it really made me happy.</p> <p>I like my room because I have enough privacy but I wish I had more space in my room. I like my chair beside the window to have a look at the garden and enjoy the beauty of summer and winter, whereas I am deprived from doing that. I feel comfortable in my room because I have my own toilet. One time I was taking a shower I slipped and fell on the ground, after wards I have not been allowed to do it on my own, they have to give me a bath, which is not pleasant for me.</p> <p>I've heard that in some homes there is a menu to choose food, whereas here we have no choice to make, we have to eat what ever is provided, like it or not. By this I don't mean that we expect the staff provide luxurious meals, like the fancy restaurants, with a variety of food and drinks, but we would like to have choices among 2 or 3 kinds of food.</p> <p>I think there should be more attention paid to the cleanliness and odor, it is really a nuisance when sometimes I feel urine smell.</p> <p>I cannot reach to my wardrobes it is vey high and I usually suppose to use alarm, but (don't say anyone) I have found out it works better if I holler.</p>	<p>Autonomy</p> <p>Helpful staff</p> <p>Privacy Enough space Toilet in the room Independency</p> <p>Having choice</p> <p>Good odour</p> <p>Quick respond Usability product in residents room</p>

	<p>I would like to go out but I don't have enough ability. I cannot go to my daughter's house as I used to. Since I have been here I have not the opportunities of meeting with my family and friends as I had before.</p>	<p>Getting Out Family support</p>
10	<p>I didn't choose this home my daughter did it because it is close to her home and I was depressed and I suffer from high blood pressure that needed to be under control. I was stressed out all the time and needed to be attended.</p> <p>I don't feel like my home, when I was in my own home I was free to do what ever and at what time I wanted. I should be ready for taking a shower. When they just pop in and say get ready for the shower I get embarrassed and annoyed. I should be ready for it beforehand. We are not those spring chickens any more you know, one has to put his foot in our shoes, to understand our turmoil and conditions. One day, you grow old and you will get what I say, we really need help.</p> <p>I am satisfied with the nurses behaviour who are kind and gentle (except one, who tries to ignore residents). they try to do a good job, but all the humans are fallible at some levels sometimes, we have to be understanding, from the pressure of work and life in the modern society, people bear.</p> <p>I prefer to stay at my room to listen to my book and watch TV, but sometimes during the day I go in the lounge to talk to other residents.</p> <p>When I need help staff come quickly, it is different with constant attention, it is attention to an emergent case, we might have been trapped somewhere , even in our own wheelchairs and we need immediate help. For me personally it is very important, but sometime I feel they ignore me.</p> <p>The entertaining programs are not good enough and TV programs are sort of boring I prefer to watch old movies. I know the people taste are different and they cannot set the programs according to our desires, but if they put a suggestion box where we can put or notes they can change the repeat ones.</p> <p>I've brought my own bed and it is very comfortable. The sheets color and materials are very fitting and calming. I would like my sheets to be more washed and changed.</p>	<p>Cleanliness</p> <p>Respectful staff Homelike environment Autonomy</p> <p>Kind and responsible staff Companionship Medical Care</p> <p>Privacy Communication with other residents</p> <p>Helpful staff Pay attention to residents Quick respond</p> <p>TV Entertainment</p> <p>Clean sheet</p>
11	<p>I chose this home because my sister was here and I was conversant with the home condition. It is cheaper than others, clean and has well- equipped suits. I have my own toilet, and everything you think.</p> <p>I like my room because it is quiet and I have my own toilet, but meanwhile there are other disturbing things too, like when some residents shout out or cry from time to time, or snoring when I am resting and you have to hear it all from your room.</p> <p>I don't like the big room I think my room is very cozy and it is more than enough for me you know because I am very old and I cannot move a lot.</p> <p>I am happy because I can do my tasks, wash my face, clean my room and get dressed but I need help for</p>	<p>Cost Cleanliness Enough Equipment</p> <p>Room with toilet Equipped room Quiet place</p> <p>Cozy room</p> <p>Independency Homelike environment</p>

11	<p>I chose this home because my sister was here and I was conversant with the home condition. It is cheaper than others, clean and has well- equipped suits. I have my own toilet, and everything you think.</p> <p>I like my room because it is quiet and I have my own toilet, but meanwhile there are other disturbing things too, like when some residents shout out or cry from time to time, or snoring when I am resting and you have to hear it all from your room.</p> <p>I don't like the big room I think my room is very cozy and it is more than enough for me you know because I am very old and I cannot move a lot.</p> <p>I am happy because I can do my tasks, wash my face, clean my room and get dressed but I need help for showering, I'm scared to take a shower alone,</p> <p>I feel like my home but my home was much bigger I do whatever I want, I can go to garden; this home has a wonderful garden and other things. Every weekend my grand children come and pay me a visit, which gives me a boost, they are welcoming here. This is a fortune, not everybody has this luck.</p> <p>Usually we have a choice between two kinds of foods and I love food, I have put on weight, I think there should be more control and attention to the quality of food and our nutrition should be addressed. Maybe if they add more vegetables to every meal it would be better for us all.</p> <p>I am completely satisfied with the staff. Except one of them, they are very supportive and friendly. I think a staff should be as patient a nurse as (she/ he) could be. We are old and we need their patient.</p>	<p>Cost Cleanliness Enough Equipment</p> <p>Room with toilet Equipped room Quiet place</p> <p>Cozy room</p> <p>Independency Homelike environment Autonomy</p> <p>Independency</p> <p>Delicious food</p> <p>Feeling supported Friendly staff</p>
12	<p>I want and try to live as normal a life as possible, in my remaining time, so I want to live my life peacefully, I cannot tolerate tension and pressure. So in the morning when I get rushed to get up and get ready it disturbs my tranquillity. Sometimes when I ask for a favour they turn into snarl, as if I am ignored. And I feel that I am disrespected. Once upon a time I was somebody with authority, now I have no power and I am needy, you know this really hurt.</p> <p>I have lived in this care home for three years, when you get old you have to adapt to everything; you live with your memories. It is very sad and depressing, you come into the hall and see the dozen of old ladies half asleep, or snoring, crooked necks with their mouth open. It is very hard when you leave your house, your dogs and everything you loved. I would like to have a pet but we are not allowed to. (oh) it is very hard, you never feel your home here, I remember when I came here, I didn't know anybody, everything was strange and I couldn't get on with people here. After 1 month I felt better, I tried to put the past behind me and live in the present.</p> <p>I enjoy chatting with other people, here is a lady that we</p>	<p>Respectful staff Kind and responsible staff Caring staff</p> <p>Homelike environment Independency</p> <p>Companionship</p>

13	<p>Staffs pay lots of attention to me. We need to be looked after properly.</p> <p>I have diabetic so I couldn't stay alone at home, here I can receive good medical care and also I feel secure, I was very lonely at home. I have come here to fill my loneliness and find a meaningful life, finding friends, and communication with people.</p> <p>These were my expectations, however, I haven't reached it yet, people are kind and caring but still I don't feel like home. My daughter comes every week to visit me, on some occasions, we go out for dinner and she takes me back.</p> <p>In the morning I socialize with people and watch TV, play bingo and if the weather is good, I take a walk, I try to keep myself active otherwise I have to go to bed, which is not good for my health. But after dinner I prefer to go to my room to spend sometimes by myself.</p> <p>The food is good but it has happened that I don't like my food as I told you I am diabetic, they have to serve me special food, based on more vegetables and less carbohydrates, it is monotonous.</p> <p>If I ask staffs to come they will quickly come they are very responsible.</p>	<p>Caring staff</p> <p>Sufficient medical care</p> <p>Visiting family</p> <p>Autonomy Privacy Meaningful activities</p> <p>Delicious meal</p> <p>Responsible staff Quick respond</p>
14	<p>I chose this home because it is all leveled, open and free, so you don't have difficulties getting around or being stuck in the lift. When the oldies get stuck in the lift they get panic and I think lift make residents dependent. It is just like a home and I feel secure.</p> <p>The people here are so caring and this gives you a feeling of comfort and tranquility, which contrast the feeling when you are in hospital, I mean getting anxious and panic. They bring me tea in the morning into my room, and they ask me if I need any help. The only trouble here is not having a toilet in the room.</p> <p>I think my room is beautiful because it has just harmony. It is nice and it is clean. The size of my room is just terrific, this is something special. I can see a beautiful garden through of the window. It is quite and a safe place.</p> <p>We have many sorts of things to do. We have conversation with other residents, there is a lady here whom I sit with and talk about the past she knows a lot of things and we talk about our very old common memories. These conversations are very interesting and bring the smile back into our faces.</p> <p>I am quite independent and I enjoy this. This is a wonderful feeling that I am sure the other residents want to have too. But some times, having something at a certain age is impossible, and knowing that without others help you cannot survive make the scenario even more depressing.</p> <p>I absolutely feel like home here and also I feel quite safe, here I never panic, when I am sure the staff are around me all the time and not far away. They are so friendly and</p>	<p>Grand floor Accessible Environment Safety Feeling Secure Homelike environment</p> <p>Caring staff Feel secure Having Toilet in the room Accessible Environment</p> <p>Beautiful environment Cleanliness Size of room View Suitable Design Safety Quite place</p> <p>Conversation with other residents Social Interaction Connecting to past memories</p> <p>Independency</p> <p>Homelike Environment Safety Friendly Staff</p>

	<p>care for you. I think the Philipinos are really caring; they are really kind to residents.</p> <p>Every morning we play game and it is very enjoyable. I try to join all the activities.</p> <p>I can receive any services that I wish. They give me a bath and get me dressed up , however I like to get dressed myself, this a good feeling because you see that at least you are good at something.</p> <p>The meals are quite good and you have menu to choose. The staff are good at cooking. They always ask us what would we like to have for lunch or dinner. I had a choice between corn beef, and corn beef salad today.</p>	<p>Kind Behaviour Caring Staff</p> <p>Entertainment Activities</p> <p>Independency</p> <p>Meal Delicious meal Having Choice</p>
15	<p>My mum was in here years ago I did a little research find a good home for my mum, she wanted to be independent, we looked everywhere for my mum and when I brought her here. I told her the area was her hometown and through her window she can see the places she was born and grew up, this made her love the place. However, she wasn't alive for so long (she fell down outside and 2 days after she died. I have chosen this care home because it is close to my daughter home. She visits me every week.</p> <p>I think I would never be happy like before in here this because although they call it home but is not really the home.</p> <p>I used to live in retirement home and it liked that home much, you know family home, we had keys for our rooms and for front door. We all were together, there were several tables but close together and the hostess used to come and have meals with us at our table's each time.</p> <p>I prefer to be with my friends outside because we were like a happy family back in old days and in the retirement home. We used to chat for hours and we went to the town to have fun.</p> <p>Food is good. The cleanliness is fair. Sometimes the cleaner misses some places to clean up. Some of these employees have no brain. They don't want these sort of jobs, they want better work. You do realize that most people here even cannot speak properly. They don't even know what they are saying and sometimes it is nonsense</p> <p>Our best time is when we have a birthday party the time that we l get to gather around the tables and celebrate.</p> <p>Some time I get a hairdresser to have my hair done and I am satisfied with the services because when I become ill they bring everything upstairs of course I try to avoid it, but I prefer to do everything on my own.</p> <p>I have blood pressure, which made my son stress out, but I feel secure here, I sometimes avoid my GP because I don't believe in doctors, especially when you grow old.They (staff) are fairy good as I said. The only point is that they don't do their job like when I need to have my medication, I have for remind them 48 hours in advance and actually give them the notice but even in that case the keep forgetting to give me my tablets on time. What</p>	<p>Family support Safety</p> <p>Homelike Environment</p> <p>Social Interaction Close relationship with staff</p> <p>Having choice Family support</p> <p>Cleanliness Quality of food Communication with staff</p> <p>Events Social Interaction</p> <p>Independency</p> <p>Medical care</p>

	<p>happened last week?! I told them on Friday that I need it, I reminded them on Saturday and didn't get them also it didn't come on Sunday because they don't work and it wasn't until Monday that I got them. This had also happened before.</p> <p>It is really bothering when I cannot hang/ pick up my cloths in the wardrobe, the hooks have installed so high that I cannot reach them.</p>	<p>Suitable Design Accessible equipment</p>
--	--	---

Appendix D Ranking DQs using Analytic Hierarchy Process (AHP)

<i>Residents</i>	<i>Companionship</i>	<i>Family Support</i>	<i>Autonomy</i>	<i>Involvement</i>	<i>Cost</i>
<i>Social Interaction</i>	1	2	2	2	3
<i>Family Support</i>	1/2	1	1/2	2	3
<i>Autonomy</i>	1/2	2	1	2	3
<i>Involvement</i>	1/2	1/2	1/2	1	3
<i>Cost</i>	1/3	1/3	1/3	1/2	1

<i>Residents</i>	<i>Companionship</i>	<i>Family Support</i>	<i>Autonomy</i>	<i>Involvement</i>	<i>Cost</i>	<i>Weight</i>	<i>Ranking</i>
<i>Social Interaction</i>	1	2	2	2	3	33.4739	1
<i>Family support</i>	0.5	1	0.5	2	3	19.2257	3
<i>Autonomy</i>	0.5	2	1	2	3	25.3685	2
<i>Involvement</i>	0.5	0.5	0.5	1	3	14.5704	4
<i>Cost</i>	0.33	0.33	0.33	0.33	1	7.36152	5

<i>Facilities and Services</i>	<i>Suitable Design</i>	<i>Accessible Equipment</i>	<i>Meal</i>	<i>Accurate Medical Care</i>	<i>Basic Facility</i>	<i>Usable Garden</i>
<i>Suitable Design</i>	1	1/3	1/3	1/3	4	2
<i>Accessible Equipment</i>	3	1	2	2	5	3
<i>Meal</i>	3	1/2	1	2	5	3
<i>Accurate Medical Care</i>	3	1/2	1/2	1	5	3
<i>Basic Facility</i>	1/4	1/5	1/5	1/5	1	1/4
<i>Usable Garden</i>	1/2	1/3	1/3	1/3	4	1

<i>Facilities and Services</i>	<i>Suitable Design</i>	<i>Accessible Equipment</i>	<i>Meal</i>	<i>Accurate Medical Care</i>	<i>Basic Facility</i>	<i>Usable Garden</i>	<i>Weight</i>	<i>Ranking</i>
<i>Suitable Design</i>	1	0.33	0.33	0.33	4	2	10.9204	4
<i>Accessible Equipment</i>	3	1	2	2	5	3	31.5567	2
<i>Meal</i>	3	0.5	1	2	5	3	25.0905	3
<i>Accurate Medical Care</i>	3	0.5	0.5	1	5	3	19.9492	1
<i>Basic Facility</i>	0.25	0.2	0.2	0.2	1	0.25	3.80055	6
<i>Usable Garden</i>	0.5	0.33	0.33	0.33	4	1	8.68269	5

<i>Caregivers</i>	<i>Caring and Sensitive Staff</i>	<i>Quick Response</i>	<i>Experienced Staff</i>	<i>Productivity</i>	<i>Well Groomed Staff</i>
<i>Caring and Sensitive Staff</i>	1	6	6	5	8
<i>Quick Response</i>	1/6	1	2	2	2
<i>Experienced Staff</i>	1/6	1/2	1	2	2
<i>Productivity</i>	1/5	1/2	1/2	1	2
<i>Well Groomed Staff</i>	1/8	1/2	1/2	1/2	1

<i>Caregivers</i>	<i>Caring and Sensitive Staff</i>	<i>Quick Respond</i>	<i>Experienced Staff</i>	<i>Productivity</i>	<i>Well Groomed Staff</i>	<i>Weight</i>	<i>Ranking</i>
<i>Caring and Sensitive Staff</i>	1	6	6	5	8	59.2716	1
<i>Quick Respond</i>	0.167	1	2	2	2	14.7913	2
<i>Experienced Staff</i>	0.167	0.5	1	2	2	11.1983	3
<i>Productivity</i>	0.2	0.5	0.5	1	2	8.79796	4
<i>Well Groomed Staff</i>	0.125	0.5	0.5	0.5	1	5.94088	5

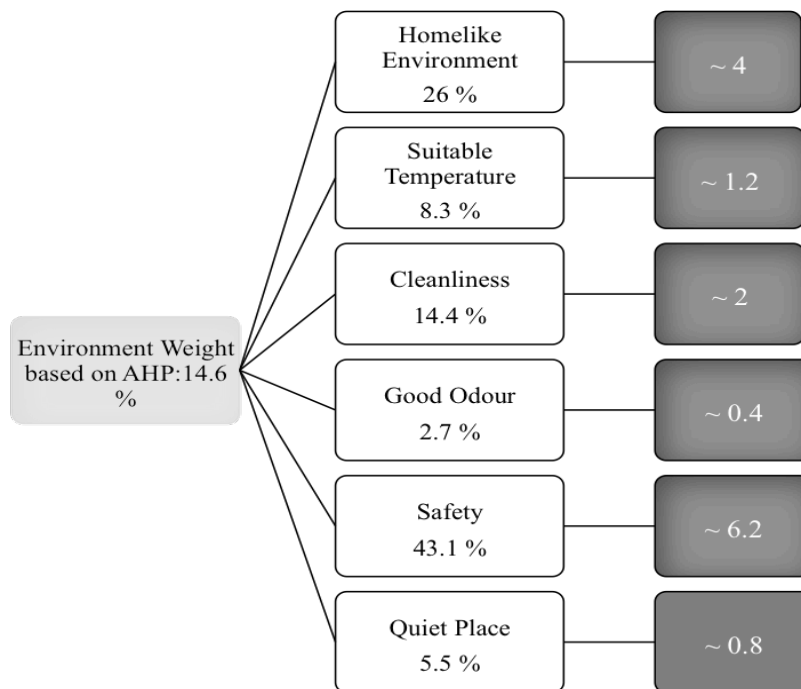
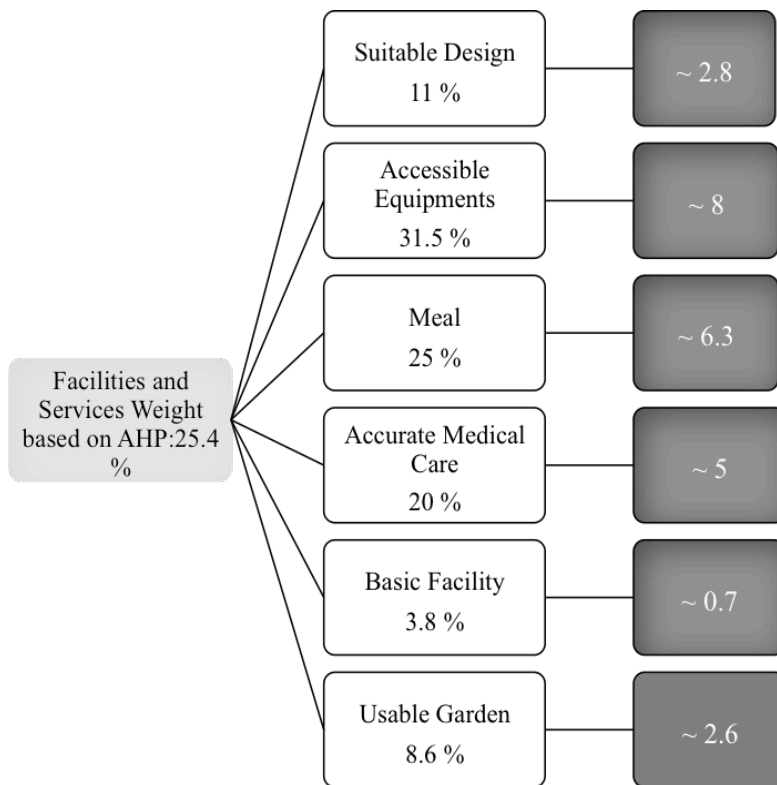
<i>Environment</i>	<i>Homelike Environment</i>	<i>Quiet Place</i>	<i>Cleanliness</i>	<i>Good Odour</i>	<i>Safety</i>	<i>Suitable Temperature</i>
<i>Homelike Environment</i>	1	4	3	8	1/3	5
<i>Quiet Place</i>	1/4	1	1/3	5	1/5	2
<i>Cleanliness</i>	1/3	3	1	6	1/4	3
<i>Good Odour</i>	1/8	1/5	1/6	1	1/8	1/3
<i>Safety</i>	3	5	4	8	1	6
<i>Suitable Temperature</i>	1/5	1/2	1/3	3	1/6	1

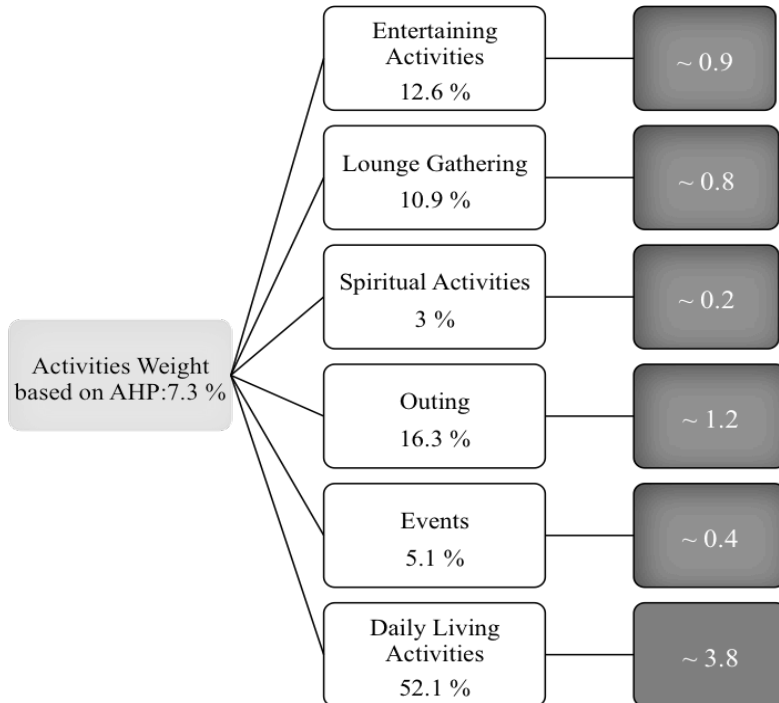
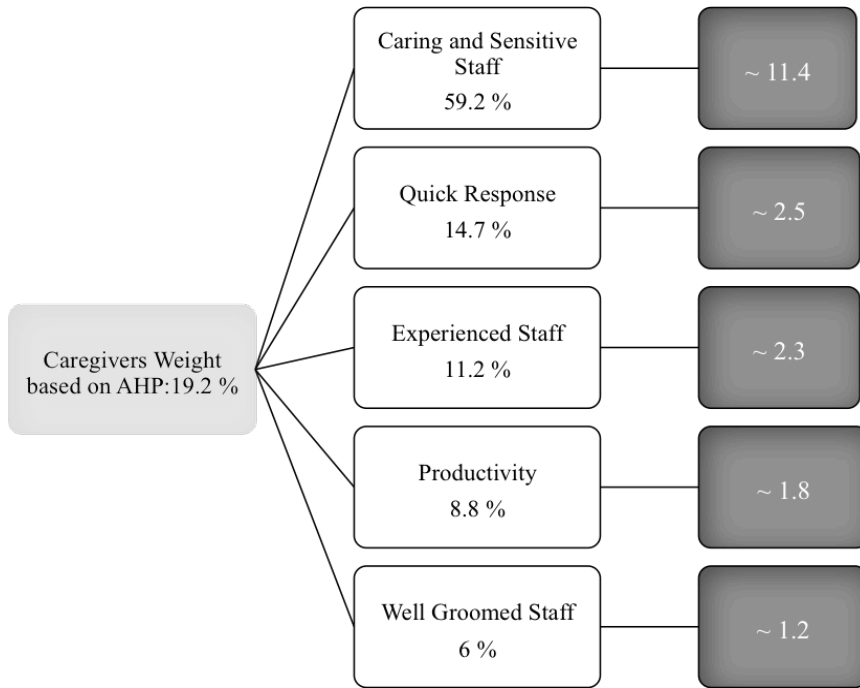
<i>Environment</i>	<i>Homelike Environment</i>	<i>Quiet Place</i>	<i>Cleanliness</i>	<i>Good Odour</i>	<i>Safety</i>	<i>Suitable Temperature</i>	<i>Weight</i>	<i>Ranking</i>
<i>Homelike Environment</i>	1	4	3	8	0.33	5	26.0288	2
<i>Quiet Place</i>	0.25	1	0.33	5	0.2	2	8.28077	4
<i>Cleanliness</i>	0.33	3	1	6	0.25	3	14.3528	3
<i>Good Odour</i>	0.12	0.2	0.16	1	0.12	0.33	2.70696	6
<i>Safety</i>	3	5	4	8	1	6	43.1433	1
<i>Suitable Temperature</i>	0.2	0.5	0.33	3	0.16	1	5.48735	5

<i>Activities</i>	<i>Entertaining Activities</i>	<i>Lounge Gathering</i>	<i>Spiritual Activities</i>	<i>Outing</i>	<i>Events</i>	<i>Daily Living Activities</i>
<i>Entertaining Activities</i>	1	2	5	1/2	3	1/5
<i>Lounge Gathering</i>	1/2	1	4	1/2	5	1/6
<i>Spiritual Activities</i>	1/5	1/4	1	1/5	1/4	1/8
<i>Outing</i>	2	2	5	1	4	1/6
<i>Events</i>	1/3	1/5	4	1/4	1	1/8
<i>Daily Living Activities</i>	5	6	8	6	8	1

<i>Activities</i>	<i>Entertaining Activities</i>	<i>Lounge Gathering</i>	<i>Spiritual Activities</i>	<i>Outing</i>	<i>Events</i>	<i>Daily Living Activities</i>	<i>Weight</i>	<i>Ranking</i>
<i>Entertaining Activities</i>	1	2	5	0.5	3	0.2	12.623	3
<i>Lounge Gathering</i>	0.5	1	4	0.5	5	0.16	10.8657	4
<i>Spiritual Activities</i>	0.2	0.25	1	0.2	0.25	0.12	2.92493	6
<i>Outing</i>	2	2	5	1	4	0.16	16.3007	2
<i>Events</i>	0.33	0.2	4	0.25	1	0.12	5.14373	5
<i>Daily Living Activities</i>	5	6	8	6	8	1	52.142	1

Appendix E Using Tree Diagram to compare all DQs





Appendix F Quality Planning Tables (QPTs)

Quality Planning Table (QPT.2)

	B. Customer Importance Rating	C. Care Home (No.2) Performance Rating	D. Our Performance Rating. Care Home (No.1)	E. Kano Category	Value of <i>K</i>	F. $m = \max(SI , DI)$	G. Target	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4.5	4	O	1	0.86	4.5	1.13	2.09	10.46	8.75
2. Social Interaction	5	3.5	3	O	1	0.82	3.5	1.17	2.12	10.62	8.88
3. Autonomy	4	3.5	2.5	O	1	0.8	4	1.6	2.88	11.52	9.63
4. Accessible Equipment	4	3	3.5	F	1.5	0.82	3.5	1	2.46	9.821	8.21
5. Meal	4.5	5	4.5	B	0.5	0.91	5	1.11	1.54	6.91	5.78
6. Safety	5	4	4	B	0.5	0.92	5	1.25	1.73	8.66	7.24
7. Family Support	4	5	4	O	1	0.68	4.5	1.13	1.89	7.56	6.32
8. Accurate Medical Care	4	4.5	4	B	0.5	0.8	4.5	1.13	1.51	6.037	5.05
9. Involvement	3	3	2.5	I	0	0.56	3	1.2	1.2	3.6	3.01
10. Homelike Environment	5	4	2	F	1.5	0.76	4	2	4.67	23.35	19.5
11. Daily Living Activities	4	4	4	O	1	0.78	4.5	1.13	2	8.01	6.7
12. Suitable Design	4	4	2.5	F	1.5	0.76	3.5	1.4	3.27	13.08	10.9

Quality Planning Table (QPT.3)

	B. Customer Importance Rating	C. Care Home (No.3) Performance Rating	D. Our Performance Rating. Care Home (No.4.)	E. Kano Category	Value of <i>K</i>	F. $m = \max(SI , DI)$	G. Target	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4.5	5	O	1	0.86	5	1	1.86	9.3	9.59
2. Social Interaction	5	3.5	4	O	1	0.82	4.5	1.13	2.05	10.2	10.6
3. Autonomy	4	3.5	4	O	1	0.8	4	1	1.8	7.2	7.43
4. Accessible Equipment	4	3	4	F	1.5	0.82	4	1	2.46	9.82	10.1
5. Meal	4.5	5	4.5	B	0.5	0.91	5	1.11	1.54	6.91	7.13
6. Safety	5	4	4	B	0.5	0.92	5	1.25	1.73	8.66	8.93
7. Family Support	4	5	5	O	1	0.68	5	1	1.68	6.72	6.93
8. Accurate Medical Care	4	4.5	4.5	B	0.5	0.8	4.5	1	1.34	5.37	5.54
9. Involvement	3	3	3.5	I	0	0.56	4	1.14	1.14	3.43	3.54
10. Homelike Environment	5	4	4.5	F	1.5	0.76	4.5	1	2.33	11.7	12
11. Daily Living Activities	4	4	4.5	O	1	0.78	4.5	1	1.78	7.12	7.34
12. Suitable Design	4	4	4	E	1.5	0.76	4.5	1.13	2.63	10.5	10.8

Quality Planning Table (QPT.4)

	B. Customer Importance Rating	C. Care Home (No.4) Performance Rating	D. Our Performance Rating. Care Home (No.6)	E. Kano Category	Value of K	F. m= max (SI, IDI)	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	5	4.5	O	1	0.86	5	1.11	2.07	10.33	10.26
2. Social Interaction	5	4	4.5	O	1	0.82	4.5	1	1.82	9.1	9.04
3. Autonomy	4	4	4	O	1	0.8	4.5	1.13	2.03	8.1	8.046
4. Accessible Equipment	4	4	4.5	F	1.5	0.82	4.5	1	2.46	9.821	9.756
5. Meal	4.5	4.5	4	B	0.5	0.91	5	1.25	1.73	7.774	7.722
6. Safety	5	4	4.5	B	0.5	0.92	5	1.11	1.54	7.698	7.647
7. Family Support	4	5	5	O	1	0.68	5	1	1.68	6.72	6.675
8. Accurate Medical Care	4	4.5	4	B	0.5	0.8	4.5	1.13	1.51	6.037	5.997
9. Involvement	3	3.5	3.5	I	0	0.56	4	1.14	1.14	3.429	3.406
10. Homelike Environment	5	4.5	4.5	F	1.5	0.76	5	1.11	2.59	12.97	12.89
11. Daily Living Activities	4	4.5	4	O	1	0.78	4.5	1.13	2	8.01	7.957
12. Suitable Design	4	4	3.5	F	1.5	0.76	4	1.14	2.67	10.67	10.6

Quality Planning Table (QPT.5)

	B. Customer Importance Rating	C. Care Home (No.6) Performance Rating	D. Our Performance Rating. Care Home (No.3)	E. Kano Category	Value of K	F. m= max (SI, IDI)	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4.5	4.5	O	1	0.86	5	1.11	2.07	10.33	10.11
2. Social Interaction	5	4.5	3.5	O	1	0.82	4	1.14	2.08	10.4	10.18
3. Autonomy	4	4	3.5	O	1	0.8	4	1.14	2.06	8.229	8.054
4. Accessible Equipment	4	4.5	3	F	1.5	0.82	3.5	1.17	2.86	11.46	11.21
5. Meal	4.5	4	5	B	0.5	0.91	5	1	1.38	6.219	6.087
6. Safety	5	4.5	4	B	0.5	0.92	4.5	1.13	1.56	7.794	7.629
7. Family Support	4	5	5	O	1	0.68	5	1	1.68	6.72	6.577
8. Accurate Medical Care	4	4	4.5	B	0.5	0.8	4.5	1	1.34	5.367	5.253
9. Involvement	3	3.5	3	I	0	0.56	4	1.33	1.33	4	3.915
10. Homelike Environment	5	4.5	4	F	1.5	0.76	4.5	1.13	2.63	13.13	12.85
11. Daily Living Activities	4	4	4	O	1	0.78	4.5	1.13	2	8.01	7.84
12. Suitable Design	4	3.5	4	F	1.5	0.76	4.5	1.13	2.63	10.51	10.28

Quality Planning Table (QPT.6)

	B. Customer Importance Rating	C. Care Home (No.6) Performance Rating	D. Our Performance Rating. Care Home (No.7)	E. Kano Category	Value of K	F. m= max (SI, DI)	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4.5	4	O	1	0.86	4.5	1.13	2.09	10.46	10.64
2. Social Interaction	5	4.5	4	O	1	0.82	4	1	1.82	9.1	9.255
3. Autonomy	4	4	4.5	O	1	0.8	4.5	1	1.8	7.2	7.323
4. Accessible Equipment	4	4.5	4	E	1.5	0.82	4	1	2.46	9.821	9.988
5. Meal	4.5	4	4.5	B	0.5	0.91	5	1.11	1.54	6.91	7.028
6. Safety	5	4.5	5	B	0.5	0.92	5	1	1.39	6.928	7.046
7. Family Support	4	5	5	O	1	0.68	5	1	1.68	6.72	6.834
8. Accurate Medical Care	4	4	4.5	B	0.5	0.8	4.5	1	1.34	5.367	5.458
9. Involvement	3	3.5	4	I	0	0.56	4	1	1	3	3.051
10. Homelike Environment	5	4.5	4	E	1.5	0.76	4.5	1.13	2.63	13.13	13.36
11. Daily Living Activities	4	4	4	O	1	0.78	4.5	1.13	2	8.01	8.146
12. Suitable Design	4	3.5	4	E	1.5	0.76	5	1.25	2.92	11.67	11.87

Quality Planning Table (QPT.7)

	B. Customer Importance Rating	C. Care Home (No.1) Performance Rating	D. Our Performance Rating. Care Home (No.8)	E. Kano Category	Value of K	F. m= max (SI, DI)	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4	4	O	1	0.86	4.5	1.13	2.09	10.5	9.4
2. Social Interaction	5	3	3.5	O	1	0.82	4	1.14	2.08	10.4	9.34
3. Autonomy	4	2.5	3.5	O	1	0.8	4.5	1.29	2.31	9.26	8.31
4. Accessible Equipment	4	3.5	4	E	1.5	0.82	4	1	2.46	9.82	8.82
5. Meal	4.5	4.5	3.5	B	0.5	0.91	4	1.14	1.58	7.11	6.38
6. Safety	5	4	4	B	0.5	0.92	4.5	1.13	1.56	7.79	7
7. Family Support	4	4	4.5	O	1	0.68	5	1.11	1.87	7.47	6.71
8. Accurate Medical Care	4	4	4	B	0.5	0.8	4.5	1.13	1.51	6.04	5.42
9. Involvement	3	2.5	3	I	0	0.56	3	1	1	3	2.69
10. Homelike Environment	5	2	2	E	1.5	0.76	3.5	1.75	4.09	20.4	18.3
11. Daily Living Activities	4	4	3.5	O	1	0.78	3.5	1	1.78	7.12	6.39
12. Suitable Design	4	2.5	3	E	1.5	0.76	4	1.33	3.11	12.5	11.2

Quality Planning Table (QPT.8)

	B. Customer Importance Rating	C. Care Home (No.8) performance Rating	D. Our Performance Rating. Care Home (No.10	E. Kano Category	Value of <i>K</i>	F. $m = \max(SI , DI)$	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4	4	O	1	0.86	4.5	1.13	2.09	10.5	10.3
2. Social Interaction	5	3.5	4	O	1	0.82	4	1	1.82	9.1	8.94
3. Autonomy	4	3.5	3.5	O	1	0.8	4.5	1.29	2.31	9.26	9.09
4. Accessible Equipment	4	4	3.5	F	1.5	0.82	4	1.14	2.81	11.2	11
5. Meal	4.5	3.5	4	B	0.5	0.91	4	1	1.38	6.22	6.11
6. Safety	5	4	3.5	B	0.5	0.92	4	1.14	1.58	7.92	7.78
7. Family Support	4	4.5	4.5	O	1	0.68	5	1.11	1.87	7.47	7.33
8. Accurate Medical Care	4	4	4.5	B	0.5	0.8	4.5	1	1.34	5.37	5.27
9. Involvement	3	3	3.5	I	0	0.56	3.5	1	1	3	2.95
10. Homelike Environment	5	2	2.5	F	1.5	0.76	3	1.2	2.8	14	13.8
11. Daily Living Activities	4	3.5	4	O	1	0.78	4	1	1.78	7.12	6.99
12. Suitable Design	4	3	3.5	F	1.5	0.76	4	1.14	2.67	10.7	10.5

Quality Planning Table (QPT.9)

	B. Customer Importance Rating	C. Care Home (No.2) Performance Rating	D. Our Performance Rating. Care Home (N.11)	E. Kano Category	Value of <i>K</i>	F. $m = \max(SI , DI)$	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4.5	4	O	1	0.86	4.5	1.13	2.09	10.46	10.4
2. Social Interaction	5	3.5	4	O	1	0.82	4	1	1.82	9.1	9.09
3. Autonomy	4	3.5	3	O	1	0.8	4	1.33	2.4	9.6	9.58
4. Accessible Equipment	4	3	4	F	1.5	0.82	4	1	2.46	9.821	9.81
5. Meal	4.5	5	4	B	0.5	0.91	4.5	1.13	1.55	6.997	6.99
6. Safety	5	4	4.5	B	0.5	0.92	5	1.11	1.54	7.698	7.69
7. Family Support	4	5	5	O	1	0.68	5	1	1.68	6.72	6.71
8. Accurate Medical Care	4	4.5	5	B	0.5	0.8	5	1	1.34	5.367	5.36
9. Involvement	3	3	3.5	I	0	0.56	4	1.14	1.14	3.429	3.42
10. Homelike Environment	5	4	3.5	F	1.5	0.76	4	1.14	2.67	13.34	13.3
11. Daily Living Activities	4	4	4.5	O	1	0.78	4.5	1	1.78	7.12	7.11
12. Suitable Design	4	4	4	F	1.5	0.76	4.5	1.13	2.63	10.51	10.5

Quality Planning Table (QPT.10)

	B. Customer Importance Rating	C. Cre Home (No.14) Performance Rating	D. Our Performance Rating. Care Home (No.12)	E. Kano Category	F. m= max (SI, IDI)	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)	
1. Caring and Sensitive Staff	5	4	5	O	1	0.86	5	1	1.86	9.3	8.72
2. Social Interaction	5	4	3.5	O	1	0.82	4	1.14	2.08	10.4	9.75
3. Autonomy	4	4.5	4	O	1	0.8	4.5	1.13	2.03	8.1	7.59
4. Accessible Equipment	4	4	3.5	F	1.5	0.82	4	1.14	2.81	11.2	10.5
5. Meal	4.5	5	4	B	0.5	0.91	4.5	1.13	1.55	7	6.56
6. Safety	5	4.5	4	B	0.5	0.92	4	1	1.39	6.93	6.49
7. Family Support	4	4	4	O	1	0.68	4	1	1.68	6.72	6.3
8. Accurate Medical Care	4	4	4.5	B	0.5	0.8	4.5	1	1.34	5.37	5.03
9. Involvement	3	3	4	I	0	0.56	4	1	1	3	2.81
10. Homelike Environment	5	3	2	F	1.5	0.76	3	1.5	3.5	17.5	16.4
11. Daily Living Activities	4	3.5	3.5	O	1	0.78	3.5	1	1.78	7.12	6.67
12. Suitable Design	4	3.5	2	F	1.5	0.76	3	1.5	3.5	14	13.1

Quality Planning Table (QPT. 11)

	B. Customer Importance Rating	C. Care Home (No.11) Performance Rating	D. Our Performance Rating. Care Home (No.14)	E. Kano Category	F. m= max (SI, IDI)	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)	
1. Caring and Sensitive Staff	5	4	4	O	1	0.86	4.5	1.13	2.09	10.5	10.6
2. Social Interaction	5	4	4	O	1	0.82	4	1	1.82	9.1	9.24
3. Autonomy	4	3	4.5	O	1	0.8	4.5	1	1.8	7.2	7.31
4. Accessible Equipment	4	4	4	F	1.5	0.82	4	1	2.46	9.82	9.97
5. Meal	4.5	4	5	B	0.5	0.91	5	1	1.38	6.22	6.31
6. Safety	5	4.5	4.5	B	0.5	0.92	5	1.11	1.54	7.7	7.81
7. Family Support	4	5	4	O	1	0.68	4.5	1.13	1.89	7.56	7.67
8. Accurate Medical Care	4	5	4	B	0.5	0.8	4.5	1.13	1.51	6.04	6.13
9. Involvement	3	3.5	3	I	0	0.56	3	1	1	3	3.05
10. Homelike Environment	5	3.5	3	F	1.5	0.76	3.5	1.17	2.72	13.6	13.8
11. Daily Living Activities	4	4.5	3.5	O	1	0.78	3.5	1	1.78	7.12	7.23
12. Suitable Design	4	4	3.5	F	1.5	0.76	4	1.14	2.67	10.7	10.8

Quality Planning Table (QPT.12)

	B. Customer Importance Rating	C. Care Home (No.6) Performance Rating	D. Our Performance Ratin. Care Home (No.3)	E. Kano Category	Value of K	F. m= max (SI, IDI)	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4.5	4.5	O	1	0.86	5	1.11	2.07	10.3	9.78
2. Social Interaction	5	4.5	4	O	1	0.82	4	1	1.82	9.1	8.61
3. Autonomy	4	4	4.5	O	1	0.8	4.5	1	1.8	7.2	6.82
4. Accessible Equipment	4	4.5	3.5	F	1.5	0.82	4	1.14	2.81	11.2	10.6
5. Meal	4.5	4	3.5	B	0.5	0.91	4	1.14	1.58	7.11	6.73
6. Safety	5	4.5	3.5	B	0.5	0.92	4	1.14	1.58	7.92	7.5
7. Family Support	4	5	4	O	1	0.68	4.5	1.13	1.89	7.56	7.16
8. Accurate Medical Care	4	4	4	B	0.5	0.8	4.5	1.13	1.51	6.04	5.72
9. Involvement	3	3.5	3	I	0	0.56	3	1	1	3	2.84
10. Homelike Environment	5	4.5	3	F	1.5	0.76	4	1.33	3.11	15.6	14.7
11. Daily Living Activities	4	4	3.5	O	1	0.78	4	1.14	2.03	8.14	7.7
12. Suitable Design	4	3.5	3	F	1.5	0.76	4	1.33	3.11	12.5	11.8

Quality Planning Table (QPT.13)

	B. Customer Importance Rating	C. Care Home (No.14) Performance Rating	D. Our Performance Rating. Care Home (No.30)	E. Kano Category	Value of K	F. m= max (SI, IDI)	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4.5	3.5	O	1	0.86	4.5	1.29	2.39	12	11.1
2. Social Interaction	5	4	4	O	1	0.82	4	1	1.82	9.1	8.46
3. Autonomy	4	4.5	4	O	1	0.8	4.5	1.13	2.03	8.1	7.53
4. Accessible Equipment	4	4	3.5	F	1.5	0.82	3.5	1	2.46	9.82	9.13
5. Meal	4.5	5	4.5	B	0.5	0.91	4.5	1	1.38	6.22	5.78
6. Safety	5	4.5	4	B	0.5	0.92	4.5	1.13	1.56	7.79	7.25
7. Family Support	4	4	4	O	1	0.68	4	1	1.68	6.72	6.25
8. Accurate Medical Care	4	4	4.5	B	0.5	0.8	4.5	1	1.34	5.37	4.99
9. Involvement	3	3	2	I	0	0.56	2.5	1.25	1.25	3.75	3.49
10. Homelike Environment	5	3	2	F	1.5	0.76	3	1.5	3.5	17.5	16.3
11. Daily Living Activities	4	3.5	3.5	O	1	0.78	4	1.14	2.03	8.14	7.57
12. Suitable Design	4	3.5	2.5	F	1.5	0.76	3.5	1.4	3.27	13.1	12.2

Quality Planning Table (QPT.14)

	B. Customer Importance Rating	C. Care Home (No.30) Performance Rating	D. Our Performance Rating, Care Home (No.22)	E. Kano Category	Value of <i>K</i>	F. $m = \max(SI , DI)$	G. Target	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	3.5	4	O	1	0.86	4.5	1.13	2.09	10.5	10.7
2. Social Interaction	5	4	3.5	O	1	0.82	4	1.14	2.08	10.4	10.6
3. Autonomy	4	4	4	O	1	0.8	4.5	1.13	2.03	8.1	8.28
4. Accessible Equipment	4	3.5	3.5	F	1.5	0.82	3.5	1	2.46	9.82	10
5. Meal	4.5	4.5	4	B	0.5	0.91	4	1	1.38	6.22	6.36
6. Safety	5	4	3.5	B	0.5	0.92	4	1.14	1.58	7.92	8.1
7. Family Support	4	4	4.5	O	1	0.68	4.5	1	1.68	6.72	6.87
8. Accurate Medical Care	4	4.5	5	B	0.5	0.8	5	1	1.34	5.37	5.49
9. Involvement	3	2	3	I	0	0.56	3	1	1	3	3.07
10. Homelike Environment	5	2	3.5	F	1.5	0.76	4	1.14	2.67	13.3	13.6
11. Daily Living Activities	4	3.5	4	O	1	0.78	4	1	1.78	7.12	7.28
12. Suitable Design	4	2.5	3.5	F	1.5	0.76	3.5	1	2.33	9.34	9.55

Quality Planning Table (QPT.15)

	B. Customer Importance Rating	C. Care Home (No.22) Performance Rating	D. Our Performance Rating, Care Home (No.19)	E. Kano Category	Value of <i>K</i>	F. $m = \max(SI , DI)$	G. Target	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4	4	O	1	0.86	4.5	1.13	2.09	10.5	10.1
2. Social Interaction	5	3.5	3.5	O	1	0.82	4	1.14	2.08	10.4	10
3. Autonomy	4	4	3.5	O	1	0.8	4	1.14	2.06	8.23	7.92
4. Accessible Equipment	4	3.5	3	F	1.5	0.82	3.5	1.17	2.86	11.5	11
5. Meal	4.5	4	4	B	0.5	0.91	4	1	1.38	6.22	5.99
6. Safety	5	3.5	4	B	0.5	0.92	4	1	1.39	6.93	6.67
7. Family Support	4	4.5	4	O	1	0.68	4.5	1.13	1.89	7.56	7.28
8. Accurate Medical Care	4	5	4.5	B	0.5	0.8	5	1.11	1.49	5.96	5.74
9. Involvement	3	3	2.5	I	0	0.56	3	1.2	1.2	3.6	3.47
10. Homelike Environment	5	3.5	2.5	F	1.5	0.76	3	1.2	2.8	14	13.5
11. Daily Living Activities	4	4	3.5	O	1	0.78	4	1.14	2.03	8.14	7.83
12. Suitable Design	4	3.5	3	F	1.5	0.76	3.5	1.17	2.72	10.9	10.5

Quality Planning Table (QPT.16)

	B. Customer Importance Rating	C. Care Home (No.30) Performance Rating	D. Our Performance Rating. Care Home (No. 18)	E. Kano Category	Value of K	F. m= max (SII, IDI)	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	3.5	3	O	1	0.86	4	1.33	2.48	12.4	10.3
2. Social Interaction	5	4	3	O	1	0.82	3.5	1.17	2.12	10.6	8.85
3. Autonomy	4	4	4	O	1	0.8	4.5	1.13	2.03	8.1	6.75
4. Accessible Equipment	4	3.5	3.5	E	1.5	0.82	4	1.14	2.81	11.2	9.36
5. Meal	4.5	4.5	4	B	0.5	0.91	4	1	1.38	6.22	5.19
6. Safety	5	4	4.5	B	0.5	0.92	4.5	1	1.39	6.93	5.78
7. Family Support	4	4	4.5	O	1	0.68	4.5	1	1.68	6.72	5.6
8. Accurate Medical Care	4	4.5	4.5	B	0.5	0.8	5	1.11	1.49	5.96	4.97
9. Involvement	3	2	2	I	0	0.56	2.5	1.25	1.25	3.75	3.13
10. Homelike Environment	5	2	1.5	E	1.5	0.76	3	2	4.67	23.3	19.5
11. Daily Living Activities	4	3.5	3	O	1	0.78	3.5	1.17	2.08	8.31	6.93
12. Suitable Design	4	2.5	2	E	1.5	0.76	3.5	1.75	4.09	16.3	13.6

Quality Planning Table (QPT.17)

	B. Customer Importance Rating	C. Care Home (No.7) Performance Rating	D. Our Performance Rating. Care Home (No.23)	E. Kano Category	Value of K	F. m= max (SII, IDI)	G. Trget	H. Improvement Ratio	I. Adjustment Improvement Ratio	J. Adjustment Importance	K. Relative Importance (%)
1. Caring and Sensitive Staff	5	4	4	O	1	0.86	4.5	1.13	2.09	10.5	10.5
2. Social Interaction	5	4	3.5	O	1	0.82	4	1.14	2.08	10.4	10.4
3. Autonomy	4	4.5	4	O	1	0.8	4.5	1.13	2.03	8.1	8.14
4. Accessible Equipment	4	4	3.5	E	1.5	0.82	3.5	1	2.46	9.82	9.87
5. Meal	4.5	4.5	5	B	0.5	0.91	5	1	1.38	6.22	6.25
6. Safety	5	5	4	B	0.5	0.92	4.5	1.13	1.56	7.79	7.83
7. Family Support	4	5	5	O	1	0.68	5	1	1.68	6.72	6.75
8. Accurate Medical Care	4	4.5	4	B	0.5	0.8	4.5	1.13	1.51	6.04	6.07
9. Involvement	3	4	3.5	I	0	0.56	3.5	1	1	3	3.01
10. Homelike Environment	5	4	3.5	E	1.5	0.76	4	1.14	2.67	13.3	13.4
11. Daily Living Activities	4	4	4	O	1	0.78	4	1	1.78	7.12	7.15
12. Suitable Design	4	4	4	E	1.5	0.76	4.5	1.13	2.63	10.5	10.6

Appendix G The evaluation questionnaire

Company:		Date:
Start:	End:	Duration
Name of Evaluator (optional)		Position:
Pre post-testing	<p>1. Do you have knowledge of how quality of care can be improved based on residents needs and requirements (please tick ✓)</p> <p>1. I know little about it <input type="checkbox"/></p> <p>2. I have heard about, but I am not familiar with it <input type="checkbox"/></p> <p>3. I am quite familiar with it <input type="checkbox"/></p> <p>4. I'm familiar with it and have experience of it <input type="checkbox"/></p>	
	<p>2. Who do you involve for improving quality in care homes? Why?</p> <p>1. Resident <input type="checkbox"/></p> <p>2. Family/ Friend <input type="checkbox"/></p> <p>3. Employees <input type="checkbox"/></p> <p><u>Comments:</u></p>	
	<p>3. Do you know what are residents' most important needs and requirements?</p> <p>1. Yes <input type="checkbox"/></p> <p>2. No <input type="checkbox"/></p> <p>Please name a minimum of 5 most important residents' requirements.</p> <p>1.</p> <p>2.</p> <p>3.</p> <p>4.</p> <p>5.</p>	

<p>4. How do you try to improve quality in your care home?</p> <p><u>Comments:</u></p> <p>5. Do you use any tools or method to improve quality in your care home?</p> <p>1. Yes <input type="checkbox"/></p> <p>2. No <input type="checkbox"/></p> <p>If yes what method(s) do you use?</p>	
<p>6. Do you know your organisation's priorities for improving resident satisfaction?</p> <p>1. Yes <input type="checkbox"/></p> <p>2. No <input type="checkbox"/></p> <p><u>Comment:</u></p>	
<p>7. How do you prioritise the factor (s), which can improve resident satisfaction?</p>	
<p>Questions:</p>	<p>Answers (Please write down your comments)</p>

Reaction	Q8. A) This session was relevant to my work	Strongly Disagree					Strongly Agree
		1	2	3	4	5	
		<u>Comments:</u>					
	Q9. B) How would you rate the session overall?	Disappointing					Outstanding
		1	2	3	4	5	
		<u>Comments:</u>					
	Q10. C) How much of the session's content could you relate back to your work?	Not much					Very much
		1	2	3	4	5	
		<u>Comments:</u>					
	Q11. D) How valuable was this session for improving residents' satisfaction in care home?	Not valuable					Very valuable
		1	2	3	4	5	
		<u>Comments:</u>					
	Q12. E) Please rate the usefulness of the resource.	Very low					Very high
		1	2	3	4	5	
		<u>Comments:</u>					

	Q 13. F) What stage (s) of this procedure did you find more useful?	
Learning	Q14. G) Can the QFD process help answer the questions you wrote down in pre-task?	<p>Not much Very much</p> <p>1 2 3 4 5</p> <p><u>Comments:</u></p>
	Q15. H) Does the session help raise your awareness of the value of new methods for improving quality in care homes? How?	<p>1. Yes <input type="checkbox"/></p> <p>2. No <input type="checkbox"/></p> <p><u>Comments:</u></p>
	Q16. I) I have gained new skills and knowledge that will improve my effectiveness.	<p>Strongly Disagree Strongly Agree</p> <p>1 2 3 4 5</p> <p><u>Comments:</u></p>
	Q17. J) What was the most valuable piece of new learning you received in this session?	<u>Comments:</u>

	Q 18. K) To what extent will the methodology be useful for improving residents' satisfaction in care home?	Not much 1 2 3 4 5 A lot Comments:
Behavior	Q19. L) Did the programme help you answer any questions you had not thought of pre-task?	1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> Comments:
	Q20. M) To what extent will the residents' satisfaction be improved as a result of the session?	Not at all... Some extent... Large extent... Comments:
	Q21. N) Will you apply what you learned from the session to your work/ organisation?	1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> Comments:
	Q22. P) Will you change your behavior based on what was learnt?	1. Yes <input type="checkbox"/> 2. No <input type="checkbox"/> Comments:

Results	Q23. Q) How has the program contributed to accomplishing care home quality improvement goals?	<p>Very low Very high</p> <p>1 2 3 4 5</p> <p><u>Comments:</u></p>
	Q24. R) How you would apply what you learnt?	<u>Comments:</u>
Other comments:		

Appendix H List of publications

Shamshirsaz, S.A. & Dong, H., 2011. Voice of Customer (VoC) analysis in care homes, *Brunel Institute for Ageing Studies (BIAS) Annual Conference*. London: Brunel University.

Shamshirsaz, S.A. & Dong, H., 2012. Improving quality of care homes. *Brunel Institute for Ageing Studies (BIAS) Annual Conference*. London: Brunel University.

Shamshirsaz, S.A. & Dong, H., 2012. Increasing residents' satisfaction in care homes. Post Graduate Poster Conference. London: School of Engineering and Design, Brunel University.

Shamshirsaz, S.A. & Dong, H., 2012. Investigating residents' satisfaction in care homes. *Emerging Researchers in Ageing Conference (ERA 2012)*. Keel: Keel University.

Shamshirsaz, S.A., Dong, H. & Aghlmand, S., 2012. Using Voice of Customer (VoC) techniques to explore residents' satisfaction in care homes in the UK. *The 4th International Conference for Universal Design (UD2012)*. Fukuoka.

Shamshirsaz, S.A. & Dong, H., 2013. Using Quality Function Deployment (QFD) to Increase Residents' Satisfaction in Care Homes. *Proceedings of ReSCon 2013*. London: School of Engineering and Design.

Shamshirsaz, S.A. & Dong, H., 2013. Understanding and ranking residents' requirements in care homes. *Proceedings of ReSCon 2012*. London: School of Engineering and Design, Brunel University.

Book Chapter

Shamshirsaz, S.A. & Dong, H., 2014. Improving residents' satisfaction in care homes: what to prioritise?. In: Langdon, P.M., Lazar, J., Heylighen, A. & Dong, H. *Inclusive Designing: Joining Usability, Accessibility, and Inclusion*, pp.119-129. Switzerland: Springer.