



**THE Q BELL: EXPERIENCES OF PATIENTS WITH DISABILITIES  
UTILISING A NEW CALL BELL SYSTEM**

By

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## DECLARATION

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DISABILITIES UTILISING A NEW CALL BELL SYSTEM

In accordance with Rule G5.6.3, I hereby declare that the above-mentioned thesis is my own work and that it has not previously been submitted for assessment to another University or for another qualification.



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04-12-2017  
.....

**DATE**

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## ABSTRACT

The Q-bell is a newly developed call bell system that aims to simplify the lives of people living with disabilities by providing a means for them to easily summon assistance from caregivers when needed. The product is designed to be hands free so that a patient only has to exert minimal pressure on the device with any part of the body such as the cheek to call for attention.

The aim of this study was to explore and describe the experiences of disabled participants regarding the functionality of the Q-bell systems during their stay in a care facility. To achieve this aim, an exploratory, descriptive, contextual, qualitative design was decided upon. There was a paucity of similar studies and this method was deemed the most effective method to fully grasp, contextualize and interpret the experiences of the research participants following the use of the Q-bell.

The research population included all people with disabilities who were in care facilities. A purposive sampling method was used to identify a small number of disabled participants in care facilities to use the Q-bell. The researcher approached selected facilities and the residents in their care who had limited to no function of their hands and arms to test the Q-bell. The participants were given the Q-bell to use for 2-3 days, after which semi-structured interviews with participating individuals were conducted. Due to difficulties the researcher had with the infrastructure at the facilities eight participants were approached and interviewed in this study.

All the interviews were conducted in private, but face to face, at the bedside of each participant, in the facilities of care. Digital voice recordings of these interviews were made subsequent to informed consent being sought from the participants. Verbatim transcripts of the recordings were made and a thematic analysis using Tesch's method, was performed by the researcher followed by a consensus meeting with the independent coder. Ethical considerations such as beneficence, justice, autonomy, informed consent were adhered to by the researcher. Trustworthiness was achieved by following Guba's principles of credibility, applicability, consistency and neutrality.

Three themes emerged from the data analysis. Theme one highlighted the participants' experiences whilst using the Q-bell. Theme two reflected the positive characteristics of the Q-bell when compared to other call devices the participants

might have used while theme three posed possible recommendations the participants had to possibly improve on the design of the Q-bell. The research report concludes with the research limitations and recommendations.

**Keywords:** Call Bells, Care facility, Disabilities, Q-bell, Experience

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# CHAPTER ONE

## OVERVIEW OF THE STUDY

### 1.1 INTRODUCTION

Call bells are prevalent in healthcare facilities across the nation and their use directly influences the delivery of nursing care. Call bells provide an opportunity for people to freely request assistance during their stay at care facilities, this technology serves as a means of communication between individuals and their care providers that are usually conducting rounds or busy with other tasks outside of the rooms.

The call bell system has developed into a vital component for healthcare facilities around the world, as modern care facilities are required to provide and maintain a nurse or emergency call system for residents. Nurses are the foundation of healthcare facilities and the nurse call system allows them to provide the greatest care to people. Call bells have enabled the transition of care from hospital wards of old, where safety and efficiency was maintained by keeping an eye on all of the people at once. Modern care facilities provide individuals with private rooms, where caregivers cannot ordinarily keep a constant watch on each person, prompting an over-reliance on call devices for assistance. Nursing staff in care facilities need the reassurance that the call bell works, providing peace of mind for both themselves and the individuals in their care.

Traditional call systems have been limited by their design to individuals who have complete or functional dexterity in their hands. They do not cater for those who have temporary or permanent loss of the use of their hands and arms. The most frequently used call bell in hospitals and other care facilities is a small, hand-held device with a series of buttons on them. Currently the market has a shortage of call devices that people with disabilities can easily use, leaving a significant number of the disabled people without the means to summon assistance, that ultimately leads to negative consequences to the individual's wellbeing or organizations being sued for negligence.

This sentiment was further affirmed by the Minister of Health, Dr Aaron Motsoaledi, during an interview with John Robbie, where he mentioned that the South African

healthcare system has been inundated with the increase in medical malpractice legal proceedings (Ramphela, 2015). The article highlights that the litigation cases had reached a crisis level prompting practitioners to avoid areas of specialisation (Ramphela, 2015). Sohn (2013:49) states that litigation arises from a misconception that people have between negligence and adverse event. The study mentions that only a fraction of injuries arise from medical negligence from the caregivers while a large number of these injuries result from inherent risks involved with certain procedures. Sohn (2013:55) further mentions that healthcare agencies should conduct research on determining the difference, in order to reduce unnecessary costs to healthcare service.

The inability to use a call bell during his stay at the care centre, inspired and led an engineer to develop the Q-bell. The university where the Q-bell was developed sought a researcher to investigate the suitability of the Q-bell for disabled people to ensure potential clients can indeed use the device, and find it user-friendly and fit for purpose. The data from this study will be utilized to make changes to the design and to make decisions regarding the feasibility of production of the Q-bell.

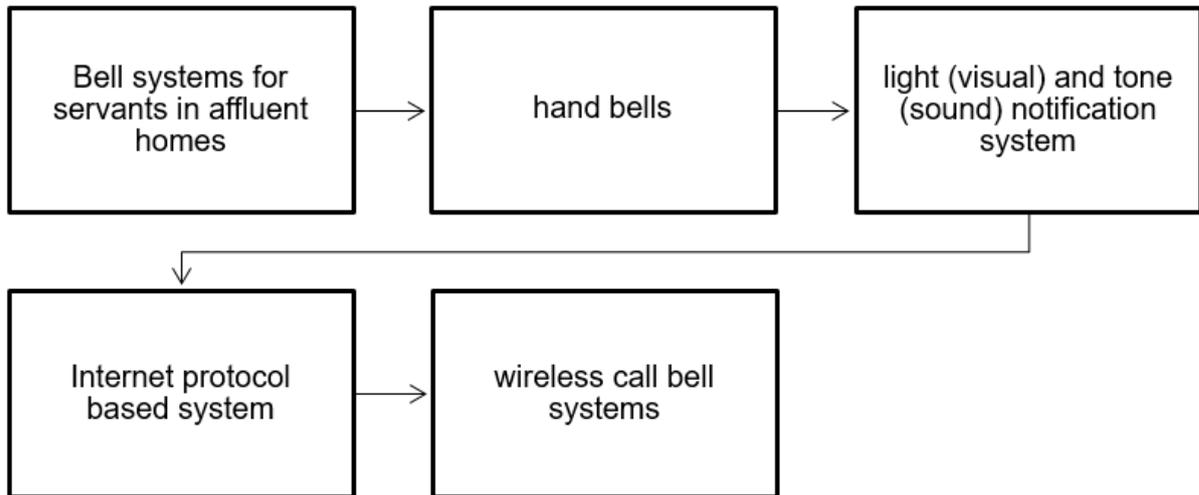
## **1.2 BACKGROUND AND RATIONALE**

The call bell system as it is known today is vastly different from its origins, with the simple form consisting of a push button in the room, a light above the door and a central location where calls can be viewed. Advances in technology, and the ever-changing healthcare system means the modern nurse call system has progressed from being a simple device into having specialised devices that offer a range of other functions besides calling assistance. The call bell now also functions as a remote to control the bed and the television.

There is no documented evidence of the earliest concept of the nurse call systems but it is believed that an alerting system for nursing care was adapted from the bell systems for servants in affluent homes. During its inception Florence Nightingale, who was at the forefront of modern nursing techniques during her era, took note of the system and applied it to her caring environment (Davis, 2017).

As stated by TekTone (2017) the internet protocol-based system is one of the biggest changes to nurse call systems. The system allows the nurse call system to

integrate with other platforms, such as the fire alarm, wander management and security systems. Since implementation, ideas on how to improve nurse call systems, have grown allowing effective communication between staff and people in their care.



**Figure 1.1: Illustration of the progress of nurse call systems**

Manufacturers of nurse call devices are stepping up to provide wireless systems that provide the same capabilities as their internet protocol based counterparts. A view point that is shared with Building Better Healthcare (2013:4) who express that enormous steps have been taken to improve and develop call bell systems designs, in an attempt to provide quality care to people, causing older less effective systems to rapidly become obsolete. Figure 1.1 illustrates the technological strides the call bell has gone through starting from a simple bell used for servants to wireless systems that can be integrated with most systems. These technological advancements namely the internet protocol based systems and the wireless systems provide the caregivers with remote access to the system using the internet as an access point. One of the earliest examples of a call bell, a bulky device that offered very little in functionality (see figure 1.2), did not provide people in care facilities with much of an option on how the residents can effectively operate the device.



**Figure 1.2: Earlier model of a call bell. (Source: Building better healthcare: 2013)**

Statistics distributed by The World Bank (2016) reveal that 15% or one billion of the world's population is currently living with some form of disability, and approximately 20% of this number, or 110 to 190 million people, have significant disabilities. Statistics South Africa (2011:57) revealed that the disability prevalence amongst individuals in South Africa aged 5 years or older is 7.5% of the population, or 2.87 million out of 38 million; 2% of these are individuals who have difficulties with movement and self-care.

Disability and its management present a challenge to the people who need care, to healthcare institutions, to healthcare providers and to communities. According to the South African White Paper on the Rights of Persons with Disabilities (2015:42), transformation of the healthcare system is needed to improve the care of the disabled. These improvements are aimed at removing barriers such as communication and strengthening access to disability-specific health services.

Joshi, Sochaliya, Purani & Kartha (2013:1) mention that the scope of healthcare needs varies widely depending on resources available to address local health problems, individual needs and personal attitudes. There is an urgent need for the healthcare departments and private providers of care, to provide a comprehensive and accessible environment for any person especially for people with disabilities, by providing excellent care during their stay at the facilities and by offering the same level of accessibility, resources and infrastructure to all patients.

Health is a human rights issue and facilities should provide people with accessible healthcare service, which includes provisions aimed at making the adaptations that are suitable for everyone (South Africa, Department of Social Development, 2015:80). Each person admitted to a hospital or a care facility expects quality healthcare. Healthcare facilities should make provision for individuals with special needs and provide them with access to assistance by healthcare providers as each person is unique and care centres need to provide for this uniqueness. Various individuals will require assistance, coming with pre-existing or acute conditions that need to be catered for. By doing this the facility can provide a unique service that can be specific to the person on the receiving end.

People in long term facilities often require assistance with basic self-care, such as ablution, ambulation and eating, and usually communicate their need for assistance by using the call bell. People trust that when they use a call device, someone will respond. Call light systems are used to communicate a person's needs to staff; and the prompt answering of the call light directly affects the satisfaction and perceptions of quality. Nurses want the reassurance that their individuals will have the ability to contact them when the need for assistance arises (Kalisch, Labelle & Boqin, 2013:2). In a study by Tzeng (2011:229), 5.7% of the participants indicated that their use of the call bell was for urgent situations, 14.3% of the respondents indicated that their use of the call bell always related to their safety, while 38.7% indicated that their use sometimes related to their safety (Tzeng, 2011:229).

An extremely competitive environment has developed over the past few decades as more healthcare providers enter the market. The increase in consumer sophistication and an increased demand for a certain quality of care has prompted organisations to constantly improve the quality of care, to maintain and grow their market share and to strengthen their customer loyalty (Joshi, *et al.*, 2013:659). The lack of provision of call bells and the assumption that individuals entering the premises have the required dexterity to move and operate a call device, will significantly affect the image of the facility and its turnover. Negative effect such as this impacts the market share and value of service prompting a change in service providers. A person's satisfaction has therefore become increasingly important in healthcare. Today, people view themselves as consumers and as such, satisfaction

can be seen as an effective indicator of an organisation's success in the market and as a leading provider in healthcare services (Prakash, 2010: 151).

The combination of the Health Charter of South Africa and the Batho Pele Principles sets guidelines on how healthcare facilities should treat people who are in their care (Department of Public Service and Administration, 1997:7). These guidelines state that people have a right to healthcare and that provisions should be made for individuals who have special needs.

Organisations and staff who prioritize satisfaction have been shown to have positive responses from participants and better compliance to treatment (You, Aiken, Sloane, Liu, He, Hu, Jiang, Li, Liu, Shang, Kutney-lee & Sermeus, 2013:160). Satisfaction greatly depends on the perceptions of the person; how they perceive the quality of care they received during their stay in hospital. The availability and efficiency of the technology used in the healthcare facility, the quality of food received, the general hygiene of the institution and the financial implications of their care, all play an important role in shaping the perception of the people (Isaac, Zaslavsky, Clearly & Landon, 2010:1025). Soundararajan (2017:3205) states that viewing satisfaction as a tool to measure the overall standard of a facility, especially with the care and treatment, will lead to smart decisions being made to improve health care and people happiness. The study further highlights the importance of satisfaction to the facility's image and is an aspect that all facilities should take note of.

Safe care is mainly determined by the ability of a person to obtain assistance when necessary. Communication between the individuals and the healthcare representative is essential for each person's well-being. This communication between people and a healthcare professional ensures not only that a person gets what they need, but also that they get what they need in a timeous and an efficient manner (Llewellyn, 2016:1).

According to Bachman (2012:3), an individual's satisfaction level with nursing care depends on the person's perception of how well the nursing staff is able to meet his or her needs. Failures of this system can result in communication breakdown and exposure to preventable harm. Communication breakdown between the healthcare

workers and the people in their care is revealed in an article by Borland (2015:1), where it was discovered that only 13% of the participants who requested assistance were immediately helped. The study also indicated that 6% of participants' calls were not answered immediately and 1% of the participants' calls were not answered at all. A study conducted by Tzeng (2011:230) states that the average person expects the nursing staff to respond to their summons within 2 minutes and 30 seconds, whereas results from this study found that at the average response time was around 3 minutes. This rapid response from the nursing staff in the study played a significant role in the overall impression of the effective care of the individuals in their care. Due to the above-mentioned, the study by Tzeng (2011:231) reflects that the vast majority of the participants (97.5%) stated that their summonses were always taken care of by the nursing personnel.

Various wired and wireless monitoring devices that use computers to alert a healthcare professional of the status of the people in their care were introduced to the healthcare field due to the urgent need for communication between the two parties, with the call bell being the most prominent and widely used device (Llewellyn, 2016:1). Although medical technology has progressed significantly, with notable contributions to the call bell and its improvement in workflow, there has been little done to improve its functionality, especially for the disabled (Tzeng, 2010:3).

The traditional design of call bells does not consider the range of difficulties disabled individuals have in using them. Certain individuals may be unable to use a call bell due to cognitive, visual, or physical disability (Duffy, Mallery, Gordon & Carver 2013:2). Quadriplegic or hemiplegic individuals will have to either wait for a nurse or make use of resourceful methods such as using the head to push the button or perhaps roll onto the call button to exert enough pressure to activate the alarm, whereas the mentally ill may not have the mental capacity to utilize a multi-button call bell.

The inability to operate a call bell raises safety concerns, especially for those deemed vulnerable due to physical disability. A Canadian study revealed that a large proportion of elderly hospitalised people were unable to access their call bells (Duffy et al., 2013:2). The study illustrated the importance of ensuring that the call bell is within reach of these individuals. Call bells also increase the sense of security

for the people in the care of the facilities and their visitors and can also be used by the nursing staff to summon colleagues for assistance in case of emergencies.

The use of multiple call bell systems and technical personnel to maintain them is costly for healthcare organisations. Using one standardized call bell, which is user friendly for both the disabled and the able bodied participants, will mitigate most of the costs involved with call systems. Mdbuyline (2014) states that acquiring a call bell system can cost organisations between \$2500 to \$10 000 (R30 000 to R120 000) per room depending on the system of choice. Organisations are thereafter charged 15 to 28 percent of the selling price in yearly software maintenance fees. These costs are extremely high and can cost facilities a large sum of money, especially if multiple devices are purchased. As a results long term facilities, especially those in the rural areas, have neither access to a system nor can they afford to purchase a system coupled with the daily operation of the facility.

### **1.2.1 Call Bells**

The design and functionality of call bells has changed significantly as we have moved into a more technological based era. Call bells have progressed from non-electric to electric and now to wireless. Modern call bells do more than request assistance from the caregivers.

#### **1.2.1.1 Benefits of call bells**

Call bell systems have made communication easier in a variety of industries but most especially in the healthcare facilities setting, where mere seconds could mean the difference between life and death. The importance of having a reliable communications system in place is invaluable and cannot be over emphasized. (Bellme, 2015).

The advantages of having an operational call system are explained by Mdbuyline, (n.d.) as:

- Eliminating resource intensive, time wasting, manual processes therefore improving efficiency and reducing costs
- Improvement effort by the facilities thus complying with best practices

- Preventing hospital-acquired conditions
- Improving satisfaction
- Leading to improved outcomes

### Improving staff satisfaction



**Figure 1.3: First type of call bell used at the care facility. (Source: Micro Nursecall Systems, 2013)**



**Figure 1.4: Second type of call bell used at the care facility. (Source: Micro Nursecall Systems, 2013)**

As stated earlier in the chapter, there have been various advancements with call bells stemming from traditional non-electric devices such as the hand bell to electronic devices and wireless internet based systems. These new systems provide adaptability for the caregivers and the people under their care. Table 1.1 below depicts the different call bell previously used by care facilities and the innovative bells that are currently available today.

**Table 1.1: Types of call bells available:**

NAME OF PRODUCT	DESCRIPTION OF PRODUCT
<b>Tradition non – electric and electrical devices</b>	
<p style="text-align: center;">Non- electrical device</p> 	<ul style="list-style-type: none"> <li>• Earlier renditions of the call system</li> <li>• Very basic design used to attract attention</li> </ul>
<p style="text-align: center;">Dovecor: Wireless Nurse Call</p> 	<ul style="list-style-type: none"> <li>• wireless and water resistant</li> <li>• can be used in bathrooms</li> <li>• makes use of a remote control device, which might not be user friendly</li> <li>• wall mounted and can be used in a variety of ways</li> </ul>
<p style="text-align: center;">Micro Nurse call Systems: MH-T08</p> 	<ul style="list-style-type: none"> <li>• South African product</li> <li>• multi-functional has TV remote switches</li> </ul>

NAME OF PRODUCT	DESCRIPTION OF PRODUCT
<b>Tradition non – electric and electrical devices</b>	
<p style="text-align: center;">Curbell: E-Z Call</p> 	<ul style="list-style-type: none"> <li>• Can be placed anywhere for activation including cheek, foot, head, etc. and large tented design allows for flexibility and ease of use</li> </ul>
<p style="text-align: center;">Curbell: Mechanical Pad</p> 	<ul style="list-style-type: none"> <li>• Perfect for participants who have difficulty using call cords or pillow speakers as they have a large, sensitive surface area and can be activated from any direction</li> </ul>
<b>Adaptive call bells</b>	
<p style="text-align: center;">Breath activated call/breath call</p> 	<ul style="list-style-type: none"> <li>• Breathcall is activated by breathing into a disposable straw and filter assembly.</li> <li>• Has a flexible gooseneck which bends to almost any position to suit the user.</li> <li>• Suitable for individuals with no motor skills</li> </ul>
<p style="text-align: center;">PAD/CALL Nurse Call</p> 	<ul style="list-style-type: none"> <li>• PadCall is a pneumatic air activated call cord</li> <li>• Designed for people who have difficulty activating standard call cords.</li> <li>• Suitable for people with sufficient motor skills to press or lean on the pad</li> </ul>
<p style="text-align: center;">Buddy Button or Jelly Bean</p> 	<ul style="list-style-type: none"> <li>• Small size for easy placement and sensitive to touch.</li> <li>• Useful for people who have limited hand dexterity.</li> </ul>

Call bells normally come with their own adapters to connect to the wall unit and, depending on the manufacturer, these devices might have different connection points and different voltages. Wireless nurse call systems are very cost effective to

implement into any medical setting or home environment as they eliminate the cost involved with installing cumbersome wall units that might have to be maintained costing the facilities. A completely wireless nurse call button means that there are no unsightly wires hanging about or the need to remove and safeguard the system and devices if any remodelling needs to be done in the future. Despite the benefits of having a wireless system, these types of devices pose a challenge in upkeep. Being completely untethered from any power source, alternate sources such as batteries are required adding to the costs to the care facilities and excluding maintenance.

However, little research was found on the ease of use of call bells, the best structure for a call bell, ease of installation or the importance of these bells in the lives of the disabled. The significance of such a study has gone by relatively unnoticed, despite the significance and consequences this will have especially for the disabled population.

### **1.3 PROBLEM STATEMENT**

Currently the market has a variety of call systems that are available to health care providers and consumers. The conventional call bell system poses a challenge for many people with disabilities as it requires them to have some manual dexterity and a measure of mental capacity in order to operate them. The inability to operate a call bell system, in a healthcare setting, was personally experienced by the developer of the Q-bell, who became paralysed due to an infection. During his time at a healthcare facility he experienced great difficulty when it came to getting attention from the nurses because he was unable to make use of his hands to summon them or to ring the hospital call button. In many instances he had to wait until the nurses came in to check on him in order to alert them to his needs. This frustrated him and prompted him to create a product that assisted in resolving the issue of call buttons that were not conducive to all participants, namely the Q-bell. In order to market the device, the product must be tested for customer satisfaction e.g. user friendliness, fit for purpose and functionality.

The following research question was therefore posed:

*How do participants with disabilities experience using the Q-bell call bell system?*

## **1.4 RESEARCH AIM**

The aim of this study was to explore and describe the experiences of participants with disabilities regarding the use of the Q-bell system during their stay in a healthcare facility.

## **1.5 RESEARCH OBJECTIVES**

The study objectives were to:

- Explore and describe the experiences of participants with disabilities, regarding their satisfaction with the Q-bell system.
- Make recommendations based on the feedback from participants in order to facilitate further development of the Q-bell system.

## **1.6 KEY CONCEPTS**

To ensure uniformity of understanding, theoretical definitions and explanations of the following concepts of the study are now listed.

### **1.6.1 Call bell**

A call bell is a device that uses electricity and is therefore tethered to the wall in some manner. It is used by the people in order to request assistance from care givers (Medical Dictionary, 2009). In this study the call bells will be limited to the Q-bell that will be provided and used by the participants for a period of time. See Table 1.1.

### **1.6.2 Care facilities**

A care facility is an institution that provides healthcare to the public. These facilities normally include hospitals, clinics and specialized care centres (MedicinePlus, 2014). In this study care facilities will be limited to long-term care and rehabilitation centres.

### **1.6.3 Disability**

The United Nations (UN) Convention on the Rights of Persons with Disabilities states *"Persons with disabilities include those who have a long-term physical, mental, intellectual or sensory impairment which, in interaction with various barriers, may hinder their full and effective participation in society on an equal basis with others"* (UN, 2006:4). In this study disabled individuals were limited to those who have suffered from an injury or illness that has led to them having limited functionality of their hands, arms and legs. The researcher will assume that the participants have the cognitive ability to use the Q-bell, even though it will be demonstrated to them.

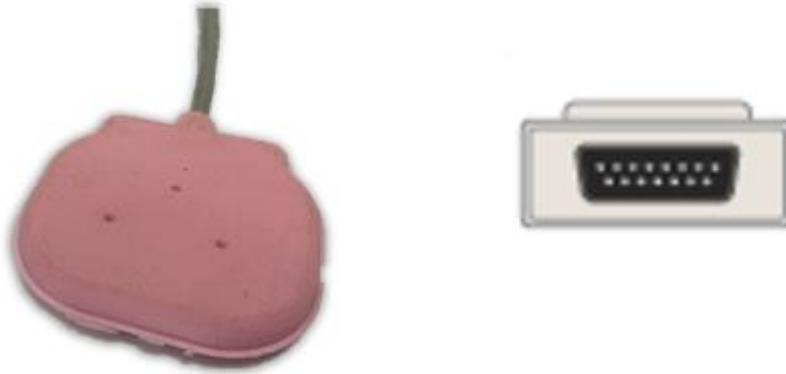
### **1.6.4 Experiences**

Experience is the process of getting knowledge or a skill from doing, seeing, or feeling things (Merriam-Webster, n.d). In this study experience was used to describe the participant's opinions whilst utilising the Q-bell.

### **1.6.5 Q-bell**

The Q-bell is designed to be user friendly for all its users. This device was developed to bridge the communication gap between the caregivers and the users. The device was designed to mainly assist people with manual disabilities to summon assistance. The key design features of the device include:

- Q-bell is a flat call device providing easier manipulation of the device.
- Instead of using one's hands to press the call button, participants can now place the Q-bell on their shoulders so that they can use their cheeks to exert pressure on the Q-bell to ring when they are in need of attention.
- A sock pocket covers the Q-bell for hygiene purposes so that when a person is discharged, the sock pocket can be removed, washed and replaced for use by the next person.
- The use of a disposable latex glove is also an option.
- The design of the Q-bell has to be connected into a serial port that is typically available at facilities such as hospitals.



Source: Curbell Medical, n.d

**Figure 1.5: Illustration of Q-bell and connection used by the Q-bell**

## **1.7 RESEARCH DESIGN AND METHODOLOGY**

Kumar (2011:94) describes a research design as the investigatory plan, procedures and strategies used by the researcher to obtain answers to research questions or problems. The design is used by the researcher to communicate how data will be collected to answer the research questions (Kumar, 2011:94). The overall decision involves justification of research methodologies that will be adopted in the study (Creswell, 2013:42). Research methods are techniques researchers use to structure a study, gather information and analyse relevant information (Polit & Beck, 2012:12). The research method gave a description of the population who participated in the study, how participants were chosen through sampling and how data was gathered and analysed. These will be discussed more fully in chapter 2.

## **1.8 CHAPTERS IN THE STUDY**

### **CHAPTER 1: Introduction and overview of the study**

Chapter 1 provided an introduction and general overview of this study. The chapter defined the research aims and objectives of this study, providing a description of the key concepts that are important this study

## **CHAPTER 2: Research design and methods**

The researcher will provide a detailed description of the research design and methods for this research study in this chapter. The chapter will also highlight the different approaches the researcher used to ensure trustworthiness and the ethical aspects pertaining to this study.

## **CHAPTER 3: Discussion of results and literature control**

This chapter will present the data findings and supportive literature related to the study. The chapter will discuss the various themes identified from the interviews conducted by the researcher.

## **CHAPTER 4: Limitations, Summary, Recommendations and Conclusion.**

In chapter 4, the researcher will present recommendations relating to possible design improvements, creating awareness and listing the research limitations. These recommendations are intended to improve the quality of health care in care facilities.

### **1.9 SUMMARY OF THE CHAPTER**

This chapter provided a brief overview of the topic being researched. The problem statement and the objectives were outlined within the context of the topic. The research methodology will be discussed in detail in chapter 2.

## **CHAPTER TWO**

### **RESEARCH DESIGN AND METHODOLOGY**

#### **2.1 INTRODUCTION**

Chapter one provided an introduction to the study in which the research problem was identified and the research objective was stated. This chapter will present an in-depth description of the research design and method.

#### **2.2 RESEARCH DESIGN**

As stated in chapter one, a research design is the investigatory plan, procedures and strategies used by the researcher to obtain answers to research questions or problems (Kumar, 2011:94). Given the nature of the study and the research questions it was decided that a qualitative, explorative, descriptive and contextual research design should be adopted. This choice was warranted due to the limited number of similar studies and deemed to be the most effective method to fully grasp, contextualize and interpret the content of the research. Such a design assists in gaining a deeper understanding of the experiences of persons with disabilities who were utilising the Q-bell call system.

##### **2.2.1 Qualitative research**

Qualitative research is the process that involves questions and procedures for exploring and understanding the context of a phenomenon that is unknown or not well understood (Creswell, 2013:42). Creswell (2013:44) further describes qualitative research as an approach to enquire into and collect data within the natural environment of the participants. Qualitative enquiry is conducted to provide the researcher with a detailed perspective of a few people by capturing the voices of the participants in the situation and translating their experiences within the given context (Creswell, 2015:5). Qualitative enquiry is conducted by researchers to allow participants to share their stories and views on the topic by removing the views of the researcher and rather focusing on the experiences of the participants in the research (Creswell, 2015:5). Qualitative data is produced in words reflecting the

participant's experiences, views, thoughts, and opinions relating to a phenomenon rather than in the form of numbers (Creswell, 2015:30).

Qualitative research provides an in-depth analysis of the characteristics of a phenomenon in an attempt to understand it (Botma, Greeff, Malaudzi & Wright, 2010:272). The researcher collects data by asking questions, which will thereafter be organised and analysed by using themes or codes to make sense of the data (Creswell, 2013:52). In qualitative research, a variety of data collection procedures are employed, allowing the researcher to collect multiple forms of data, adequately analyse them, and to spend adequate time in the field (Creswell 2015:30). A qualitative researcher provides high quality reports based on an in-depth examination of the characteristics or qualities of a phenomenon ensuring accurate representation of the participant's views (Creswell, 2015:31). Qualitative researchers often ask emotion-laden, close to people and practical questions (Creswell, 2013:51).

Qualitative research was relevant to this study as the researcher wanted to understand and describe the participants' experiences whilst utilizing the Q-bell. The qualitative design enabled the researcher to collect data from the participants by using semi-structured interviews. Collecting data in the participant's natural setting allowed the researcher to eliminate power relationships between him and the participants, making the participants feel at ease and allowing him to gather contextual information that would enrich the description and findings.

The researcher was only able to interview a few participants but collected rich data using in-depth individual interviews in this research study. The researcher asked participants open-ended questions to further understand their experiences whilst using the Q-bell.

### **2.2.2 Explorative research**

Explorative research aims to lay the groundwork for and provide information on situations where there is a limited amount of data (Marshall & Rossman, 2010:68). Creswell (2015:6) states that the use of an explorative design is used to explore a problem where the population is insufficiently studied or is difficult to access. In these cases, there is little information about the population, question or

phenomenon. In exploratory research, a small sample is used to gather a great deal of information. The researcher develops and clarifies ideas, formulates questions and hypotheses aimed at collecting data by using various data collection methods (Struwig & Stead, 2013:6).

The researcher wanted to explore the experiences of the participants regarding their use of the Q-bell, because little information was available on the topic. In this study the researcher was unaware of the possible difficulties individuals with disabilities had regarding summoning assistance from the care-givers. The explorative research design allowed the researcher to acquire a deeper understanding of how each participant experienced the use of the Q-bell in order to obtain relevant information about the need for the device and how its overall design further aided the participants in summoning assistance when needed.

### **2.2.3 Descriptive research**

Descriptive research aims to document and describe the characteristics of a phenomenon of interest (Marshall & Rossman, 2010:68). The purpose of descriptive research is to observe, describe and document facets of a situation as it occurs in its environment (Polit & Beck, 2012:226). These descriptions are given so that there is an accurate account of the phenomenon, issue or subject being reviewed.

The descriptive research approach was used by the researcher to document the participants' experiences of the Q-bell so that the researcher and the readers can understand these experiences better. Descriptive research allowed the researcher to immerse himself in the experiences of each participant as they described how they utilized the device so that the researcher could narrate the participant's experiences better. By providing thick description, the researcher conveys his knowledge of the experiences of the participants, allowing the reader an opportunity to actively immerse him/herself within the phenomenon being investigated.

### **2.2.4 Contextual research**

Contextual research allows the researcher to obtain a deeper understanding of the participants, by examining the context of the participants' surroundings to understand their behaviours, needs and goals (Ritchie, Lewis, McNaughton &

Ormston, 2013:31). Contextual research emphasises the macro and micro framework of an individual and is closely aligned to holism that scrutinises the social environment in its entirety (Struwig & Stead, 2013:11). Contextual research is performed so that any researcher wishing to repeat the study can easily do so.

It was therefore important for the researcher to be part of the participants' context in order to understand their experiences regarding the Q-bell and to be familiar with the device. The researcher took into account the fact that the context can affect the behaviour of the participants and therefore kept his focus on the objectives of the research study. In this study, the researcher went to the care facilities to meet with the participants in their environment to investigate their experiences utilising the Q-bell. The researcher used this opportunity to observe the participant's environment, documenting the different contexts in which the Q-bell was used.

## **2.3 RESEARCH METHOD**

Research methods are techniques researchers use to structure a study, gather information and analyse relevant information (Polit & Beck, 2012:12). The research method will give a description of the population who participated in the study, how participants were chosen through sampling and how data were gathered and analysed. Methods used for data collection and analysis for this study are discussed below. In this research study, semi-structured individual interviews were used to collect data. Wagner, Kawulich and Garner (2012:134) state that interviews structured in this manner provide the researcher with the flexibility to probe and explore deeper to get clarity on issues that emerge during the course of the interview.

The researcher had to request assistance from the different gatekeepers at the respective healthcare facilities in the selection of the research participants who were best suited for the study and who fit the research criteria as indicated in table 2.1.

### **2.3.1 Research Population**

The research population includes all the individuals of interest for a particular study (Hanlon & Larget, 2011:7). Grove, Burns & Grey, (2013:44) state that the research population consists of all the elements that meet the criteria for inclusion. Collis and

Hussey (2014:62) further describe a population as a statistically valid, defined group of people or objects for study. The research population for this study were all disabled individuals who were residents in Port Elizabeth care facilities and who needed assistance from time to time.

### 2.3.2 Sampling

A research sample is defined as a sub-set of the population of interest (Hanlon & Larget, 2011:7). A sample should be an unbiased sub-set that is representative of the population and should represent the interest of the study (Collis & Hussey, 2014:197). According to Creswell (2015:77), qualitative research does not have a definitive sample size therefore, due to the in-depth nature of qualitative research studies, samples tend to be small with a transitional stance of obtaining data saturation. The sample size must not be so small that it will be difficult to achieve data saturation. Data saturation is achieved when themes and categories in the data become repetitive and no new information can be obtained from any new participants. This is when the researcher must cease collecting data (Creswell, 2015:77). A purposive sampling strategy was used to identify a small number of disabled participants in care facilities to use the Q-bell. Eight participants were used in this study based on the inclusion and exclusion criteria stated below in table 2.1. The researcher experienced some difficulties in obtaining facilities that were compatible with the Q-bell and as such the centres around Port Elizabeth were chosen by the researcher.

**Table 2.1: Sampling: Inclusion and exclusion criteria**

Inclusion criteria
<ul style="list-style-type: none"> <li>• Participants must be 18 years or above</li> <li>• Able to give verbal consent</li> <li>• People who have learned to cope with their disability, as they will not be in the early stages of trauma; individuals who have accepted their disability.</li> </ul>

Exclusion criteria
<ul style="list-style-type: none"> <li>• Any person who has functionality of their hands and arms.</li> <li>• People who are under guardianship e.g. children or people with cognitive dysfunctions</li> <li>• People that have difficulties with verbal communication</li> </ul>

### **2.3.2.1 Purposive sampling**

Purposive sampling is defined as the strategic selection of participants or sites that will aid in the understanding of the research problem (Creswell, 2015:77). Purposive sampling is a common non-probability sample technique, where the participants of the study are selected based on a criterion relevant to the research question (Ruane, 2016:248). The researcher actively selects the most purposive group that will provide the most information about the research topic (Ruane, 2016:248).

This was the most useful strategy that the researcher could have used to collect the most relevant data, as it provided the researcher with control of the variables needed to select the research participants. During the data collection phase the researcher approached the gatekeepers of the facilities knowing specifically the desired participant that he needed for the study, based on the criteria stated in his inclusion and exclusion criteria.

### **2.3.3 Data gathering**

Data gathering refers to the acquisition of information required to address the research problem. Qualitative research utilizes various methods of data collection; semi-structured interviews were the primary data collection method used in this study due to the amount of detail it provides from each participant (Edwards & Holland, 2013:30).

Prior to conducting the research study, the researcher obtained approval from the Nelson Mandela University Departmental Research Committee in the Department of Nursing Science and from the Faculty Postgraduate Studies Committee of the Faculty of Health Sciences (see annexure C) for permission to implement the study.

The researcher used web-based platforms to obtain information about the possible facilities. These included organisations such as frail care facilities, rehabilitation centres, old age homes and retirement homes that housed individuals for an extended period of time that he could approach to request assistance. The researcher scheduled meetings with the facility representatives, where permission and assistance were sought from them by means of a formal letter (see annexure A) and a copy of the research proposal clearly stating the objectives and methodology of the study, and ethical approval was presented (see annexure E). A sample device was also brought by the researcher to ascertain compatibility with the system that was in place at the different facilities.

The gatekeepers at the facilities notified the researcher that the sample device (see figure 1.3) that he brought was not compatible with the system that they had (see figures 2.1, 2.2 and 2.3) and in order for the researcher to continue he had to bring a device with a different connection. The researcher then contacted the developer and requested assistance with producing a different adapter that was compatible with the systems. After several days waiting, the developer notified the researcher of the production and completion of a new adapter that could be used with the Q-bell and the systems available at the care facilities.

The researcher thereafter approached the gatekeeper requesting research participants who meet the inclusion criteria stated in table 2.1. Participants were then introduced to the researcher through the gatekeepers. Subsequent to these introductions, the researcher engaged in pleasantries with the participants where the researcher explained the purpose for his visit, highlighting the purpose of the study including the research aims and objectives and requested participation in this study. It was also pointed out that the interviews would be treated with confidentiality and details given by one participant would not be shared with any other person; the manner in which the interview would be recorded was explained. Permission was granted by the participants to use a digital voice recorder.

The researcher, assisted by the gatekeepers, installed the Q-bell onto the system at the facility. The device was then tested for functionality, and positioned within reach of the participants by the researcher. The participants were asked whether they were satisfied and changes were made to rectify any issues such as the

placement of the Q-bell from the participant. The researcher scheduled follow up dates with the participants after 2-3 days of utilising the Q-bell device. The researcher left his contact details with the caregivers and asked to be contacted should a device became problematic or stop operating. On the scheduled date the researcher returned and conducted the interviews with all the participants.

The participants' convenience, comfort and privacy were all taken into consideration when the researcher chose the setting for the interviews. He intended to yield the best possible result for the study by not being disruptive to the daily routine of the participants. The researcher arranged with the participants and the gatekeepers to conduct the interviews in the participants' private rooms, in order to minimize noise and distractions as well as being convenient for each individual, as advised by Edwards & Holland (2013:43).

Rapport is a condition where the interviewers create a sense of comfort and trust between themselves and the respondents so that the respondents feel at ease throughout the interview process (Ruane, 2016:192). Rapport was established by the researcher by conducting the interviews in the rooms of the participants, showing interest and respect for what was being said by the participants, whilst attentively listening to the responses the participants were giving. The interviews were started with the key research question given in chapter 1 (*Tell me how you experienced using the Q-bell?*) and further questions were derived from the answers given by the participants. Participants were allowed to express their views and ideas about particular issues freely, clearly and to elaborate within the focus of the subject. Immediately after each interview a written account was made by the researcher of what he had seen, heard, experienced and thought during the course of the interviews.

The participants were given the opportunity to ask any questions or add any additional information before the interviews were concluded. The transcribed data was augmented with field-notes taken after the interviews.

#### **2.3.4 Entry to the site**

Prior to conducting the research study, the researcher must gain entry to sites that are suitable for the research enquiry and seek approval from the gatekeepers (Polit

& Beck, 2012:184). The researcher made arrangements with the gatekeepers at each facility to consult with them and inform them about the purpose of this research and request access to approach possible research participants. Gatekeepers were supplied with information about the research including a printed copy of the research proposal, a formal request letter and proof of ethical clearance from the tertiary institution.

### **2.3.5 Data Collection**

Creswell (2013:145) states that data collection is the steps that the researcher takes prior, during and after collecting the relevant data from the chosen sample. It involves gaining permission, conducting a sampling strategy, developing the means for recording information, ensuring data storage and abiding by ethical considerations.

Data was collected using semi-structured interviews with participating persons. Semi-structured in-depth interviews make use of an interview guide with basic questions to gain in-depth knowledge about a phenomenon. The interviews were conducted in a manner that was flexible enough to allow the researcher to probe and explore deeper on emerging issues or topics that might have arisen during the interview (Wagner *et al.*, 2012:134). Semi-structured interviews allow for an exchange of information between the interviewer and participant, where the participant freely expresses their views on the topic of discussion.

The researcher with the assistance of the gatekeeper, approached possible candidates requesting their participation in this study. The researcher read the attached information letter (see annexure B) to the participants which contains the goals and the objectives of the study, the rights of the participants, consent form, and obtained informed consent verbally from participants. Subsequently the participants who agreed to take part in the research study were given a Q-bell to use for 2-3 days and thereafter interviews were conducted to ascertain their experience while using the call device.

### **2.3.5.1 Semi-structured interviews**

All the interviews were conducted face to face, at the bedside of each participant in the facilities of care. Digital voice recordings of these interviews were made by the researcher subsequent to verbal recorded consent from the participants.

The following introductory question was asked of the participants of the study:

*Tell me how you experienced using the Q-bell?*

Due to difficulties in obtaining facilities that were compatible with the modifications of the Q-bell, care centres and rehabilitation hospital in and around the Port Elizabeth Metropolitan area were chosen by the researcher. The chosen area provided the researcher with the convenience to contact the developer for any technical assistance with the functionality and incompatibility of the devices in order to not compromise or cause undue harm to participants resulting from possible malfunctions with the device. Only eight participants could be accessed based on the availability of facilities and participants in the area as opposed to the traditional standpoint of interviewing until data saturation is reached. Despite this limitation, data saturation was achieved and deep and rich data was collected from the participants. The interviews were transcribed verbatim by the researcher with the aid of an assistant; the participants were given pseudonyms as more interviews were conducted, after which transcripts were given to an independent coder.

Semi-structured interviews were used to gain a detailed understanding of the participant's experience and perceptions of the research topic. The interviewer has the flexibility to follow up particular avenues that emerged during the interview (Edwards & Holland, 2013:29). At the same time, the qualitative interviewer must be familiar with the questions to be asked. This allows the interview to proceed smoothly and naturally (Edwards & Holland, 2013:72).

Since there were no predetermined responses, the semi-structured interview allowed the researcher the freedom to probe and explore within the predetermined questions.

### **2.3.5.2 Observations and field notes**

Observations according to Polit & Beck (2012:590) are efforts by the researcher to focus on the aspects of a situation or conversations that are relevant of the phenomena being studied.

#### **Field notes**

Field notes are a written account of all the audio or photographic evidence the researcher hears, sees, experiences and thinks about during the course of interviewing (Ruane, 2016:218). They include both empirical observations and personal interpretations of the researcher. Field notes are either used as part of the data or for verification purposes (Struwig & Stead, 2013:137). The researcher needs to have observational skills in not only the situation in which the research takes place, but also of the environment and the emotional cues the participant expressed.

The researcher made hand-written field notes after the interviews to document various facial expressions and emotions of the participants. The researcher had to do this as some of the participants of the study could not effectively articulate themselves verbally. The researcher documented when the participants shook their heads in disapproval or approval to particular statements. These field notes allowed the researcher to better understand the meaning the participants revealed with regards to their experiences using the Q-bell.

## **2.4 DATA ANALYSIS**

Data analysis is a series of choices on how the researcher interacts with the data collected during the interview process, and allows the researcher to organise and bring meaning to large amounts of data (Struwig & Stead, 2013:178). Preliminary analysis of the transcripts was performed by the researcher who followed the steps specified in Tesch's method of qualitative data analysis to ascertain key themes of particular relevance to the study (Creswell, 2009:186).

The steps followed during this analysis include the researcher:

- Obtaining a sense of the whole storyline. This is done by the researcher reading attentively through all the transcripts, to understand the response and achieve an impression of the data
- Re-reading the transcripts in an attempt to get the underlying meaning. During this process the researcher's thoughts are noted in the margins of the transcripts.
- Clustering similar topics into columns, arrayed as major topics, unique topics and leftovers.
- Abbreviating the topics as codes and writing the codes next to the appropriate segments of the text to see whether new categories and codes emerge.
- Finding the most descriptive wording for the topics and turning them into categories.
- Making a final decision on the abbreviation for each category and arranging these codes in alphabetical order.
- Assembling the data material belonging to each category in one place and performing a preliminary analysis.
- If necessary, recoding the existing data.

Emerging themes were identified by listening to the recordings of the interviews, after which the researcher developed themes, sub-themes and categories that answered the research question.

The independent coder was an experienced person who has done coding for many years. She was given the transcripts from the interviews and a copy of Tesch's methodology used by the researcher. The independent coder was asked to sign a confidentiality agreement developed by the researcher (see annexure D) in order to ensure that the rights and confidentiality of the participants will be upheld. Once coding was done independently by both parties, the researcher and the independent coder discussed the findings and reached a consensus regarding the themes. A consensus report was thereafter presented to the research supervisors for evaluation. Analysis of the consensus report led the researcher, independent coder and research supervisors to agree that data saturation, in spite of the low number of participants, was obtained by the researcher.

### **2.4.1 Pilot Study**

A pilot study is a study on a smaller scale conducted before the intended research study. The pilot study should be planned and executed in the exact manner in which the research will be conducted (Arain, Campbell, Cooper & Lancaster, 2010:5). A pilot study gives the researcher an opportunity to evaluate the feasibility of the study, and to test the research protocols, sampling strategies and data collection instruments (Thabane, Ma, Chu, Cheng, Ismaila, Rios, Robson, Thabane, Giagregorio & Goldsmith. 2010:9).

The pilot study was performed in the same manner as the main study. After obtaining consent from the facility heads, the researcher conducted a pilot study using two residents in the facilities who met the inclusion criteria. These interviews were used in the pilot study and assessed to verify the question and to hone the researcher's interviewing technique. The supervisors assessed the transcribed interviews and made suggestions for change where necessary. The researcher was able to extract themes from the transcribed interviews. The pilot interviews were included as part of the main study.

### **2.4.2 Literature Control**

Literature control is an important part of the research process as it substantiates the researcher's findings using existing literature and shows how the findings contribute to and develop challenges to what is already known about the topic. The exploratory nature of qualitative research means that sometimes literature to support the initial aspects of the study may be very limited. An extensive literature control was conducted to verify the research findings and will be presented in chapter 3.

## **2.5 TRUSTWORTHINESS**

Although verification of the findings occurs throughout the steps in the process of research, this discussion will indicate the procedures that were undertaken in this study to validate the findings. Lincoln and Guba (1985:295) propose that a qualitative study can only be regarded as trustworthy if it is worth paying attention to. Guba's (1985) model describes criteria for assessing trustworthiness namely credibility, applicability, consistency and neutrality. Struwig & Stead (2013:136)

state that trustworthiness is concerned about the truth of the research, which can be addressed by following the concepts provided by Lincoln and Guba (1985:295) mentioned earlier. The researcher will provide detailed information about the strategies he used under each of these headings.

### **2.5.1 Credibility**

Credibility refers to the confidence in the value of the data and subsequent interpretations (Polit & Beck, 2012:585). Polit and Beck (2012:585) further state that credibility has two main areas of concern which are:

- The manner in which the research is conducted to increase its authenticity.
- The strategies used to prove the credibility of the research report.

In this study, credibility was achieved by ensuring an accurate representation of the individuals' experiences. Credibility was guaranteed by the use of a digital voice recorder that the interviewer used to record what was said to him by the participants. This was done by utilizing the following strategies:

#### **a) Member checking**

Maxwell (2013:126) states that member checking is a particularly important step in establishing the credibility of qualitative data. This occurs when the researcher provides feedback to participants about the emerging interpretations. It is done to ensure that the information gained is a true reflection of what the participants meant to say during the initial interviews.

#### **b) Triangulation**

Triangulation refers to the use of multiple sources to draw conclusions about what constitutes the truth (Maxwell, 2013:128). Polit and Beck (2012:590) state that triangulation helps to capture a more complete and contextual representation of the key phenomenon regarding the inquiry. Triangulation is the act of using more than one source of data to illustrate a single point (Marshall & Rossman, 2010:252). Triangulation is used to minimize the chances of bias or associations developing due to a single source being used by the researcher. Triangulation also assists the researcher to make sense of and understand the various aspects of the resulting

topic and results. One of the strategies the researcher used was to interview participants from different nursing homes.

### **c) Peer examinations**

Polit & Beck (2012:594) discuss the use of peer examinations as another quality development strategy, where knowledgeable peers are used to review and study the facets of the study. The researcher consulted his research supervisors to discuss the research process and findings, due to their extensive knowledge of qualitative research.

### **d) Ensuring interview skills**

Brinkmann & Kvale (2015:75) discuss the importance on focusing on the manner in which the interview questions are phrased. Prior to data collection the researcher should ensure that his or her interviewing technique is refined to avoid leading the participants in a specific path. In this study a pilot study was conducted and analysed by the research supervisors, this assisted the researcher to refine and hone the manner in which the questions were phrased to the participants of the study. The researcher further asked the participants of the pilot study and subsequent interviewees the same introductory research question, which ensured that the data collected would be transferable by maintaining the same conditions throughout the data collection process.

### **e) Pilot study**

As mentioned above the researcher conducted a pilot study using the same manner as the main study by the researcher. The pilot interview was assessed by the supervisors who made suggestions for change. The pilot interviews were included as part of the main study.

### **f) Independent coder**

As previously discussed in this chapter, an independent coder was used by the researcher to ensure that the information was trustworthy. The researcher compared data that he had analysed with the independent coder to compare similarities and differences in identified themes.

### **2.5.2 Applicability**

Applicability or transferability means that the findings obtained in the study can be applied to other participants and achieve similar results (Wagner et al., 2013:243). Transferability refers to the potential for the findings to be transferred to or have applicability in other settings or with other groups (Polit & Beck, 2012,585). Applicability was achieved by providing information on the context of study. The researcher was able to ensure applicability by providing a dense description, independent coding and nominated sample during the research process.

#### **a) Dense descriptions**

Dense descriptions use rich details to illustrate the phenomenon being studied, by capturing the thoughts and feelings of the participant and providing the reader with a sense of authenticity wherein they can cognitively place themselves (Roller & Lavrakas, 2015:44). Detailed descriptions of the research methodology, literature control, transcribed interviews were provided to assess how transferable the findings were. The descriptions were written in such a manner that another researcher would be able to follow and replicate the proceedings of this study.

#### **b) Nominated sample**

As discussed previously in this chapter, the researcher used a purposive sampling method to collect data from the participants. Purposive sampling was implemented as a strategy of selection which ensured that the researcher could select the participants who would provide the most information. Inclusion and exclusion criteria were used to ensure that suitable participants were used for this study. Participants who were used in this study could provide rich descriptive data on the objective of this study, enabling the researcher to provide a guideline on the participants, thus ensuring transferability.

#### **c) Independent coding**

The techniques or strategies used were discussed previously in this chapter.

### **2.5.3 Consistency**

Consistency is defined as the accuracy of translation of information from various sources, providing a concurrent sequence of events, which allows for the reconstruction of the study (Wagner *et al.*, 2013:243). Consistency was achieved by the following strategies; dense description, independent coding and peer reviews. The strategies used to ensure consistency were previously discussed in this chapter.

### **2.5.4 Neutrality**

Neutrality ensures that the findings obtained correlate to the data, and are not fabricated from the researcher's thoughts (Wagner *et al.*, 2013:243). Interviews were audiotaped and transcribed verbatim. This ensured that there was no loss of data and that all of the findings were discovered in this study. Strategies such as reflexivity, bracketing and triangulation were used by the researcher. Reflexivity and triangulation were previously discussed in this chapter.

#### **a) Bracketing**

Whilst conducting this study the researcher kept his own assumptions of the topic and acted as a stranger who is unaware of the facets that revolve around the research objective. This was done in order to understand the world from the participants' point of view.

#### **b) Reflexivity**

Reflexivity involves the recognition that researchers can affect the research process due to their backgrounds, values and their social and professional identities (Polit & Beck, 2012:589). Reflexivity is the process in which the researcher searches for his or her personal feeling and experiences that may affect the research study (Burns & Grove, 2011:546). To diminish the effects of reflexivity the researcher continually reflected on his own notions and monitored relationships with the participants and his own reactions to the participant's accounts.

## **2.6 Ethical considerations**

Research ethics provide guidelines for responsible and professional conduct. The researcher needs to adhere to virtuous ethical practices and standards when conducting the study, maintaining a balance between the benefits of the research and protecting the rights and dignity of the participants (Pera & Van Tonder, 2012:326). Ethics is described by Neuman, (2011:143) as what is and is not morally legitimate in research procedures, and serve as the standard and basis on which the researcher should evaluate his or her conduct. The information obtained from this study such as the recordings of the interviews will be kept securely by the researcher for a period of five years in a locked cabinet to ensure confidentiality as per the regulations of the Research Committee. The researcher upheld the following ethical principles:

### **2.6.1 Beneficence and Non-maleficence**

The principle of beneficence is the effort made by the researcher to limit risks to the participant whilst maximizing benefits to the society (Marshall & Rossman, 2010:47). Beneficence is the obligation to do good, while non-maleficence refers to removing harm (Burns, Bradley & Weiner, 2011: 418). With this study, the researcher took steps to promote good and avoid any harm that could result from participating in the study. The participants were informed of their right to withdraw from the study at any stage. Any questions raised by the participants were answered honestly by the researcher. The objective of this study was explained to them and their privacy was ensured and participants were also informed that there would be no reprisal from myself or the facility if they withdrew from participating. Discrimination against the participants was avoided by the researcher.

### **2.6.2 Justice**

Justice focuses more on the selection of participants. Ethical selection included everyone who met the inclusion criteria of the study, namely that one group of individuals should not benefit more than any other (Marshall & Rossman, 2010:47). Participants were treated fairly and equitably throughout the study. Participants were solely selected based on the conditions stipulated in the inclusion criteria (see

table 1.2) and not by any incidental conditions. Participants of the study were not in any way coerced, exploited or discriminated against to participate in the study.

### **2.6.3 Autonomy and Respect**

The right of an individual to self-determination is autonomy (Pera & Van Tonder, 2012:332). No participants in this study were coerced or forced to participate in this study. Informed consent by the participants prior to participation was obtained by the researcher. Participants were informed about the objectives of the study, and all questions were answered honestly, to ensure that an informed decision was made by the participants. The research participants were given the opportunity to withdraw from the study at any time, a decision that was respected by the researcher. The researcher approached long-term and rehabilitation care facilities, and exclusively approached people who have learned to cope with their disability (see table 2.1 for the criteria).

### **2.6.4 Informed consent**

Informed consent is the process that may be verbal or written, where a participant is informed about the facts of a study or procedure (Fan, 2015:100). The researcher ensured that the participants who took part in the study did so voluntarily without any inducement or coercion, after having been informed of the purpose of the study and its methods. Participants were also clearly informed that they were at liberty to withdraw at any point of the study if they so desired. Although the participants of the study could not give written consent as they were unable to use their hands due to their disabilities, verbal consent was obtained and kept on record by means of a digital voice recorder.

### **2.6.5 Veracity**

Veracity is defined as the principle of truth telling; the quality of being true, honest and accurate (Burns *et al.*, 2011:417). In this study, the researcher disclosed all relevant information to the participants, enabling them to make an informed decision regarding their participation in the study. Patients were informed about the objectives of the study, given the opportunity to ask questions and these were answered honestly by the researcher.

### **2.6.6 Fidelity**

Fidelity requires one to maintain trust and confidence by being respectful, truthful and dedicated to a promise of care. It may also pertain to the relationship between a healthcare provider or physician and patient (Burns *et al.*, 2011:417). The researcher presented himself to the participants of this study with all the required information and the objective of the study. He respected them, was truthful, fair and dedicated while conducting the study.

### **2.6.7 Confidentiality**

Burns and Grove (2011:117) state that confidentiality is the manner in which the researcher handles private information disclosed to him/her by the participants. Participants of the study were assigned pseudonyms and remained anonymous throughout the study. All participants were assured that the researcher would have sole use of and access to the digital recorder used during the interviews. However, facility staff had to assist with the selection process and total anonymity within the care facility was not possible.

### **2.6.8 Ethical Permission to conduct study**

The research proposal was sent to the research committees of the Department of Nursing Science and the Faculty of Health Sciences Postgraduate Research Committee for ethical consideration (see Annexure C). The researcher also followed the ethical principles, by protecting participants from harm or exploitation, beneficence, respect, autonomy and justice, as mentioned above. The researcher approached each participant through the gatekeepers requesting their participation in the study. Given the nature of the research undertaken verbal consent was requested and recorded by the interviewer subsequent to explanation of the research. Participants who were willing to take part in the study were given a Q-bell to use for a set period of time.

## **2.7 SUMMARY OF THE CHAPTER**

In this chapter, the researcher provided an in-depth discussion of the research design and methods for this research study. The rationale for the design and methods used were outlined. Approaches for ensuring trustworthiness and ethical

considerations were also discussed. Chapter 3 will outline the findings of the interviews and the literature control.

## CHAPTER THREE

### DATA ANALYSIS AND FINDINGS

#### 3.1 INTRODUCTION

The research design and method were discussed in chapter two. Trustworthiness and ethical considerations were explored and the researcher also indicated how these concepts would be applied throughout the research study. This chapter will present a discussion on the identified themes which address the research question. The themes that were identified will be discussed separately and an in-depth explanation will follow on the identified sub-themes. Each theme that is discussed will be supported by relevant quotations from the participants who took part in the interviews during the data collection process together with the applicable literature review.

#### 3.2 DEMOGRAPHICS OF PARTICIPANTS

A total of eight (8) participants were interviewed for this study, three (3) males and five (5) females. All the participants included and interviewed in this study met the inclusion criteria, were people with limited movement and who are currently in care facilities. The participants of this study each had a medical condition that affected their mobility and limited the functionality of their hands and arms (see table 3.1).

**Table 3.1: Characteristics of the research participants**

Participants	Participants code	Gender	Age	Condition	Type of facility of care
Participant 1	QB1	Male	48	Congenital defect (Cerebral palsy)	Residential care facility
Participant 2	QB2	Male	50	Spinal Injury (Sport related)	Residential care facility
Participant 3	QB3	Male	51	Spinal Injury (Assault)	Residential care facility
Participant 4	QB4	Female	41	Spinal Injury (MVA)	Residential care facility
Participant 5	QB5	Female	76	Multiple Sclerosis (MS)	Old age home and frail care
Participant 6	QB6	Female	81	Elderly (Frail) Severe Arthritis	Old age homes and frail care

Participants	Participants code	Gender	Age	Condition	Type of facility of care
Participant 7	QB7	Female	74	Elderly (Frail)	Old age homes and frail care
Participant 8	QB8	Female	52	Stroke	Old age homes and frail care

### 3.2.1 Context of the study

The researcher was given the opportunity to conduct research on a new call device, the Q-bell, in order to ascertain its suitability for people living with disabilities in health care facilities throughout all health services. The researcher met with the developer's business representative to further discuss this initiative and to ascertain the scope of the investigation. The researcher was then given Q-bells to use as test samples by the participants.

As discussed in chapter 2, the study was conducted at different long-term care facilities available in the Port Elizabeth region. Most of the facilities the researcher visited were privately-owned with residents who booked themselves in at the facilities. The researcher used web-based platforms to obtain a number of the possible facilities such as frail care facilities, rehabilitation centres, old age homes and retirement homes that housed individuals for an extended period of time that he could approach. These care facilities all provided 24 hours a day care to disabled and frail patients who might have a call bell system in place. The researcher generated a list of possible facilities (with contact details) in and around the Port Elizabeth area requesting appointments for meetings. Multiple care facilities were contacted and visited by the researcher.

#### 3.2.1.1 *Difficulties experienced whilst doing the research*

The researcher experienced difficulties with finding suitable care facilities with a call system infrastructure that could accommodate the Q-bell configuration. Currently a vast number of facilities use improvised or outdated systems that are not adaptable to the current available technology. Some facilities either do not have or do not supply the individuals with call bells. State run hospitals in the region do not supply call bells to individuals in their care. Two sites the researcher visited had no operational call bells either due to unresolved technical problems with the system

or because of an absence of a call bell system leaving the residents without any means of communication.

As mentioned in chapter two, aside from having difficulties with finding facilities that can use the Q-bell, the researcher encountered problems with the wall units that the device connects to. The researcher found that of the eight participants of this study, five had been using the call device in figures 2.1 and 2.2 and the remaining three participants were using a different call device (see figure 2.3). The initial design of the Q-bell was not interchangeable with the connection ports that were available at the facilities. To overcome this, the researcher consulted the developer of the device to provide various adaptors for the different sites that he had approached that had a system for a call device. By the conclusion of the data collection process the developer had made two alternative configurations to the initial design of the Q-bell for the purpose of this study.

### 3.3 PRESENTATION OF RESULTS

From the data analysis three themes emerged. Theme 1 showed that the participants had overall positive experiences with the Q-bell, with one of the participants showing signs of ambivalence towards the proposition of changing the current system that was available to her. Theme 2 describes the different characteristics the participants noted whilst using the device. Theme 3 describes the participants' opinions relating to the Q-bell.

**Table 3.3: Identified themes and sub-themes**

THEME		SUB-THEME	
1	Participants described their experiences with the Q-bell	1.1	The overall experiences of participants were positive
2	Participants identified characteristics of the Q-bell compared to other available systems	2.1	Q-bell had many positive characteristics
		2.2	Some areas of negativity were experienced
3	Participants made recommendations	3.1	Recommendations for further development
		3.2	Recommendations for wider education

### **3.4 THEME 1: PARTICIPANTS DESCRIBED THEIR EXPERIENCES WITH THE Q-BELL**

Providing a specific user-friendly call device can pose its own challenges such as suitability, comfort and ease of use, with individuals with disabilities having their own unique challenges. When designing the Q-bell, the developer had to consider the above-mentioned, while thinking of a device that would be suitable to provide for the current needs of a specific device to accommodate the needs of various people. The development of the Q-bell aims to provide an alternative that is suitable for the disabled, especially those who find it difficult to operate the one currently available to them. This device will address the void in South African healthcare by providing for those who are in need of an alternative call system, especially for those who have limited manual dexterity, attempting to improve on the current method by which they are able to summon care.

The research findings indicate that the participants had an overall positive experience whilst using the Q-bell. Participants highlighted various specific design and engineering features that easily allowed them to call for assistance when they needed it. The next section of this report will elaborate on these experiences as they were described by the participants.

#### **3.4.1 Sub-theme 1.1: The overall experiences of participants were positive**

From the data analysis, it was found that the participants using the Q-bell experienced its use positively. The data indicated that the device was easy to use especially for individuals with disabilities. This was pertinent to this study, as the Q-bell is a device specifically designed to provide ease of use for individuals who struggle to use the current devices at their facilities. The researcher also took note of this whilst one of the participants was demonstrating how he had to manoeuvre to access the previous device, let alone using the device. The participant had a spinal injury that affected his manual dexterity. The device that the participant used had been designed for easy operation, but its size and the plastic material that it was made of made handling a difficult task for him.

*“No the bell was very nice is soo easy to work.” [QB8:1]*

*“it... it was easier” [QB1:1]*

Several participants of the study expressed that the size coupled with the ease of use, greatly impressed them. The participants had up until then, been attempting to utilise a call bell that they could hardly use because of their various disabilities. During their brief usage of the Q-bell, the participants expressed their delight in using the device as it they did not struggle while utilizing it.

Findings in a study conducted by Ganle, Otupiri, Obeng, Edusie, Ankomah & Adanu (2016:8) revealed that sometimes healthcare facilities and the healthcare providers don't consider or understand the needs of individuals with disabilities, placing everybody under an umbrella category that is not suitable for everybody. Crosier (2017), in her article, describes how an individual who has cerebral palsy struggles with accessing the resources. The subject of the article explains his difficulties with what might be considered mundane to another person. He expressed that his difficulties included buttons, switches and knobs that were often out of reach.

Ganle *et al.*, (2016:8) state that the infrastructure in healthcare facilities is often unfriendly for the individuals in their care. Facilities commonly acquire generic devices, rather than user-specific devices for a diverse population. A participant expressed how she felt that the design of the Q-bell device is an improvement on the one she was currently using.

*“...I don't want to say it's better than what we had, but well it is an improvement I would say.” [QB7:2]*

The participant's comfort with using the infrastructure was one of the main findings addressed in the study as this will ultimately contribute to the overall care of the individual. Participants who tested the Q-bell stated that using the bell was comfortable and it could be easily placed at their side where it was be accessible.

*“it is small; it is not big like the other one” [QB1:2]*

As illustrated in chapter 2 (see figures 2.1 and 2.2) the researcher encountered a certain type of call bell in the facilities and, aside from three participants who were using the plastic version (see figure 2.3), the participants expressed their dislike of the device. The participants felt that the device was too big and heavy causing discomfort when operating the device.

*“Q-bell is very very sensitive, very small you know but as small as it is for me on my pillow you don’t take much space cause that one I used, the previous one that I used is taking too much space you know...”* [QB3:2]

Some participants commented that the device design worked exceptionally well especially for disabled individuals, as the design is not limited to the participants’ manual dexterity. The participants in this study were all affected by ailments limiting the use of their hands. Participants had to use various body parts to operate the device. One of the participants in this study had an apparatus attached to his head that he used to operate and move various objects in the facility. While another participant struggled to use his previous device, often resorting to biting it in order to operate it.

*“So this one is easy you can just put it here just in not just in the neck”* [QB2:1]

*“the other bell was difficult to press sometimes because my fingers in this hand cover the other hand sometimes I had to bite on the bell to ring it so this one you can just touch.”* [QB8:1]

A study conducted by Krahn, Walker & Correa-De-Araujo (2015:6) highlighted that there are unmet disparities in healthcare for people with disabilities that need to be addressed. Dezfuli, Akbarfahimi, Nabavi, Mehraban & Jafarzadehpur (2015:6) conducted a study on how multiple sclerosis affects people’s dexterity. The study highlighted that persons with Multiple Sclerosis (MS) are affected by a loss of physical strength and poor contrast to sensitivity. The study further discusses that 75% of individuals with MS are affected by tremors, poor co-ordination and restricted range of movement. One of the participants of the current research had MS and during the period she had with the Q-bell experienced no adverse effects in her care. She found the Q-bell comparable to the previous device she used.

*“The previous one wasn’t better, they are equal.”* [QB5:1]

As mentioned by one of the participants, the Q-bell design also gave her the reassurance that the device worked and that someone was on the way to address her need due to the illuminating light on the systems wall unit; her previous device did not do this.

*“Okay with this one I was pleased cause I just had to look at it where the pink light comes on” [QB7:2]*

*“And that I thought, you know as long as I can see that then I know it’s ringing cause I don’t hear that well.” [QB7:2]*

In an article by Sparkes (2014) on an assistive tool for individuals who are hard of hearing, he mentions that the use of lights as an assistive tool completely changes the worldview of the hard of hearing. Using a light changes the environment into a visual one, making them feel more confident and providing better connection. By seeing the light, the participant did not have to rely on her poor hearing. The researcher also saw that she was impressed with this as while the participant was discussing this with the researcher she pointed to the wall unit where the device was plugged in to show the researcher where the light she mentioned was coming from.

The financial implications of co-ordinating a care facility is costly throughout the world. Calmus (2013:3) state that the sheer number of individuals who need care is straining the long term care system in the United States of America. A similar sentiment is mentioned by Ellis & Mavovana (2017) who state that old age and frail care centres are under strain and local departments cannot provide for all those who are in need. During the course of recruiting participants for the study the researcher found that the vast majority of the facilities have the bare necessities needed to take care of the residents. The researcher also noted that the care facilities request donations from family members.

The availability of one device was something that the researcher also saw during his data collection, as many of the facilities that he visited only used one type of device for all the residents in their care (illustrated in figure 2.1 and 2.2). A staff member at one of the facilities mentioned that this was purely because of financial constraints that afflict the facilities, stating:

*“It works for now, and changing it will cost us a lot of money”*

Another gatekeeper that the researcher met told the researcher that although the current call bell is old, the facility was donated the systems as they could not afford

to purchase one of their own. As previously discussed in chapter one the costs involved in placing and maintaining a nurse call system are extremely high. Dewsbury & Ballard (2014: 512) state that purchasing a simple button operated call bell can be relatively cheap, the challenge only comes when a facility needs to provide a specific device for people that use their services.

The market needs a more cost-effective device that can be purchased once and used by anybody regardless of condition. Chouffani (2011) states that although call systems can be expensive, this can be resolved by implementing a unified nurse call system. The article further mentions that this will provide better interaction between the staff and the person in their care.

Although the device was easier for participants to use, some participants felt that the Q-bell was comparable to the one they used previously. Two elderly participants using the Q-bell showed signs of ambivalence when interviewed regarding their use of the bell.

*“You know it just doesn’t make any difference” [QB6:1]*

These responses from the participants could be a result of resistance to change that is sometimes seen in elderly people who are fearful of technological changes. The researcher also noted that whilst he was conducting his interview the participant initially did not pay attention to him and simply lay in bed without making eye contact. She later became more comfortable when the researcher assured her that the facility might not change the current device. The participant then opened up to the researcher. The participant was indifferent about the study and expressed that her experience with the Q-bell was comparable with her previous device.

Yilmaz & Kilicoglu (2013:4) state that resistance to change may be caused by an embedded security of the past. The study highlights that people are sometimes resistant to change due to fears that arise from facing a new or unfamiliar method of doing things and feel that what is known is the best. Islami (2015:1124) describes strategies such as education and communication, participation and involvement and facilitation and support that can be used to overcome resistance to change. Had these strategies been applied, the participants may have been more accepting of and embracing the opportunity for change.

### **3.5 THEME 2: PARTICIPANTS DESCRIBED CHARACTERISTICS OF THE Q-BELL COMPARED TO OTHER AVAILABLE SYSTEMS**

In this study, participants expressed their views of the different characteristics of the Q-bell when comparing it to the other devices that they are exposed to. These characteristics are the cardinal aspects of the Q-bell that make it different from the other bells, providing ease of use for the disabled.

#### **3.5.1 Sub-theme 2.1: The Q-bell had many positive characteristics**

Data from the study indicate that the Q-bell design provided ease of use for the participants. Participants described multiple design characteristics that they found to be an advantage when using the Q-bell in comparison to other bells that they have used, either in their current facility or elsewhere. Participants previously experienced difficulties with the size of other bells.

*“To, to me is fine is lighter than that one before that one because that one is big thing it is so heavy .....you know” [QB2:1].*

The participants in this study also felt that their previous bell was very cumbersome and often very heavy for them to effectively use. Due to size the previous bells led to them experiencing several difficulties in placing the device on a suitable surface or sometimes even being unintentionally hurt by the device.

*“So that one cannot put it there in [on] my chest” [QB2:4]*

*“The other one you could get into the bed and find that you are laying on top of the old one which would make it sore tomorrow” [QB6:6]*

*“...you know you pick it up quickly and slap yourself in your face...” [QB6:4]*

The size of the call bell was also a facet that was expressed by the participants; the participants felt that the device was too large making it difficult to be carried or moved around (Galinato Montie, Patak & Titler, 2015:7). It was also mentioned by one of the participants that due to the size of the previous call bell, he had difficulties in placing the device where he would have preferred, often the device would roll back to its initial position with every attempt to move it with his mouth.

*“No, no, bhuti, the length of the cord no because the first one is easier not as heavier that is why you pull it up and then sometimes, you hold by the cord maybe I put it up sometimes cord I pull it by that or maybe sometimes is not easy.”*  
[QB2:8] (Demonstrates how he uses his mouth to pull the device up but, due to its weight, it falls back down again)

The flat slim design of the Q-bell was mentioned by a participant as a positive characteristic of the Q-bell. This reduced the likelihood of participants sustaining injuries caused by accidentally rolling onto the call bell.

A similar study by Galinato *et al.*, (2015:10) highlighted that technological advancements with call bells greatly affect the use of a device and how it affects the satisfaction and perception of their care at a facility. Participants mentioned that the structure of the previous bell made it difficult to request assistance, limiting when and how they can communicate their needs to the caregivers. The participants had to resort to other means to request assistance such as asking a neighbour to call staff on their bells or wait for caregivers to do their rounds before they could be assisted.

*“...then ja sometimes I scream, when my neighbour hear me then he touch the bell off.”* [QB3:4]

Call bells are important devices that provide people in care centres with access to what they need. Individuals view its availability not only as a convenience but as a bridge between themselves and their needs. Tzeng (2011:232) notes that the individuals saw the call bell as the effective solution for communication rather than having to wait or yelling to get attention. Cioffi, Plumadore & Clark (2013:41) state that people sometimes incur injury in hospitals due to them taking risks by attempting to perform various tasks because of the lack of assistance from caregivers. This situation could cause serious harm to the participant's health had he taken the risk of trying to rectify the situation.

Experiences expressed in this study alluded to the degree of sensitivity of the Q-bell, mentioning that this greatly facilitated its use. The ease of use was one of the main designing elements incorporated in the final product of the Q-bell.

*“It was so easy to use sometimes I would use my elbow or the side of my face to use it and it would ring so easily for me.” [QB4:1]*

The overall design of a call bell is important, as designs should consider the individuals they aim for and how the users will be able to access the functions. The Q-bell design with the rubber padding and protective sock was an essential part in limiting the movement of the device but it also provided a hygienic solution to sterilize the product between users.

*” ... the previous one was sensitive and it used to move a lot” [QB2:2]*

*“No I don’t, mmmh it wouldn’t slip down at the back of the bed...” [QB6:2]*

A study by Barai, Brash & Bamford (2015:1) highlights the importance of having a suitable call system that can be easily accessed by the people. The study revealed that 52% of the participants’ call bells were usually inaccessible therefore they were unable to contact the caregivers to assist them with their needs.

*.” And even now when you explained about it you know didn’t even know before you tell me now that even that cloth or sock you put it on a to cover the bell is a protected for hygienic ja, so this one I mean ja” [QB3:6]*

The Q-bell is a significant step forward for the healthcare system. Its unique design was specifically developed to improve the care for people with disabilities, allowing anyone to easily manipulate the device to call for assistance. Due to its general use in the care facilities it is also designed to provide a hygienic advantage over currently available call devices. The removable sock was designed to reduce the incidence of potential nosocomial infections that can be acquired by using the device for extended periods of time or between users. Freeman, Nimmo, Gregory, Tiong, De Almeida Mc Aulife & Roberts (2014:2) also highlighted the prevalence of bacteria such as the extended spectrum beta lactams (ESBL) species in care facilities. Findings from the study by Freeman *et al.* (2014:2) indicated that the call bell is the second highest source of these organisms, with the toilet seat being the first. Transmission of these organisms poses a serious health concern for anybody in care facilities.

### **3.5.2 Sub-theme 2.2: Some areas of negativity were experienced**

Although the sensitivity of the bell made a significant difference to the ability of the participants to request assistance, some participants expressed that the heightened sensitivity led to an increase in false alarms that negatively affected the caregivers' attitudes.

*“Yes the one time I didn't realise you know that I pressed it but the sisters came in here...”* [QB7:3]

Alarm fatigue is a well-documented phenomenon where several studies are conducted on the adverse effects it has not only on the person but also on the nursing personnel. A study conducted by Jones (2014:1) state that on an average 350 alerts are made per bed in general wards and an average of 771 alerts are made per bed for intensive care units. The study further mentions that although there is a high number of the alerts, 85% - 90% of these alerts are false or “nuisance” alarms.

Daniels (2014:1) state that a person may incur harm or have their treatment delayed due to an increase fatigue from the caregiver because of frequent activation of the call devices. Schmid, Goepfert & Reuter (2013:3) state that false alarms create annoyance in the caregiver that leads to a complete inactivation of the system or an increase in the threshold to operate the device. Alarm fatigue caused a person in hospital care to be accidentally poisoned by an overdose of an antibiotic, where the caregivers were too busy and tired from assisting people (Reisenwitz, 2015). A study conducted by Tzeng (2010:11) states that 53% of the respondents thought that answering calls prevented them from conducting the critical aspects of their roles.

Reader and Gillespie (2013:3) found that neglect can be found to have two aspects namely procedural neglect, and caring neglect. Procedural neglect in the study refers to failures of the healthcare worker to achieve objective standards of care. Caring neglect refers to behaviours that lead to people believing that the care workers have an uncaring attitude. The study further highlights that neglect is not something that the care worker does intentionally, and is a result of high workloads and burnouts.

### **3.6 THEME 3: PARTICIPANTS MADE RECOMMENDATIONS**

A participant in this study made a recommendation regarding the design of the Q-bell in order to improve its overall functionality and use. These recommendations were offered by the participants in response to the researcher's question regarding possible recommendations in order to potentially improve the current design of the device.

#### **3.6.1 Sub-theme 3.1: Recommendations for further development.**

A participant suggested a design improvement of the Q-bell based on her personal experience whilst using the device. Design recommendations aid in the development of the product, possibly making the product more appealing and improving its general usage in the facilities.

*“But I am used to the other cable that’s why, the cable was thinner. But it didn’t bother me I just thought maybe a thinner cable can be nicer.” [QB8:1]*

*“Maybe a hook on the wall or one of those plastics stick-on. Like that one there” [QB5:2].*

This recommendation was based on how the previous device was placed in the room. The device was placed on a hook by the caregivers letting it hang near the participant, limiting its movement to a confined area for easier access. The participant felt that if the Q-bell were to be confined in the similar manner either by a hook or by an adhesive substance, this would be an idea that can be used in future.

Barai *et al* (2015:1) conclude that a person's safety is of utmost importance, especially to those who are deemed vulnerable due to a disability. The study recommends that increased awareness, empowerment and improved equipment that allows easier attachment would significantly reduce unintentional neglect of a person.

#### **3.6.2 Sub-theme 3.2: Recommendation for wider education**

A participant who was interviewed expressed how glad she was that there were developments aimed at improving the care of people. She expressed how

sometimes people are secluded in the facilities, and are often not exposed to the different technological advancements that have emerged.

*“...you know sometimes we are unaware of what [is] out there, and people like you coming here to show us these things is so helpful.” [QB4:1]*

As illustrated in table 2.1, adaptive call bells that can be used by a wide range of people are available, but currently none of the facilities visited by the researcher had adapted to new technological advancements such as the Q-bell. Lorenzi (2017) explains that technological advancement has a significant role in putting the control of healthcare within reach for both the caregiver and the people who are being cared for. These advancements increase productivity from the nursing staff by giving them more time to conduct more meaningful tasks.

### **3.7 SUMMARY OF CHAPTER**

Throughout this study the researcher explored and described the experiences of the disabled utilising the Q-bell at their respective care facilities. The data analysis process has revealed a number of themes and sub-themes that have been supported by previous studies. In the following chapter the researcher will present recommendations relating not only to possible design improvements but recommendations to the care facilities regarding structural advancements. The limitations of the study and recommendations for future research will also be discussed in Chapter 4.

## **CHAPTER 4**

### **CONCLUSIONS, LIMITATIONS AND RECOMMENDATIONS**

#### **4.1 INTRODUCTION**

The researcher analysed the question regarding the experiences of people with disabilities utilising a new call bell system, regarding its suitability for people with disabilities. The previous chapter (Chapter 3) dealt with data collection and showed that there are indeed challenges that the participants are dealing with that can be rectified, to improve the care and overall satisfaction of the people in care facilities. Chapter 4 gives an overview of the study and focuses on giving conclusions derived from the study and offers pertinent recommendations. The next section presents the summary of the study and key findings of the study. This will be followed by the limitations and recommendations for the study.

#### **4.2 SUMMARY OF THE STUDY**

In chapter 1 the researcher provided the background to the study and a literature review, a statement of the main research problem, concept clarification and research methodology.

Chapter 2 provided an in-depth discussion of the research design and methods for this research study. The rationale for the design method used were outlined. The research methodology was discussed to address the research problem followed by the research design and ethical considerations.

In chapter 3, following an analysis of the data collected by the researcher and an independent coder, consensus was reached and themes and sub-themes that have been supported by previous studies were identified. The findings were presented in the form of a table with three themes and their sub-themes being identified after analysis. A literature control was done to support the findings following data analysis. The results revealed that the participants had an overall positive experience using the Q-bell, whilst listing key characteristics that they found praiseworthy and making recommendations for future designs.

### **4.3 OBJECTIVES OF THE STUDY**

The first objective of this study was to:

- Explore and describe the experiences of participants with disabilities, regarding their satisfaction with the Q-bell system.

The second objective of this study was to:

- Make recommendations based on the feedback from participants in order to facilitate further development of the Q-bell system.

The researcher achieved the first objective by giving participants the Q-bell to use over two to three days and then conducting a face to face interview with the participants in different healthcare facilities and finding out from the participants how they experienced the Q-bell system. Based on the identified themes discussed in chapter three, the overall experience whilst utilising the Q-bell were positive. The participants' satisfaction with the Q-bell was then determined and the researcher found that participants found the Q-bell's design worked exceptionally well, especially for disabled individuals, as the design is not limited to the participants' manual dexterity compared to the bells they were using before.

The second objective was achieved by the researcher by noting all recommendations made by the participants based on how they found the Q-bell's design and how it works. As discussed in chapter three some participants made recommendations on the design of the Q-bell such as possible thinning of the cord. These recommendations made by the participants satisfied the second objective of the study.

### **4.4 CONCLUSIONS OF THE STUDY**

After analysis of the data the following aspects became evident. Three main themes emerged from the data. The participants expressed a variety of key points regarding their use of the Q-bell. Reasons for the main points will now be discussed.

#### **4.4.1 Theme 1: Participants described their experiences with the Q-bell**

The focus in the first theme was on the experiences the participants had during their use of the Q-bell. The opinions discussed by the participants were generally positive. The participants enjoyed using the device highlighting that the device was easy to use despite their conditions as opposed to the other device they have been using. Participants explained some of the hardships they have with the device that they currently used.

#### **4.4.2 Theme 2: Participants identified characteristics of the Q-bell compared to other available systems**

The second theme's emphasis was on the characteristics the Q-bell, compared to other call systems that the participants had been exposed to. Key design features were mentioned by the participants that they felt were integral to the use of the device. These features were described by the participants and how they made a difference to their care. Again, within this theme, the participants mentioned some of the hardships they encountered while using the other call devices.

#### **4.4.3 Theme 3: Participants made recommendations**

Theme three concentrated on the recommendations made by the participants as they felt the suggestions were important. Only two recommendations were expressed by the participants. Firstly, the participants made a recommendation on further development and secondly, recommendations for wider education were proposed.

### **4.5 LIMITATIONS OF THE STUDY**

As with any study the researcher identified some limitations. These limitations will inform future researchers about the constraints that the researcher faced so as not to repeat them.

#### **4.5.1 Low number of participants obtained for the study**

One of the limitations of this study was the lack of participants as the researcher only interviewed eight participants instead of maintaining the traditional view of interviewing until data saturation. As discussed in chapter two, the researcher had

encountered some difficulties in finding suitable facilities that could accommodate the Q-bell. This greatly reduced the number of participants who met the criteria stipulated in chapter 2, as the researcher had to omit those individuals due to there being no infrastructure available. Despite the low number, data saturation was achieved.

#### **4.5.2 Cognitive impairment**

The responses gathered by the researcher during interviews might have been limited due to possible limitations in the participant's ability to articulate adequately as a result of possible cognitive impairment. Some key responses or ideas might not have been included or omitted by the participants due to their lack of clear dialogue during the interviewing process.

#### **4.5.3 Language barrier**

The researcher also faced difficulties with the language barrier from the participants. The researcher had to translate some of the research questions so that the participants could understand. The language barrier also factored in how some of the interview questions were answered by the participants, in some cases the participants could not articulate themselves fully.

### **4.6 RECOMMENDATIONS**

It is anticipated that the recommendations made here will assist in the development of this field of study. Based on the findings, the researcher makes the following recommendations.

#### **4.6.1 Recommendations on implementing a universal wall unit**

As discussed in chapter two the researcher experienced difficulties with connecting the Q-bell, which resulted in the production of two more connection configurations to the initial design. This was caused by variations in how the device can be connected depending on the system in use. The researcher hereby recommends the implementation of a universal wall unit, with one method of connection. This could potentially reduce costs for the institutions limiting variation in connections

and maintenance of the devices. Universal units will make installation, ease of use and replacements easier further limiting the costs to the facilities.

#### **4.6.2 Wireless device**

The use of wireless devices is rapidly progressing throughout the world with emerging ideas and faster web access. The researcher also recommends the implementation of wireless nurse call devices. Using wireless devices will allow the call device to be interchangeable between sites, only requiring software changes.

#### **4.6.3 Recommendations for further research**

The study focused on the investigation of the experiences of the participants, which are not in the acute phase of recovery, using the Q-bell in the Port Elizabeth area. Future studies should focus on the experience of people who are acutely affected by a condition. By doing this a holistic picture of the functionality of the Q-bell can be obtained.

#### **4.6.4 Recommendations for education**

There is no doubt that effective use of call bells depends greatly on the competence of the caregivers. Based on the research findings, it is recommended that all care providers should be given tailored training with regard to the use of call bells. The researcher tested the Q Bell and is of the opinion that the Q-bell can make it easier for care givers to improve the accessibility of care, help and support for people living with disabilities. This can be achieved by in-house seminars and workshops as well as by outsourcing it to professional consultants. Awareness of the availability of devices such as the Q-bell should be promoted in care facilities, as these devices can aid individuals.

### **4.7 SUMMARY OF CHAPTER**

This chapter described an overview of the different chapters of this research study as well as the limitations and recommendations of this study. The findings of this research demonstrated that participants were satisfied with the Q-bell as they found it very easy to use but they also expressed the need for more systems like the Q-bell to be implemented as it made it easier for them to get assistance from

caregivers. Several recommendations were made, including the implementation of a universal wall unit; adopting a wireless approach to healthcare and further studies to obtain a holistic picture of the use of the Q-bell.

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## ANNEXURES

### ANNEXURE A: PERMISSION LETTER TO FACILITIES



• PO Box 77000 • Nelson Mandela Metropolitan University  
• Port Elizabeth • 6031 • South Africa • [www.nmmu.ac.za](http://www.nmmu.ac.za)



**18 August 2016**

Dear Sir/Madam

#### **REQUEST FOR PERMISSION TO CONDUCT RESEARCH**

My name is Siphiwo Sithole, and I am a Master's student at the Nelson Mandela Metropolitan University (NMMU) in Port Elizabeth. I wish to conduct a research study for my Master's treatise titled *Q-bell: An exploratory study on its use by persons with disabilities*. This project will be conducted under the supervision of Dr. S. du Rand (NMMU, South Africa) and Mrs. G. Klopper. Further, the study has received ethical clearance from the NMMU research committee, ethics reference number H16-HEA-NUR-036.

I am hereby seeking your consent to approach patients in your care for the purpose of data collection for the above-mentioned study. Permission will be sought from the individual patients and only those who give consent will participate. The researcher will perform interviews, which will be recorded for further transcription. Each interview conducted will take approximately 30 minutes and all information collected will be treated ethically and in strict confidence. At no time will your institution be identified by name.

I have provided you with a copy of my treatise proposal which includes copies of the measure and consent and assent forms to be used in the research process.

Upon completion of the study, I undertake to publish the results obtained in an attempt to improve patient care. If you require any further information, please do not hesitate to contact me or my research supervisors on 076 379 7762 or e-mail:

s209062774@nmmu.ac.za. Dr. S. du Rand on 041 504 2615 or e-mail:  
Suzette.duRand@nmmu.ac.za.

Thank you for your time and consideration in this matter.

Yours sincerely,

Siphiwo. G. Sithole

Nelson Mandela Metropolitan University

## ANNEXURE B: INFORMATION TO PARTICIPANT



• PO Box 77000 • Nelson Mandela Metropolitan University  
• Port Elizabeth • 6031 • South Africa • [www.nmmu.ac.za](http://www.nmmu.ac.za)



**18 August 2016**

Dear Sir/Madam

### **REQUEST FOR YOUR PARTICIPATION IN A RESEARCH PROJECT**

My name is Sipiwo Sithole, and I am a Master's student at the Nelson Mandela Metropolitan University in Port Elizabeth. I wish to conduct a research study for my Master's treatise titled *Q-bell: An exploratory study on its use by persons with disabilities*. This project will be conducted under the supervision of Dr. S. du Rand (NMMU, South Africa) and Mrs. G. Klopper.

The goal of this study is to introduce a product, the Q-bell, that was developed. The Q-bell is a patient call device aimed at improving the conditions of care in health facilities especially for people with disabilities.

Interviews will be conducted in order to collect information and opinions on the functionality of the product. Each interview will last approximately 30 to 45 minutes. The interviews will be recorded and transcribed verbatim and kept safe for a period of 5 years. The data will be kept confidential at all times. Although your identity will at all times remain confidential, the results obtained from this will be shared with the developer and the development team for possible improvements if necessary. The results may also be presented at a conference or in journal publications.

To participate in this study, it is required that I obtain consent from you, indicating that you understand the context of this study and agree to participate.

Furthermore, it is important that you are aware that participation in this research is completely voluntary. You are not obligated to take part in this study. If you choose not to participate your care and rights will not be affected in any way and you will

not incur any penalty and/or loss of benefits to which you may be entitled. If you participate, you have the right to withdraw from the study at any given time without any penalty or loss of benefits.

If you require any further information, please do not hesitate to contact me on 076 379 7762 or e-mail: s209062774@nmmu.ac.za. Dr. S. du Rand on 041 504 2615 or e-mail: Suzette.duRand@nmmu.ac.za.

Thank you for your time and consideration in this matter.

Yours sincerely,

Siphiwo. G. Sithole

Nelson Mandela Metropolitan University

## ANNEXURE C: ETHICAL APPROVAL



Copies to:  
Supervisor: Mrs G Klopper  
Co-supervisor: Dr SM du Rand

Summerstrand South  
Faculty of Health Sciences  
Tel. +27 (0)41 504 2956 Fax. +27 (0)41 504 9324  
Marilyn.Afrikaner@nmmu.ac.za

Student number: 209062774

Contact person: Ms M Afrikaner

11 November 2018

Mr SG Sithole  
88 Lewerkie Street  
Cotswold Extension  
Port Elizabeth  
6045

### FINAL RESEARCH/PROJECT PROPOSAL:

QUALIFICATION: MA HEALTH AND WELFARE MANAGEMENT  
TITLE: THE Q BELL: EXPERIENCES OF PATIENTS WITH DISABILITIES  
UTILISING A NEW CALL BELL SYSTEM

Please be advised that your final research project was approved by the Faculty Postgraduate Studies Committee (FPGSC) subject to the following amendments/recommendations being made to the satisfaction of your Supervisor/s:

### COMMENTS/RECOMMENDATIONS:

1. The proposal was well prepared.
2. Reference list - publication year cited in text different to year listed in the reference list (Duffy, Wagner).

Please be informed that this is a summary of deliberations that you must discuss with your Supervisor/s.

FPGSC grants ethics approval. The ethics clearance reference number is H16-HEA-NUR-036 and is valid for three years.

We wish you well with the project.

Kind regards,

Ms M Afrikaner  
Faculty Postgraduate Studies Committee (FPGSC) Secretariat  
Faculty Administration  
Faculty of Health Sciences

## ANNEXURE D: INDEPENDENT CODER CONFIDENTIALITY AGREEMENT



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• Port Elizabeth • 6031 • South Africa • [www.nmmu.ac.za](http://www.nmmu.ac.za)



**Nelson Mandela  
Metropolitan  
University**

*for tomorrow*

### CONFIDENTIALITY AGREEMENT

I, Mariana Lourens, agree with the following statements:

I understand that I may come in contact with confidential information. As part of the condition of my work with Sipiwo Sithole. I hereby undertake to keep in strict confidence any information regarding any respondents and/or interviews of the Master's treatise titled *Q-bell: An exploratory study on its use by persons with disabilities* or any other organization that comes to my attention.

Any and all information that might arise during my work on the Master's treatise titled *Q-bell: An exploratory study on its use by persons with disabilities* will only be shared between myself and Sipiwo Sithole, and on other third party.

Mariana Lourens

(Print Name)

M Lourens

(Signature)

M Lourens

(Signature of witness)

Dated this 18th day of September, 2017.

**ANNEXURE E: FACILITY CONSENT**



HOME SWEET HOME

4 How Avenue, Central, Port Elizabeth  
Tel: 041-3730231 Fax: 041-3730263  
Company Reg # 2010/022120/23  
Nursing Sister BHF 088 000 8831726

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15 June 2017

Port Elizabeth.

TO WHOM IT MAY CONCERN

MR SIPHO SITHOLE presented documentation to "HOME SWEET HOME" concerning the testing of the "NEW CALL BELL SYSTEM" for the Aged and Frail care.

The bells were installed and Residents where the trials were done were interviewed by Mr Sithole re: the effectiveness of the new system.

Trust the above is in order, do not hesitate to contact us should you have any further queries.

Many thanks,  
Yours sincerely,

MRS V MCKAY  
OWNER

## **ANNEXURE F: INTERVIEWS**

**QB3**

**Interviewer** Good morning sir

**QB3** Hi Bhuti

**Interviewer** Aaah it's very nice to meet you again

**QB3** Ja

**Interviewer** First and foremost I would like to thank you for participating in this research study you have done me a huge favour and I really appreciate what you are doing for me.

**QB3** Ja

**Interviewer** And now sir as discussed on Friday I placed a bell in your room and mmh for you to use over the weekend.

**QB3** Yes

**Interviewer** And as agreed upon I will come back on Monday to find out how you experienced this bell.

**QB3** Yes

**Interviewer** So sir if you don't mind can you just tell me as much as possible how you experienced the Q-bell.

**QB3** Ja to using the Q-bell for me is very helpful, its useful as the people who live with disability as the people we haven't got the strength on our arms and our wrists. You know but that bell is very very gentle but it is very touchable cause as you as myself cause I am a spinal cord injury so I have no function on my arms but as the Q-bell was put next to my forehead on my side it it, I was not battling to use the bell cause I only had to touch it using my forehead by the side of my forehead so I give it 100 %.

**Interviewer** You give the bell a 100%?

**QB3** Ja I give 100%, really its helpful to people who live with the disability, very sensitive.

**Interviewer** I am happy to hear that. Mmmh if I may just ask you, you said that you had difficulties with strength

**QB3** On the arms

**Interviewer** Yes sir, was this effective for you perhaps with the previous bells that you might have been exposed to? As in if I may just elaborate you were struggling a bit to use the previous one because of your strength?

**QB3** No this one here is good because the previous one the first one was smaller one and you had to put the thumb to let it off but now they bring the bigger ones and the bigger one is similar as this one is same as this one.

**Interviewer** Is similar to this one?

**QB3** Ja

**Interviewer** So with the smaller one that you had before you had great difficulty to use it

**QB3** Ja I had great difficulty because that one was very small, we have to push the thumb.

**Interviewer** Okay so the other one you had to use your thumb to push in for assistance then that was not ideal for you?

**QB3** yes it was not ideal and then I complain then they come to use this big one.

**Interviewer** The big one?

**QB3** Ja the big one is sensitive same as this one.

**Interviewer** Okay so the one that you previously had before and the Q-bell had the same sort of sensitivity being in terms of how you touch it when you request assistance?

**QB3** Ja it's the same

**Interviewer** Aah but then if I may just ask you how does the Q-bell fair against the big one?

**QB3** Ja the Q-bell is very very sensitive , very small you know but as small as it is for me on my pillow you don't take much space cause that one I used ,the previous one that I used is taking too much space you know sometimes when I shake my head I just touch it and the it comes off .so during the weekend I experienced this one the Q-bell that if you put it on the pillow is not moving and and is standing there where you are , ja and when I move my head I don't even touch it you know unless I touch it purposefully .

**Interviewer** Okay so with the with the big one as referred I can say you had false alarms.

**QB3** Mmmmh

**Interviewer** So did that actually influence anybody in this place .....?

**QB3** No it was fine

**Interviewer** It was fine so they understood that.

**QB3** Yes

**Interviewer** Okay sir that's fine

**Interviewer** Aaah also you said that it was easy to touch, If I may ask how did you actually operate the Q-bell and with what part of your body did you use?

**QB3** The old one or the new one?

**Interviewer** The Q-bell and the old one yes sir.

**QB3** For me is good cause I can sometimes push it with the hands but the most of the time I use my side of the forehead.

**Interviewer** Okay so how do you start do u put the bell

**QB3** No I put the bell on top of the pillow infront of my forehead.

**Interviewer** Okay

**QB3** Then I just lean forward and then press it with my head.

**Interviewer** Oh okay so you use your forehead

**QB3** Yes

**Interviewer** Okay then you use to press it from the bed and then the forehead.

**QB3** Ja I use the pressure from the pillow

**Interviewer** Okay sir and mmmh you said that as well that the old one or the Q-bell, or what you are saying with the Q-bell is it doesn't move when you put it on the pillow.

**QB3** Yes this one of yours

**Interviewer** Yes and if I can just ask did you have problems with bells that are moving a lot when you are perhaps resting or something along those lines ?

**QB3** Ja with my old ones

**Interviewer** The old ones?

**QB3** ja cause this one is plastic

**Interviewer** Okay

**QB3** Cause sometime it's sliding down on the pillow

**Interviewer** Okay so the older one would normally slide down?

**QB3** Yes it is sliding

**Interviewer** Okay when its slide would it be out of you reach?

**QB3** Sometimes ja it will slide out of my reach.

**Interviewer** And when it was out of your reach how would you actually get that bell back.

**QB3** Sometimes I wait, waiting for the nurse to come, sometime is at twelve o'clock or four o'clock in the morning so I stay without it.

**Interviewer** So you stay without the bell the older one till someone comes and check up on you?

**QB3** Ja its sliding down until someone comes and check and take a round and check.

**Interviewer** Ooh okay sir so you had some difficulties with this old one?

**QB3** Yes with the older one cause it is plastic and I can't stand on it

**Interviewer** Okay I see it would slide down a lot and out of you reach quite frequently?

**QB3** Ja

**Interviewer** Mmmm if I may ask you again sir with that was there any situation that you actually need some assistance and you couldn't because the bell was like completely out of your reach?

**QB3** Ja sometimes

**Interviewer** Sometimes, sometimes you actually definitely do need some sort of assistance?

**QB3** I need some sort of ...

**Interviewer** Assistance?

**QB3** Assistance you know

**Interviewer** But then you were forced to wait.

**QB3** There was this other time the bell was running, then ja sometimes I scream, when my neighbour hear me then he touch the bell off.

**Interviewer** Oh okay so when it happens you would scream and your neighbour would assist you?

**QB3** Ja he will assist me.

**Interviewer** Okay, if I may do ask you one more thing mmmh if you had to list the pros and cons of the Q-bell what would you say? Like if you had to list them or perhaps compare them if you had to compare the Q-bell, what's its highlight and its downfalls compared previous ones?

**QB3** Ja the Q-bell is 100% compared to others cause for me when I was using it during the weekend, didn't have a problem ,didn't have a slide of the Q-bell when you put there you positioned and it stayed in that position you know.so really its helpful.

**Interviewer** Is there anything that you would like to perhaps sorry is there anything that you perhaps didn't like about the Q-bell?

**QB3** Not for me; no problem

**Interviewer** No problem, so even if I would give you a chance perhaps to meet the gentleman or the developer of the Q-bell you wouldn't have anything to suggest to him or recommend him in terms of his design?

**QB3** No

**Interviewer** No?

**QB3** I mean what he has done is has done a good job for me and for the people who live with a disability so his idea is is very very rare. His aaah I don't know how to put it cause really that Q-bell is working 100%.

**Interviewer** 100%, so you would say he came up with a good idea

**QB3** Good idea yes.

**Interviewer** And it is very... sorry, it's very aah helpful?

**QB3** Yes very very

**Interviewer** I just wanna ask you one more thing have you, you said that you used your forehead to operate the bell did you perhaps try any other part of your body to use the bell?

**QB3** Ja I did try the one time I think on Friday or Saturday to touch with my my back of my head

**Interviewer** Okay

**QB3** Cause I had I slowly move and put it on my wrist the I try, as I sit it then it come off.

**Interviewer** Okay it came off with the slight touch?

**QB3** Ja slight touch with back of my head it just coming off.

**Interviewer** Okay so when you had to compare it to the old one you couldn't perhaps do that or could you as well?

**QB3** Yes I could but when I tried to touch it just slide out of my pillow

**Interviewer** Okay so the big one

**QB3** Cause I rather use my forehead.

**Interviewer** Okay I see I see so you rather use your forehead cause with your head it slides

**QB3** The side of my head ja.

**Interviewer** So is it correct for me to say that the older ones you had a huge problem of falling off the bed.

**QB3** Ja

**Interviewer** Sliding away

**QB3** Sliding away from me and of the position where I put it.

**Interviewer** When it did slide away from you aside from having a sister coming and get or when the sister comes to do her rounds and assist you is there any other way that you tried to mmh call or pull the bell back towards you?

**QB3** Hhhmmhh(no) unless sometimes the cord is near me then I try to pull with the teeth or maybe to grab and pull it towards it is difficult sometimes as I pull then it goes away now.

**Interviewer** So everytime you pull it would run back

**QB3** Run backwards

**Interviewer** Okay so it was a futile exercise for you?

**QB3** Ja

**Interviewer** Okay so now with it running away I am assuming as you said it had a weight problem if I may say?

**QB3** Aah for me is need something underneath to stick on.

**Interviewer** Okay

**QB3** Cause it is plastic then it slides, slide easy to the pillows.

**Interviewer** I see

**QB3** Ja to the pillow cases. Cause as I compare to this one this one is got a cloth then it stick cloth to cloth of the Q-bell, if they could have that idea of the cloth to this ones you know maybe it could stick on the cloth.

**Interviewer** So the actual cloth that's wrapped around it was very helpful?

**QB3** Ja was very helpful

**Interviewer** Okay sir if I may tell you quickly about the cloth the cloth was actually designed or the sock was designed for hygiene purposes

**QB3** Okay

**Interviewer** Because I had a concern that with it being given from patient to patient transfer you would actually wash that cloth and then reissue it.

**QB3** Okay

**Interviewer** How do you feel about that?

**QB3** Ja it is good man cause you take it off and was it for hygienic cause sometime you use a long time and it becomes dirty.

**Interviewer** Okay if I may just as you quickly sir is there anything else you would like to add with the experience with this bell? That perhaps wasn't covered in this interview?

**QB3** No sir this Q-bell was 100% is 100% cause really for me I haven't got a query just is from Friday till Sunday night .ja for me ja cannot have a complain. And even now when you explained about it you know didn't even know before you tell me now

that even that cloth or sock you put it on a to cover the bell is a protected for hygienic ja, so this one I mean ja

**Interviewer** So sir would you recommend the old bell or the Q-bell for people with disability?

**QB3** Ja the Q-bell yes.

**Interviewer** The Q-bell?

**QB3** Ja

**Interviewer** The Q-bell is it for your own personal recommendation or do you feel that this Q-bell will actually will be better for all disable people?

**QB3** All the people who live with a disability.

**Interviewer** Disability?

**QB3** Ja cause the most of us some of us you see we can't even move the hands

**Interviewer** Yes yes

**QB3** But with the Q-bell just to put in front of you or side of your forehead just is very sensitive to touch and become off.

**Interviewer** Okay sir, what I am getting from you is its ease of use is very ....

**QB3** Its ease of use ja

**Interviewer** It's a common feature of the Q-bell.

**QB3** Yes

**Interviewer** Okay sir that's how I would like to conclude this interview. I would like to thank you and your inputs, and what you said today will be taken into consideration and thank you very much for assisting me.

**QB3** Thank you guys for showing us this Q-bell you know cause ja you are our I didn't even know that there is something like the Q-bell but we we we used our old assisting bells ja its new three years they put it in three years ago this new bells. Before we were having the bells that working with electricity then they cut it off then they put the new system. Ja the system the hospital use the government hospital they are using the same system but ja one thing they didn't recognise is the bell is bigger ja is bigger than this Q-bell that you guys do make it.

**Interviewer** Okay so this one its size was its downfall or its design flaw and the Q-bell compared to...

**QB3** Compared to this one is good.

**Interviewer** Even the size as well?

**QB3** Ja even the size as well, it's the right size.

**Interviewer** That's good to hear sir.

**Interviewer** Thank you very much sir.

**QB3** Thank you

**Interviewer** See you soon

**QB3** Thanks man.