

The influence of trust and commitment on the choice of a medical devices supplier in South Africa

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ABSTRACT

Effective supplier relationship management and its impact on organizational performance is an increasingly important area of interest in the academic and the business world today. Most of the established and successful companies focus strongly on the development of closer ties with other organizations in search of competitive advantage and improved market positioning. The current literature reported trust and commitment as facilitators of long term supply chain partnerships in medical devices industry. South African healthcare has two major challenges; healthcare costs and the poor quality of the public healthcare. Both high cost and poor service can be linked to poor supply chain management. The main objective of this study was to establish whether trust and commitment influence the choice of the medical devices supplier in the South Africa. This study aims to gain insight into the factors that lead to the participants deciding to go with a specific supplier in the South African medical devices industry, paying special attention to trust and commitment. An empirical research using a questionnaire was conducted within hospitals procurement departments in Gauteng Province, South Africa. The questionnaire was developed from a literature review and contains questions and items relevant to the research problem. The finding showed that both trust and commitment have positive influence on the choice of a medical devices supplier by hospital procurement departments. However, commitment has the strongest influence of all the other constructs. The results also show that competence is vital in order to develop trust with hospitals procurement. Thus, it can be concluded that hospitals find it important to associate with suppliers that are competent and trustworthy. Further research into the operations of the South African healthcare sector is highly recommended. It is recommended that academics study vigorously the industry in order to come up with solutions to achieve envisioned better and efficient healthcare system for all South Africans.

Keywords: Trust, Commitment, Medical Devices, Procurement Management, Supplier Relationship Management.

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ABBREVIATIONS

A	- Alpha
COMP	- Competence
COMT	- Commitment
GDP	- Gross Domestic Product
ITR	- Intension to Repurchase
N	- Number
SCM	- Supply Chain Management
ST	- Supplier Trust
SAMED	- South African Medical Devices Industry
WHO	- World Health organization

CHAPTER 1: INTRODUCTION AND PROBLEM STATEMENT

1.1. INTRODUCTION

This chapter introduces the topic for this research study. The research explores the influence of trust and commitment in the choice of a medical devices' supplier in the South African market. Firstly the background will be presented, followed by the research question and objectives. Then the relevance of the study will be presented followed by a brief research methodology outline. Finally, the chapter layout of the mini dissertation will be outlined.

1.2. BACKGROUND

Health professionals comprise the backbone of the health care system. According to Silva, Campos and Pereira (2011), health professionals are daily entrusted with the responsibility of caring and preserving the lives of patients. They argued that their role in providing optimal patient care and satisfaction is critical and indispensable.

Thrall (2016), in his writing posited that health professionals achieve this by applying their clinical knowledge coupled with the technology of medical devices in order to diagnose and order precise treatment. According to the World Health Organization (2014), a medical device is defined as an article, instrument, apparatus or machine that is used in the prevention, diagnosis or treatment of illness or disease, or for detecting, measuring, restoring, correcting or modifying the structure or function of the body for some health purpose.

Numerous of these medical devices are being utilised daily by healthcare professionals for diagnosis and treatment of different medical related conditions. Furthermore, medical devices equip the healthcare practitioners with tools that allow them to perform their duties of patient care more effectively and efficiently (WHO; 2006).

The medical devices industry is controlled by SAMED (South African Medical Device Industry Association and comprises over 300,000 different medical devices (SAMED, 2013). These devices are manufactured by specialised companies and need to be purchased by the health professionals before use in hospitals.

Therefore, to obtain the medical devices for hospitals, procurement processes have to be followed. Effective health technology procurement practice is instrumental in ensuring provision of safe, equitable and quality health care. Effective procurement also ensures that all parties involved enjoy benefits. (WHO, Procurement Process Resource Guide, 2011).

WHO (2011) stated that the two important factors that greatly influence the procurement process are supplier service and cost. Poor procurement of the medical devices has been linked to poor healthcare service and increased transaction cost.

Dobrzykowski, Callaway and Vonderembse (2015) argued that as healthcare costs increase, hospitals are faced with the challenge of balancing the costs and still provide quality care. As a result of the great number of medical devices that hospitals need to procure, hospitals and supplier companies need to be closely connected and a complete supply chain is crucial to ensure an adequate supply of products. Delays in supply of the products can negatively impact on both the supplier and the hospitals operations (Cheng-Min,Cheng-Tao,Bor-Wen and Pen-Chen, 2013).

Specifically, trust and commitment have been identified as being the critical drivers of successful supply chain management between the hospital and device suppliers (Cheng-Min,Cheng-Tao,Bor-Wen and Pen-Chen, 2013). According to Nyaga, Whipple and Lynch (2010) research, they found out that trust and commitment led to improved satisfaction and performance.

Furthermore, through their survey of the medical supplies procurement staff in Taiwan, Chao and Cheng (2013) reported that trust had a significant positive effect on future relationships. It was a key factor for successful supply chain management, they further contended.

Trust as defined by Hausman and Johnston (2010) is the confidence in the integrity and reliability of another party, rather than confidence in the partner's ability to perform a specific action. They further reasoned that trust between partners led to long term partnership which is linked to competitive advantage gained through successful supply chain management.

1.3. CAUSAL FACTORS

The causal factors for this study that centre on the customer and supplier of medical devices were as follows:

- The costs of medical devices are continuously increasing while resources are becoming more limited to deliver and maintain the healthcare system. Money is spent in procuring medical devices. However, it needs to be established whether the procurement processes follow the fundamental supplier - customer relationship management principles that have been established as being instrumental in delivering products in a cost effective and efficient way.
- For this study, focus was on evaluating whether trust and commitment is influential in the procurement of medical devices.
- The South African government is in the process of implementing the National Health Insurance as a Universal Healthcare Coverage system aimed at delivering an all-inclusive high quality, cost effective healthcare.
- Trust and commitment between the supplier and a customer have been identified as critical in improving the processes. Improving processes leads to a reduction of waste, rework, and delays, lower costs and positive company image (Mosadeghrad, 2014).
- South Africa has very limited resources. Healthcare per capita expenditure in South Africa was \$593 in 2016, compared to per capita expenditure of above \$3,000 for

the developed countries (Mosadeghrad, 2014). In spite of these challenges, there is still exorbitant amount of unfruitful expenditure in procurement reported annually in.

- Therefore, a highly efficient procurement process is instrumental in curbing the costs and ensuring sustainable supply of medical devices. Scientific research in the healthcare procurement is important in developing a collection of knowledge needed to understand how the system functions beyond policies but real life implications.

1.4. IMPORTANCE OF THE STUDY

A South African procurement environment is unique from other parts of the world due to unique procurement regulations such as preferential procurement. As such it is important to understand to what extent does the current literature apply to South African context (Mosadeghrad, 2014).

The South African government has made efforts to invest into the industry to improve and ensure quality universal healthcare to all South Africans. Therefore, it is necessary to create scientific data that gives insight into the South African medical healthcare space. Through critical analysis, a comparison can be made against other parts of the world, who have successfully implemented efficient procurement space for excellent healthcare delivery.

Testing factors that are supported by literature as being integral to high performance and subsequently leading to high quality healthcare system is crucial in South African context. Trust and commitment were reported as raising effectiveness and productivity leading to supply chain management environment which leads to reduced costs and superior service (Morgan and Hunt, 1994).

This study looked beyond the tangible factors of buyer–supplier relationships in order to understand the role these intangible factors have on buyer–supplier relationship continuity and future collaboration. The outcome of this study will give an understanding whether South African hospitals place any value on trust when choosing the medical

devices suppliers. In addition, it will tell whether trust will influence their choice and commitment to suppliers. The outcome will further benefit the supplier of medical devices in their strategies to form long lasting relationships with hospitals.

1.5. PROBLEM STATEMENT AND RESEARCH QUESTION

The relationship between effective supplier relationship management and its impact on organisational performance is an increasingly important area of interest in the academic and the business world today. Most of the established and successful companies focus strongly on the development of closer ties with other organisations in search of competitive advantage and improved market positioning. This has triggered the need to develop better relationships with suppliers to enhance supply chain performance.

Healthcare expenditure in South Africa makes 8.4% of the GDP. Of this expenditure, 28% is spent on goods and services. The healthcare industry is economically significant but there is very little academic literature about the South African industry (Habidin, Shazali, Salleh, Zainol, Hudin and Mustaff, 2015).

Initiatives to study and generate industry specific academic knowledge will add to better understanding and management of the complexity of healthcare supply chain. According to De Vries and Huijsman (2011), studies with a mono-disciplinary focus, an interdisciplinary focus on Supply Chain Management issues in health services seems to be necessary.

South African healthcare has two major challenges; healthcare costs and the poor quality of the public healthcare. Both high cost and poor service can be linked to poor supply chain management.

Therefore, the study aims to investigate three questions:

1. Is the relationship between hospitals and suppliers of medical devices characterised by trust and competence?
2. Does trust lead to commitment / satisfaction in the relationship between hospitals and medical devices suppliers?

3. Does trust and commitment influence the choice of medical devices suppliers and does it bring satisfaction and intention to repurchase?

1.6. RESEARCH OBJECTIVES

1.6.1. Primary objectives

The main objective of this study is to establish whether trust and commitment influence the choice of the medical devices supplier in the South Africa. It is to measure the other related constructs competence, satisfaction and intention to repurchase

This study aims to gain insight into the factors that lead to role players deciding to go with a specific supplier in the South African medical devices industry, paying special attention to trust and commitment. The current literature reported trust and commitment as facilitators of long term supply chain partnerships medical devices industry.

1.6.2. Secondary objectives

The study seek to establish if there is an existing trust on suppliers by hospitals personnel involved in procurement of the medical devices for hospital, and what is the main causal factor. It further evaluates whether this leads to satisfaction and intention to repurchase.

1.7. RESEARCH METHODOLOGY

1.7.1. Description of overall research design

The study took a quantitative approach. The principles of quantitative research support the concept that scientific data can be collected and statistically analyzed

1.7.2. Target population/sampling

According to Bryman and Bell (2014), the study population is individuals who possess specific characteristics in the universe and defined as the segment of the population that is selected for research. It is subset of the population. These individuals represent a group in a population of study for a research problem, results from which will be generalised.

Furthermore, the need for a sample is driven by the impracticality of collecting data from the entire population. Budget and time are constraints to surveying the entire population (Saunders and Lewis, 2009).

Sampling techniques that can be used fall under two groups, probability and non-probability sampling. With probability sampling, a chance of each case being included in a sample is usually equal. While for non-probability sampling the chance of the case being included is unknown and as such, although generalization can still be made, it is not possible to make a statistical estimation of the population characteristics. This is contrary to probability sampling which allows for statistical estimation (Saunders and Lewis, 2009).

The sample for this study was private and public hospitals procurement staff responsible for procurement of medical devices in Gauteng Province, South Africa. The medical devices procurement staff were sampled strategically because of their role and insight into the procurement of medical devices.

According MedPages (2017), the number of public hospitals in Gauteng is forty one (41) and the number of private hospitals is ninety nine (99). As such, the total number of hospitals from which the sample was obtained is 140. For this study, an assumption was made that each hospital has at-least one buyer/ stock controller and a manager/ director. To increase a chance of getting a response from each of the hospitals, the study unit was decided at 140 and a questionnaire was dropped at each of the hospitals. The population is therefore two hundred and eighty.

1.7.3. Data collection

To accomplish the objectives of this study, an empirical research was conducted within hospitals procurement departments in Gauteng Province, South Africa. All hundred and forty (140) hospitals procurement departments in Gauteng were approached to participate in this study. The questionnaire was formulated as to receive independent responses from the individuals surveyed. Primary data was collected in the form of results from quantitative questionnaires sent out to the target group.

1.7.4. Data analysis

Quantitative methods emphasize objective measurements and the statistical, mathematical, or numerical analysis of data collected through polls, questionnaires and surveys, or by manipulating pre-existing statistical data using computational techniques (Muijs and Daniel 2010). The study used quantitative research, focusing on gathering numerical data and generalizing it across groups of people or to explain a particular phenomenon.

Data was analysed to research the relationship between trust and commitment in the decision or intension to procure from suppliers of medical devices.

1.7.5. Ethical consideration

The undertaking of this research upheld the following codes:

- Maintained respect and protection of participants and the community within which this research was conducted. All measures were taken to ensure identity of participants and institutions was protected.
- The principles of transparency were observed. All participants were informed of the aims and implications of the study and the possible outcomes and benefits thereof. Participation was to be voluntary and no financial reward was to be offered.
- The conduct of this research was such that the highest scientific quality was achieved.

1.8. OUTLINE OF THE STUDY

The layout of this study report is as follows:

Chapter 1: Introduction

This part of the report describes the research background. It also provides the purpose of this research, the research objectives, causal factors and the research outlines flow and the dissertation structure.

Chapter 2: Literature review.

Supply chain theory was reviewed. Trust and commitment concept as well as the impact they have in procurement efficiency was reviewed as well. In addition, medical devices and South African procurement frameworks was also reviewed.

Chapter 3: Research design and methodology.

Research sampling, measures and data collection procedure were provided in this section of the dissertation.

Chapter 4: Data analysis and interpretation.

Statistical techniques are used to check for the measurement reliability, validity and the research model fit using statistical software programs.

Chapter 5: Conclusions, implications and overall dissertation contributions.

The overall concluding remarks informed by the findings of the empirical research were given. Future research directions were indicated and the overall dissertation contributions provided.

CHAPTER 2: LITERATURE REVIEW

2.1 CHAPTER OVERVIEW

This chapter gave an overview of medical devices. The definition and their variants and general use are outlined. Attention was given to supply chain relationship between suppliers of medical devices and the hospitals, paying special attention to the role trust and commitment play.

2.2 MEDICAL DEVICES OVERVIEW

According to SAMED (2014), Medical devices' use in the healthcare industry is becoming an increasingly important element for the diagnosis and treatment of different medical conditions. As stated by McFadden, Henagan and Gowen (2009), healthcare is an important service industry given not only the criticality of quality and safety in delivering patient care but also the high cost associated with it.

The World Health Organization defines medical device as any instrument, apparatus, implement, machine, appliance, implant, and reagent for in vitro use, software, material or other similar or related article, intended by the manufacturer to be used, alone or in combination, for human beings, for one or more of the specific medical purpose(s) of:

- diagnosis, prevention, monitoring, treatment or alleviation of disease,
- diagnosis, monitoring, treatment, alleviation of or compensation for an injury,
- investigation, replacement, modification, or support of the anatomy or of a physiological process,
- supporting or sustaining life,
- control of conception,
- disinfection of medical devices
- providing information by means of in vitro examination of specimens derived from the human body;
- and does not achieve its primary intended action by pharmacological, immunological or metabolic means, in or on the human body, but which may be assisted in its intended function by such means.(WHO; Medical Devices)

As authored by SAMED (2014), there are over 300,000 Medical Devices in use and include a variety of products ranging from a simple syringe to a life support machine and classified into several categories.

2.3 CATEGORIES OF MEDICAL DEVICES

The main categories can be summarized as below:

- **Diagnostic equipment** - includes imaging machines such as ultrasound and MRI machines, PET and CT scanners, and X-ray machines;
- **Therapeutic equipment** includes infusion pumps, medical lasers and LASIK surgical machines;
- **Life support equipment** – a group of medical machines that are used to maintain bodily function. Such machines include ventilators, anaesthetic machines, heart-lung machines, ECMO and dialysis machines.
- **Medical monitors** allow medical staff to measure a patient's medical state. Monitors may measure patient vital signs and other parameters, including ECG, EEG, and blood pressure and dissolved gases in the blood;
- **Medical laboratory equipment** automates or helps analyze blood, urine and genes; and
- **Diagnostic medical equipment** may also be used in the home for certain purposes, e.g. for the control of diabetes mellitus.

2.4 SOUTH AFRICAN MEDICAL DEVICES MARKET

As estimated by Mueller, Govender and Basu (2014), the South African medical devices and the medical diagnostic sector are estimated to be worth US\$2.5 - US\$3 billion.

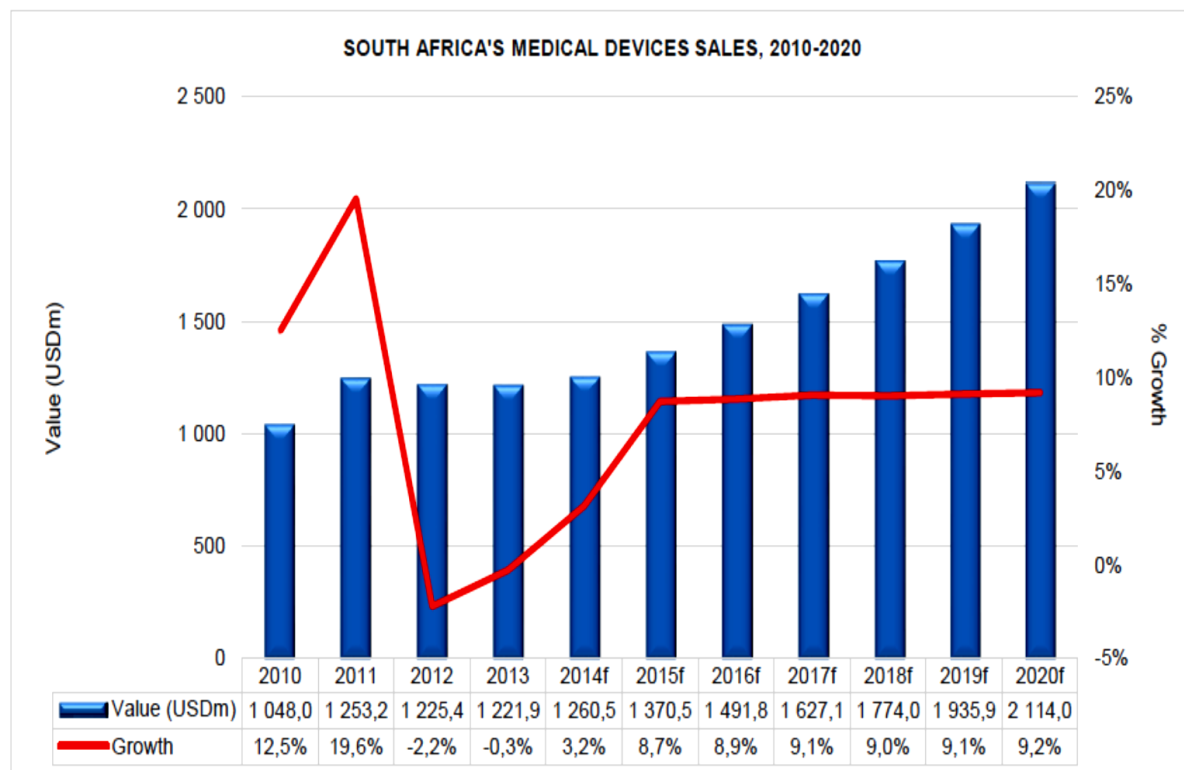
On one hand, SAMED (2014) estimated that the South African medical device market was valued at USD1.2bn in 2013. It generated revenues in excess of ZAR12.1bn and it is amongst the top 30 largest in the world.

The South Africa's medical device manufacturing firms are largely small to medium sized businesses and often integrate the distribution activity with manufacturing. These

manufacturers mainly focus on producing basic medical equipment and supplies such as bandages and dressings, medical furniture and low technology items.

South African companies face competition from multinational companies that operate in a joint venture capacity with local firms.

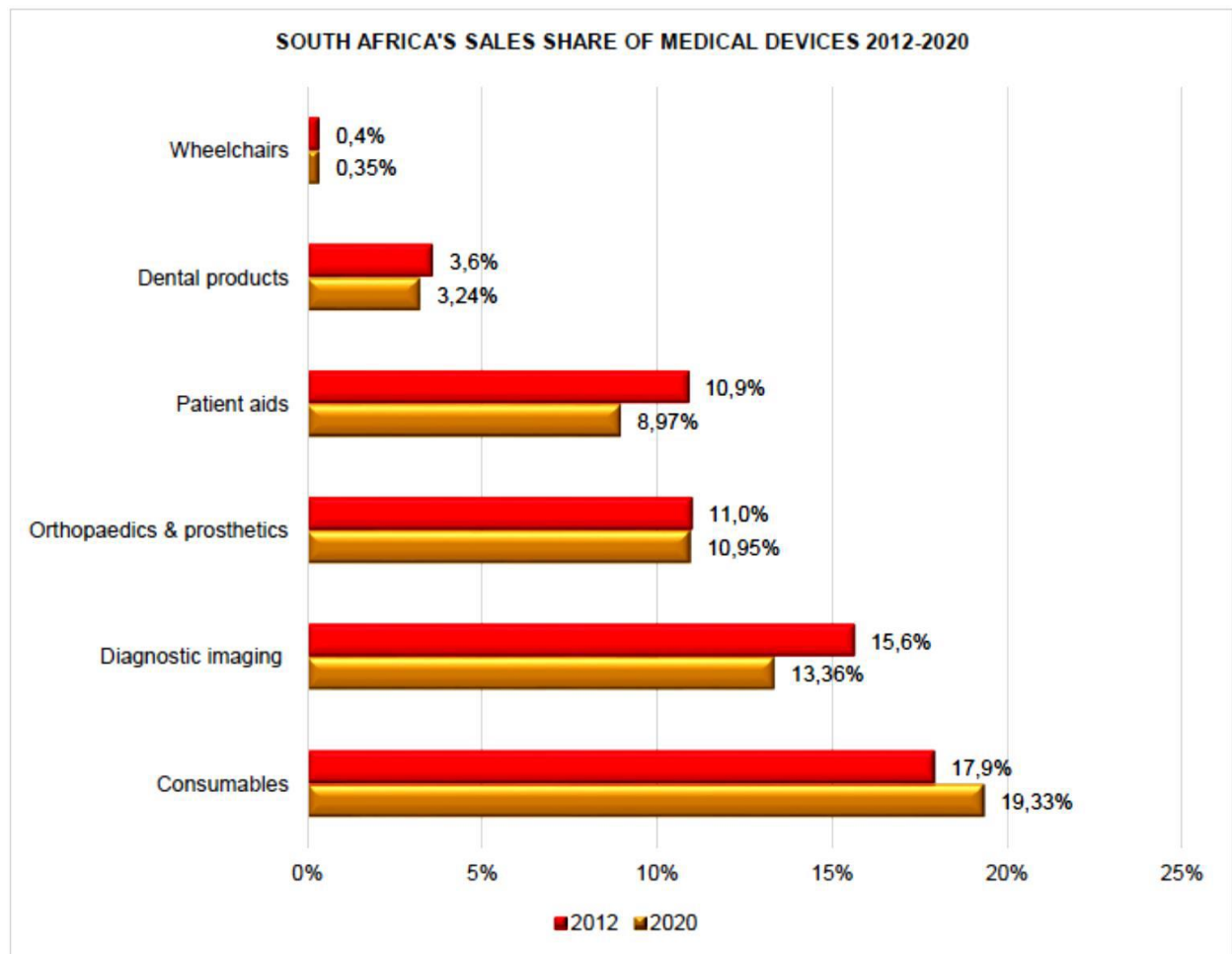
Figure 1.1: South African Medical Devices Sales



Source BMI 2014

Figure 1.2 shows the market share of South African companies. It can be seen that syringes, needles and catheters continue to account for the largest share of medical devices sales in South Africa for the period 2010 to 2020.

Figure 1.2: Shows the market share of South African companies.



Source: BMI 2014

The SWOT analysis of South African medical devices industry

Strengths	Weaknesses
➤ Wealthiest African economy whose healthcare system is envied by other African nations ➤ Strong, sizeable private sector	➤ Poor infrastructure, particularly in the extensive rural areas, limiting efficiency of healthcare delivery as well as the shortage of medical personnel
Opportunities	Threats
➤ Public-private partnership growth ➤ Imports account for around 95% of market ➤ Emergence of affluent, middle class	➤ Inadequate public funding for development of public health system ➤ Depreciating Rand is making imports less affordable

Source: Business Monitor International, 2014

2.5 PROCUREMENT OF MEDICAL DEVICES

According to McFadden, Henagan and Gowen (2009), access to high-quality and appropriate medical devices are a foundation to the delivery of efficient and effective healthcare. In addition, Herzlinger (2006) alluded that the use of medical devices impacts the delivery of healthcare. On one hand, the decision-making process relating to ordering of medical devices results in poor service delivery (Balestra, Knaflitz, Massa and Sicuro, 2007). With South Africa in the process of introducing National Health Insurance to improve provision of universal health coverage, efficient and effective ordering and use of medical devices can assist the country in achieving its goal of delivery quality healthcare to all citizens. The procurement process supports healthcare delivery. However, often, lowest-acquisition price guides procurement decisions and thus may not be aligned with the needs of clinical procedures. Ideally, procurement decisions should be guided by principles of transparency and money should be spent efficiently as posited by Lingg, Wyss and Durán-Arenas (2016). Furthermore, a common practice across national procurement systems is that the focus is on cost-containment,

but basing purchasing decisions on a broader range of criteria, such as quality, supplier competence, reliability and health outcomes, might better allow governments to achieve value for money and support patient access to beneficial innovations (Sorenson and Kanavos, 2011).

2.6 SUPPLIER RELATIONSHIP MANAGEMENT

Mettler and Rohner (2009) defined supplier relationship management is the process that defines how a company interacts with its suppliers. Just as a company needs to develop relationships with its customers, it also needs to foster relationships with its suppliers. The desired outcome is a win-win relationship where both parties benefit, they further alluded. Hospitals need the services of their suppliers in order to fulfil the needs of the patients. This makes management of the supplier's relationships critical. Suppliers directly contribute to the service delivery. Any failure by the supplier directly and negatively affects the performance of the service firm. Sustainable relationships build on trust, collaboration, responsiveness and coordination is important in order to ensure good and uninterrupted service (Baltacioglu, Ada, Kaplan, Yurt And and Cem Kaplan, 2007).

Hospitals by virtue of their function can be classified as service businesses in which any product they procure is to facilitate their service offering to patients. The procurement of the products affects directly the quality of service delivery (Naidu, 2009). Supplier relationship management is also vital to healthcare service supply chains.

Supplier relationship management is reported as playing a crucial role in the reduction of costs and the optimization of performance (Mettler and Rohner, 2009). However, most hospital buying agents are only expected to accomplish the best price for the needed goods which could lead to weak trust between the buyer and the supplier's relationship (Sorenson and Kanavos, 2011). This is in contrast to industries characterized by intense competition such as automotive or the consumer electronics industry. Supplier relationship management is reportedly not being paid much attention to in healthcare (Mettler and Rohner, 2009).

According to Mentzer, DeWitt, Keeble & Zacharia (2012) supplier relationship management is considered to be a comprehensive approach to managing a company's interactions with its suppliers of goods and services. The goal is to streamline and make the process between a company and its supplier more effective (Kosgei and Gitau, 2016)

A study by Li, Ragu-Nathan, Ragu-Nathan and Rao (2006), reported that higher levels of supply chain management practice can lead to enhanced competitive advantage and improved organizational performance. Kosgei and Gitau (2016) supported this in their study and reported that understanding and practicing of supply chain management with key focus on supplier relationships is an essential prerequisite for staying competitive in the global race and enhancing profitably in the market.

Li, Ragu-Nathan, Ragu-Nathan and Rao (2006) further advanced that competitive advantage can have a direct, positive impact on organizational performance. Furthermore, competitive advantage can have a direct and positive impact on organizational performance. The empirical results from a study by Chong, Chan, Ooi and Sim (2011) suggested that strategic supplier partnership, customer relationship, information sharing can improve firms' innovation and organizational performance. The results of the study supported that organizational performance is positively associated with constructs of each supply chain innovation factor. (Lee, Lee and Schniederjans, 2011)

Furthermore, effective supply chain management has become a potentially valuable way of securing competitive advantage and improving organizational performance since competition is no longer between organizations, but among supply chains. The long-term relationship between the organization and its suppliers is considered to leverage the strategic and operational capabilities of individual participating organizations to help them achieve significant ongoing benefits (Li, Ragu-Nathan, Ragu-Nathan and Rao, 2006). Supply chain significantly impacts on hospital performance by reducing capacity adjustments and service delays (Samuel, Gonapa, Chaudhary and Mishra, 2010; Habidin, Shazali, Salleh, Zainol, Hudin and Mustaff, 2015).

Effective implementation of supply chain management in the healthcare industry is a powerful tool to cope with emerging challenges relating to tremendous growth and escalating costs as a result of requirements for improved service quality and technological advancements (Baltacioglu, Ada, Kaplan, Yurt And and Cem Kaplan, 2007).

In a study to develop a framework for services supply chain, Baltacioglu, Ada, Kaplan, Yurt And and Cem Kaplan (2007) found that successful management of service businesses requires an integrated supply chain management approach, close relations with suppliers of goods and customers, to gain the synergy advantage of cooperation in the chain. Additionally, any flaws or failures in supplier services can create health-threatening risks. Therefore, maintaining 'healthy' relationships with service suppliers emerges as one of the critical tasks for healthcare industry.

Given the complex and interdependent structure of supplier– buyer relationships in the chain, supplier relationship management, which is responsible for the selection of suppliers, collaborative service design processes, definition of optimal sourcing strategies and the actual procurement processes, directly contributes to actual service performances and plays a key role in the effective management and maintenance of the system (Baltacioglu, Ada, Kaplan, Yurt And and Cem Kaplan, 2007).

2.7 CONCEPT OF TRUST

Trust was a concept only perceived as being applicable only in interpersonal relationships. During mid-20th century, researchers made discoveries about the significance of trust in relationships. This led to the discovery of various dimensions and attributes of trust (Dahwa, Al-Hakim and Ng, 2013). Morgan and Hunt (1994) argued that trust along with commitment is key to cooperative behaviors essential for the success of interfirm alliances. Trust is a multidimensional concept with various conceptualizations. Table 1.1 illustrates the most common definitions of trust by different scholars.

From analyzing these definitions, it can be noted that trust relation implies that there are at least two parties involved, a trustor and a trustee. The trustor is the party that is in a vulnerable situation with a high level of uncertainty. The trustee is the party whom the trust is placed. The trustee as such has an opportunity of the trustor's vulnerability (Mohammed, Sahay, Vinita and Waheed, 2010).

In relationships, each partner always seeks to maximize his or her own worth from the relationship, the outcome of which leads to engagement, continuation, or termination of the relationship. Accordingly, partners will be rational and calculative of the best worth and social outcomes and, at the same time, compete for rewarding situations, while trying to avoid punishments. These are the premise on which Social Exchange Theory (SET) is based on. From a broad sociological perspective, trust is understood as deriving from these social forces. Social exchange theory (SET) employs an economic approach to situations in social relationship. The central ideology of SET is that people in a relationship determine whether to continue or terminate the relationship based on the comparison of rewards to costs for maintaining the relationship (Jeong and Oh, 2017).

Table 1.1: Definitions of trust

	Authors	Definitions of trust
1.	Ganesan, 1994	Trust is the willingness to rely on an exchange partner in whom one has confidence. Two distinct components: objective credibility, belief that the other has the expertise to perform the job; and goodwill, belief that the other has motives beneficial to the target when new conditions arise for which a commitment was not made
2.	Lewicki and Bunker (1995)	Trust is a state involving confident positive expectations about another's motives regarding oneself in situations of risk
3.	Mayer et al. (1995)	Trust is willingness of a party based on the expectations that the other party will perform a particular action important to the trustor, irrespective of the ability to monitor or control the party
4.	Strutton et al. (1996)	A willingness to rely on an exchange partner in whom the customer has confidence
5.	Bidault and Jarillo (1997)	Trust is believing that the other party will behave in our best interests
6.	Doney and Cannon (1997)	Trust requires an assessment of the other party's credibility and benevolence
7.	Bhattacharya et al. (1998)	Trust is an expectancy of positive (non-negative) outcomes that one can receive based on the expected action of another party in an interaction characterized by uncertainty
8.	Grandison and Sloman (2000)	Trust is the firm belief in the competence of an entity to act dependably, securely, and reliably within a specified context
9.	Mui et al. (2002)	Trust is a subjective expectation an agent has about another's future behavior based on the history of their encounters
10.	Svensson (2004)	Trust is an important factor in business relationships since people manage the business activities
11.	Olmedilla et al. (2005)	Trust of a party A to a party B for a service X is the measurable belief of A in that B behaves dependably for a specified period within a specified context (in relation to service X)
12.	Laequddin et al. (2009)	Trust is a threshold level of a supply chain member's (trustor's) risk bearing capacity related to trustee

Source: **(Gaurav,Garg and Anish, 2013)**

2.8 CONSTRUCTS OF TRUST

Trust in marketing literature is often conveyed through constructs such as customer commitment, competence, loyalty and firm's reputation perception (Morgan and Hunt, 1994; Doney and Cannon, 1997; Falkenreck and Wagner, 2010; Starr-Glass, 2011). Table 2 illustrates the constructs that affect level of trust between partners in procurement transactions. For the purpose of this study the focus will be on competency as the main contrast for constructs.

2.8.1 Competence

It is important for companies to pay more attention on their service provider general competence of fulfilling contracts, more especially in financial crisis. Service provider who fail to fulfil contract leads to expensive transactions arising from termination as well cost delayed delivery (Li, Sun, Wu and Wu, 2012).

Competence trust is believed to be one of the most important trust construct in supply chain cooperation. It is the foundation of all the types of trust. The belief that partners will maintain a trust relationship and that they will fulfill the contract stand on the identification and the belief that the partner holds the ability of implementing cooperation (Li, Sun, Wu and Wu, 2012).

Competence is defined as the degree to which customers perceive that the supplier has the required skills and knowledge to supply the product (Mohammed, Sahay, Vinita and Waheed, 2010). Competence is a balance between knowledge, skills and attitude.

Table 1.2: Multidimensional constructs of trust in procurement

Constructs of trust	Dimension analysis	Authors
Closeness	Social bonding Building joint outcomes Sharing of information Joint decision making	Baily et al., 2005; Gefen, 2000; Tomkins, 2001; Holmlund, 2004; Bruce et al., 2004; Harrison & Van Hoek, 2002; Storey, 2002
Security	- Track record / history - Credibility - Character endorsement - Acceptance of duty to protect rights of partners - Acknowledgement of duty to protect interests of partners	Gefen, 2000; McRobb & Rogerson, 2004
Openness	- Internal stakeholder engagement - External stakeholder engagement - Working together - Willingness to disclose trade secrets	Hart et al., 1986; Preece, 2002; Salam et al., 2005
Commitment	- Senior management support - Long term relationship - Coordinated arrangements - Structured organization - Leadership and accountability - Visibility - Willingness to take risk	Baily et al., 2005; Rosen & Jerdee, 1977; McRobb & Rogerson, 2004; Morgan & Hunt, 1994
Honesty	- Ethical conduct - Transparency - Open intentions / motives	Cook and Wall, 1980; Kee & Knox, 1970; McRobb & Rogerson, 2004
Competence	- Capability - Character endorsement - Traceable reference	Butler, 1991; Rosen & Jerdee, 1977; Butler & Cantrell, 1984; Lieberman, 1981; Kee & Knox, 1970; Preece, 2002; Bews & Rossouw, 2002
Dependability	- Reliable - Deliver on promises - Walk the talk - Flexibility	Butler & Cantrell, 1984; Coleman, 1990; Dasgupta, 1988; Gambetta, 1988; Good, 1988; Zand, 1978; Pavlon & Gefen, 2004

Source(Dahwa, Al-Hakim and Ng, 2013)

Other factors that affect the level of trust between partners include specific asset investment, behavioral uncertainty and information sharing. A study by Kwon and Suh (2004) indicates positive association between trust and both sides specific asset investment and a negative association between trust and behavioral uncertainty. Information sharing was also found to be reducing the level of behavioral uncertainty as consequently improving the level of trust. Trust building process was also reported to have strong positive association with partner's market reputation and inversely affected by perceived conflict. The study also confirmed the Morgan and Hunt trust-commitment hypothesis by reporting high level of commitment as a consequence of high level of trust (Kwon and Suh, 2004).

2.9 TRUST IN THE SUPPLY CHAIN

Traditionally, product quality and price were considered to be prerequisites in attaining sales and customer loyalty (Gounaris, 2005). However, business environment has been rapidly changing forcing the market players to look for more creative ways to stay ahead and gain competitive advantage. This shift led to the diminishing importance of quality and price alone in business to business transactions and relationship marketing. Building trust in buyer-seller relationships is a focal issue in relationship marketing (Doney and Cannon, 1997). There are three key perspectives of trust in supply chain relationship, i.e. characteristics trust, rational trust (cost and benefit, dynamic capabilities, technology) and institutional trust/security system (Mohammed, Sahay, Vinita and Waheed, 2010).

Over the years researchers came up with many definitions that relate to different disciplines. However, categorization of trust mainly adopted by supply chain scholars was advanced by Sako (1992). Trust was distinguished according to contractual, competence, and goodwill trust (Mohammed, Sahay, Vinita and Waheed, 2010).

Contractual trust occurs when partners expect that their counterparts will adhere to contractual clauses. Competence trust arises when partners believe that their counterparts possess the needed capabilities for performing specific tasks. Goodwill trust occurs when partners make open-ended commitments to take initiatives for mutual

benefits while refraining from taking unfair advantage of their counterparts (Mohammed, Sahay, Vinita and Waheed, 2010; Sako, 1992).

Within buyer-seller relationship, there are typically four entities involved: 1) buying organization, 2) the buyer – buying organization representative, 3) vendor organization and, 4) sales Representative – vendor's representative (Ganesan and Hess, 1997). The relationship can be formed between these four entities in a variety of ways. Firstly organizational trust refers to trust that exist between the buyer and the vendor organization.

Secondly interpersonal trust refers to trust between the buyer and seller representatives; thirdly intra-organizational trust refers to trust between the buyer and vendor or trust between sales representative and the buying organization; and lastly inter-organizational trust refers to trust between buying and vendor organization. Inter-organizational trust reflects the accumulation of the individual level trust existing among multiple individuals across organizations (Ganesan and Hess, 1997).

2.10 EFFECT OF TRUST TO SUPPLY CHAIN PERFORMANCE

Supply chain scholars have argued that trust is a significant predictor of positive performance outcomes in business relationships (Panayides and Lun, 2009; Capaldo and Giannoccaro, 2015). A balance of power and trust in supply chain offsets uncertainty and risk (Ireland and Webb, 2007). Brinklov, Kalko and Surlykke (2009) identified trust and innovativeness as the antecedents to higher performance in supply chain.

The interdependence occurs in supply chains because of the dependence of supply chain partners for product and process accomplishments. Capaldo and Giannoccaro (2015) also further confirmed the importance of trust in supply chain by demonstrating that the existence of trust based relationships in the supply chain influences supply chain performance. Managers should pay attention to inter-firm trust because it can decrease the transaction costs of relationships and thus providing competitive

advantage (Laaksonen, Jarimo and Kulmala, 2009). Improving hospital supply chain performance has become increasingly important as healthcare organizations strive to improve operational efficiency and to reduce cost. Chao, Yu, Cheng and Chuang (2013) also reported that for hospitals intending to reduce the operating cost, it is vital that the build effective ongoing supply chain relationships.

There are more researchers who investigated factors that influence the efficiency of the procurement process. In a study by Loice (2015), it was reported that commitment, communication and cooperation and trust had a positive and significant effect on procurement performance. High levels of trust, cooperation, commitment and communication were reported to be enhancing sustainable competitive advantage and subsequently improving procurement performance (Loice, 2015).

A study by Yasir Yasin and Maqsood Ahmad (2013) also confirmed the effect trust has on long-term commitment between partners on inter-organizational exchange cost. A statistically significant negative relationship between inter-organizational trust and costs of negotiation was reported. It was also found that trust helped partners to exchange resources faster, devote more funds to the venture and exchange knowledge and information smoothly (Yasir Yasin and Maqsood Ahmad, 2013).

As illustrated in table 1.2, trust in supply chain happens as a consequence of a numbers of constructs. Trust also leads to a couple of consequences such as commitment, cooperation, satisfaction, sales growth, current suppliers' choice, current supplier choice as well as intension to stay. Among all the consequences of trust, commitment is the most mentioned and the two are said to be having the strongest positive correlation. As trust increases, likewise commitment increases (Kamers, 2015).

2.11 COMMITMENT

Commitment represents the perception that the relationship with a particular correspondent is important enough to invest special effort to maintain it (Morgan and Hunt, 1994). According to Egan (2008) relationship commitment is the most commonly

used dependent variable used in buyer–seller relationship studies. It is seen by many as the ‘end-game state’ of relationship marketing. Commitment implies the importance of the relationship to the parties and their desire to continue it (Egan, 2008).

Trust and information sharing between trading partners lead to improved relationship commitment in supply chain management (Ambrose, Marshall and Lynch, 2010). In a study by Wu, Weng and Huang (2012) to verify a fit of the commitment- trust theory, the research results showed that higher levels of trust between two parties of an exchange relationship can lead to better interactions. Trust is an important factor affecting supply chain partnerships as it aids increase in interests of both parties and commitment. Higher levels of commitment can help increase value benefits, reduce a partner's propensity to leave, and enhance supply chain cooperation efficiency (Wu, Weng and Huang, 2012).

Commitment improves as the level of trust and information sharing increases (Ambrose, Marshall and Lynch, 2010). Hartmann, Klink and Simons (2015:110) support this argument by stating that a direct relationship exists between trust and commitment, because a higher level of trust between parties in a relationship implies greater commitment of one party to the other. Many failures in supply chain happen as result of poor communication and transmission of expectations. To obtain the level of integration needed for successful supply chain, commitment is key factor (Fu, Fu, Han, Han, Huo and Huo, 2017).

2.12 CUSTOMER SATISFACTION

Customer satisfaction is defined by Roberts-Lombard (2009) as the degree to which the performance of a product or service matches up to the expectation of the customer. There are many other proposed definitions but they all centered on fulfilment of customer's expectations. Perception is defined as the customer's believe concerning the service received or experienced.

The customer forms expectations about the product or service quality. Such expectations are based on needs, values and recent customer experience with the

product or supplier. Satisfaction is influenced by the expectations which are raised during an evaluation of a service or product (Hu, Kandampully and Juwaheer, 2009). Eventual customer satisfaction or dissatisfaction is an emotion formed in response to the customer's evaluation of the discrepancy between expectations and actual performance. The customer is satisfied if the performance meets or exceeds the expectations. If the performance does not meet the expectations then the customer becomes dissatisfied (Hu, Kandampully and Juwaheer, 2009; Balaji, 2009).

Customer satisfaction is key to customer retention (Xu, Goedegebuure and Van der Heijden, 2007). Customer perceived service quality was reported by Xu, Goedegebuure and Van der Heijden (2007) as having significant effect on customer satisfaction while customer satisfaction is positively related to loyalty in terms of positive word of mouth, willingness to pay more and to stay with the business. Satisfaction plays a critical role in retaining the customer. The implication is that companies should better manage their relationships with the customers (Khan, 2012).

Customer satisfaction is also a source of strategic competitive advantage for many companies. In a replica study to evaluate the antecedents and outcomes of satisfaction in buyer-supplier relationships in South Africa, they pointed out that the need for organizations to direct resources towards the establishment of relationships was vital. They found that trust and commitment was vital to help ensure increased satisfaction, which, in turn, will result in greater coordination and cooperation in business relationships as well as long-term continuation of the relationship (Roberts-Lombard, Mpinganjira and Svensson, 2017).

CHAPTER 3: EMPIRICAL STUDY AND RESULTS

3.1. INTRODUCTION

Chapter one gave an overview of the topic, the objectives and the importance of the study. Chapter two gave details of existing literature on the topic and laid the foundation for execution. Attention was given to supply chain relationship between suppliers of medical devices and the hospitals, paying special attention to the role trust and commitment play.

The focus of this chapter will be on the execution of the study. The research design will be discussed in line with the objectives. The chapter will focus on the choice and composition of the measuring instrument, the population, data collection and interpretation thereof.

3.2 OBJECTIVES OF THE EMPIRICAL STUDY

The main objective this study was to determine the influence of trust and commitment in deciding the choice of a medical supplier in the hospital procurement process.

The empirical objectives were to determine:

- The influence of the trust and competence
- The relationship between trust and commitment
- The influence of trust and commitment on the intension to repurchase medical devices and satisfaction by hospitals.

3.3 PROCEDURE AND SCOPE OF THE STUDY

The study took a quantitative approach. The principles of quantitative research support the concept that scientific data can be collected and statistically analysed.

3.3.1 Sample population and size

Study population is individuals who possess specific characteristics in the universe. These individuals represent a group in a population of study for a research problem, results from which can be generalized (Bryman and Bell, 2014).

According to Welman, Kruger & Mitchell (2010; 50), a population refers to a group of prospective participants in a research study to whom a researcher would want to generalize the results of an empirical study. The population was defined as all hospitals in South Africa and this was 240 in total. Furthermore, it was identified as procurement employees at government and private hospitals in South Africa. These were individuals that are involved in purchasing of medical devices, either as a buyer, stock controller, manager or director. Initially the researcher aimed to do a nationwide study and the questionnaires distributed by email. However the approach proved to be not feasible because the dispersion of the population. Thus a sample was selected to be hospitals in Gauteng.

As defined by Bryman and Bell (2014), a sample is the segment of the population that is selected for research. It is subset of population. The total population size is necessary to calculate the sample size in order to get statistically accurate results for quantitative research. The sample for this study was private and public hospitals procurement staff responsible for procurement of medical devices in Gauteng Province, South Africa. The medical devices procurement staff were sampled strategically because of their role and insight into the procurement of medical devices.

According MedPages (2017), the number of public hospitals in Gauteng is forty one (41) and the number of private hospitals is ninety nine (99). As such, the total number of hospitals from which the sample was obtained is 140. For this study, an assumption was made that each hospital has at-least one buyer/ stock controller and a manager/ director. To increase a chance of getting a response from each of the hospitals, the study unit was decided at 140 and a questionnaire was dropped at each of the hospitals. A probability sampling technique was used, where each member of the population had a chance to be selected. This was achieved by making available one questionnaire at every hospital procurement department where anyone of the employees could complete it.

3.3.2 Survey instrument

A questionnaire was used as a survey instrument for this study because it was the most convenient method for the targeted population. The questionnaire was developed in a way to meet the objectives as set out in chapter one of the study.

Firstly, section A of the questionnaire dwelt on the demographics;

- Age
- Gender
- Race
- Highest qualification
- Employment level
- Employment sector
- Occupation
- Number of years of experience

Secondly, section B of the questionnaire was subdivided into five constructs; supplier trust, competence, satisfaction, commitment and intension to repurchase.

In the context of these study, supplier trust also referred to as trust, is the trust the hospital has on their medical devices supplier; Competence refers to supplier competence; satisfaction refers to satisfaction by hospital on the suppliers of medical devices suppliers; commitment is the refers to hospital commitment on their medical devices suppliers; and lastly the intension to repurchase by hospital from the medical devices supplier. The selection of these constructs was guided by literature in the subject of trust and commitment in supply chain. Existing questionnaires for each construct were adopted and the following are the questions for each construct:

- Supplier trust T1 to T3
- Competence T4 to T6
- Satisfaction T7 to T9
- Commitment T10 to T11

- Intention to repurchase T12 to T13

A minimum of one item for each construct was used. According to Gliem and Gliem (2003), single-item question are unreliable as compared to multi-item questions and only multi-item questions should be used to make inference to the research study results. The questionnaire is shown in the table below.

Table 3.1. Research questionnaire

T1. The relationship between our hospital and its medical devices suppliers is characterized by high level of trust
T2. This medical devices supplier is good at keeping promises
T3. I trust that this medical devices supplier will deliver goods and services on time
T4. I feel confident about this medical devices supplier's skills
T5. This medical devices supplier has the ability to accomplish what they say they will do
T6. This medical devices supplier is known to be successful at the things they try to do
T7. I am satisfied with the products from this medical devices supplier
T8. I am satisfied with the service from this medical devices supplier
T9. This medical devices supplier is trustworthy throughout the whole process
T10. We expect to be doing business with this supplier for a long time
T11. I feel a sense of loyalty to this medical devices supplier
T12. If I was a purchasing manager for an organization, I would purchase products from this supplier again
T13. If I was a purchasing manager in an organization, given the same terms and conditions as other products, I would purchase this supplier's product

A five Likert scale for each of section B questions was used and the scale measurements were as follows; 1 - Strongly disagree, 2- Disagree, 3 – Neutral, 4-Agree and 5 – Strongly agree.

3.3.3 Data collection

A total of 140 questionnaires were printed. One questionnaire was hand delivered to each of the 140 hospitals in Gauteng. The respondents were not pre-selected; any of the procurement employees could complete it. The collection for each area was scheduled within 5 days of dropping off the questionnaire. The process took three months to cover the area.

A total of 43 questionnaires were completed which represents 30.7% response rate. The reason for non-response was twofold. The first reason was due to targeted participants being too busy and not having time to complete the questionnaire by the time the researcher returned for collection. The second reason encountered was resistance by targeted participants to take part in any survey and referred the matter to top management because of bureaucratic impediments.

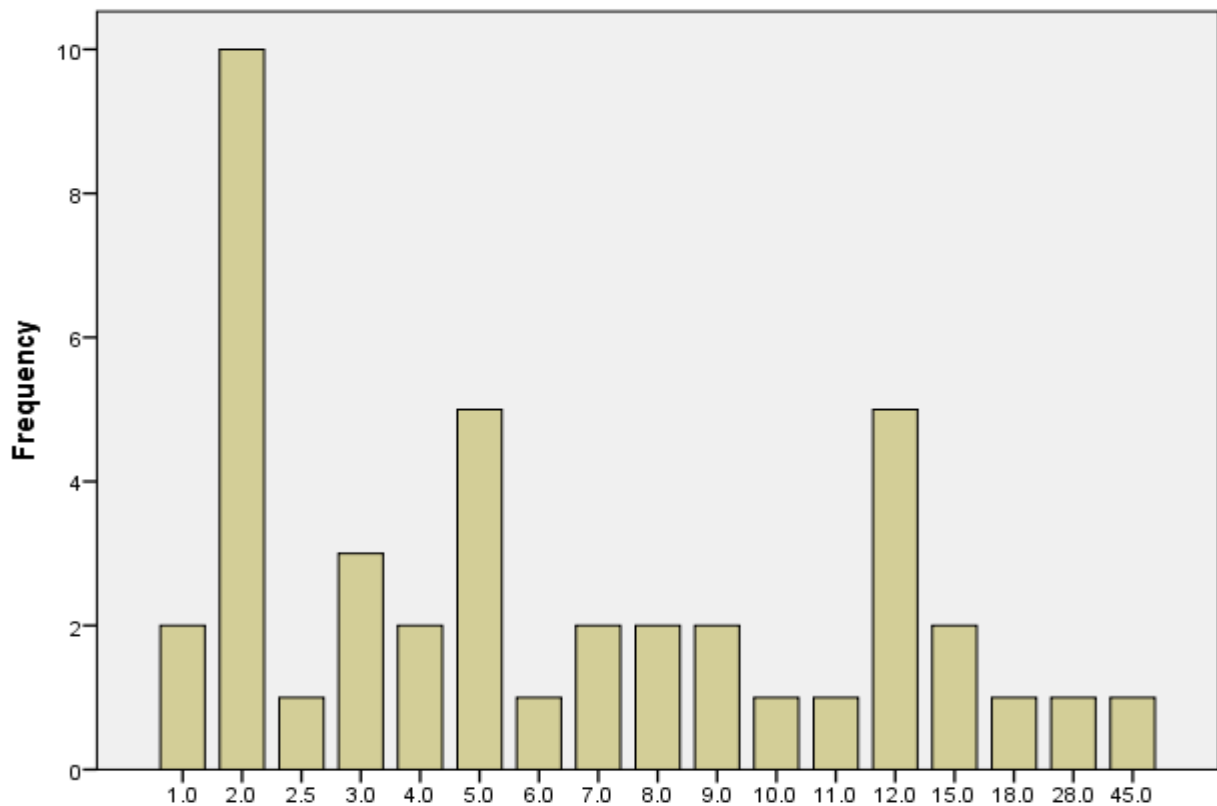
Statistical Consulting Services of the North West University analysed the data using SPSS.

3.4 DEMOGRAPHICAL PROFILE OF RESPONDENTS

3.4.1 Respondents by age

The biggest group was between the ages of 31 and 40 which made up 50%, followed by age group 21-30 (24%). The remainders of the respondents were from age 40 and above which made up a combined 26%.

Figure 3.1: Demographics of the respondents according to years of experience



3.4.2 Respondents by gender

The respondents almost represented a 50% split by gender. The male respondents made up 49% (21) while females made up 51% (22). All 43 respondents were valid.

Table 3.2. Frequency and Validity by Gender

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
Male	21	48.8	48.8	48.8
Female	22	51.2	51.2	100.0
Total	43	100.0	100.0	

3.4.3 Respondents by race

According to race demographics, 82% (35) of the respondents were black and 14% (6) white. This almost represents closely the demographics of the South African population having more blacks than whites.

Table 3.3. Frequency and Validity by Race

Race	Frequency	Percent	Valid Percent	Cumulative Percent
Black	35	81.4	81.4	81.4
White	6	14.0	14.0	95.3
Coloured	1	2.3	2.3	97.7
Indian	1	2.3	2.3	100.0
Total	43	100.0	100.0	

3.4.4 Respondents by level of employment

The mix according to level of employment had a good representation of all the levels with 51% of the respondents at junior management and work force positions, while the balance of 49% represented a combination of middle and senior management.

Table 3.4. Frequency and Validity by level of employment

Level of employment	Frequency	Percent	Valid Percent	Cumulative Percent
Work-Force	12	27.9	27.9	27.9
Junior Management	10	23.3	23.3	51.2
Middle Management	8	18.6	18.6	69.8
Senior Management	13	30.2	30.2	100.0
Total	43	100.0	100.0	

3.4.5 Respondents by qualification

Most of the respondents had a Diploma/ Degree (51%), followed by those with postgraduate qualification (33%). The least number of respondents had only a matric certificate (16%).

Table 3.5. Frequency and Validity by level of employment

Highest Certificate	Frequency	Percent	Valid Percent	Cumulative Percent
Matric	7	16.3	16.3	16.3
Diploma/ Degree	22	51.2	51.2	67.4
Postgraduate	14	32.6	32.6	100.0
Total	43	100.0	100.0	

3.4.6 Respondents by sector

The public sector was represented by 65% as compared to the private sector at 35%.

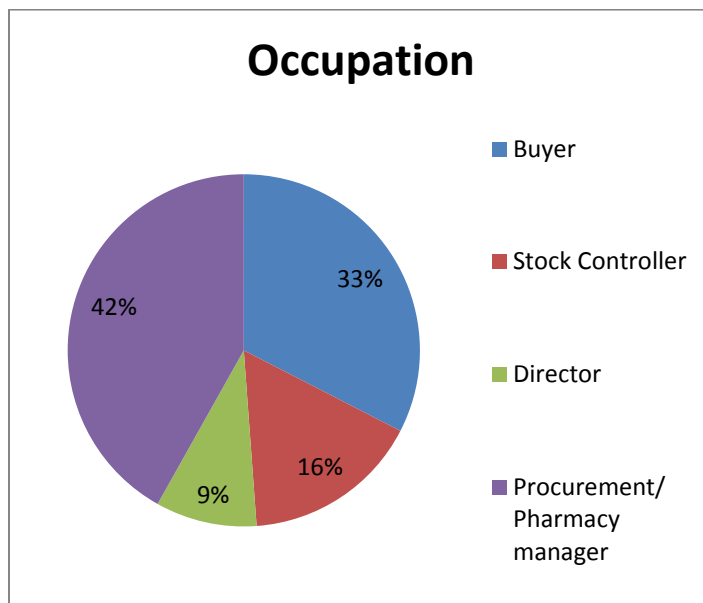
Table 3.6. Frequency and Validity by business sector

Business Sector	Frequency	Percent	Valid Percent	Cumulative Percent
Private	28	65.1	65.1	65.1
Public	15	34.9	34.9	100.0
Total	43	100.0	100.0	

3.4.7 Respondents by occupation

Demographics by occupation showed that 51% (22) of the respondents were employed as managers or directors while 49% (21) were employed as buyers and stock controllers. It was expected that the percentage of managers and directors should contribute almost 49% to agree with the statistics on the level of employment. About 2% of the respondents incorrectly completed the occupation segment.

Figure 3.2: Demographics of the respondents according to occupation



3.4.8 Respondents by years of experience

The years of experience did not reveal a particular trend. There were hikes at 2 years (10), 5 and 12 years (5) in terms of frequency. However, one director had 45 years of experience. Generally, the population did not have many years of experience. About 50% had less than 5 years of experience. The trends are summarised in table 3.7 below.

Table 3.7. Frequency and validity by years of experience

Years of experience	Frequency	Percent	Valid Percent	Cumulative Percent
1.0	2	4.7	4.8	4.8
2.0	10	23.3	23.8	28.6
2.5	1	2.3	2.4	31.0
3.0	3	7.0	7.1	38.1
4.0	2	4.7	4.8	42.9
5.0	5	11.6	11.9	54.8
6.0	1	2.3	2.4	57.1
7.0	2	4.7	4.8	61.9
8.0	2	4.7	4.8	66.7
9.0	2	4.7	4.8	71.4
10.0	1	2.3	2.4	73.8
11.0	1	2.3	2.4	76.2
12.0	5	11.6	11.9	88.1
15.0	2	4.7	4.8	92.9
18.0	1	2.3	2.4	95.2
28.0	1	2.3	2.4	97.6
45.0	1	2.3	2.4	100.0
Total	42	97.7	100.0	
System	1	2.3		
	43	100.0		

Looking at the above statistics of the respondents, it can therefore be concluded that the demographics of the respondents was representative of the population. The summary of the demographics is presented in figure 3.3 below

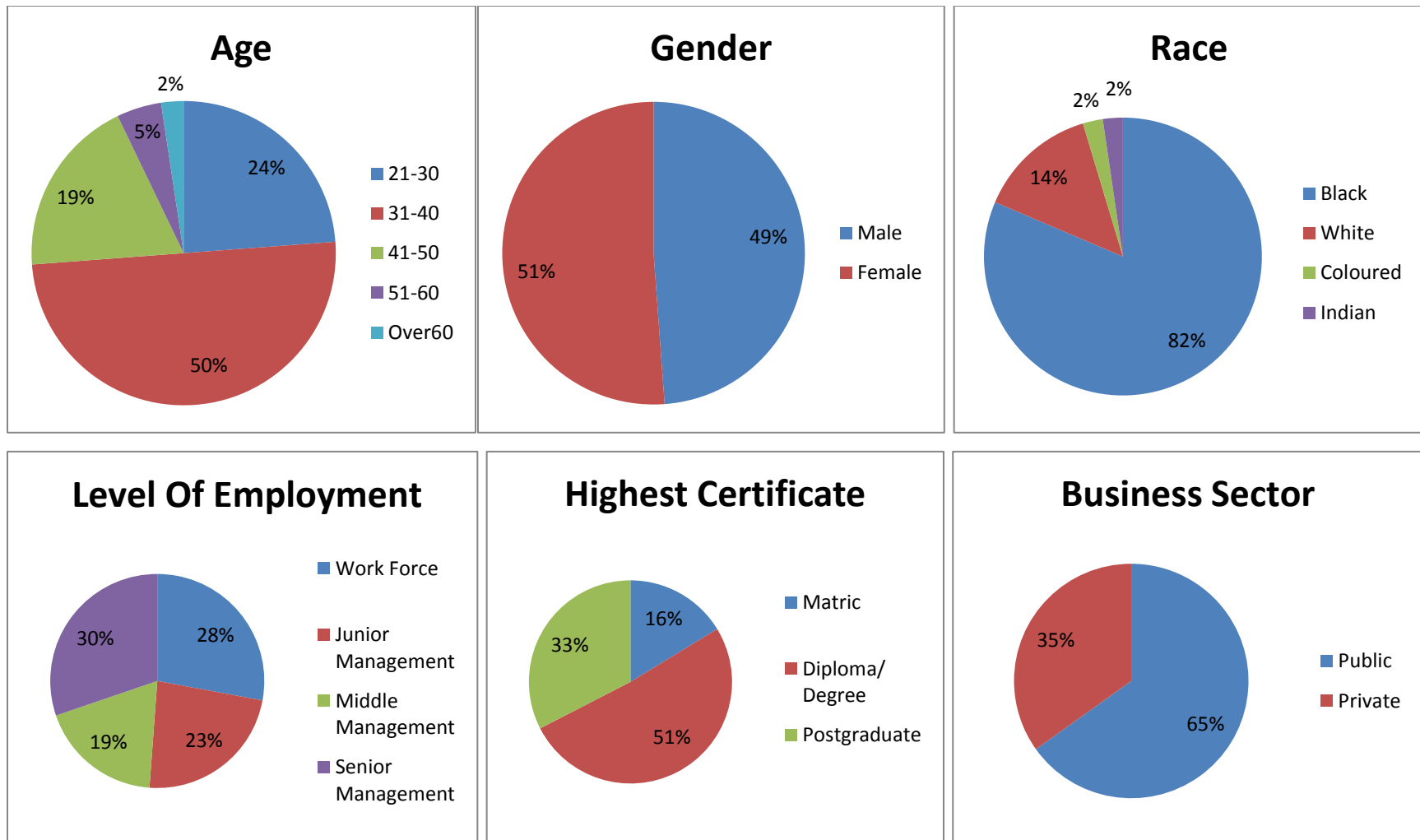


Figure 3.3: Summary of the demographics profile of respondents

Table 3.8 below shows the range of the score and the mean by question. As observed in the constructs mean with multi-items, competence had the highest mean but looking at the individual questions, the highest mean of 4 is observed for question T7 (product satisfaction). The other two items to measure satisfaction score lower than average mean score for competence.

Table 3.8: Descriptive statistics

	N	Minimum	Maximum	Mean	Std. Deviation
T1. The relationship between our hospital and its medical devices suppliers is characterized by high level of trust	43	2	5	3.77	0.812
T2. This medical devices supplier is good at keeping promises	43	1	5	3.65	0.997
T3. I trust that this medical devices supplier will deliver goods and services on time	43	1	5	3.74	0.928
T4. I feel confident about this medical devices supplier's skills	43	2	5	3.88	0.731
T5. This medical devices supplier has the ability to accomplish what they say they will do	42	2	5	3.88	0.550
T6. This medical devices supplier is known to be successful at the things they try to do	43	2	5	3.86	0.601
T7. I am satisfied with the products from this medical devices supplier	42	2	5	4.00	0.733
T8. I am satisfied with the service from this medical devices supplier	43	2	5	3.77	0.751
T9. This medical devices supplier is trustworthy throughout the whole process	43	1	5	3.74	0.819
T10. We expect to be doing business with this supplier for a long time	43	1	5	3.88	0.905
T11. I feel a sense of loyalty to this medical devices supplier	43	2	5	3.86	0.743
T12. If I was a purchasing manager for an organization, I would purchase products from this supplier again	43	1	5	3.86	0.833
T13. If I was a purchasing manager in an organization, given the same terms and conditions as other products, I would purchase this supplier's product	43	2	5	3.84	0.785
Trust Commit	43	2.08	4.92	3.8259	0.58434
Valid N (listwise)	41				

3.5 RELIABILITY

To test for reliability of each of the 5 constructs within the instrument, the Cronbach's Alpha was used. Cronbach's Alpha was developed by Lee Cronbach in 1951 (Tavakol and Dennick, 2011). The aim was to provide a measure of the internal consistency of a test or scale. It is expressed as an alpha (α) value from 0 to 1. The higher the value, the more reliable the instrument is. An $\alpha > 0.7$ is acceptable while an $\alpha > 0.8$ is good.

For each construct, at-least two items were used to ensure reliability. According to Gliem and Gliem (2003) single-item question are unreliable as compared to multi-item questions and only multi-item questions should be used to make inference. For example, the instrument will yield a low α value if it produces different scores each time it is tested under the same conditions (Tavakol and Dennick, 2011).

Cronbach Alpha is expressed using the following equation:

$$\alpha = \frac{K}{K-1} \left(1 - \frac{\sum_{i=1}^K \sigma_{Y_i}^2}{\sigma_X^2} \right)$$

α = Cronbach's alpha coefficient

K = number of scale items in the construct

σ_X^2 = Variance observed with total item scores

$\sigma_{Y_i}^2$ = variance associated with item i

The Cronbach's alpha coefficients for the five constructs are presented in the table below.

Table 3.9: Cronbach Alpha for the measured constructs

Construct	Questions	Cronbach's		Std.	
		Alpha	Mean	Deviation	N
Supplier trust	T1, T2, T3	0.834	3.7209	0.79326	43
Competence	T4, T5, T6	0.774	3.8721	0.52180	43
Satisfaction	T7, T8, T9	0.798	3.8333	0.64550	43
Commitment	T10, T11	0.777	3.8721	0.74875	43
Intention To Repurchase	T12, T13	0.932	3.8488	0.78327	43

The results on table 3.9 demonstrated Cronbach alpha scores of between 0.774 and 0.932 for the five constructs. According to Tavakol and Dennick (2011), the alpha value of greater than 0.5 indicates that the instrument is reliable. Therefore, instrument was reliable for all five constructs. Reliability was acceptable for competence, satisfaction and commitment constructs at Cronbach Alpha scores of 0.774, 0.798 and 0.777 respectively. The Cronbach alpha value for supplier trust was good at 0.834 and excellent for Intention to repurchase at 0.934.

The results also indicated high mean scores for the five constructs at a mean score of 3.5. This shows that all the five constructs have an overall positive influence in this study. The results illustrate that there is trust between medical devices suppliers and the hospitals at the mean value of 3.7209. Competence and commitment both have the highest mean value of 3.8721 compared to the other constructs. These results suggest that the hospitals value the competence of the medical devices suppliers. The reason could be attributed to the large variety of products that the hospitals have to procure, some of which require specialized skills. That could be the main reason why hospitals would rather deal with competent supplier who can offer operational training as well as back up service.

3.6 CORRELATIONS

Spearman's rho which is a nonparametric equivalent of the Pearson correlation is used to measure the linear correlation between two variables. A positive correlation between two constructs implies that as one construct increase, the other one increase as well. Negative correlation implies that as the one construct increase, the other one decrease (Welman, Kruger & Mitchell, 2010; 234).

Table 3.10 show positive correlations between all constructs at varying strengths. The intention to repurchase is influenced by the constructs in the following chronological order; supplier trust, satisfaction, competence and the strongest being commitment at $p=0.704$. This is in line with literature.

According to Egan (2008), commitment is seen as the 'end-game state' of relationship marketing. The results show that commitment strongly influenced the intention to repurchase in hospitals. Supplier trust positively correlated with other constructs in the following order; competence, satisfaction and commitment.

Table 3.10: Spearman Coefficient Correlations

	ST	COMP	SATF	COMM	ITP
Supplier trust	1.000				
Competence	.642	1.000			
Satisfaction	.553	.621	1.000		
Commitment	.526	.620	.565	1.000	
Intention to repurchase	.548	.591	.552	.704	1.000

Correlation is significant at 0.01

Table3.11. Pearson correlation

Construct	ST	COMP	SAT	COMM	IPT
Supplier trust	1				
Competence	.653	1			
Satisfaction	.597	.740	1		
Commitment	.566	.643	.624	1	
Intention repurchase	.569	.689	.687	.788	1

Correlation is significant at 0.01

3.7 CHAPTER SUMMARY

In this chapter, the research methodology and design as well as the empirical study results were discussed. The demographical profiles of the respondents, frequency analysis, the descriptive statistics, reliability as well as the correlation between the four constructs were discussed.

The objectives of the study have been answered. The five measured constructs have a big influence in determining the choice of medical device supplier during procurement. The following chapter will draw up conclusions and recommendations for future studies. The limitation to be considered for this study will also be discussed.

CHAPTER 4: DISCUSSION, CONCLUSION AND RECOMMENDATIONS

4.1. INTRODUCTION

The main objective of this study was to establish how trust and commitment, as non-tangible factors of supply chain management influences the choice of medical devices suppliers.

The purpose was to establish whether trust does exist, what leads to development of trust and what the consequences are. Does it lead to satisfaction, intention to repurchase? The motivation to do the study was influenced firstly by the interest to establish what factors are at play between medical devices suppliers and hospitals in a South African context.

Secondly, to determine if the inefficiency and cost of the healthcare in South Africa is driven by lack of compliance to intangible but fundamental factors that are reported as the drivers of efficient supply chain performance and consequently competitive advantage.

This chapter will draw-up conclusions to the empirical study and recommendations will be made.

4.2. INFLUENCE OF TRUST AND COMMITMENT OF THE CHOICE OF MEDICAL DEVICES SUPPLIER

According to Ambrose, Marshall and Lynch (2010), commitment is a consequence of trust. Egan (2008) reported that commitment was the greatest indicator of the customer's purchasing intentions. The results as discussed in chapter three showed that both trust and commitment have positive influence on the choice of a medical devices supplier by hospital procurement departments as reflected on table 3.10. This means that hospital procurement staff value trust between them and the medical device supplier as well as the supplier's commitment to the hospital. However, commitment has the strongest influence of all the other constructs. These findings are in line with the literature.

4.3. TRUST BETWEEN HOSPITALS AND MEDICAL DEVICES SUPPLIERS

Based on the experience and perception of the hospital procurement, there is trust on medical devices suppliers. The results also showed that amongst the constructs, trust has the strongest correlation with competence (table 3.10).

According to Li, Sun, Wu and Wu (2012) trust occurs as a result of many constructs. From the study, competence has the greatest influence among the supply chain partners.

It should also be noted that from table 3.8, satisfaction on the quality of the products had the highest mean score of all the items lines. It was the only item with a mean of four (agree) while others had upper threes. This suggests that although competence had the greatest relationship with trust, product quality as an individual item is important for hospitals. The implication is that product quality and competence are important in developing trust between hospitals and medical devices suppliers.

4.4. THE RELATIONSHIP BETWEEN TRUST AND COMMITMENT

From the results on table 3.10, it can be concluded that trust had a positive correlation with supplier trust. Commitment in this study was tested as a consequence of trust. Trust which is influenced greatly by competence, consequently affects the development of commitment. Commitment as indicated, leads to positive intention to repurchase by the hospital. This study effectively proved that supplier trust, competence and commitment have an influence in the procurement process. They positively affect procurement. Other constructs such as satisfaction and intention to repurchase are also driven by these.

Therefore lack of compliance to these intangible but fundamental factors that are reported as the drivers of efficient supply chain performance and consequently competitive advantage affect the medical device supply chain industry.

4.5 LIMITATIONS OF THE STUDY

- The population was confined to one province mainly due to non-responsiveness of the target population via other communication means such as email. For convenience and cost, the researcher drew focus on one province in order to be able to schedule drop-offs and pick-ups of the questionnaires. Although the healthcare industry is uniform and the medical devices companies being few and giving services country wide, the results cannot be generalized to South African healthcare industry as a whole because non-probability sampling was used.
- Not all antecedents and consequences of trust were tested. Only those that have been reported in literature as having the greatest influence.

4.6 RECOMMENDATIONS AND FUTURE STUDIES

Based on the finding, it can be confirmed that trust and commitment influence the customer's repurchasing intentions. Commitment has a stronger influence on repurchasing intentions than trust. These findings are in line with the literature on supplier relationship management. The findings have implications on the medical devices suppliers. They need to recognize that, although the South African procurement system is highly regulated for Preferential Procurement, the hospitals still find it important to do business with suppliers that are competent and can be trusted. Thus, it is recommended that the suppliers of medical devices make it a priority to devote resources in building relationships with hospitals procurement departments.

Trust and commitment are intangible factors that have been reported in literature as the drivers of efficient supply chain performance and subsequently competitive advantage. The study showed that the South African healthcare procurement departments are influenced by these intangible factors in their choice of medical devices supplier. However, despite this conformance, healthcare in South Africa is characterised by high cost and poor quality. Studies to investigate the driving forces of the high cost and poor quality need to be further conducted.

More comprehensive research in supplier relationship management is also recommended, looking at all antecedents as well as consequences of trust and commitment in medical devices industry

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APPENDICES

Appendix A: Questionnaire

Background

Dear participant, I am currently enrolled for a management course (MBA) at the NWU business school. As part of the requirements for successful completion of this course, I am required to select a topic to research about and complete mini dissertation. My research is titled: **The influence of trust and commitment on the choice of a medical devices supplier in South Africa**. By completing this questionnaire, you will assist me in achieving this goal.

Explanation of procedures

Your participation is completely voluntary and anonymous. The information gathered during this project is for academic purposes only and will at all times remain confidential.

Should you feel uncomfortable you are welcome to withdraw consent and discontinue participation at any given moment in time without penalty.

Because participation is anonymous, the questionnaire that you will be asked to complete does not require any personally identifying particulars. However, in order to obtain your permission to participate in an ethical manner, the “agreement” section below requires your signature as evidence of your informed consent to participate willingly. This cover page should then immediately be separated from the actual questionnaire which follows on page two. This is done in order to obtain your consent to participate while protecting your anonymity at the same time. Both the signed consent form on the cover page as well as the completed questionnaire must be returned to the researcher; these may be returned separately from each other so that the researcher cannot connect any specific person to a particular questionnaire.

Agreement

The agreement section implies that you have read the explanation given above. Your signature below indicates that you understand the parameters of your participation and agree to take part in this research study. Your participation is much appreciated.

Signature of Participant _____ Date _____

Participant's Name _____ Date _____

QUESTIONNAIRE

SECTION 1: BIOGRAPHICAL INFORMATION

Dear participant, thank you for sparing your precious time to complete this questionnaire.

The following information is needed to enable meaningful data analysis. We appreciate your help in providing this important information.

Mark the applicable block with a cross (X). Complete all questions.

Bio1: Please state your age.....(years)

Bio 2	Gender:	1. Male	2. Female
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Bio 3	Race:	1. Black	2. White	3. Coloured	4. Indian	5. Other
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Bio 4	Level of Employment:	1. Work force	2. Junior management	3. Middle management	4. Senior Management
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Bio 5	Highest Certificate:	1. Below Matric	2. Matric	3. Diploma / Degree	4. Postgraduate
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Bio 6	Business Sector	1. Public	2. Private
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Bio 7: Current occupation.....

Bio 8: How many years of work experience do you have in your current employment position?.....

SECTION 2: TRUST AND COMMITMENT MEASUREMENT

The following statements aim to tap your personal experiences based on your memorable encounter and experience with supplier of medical devices for the hospital you work at. Would you please indicate to what extent you agree with these statements by using the following 5-point scale, where **1= Disagree strongly** and **5= Agree strongly**:

1		2	3	4		5		
Disagree strongly		Disagree Somewhat	Neither agree nor disagree	Agree		Agree strongly		
T1	The relationship between our hospital and its medical devices suppliers is characterized by high level of trust			1	2	3	4	5
T2	This medical devices supplier is good at keeping promises			1	2	3	4	5
T3	I trust that this medical devices supplier will deliver goods and services on time			1	2	3	4	5
T4	I feel confident about this medical devices supplier's skills			1	2	3	4	5
T5	This medical devices supplier has the ability to accomplish what they say they will do			1	2	3	4	5
T6	This medical devices supplier is known to be successful at the things they try to do			1	2	3	4	5
T7	I am satisfied with the products from this medical devices supplier			1	2	3	4	5
T8	I am satisfied with the service from this medical devices supplier			1	2	3	4	5
T9	This medical devices supplier is trustworthy throughout the whole process			1	2	3	4	5
T10	We expect to be doing business with this supplier for a long time			1	2	3	4	5
T11	I feel a sense of loyalty to this medical devices supplier			1	2	3	4	5

1		2	3	4		5		
Disagree strongly		Disagree Somewhat	Neither agree nor disagree	Agree		Agree strongly		
T12	If I was a purchasing manager for an organization, I would purchase products from the supplier again			1	2	3	4	5
T13	If I was a purchasing manager in an organization, given the same terms and conditions as other products, I would purchase this supplier's product			1	2	3	4	5

Appendix B: Captured Data

Bio1	Bio2	Bio3	Bio4	Bio5	Bio6	Bio7	Bio8	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13
22	1	3	1	2	1	Procurement Co-ordinator	2.5	4	3	4	4	4	4	4	4	4	4	4	4	4
25	2	1	1	2	1	Buyer	2	4	5	5	4	4	4	5	4	5	5	5	5	5
36	2	1	4	4	1	Procurement Manager	2	3	4	3	4	4	4	4	3	3	4	4	4	4
39	2	2	2	3	2	Buyer	7	4	4	4	4	4	4	4	4	4	4	4	4	4
36	1	1	4	4	2	Procurement Manager	18	4	4	5	4	4	4	5	4	5	5	4	4	4
32	1	1	3	4	1	Manager	5	3	4	4	3	3	4	3	4	4	3	4	4	4
43	2	1	4	3	1	Supply Chain Director	8	4	4	3	4	4	4	5	4	4	4	4	4	4
25	2	1	1	3	1	Procurement Clerk	1	4	3	4	4	4	4	3	4	5	5	4	4	3
22	2	1	2	2	1	Buyer	2	4	5	3	4	4	4	4	3	4	5	4	4	4
32	2	2	1	3	2	Buyer	2	4	4	4	4	4	4	4	4	4	4	4	4	4
36	2	1	4	4	1	Procurement manager	2	2	4	4	4	4	3	4	4	4	3	3	4	4
37	1	1	3	3	1	Manager	3	2	1	1	2	4	4	4	4	3	3	2	3	3
34	1	1	1	3	1	Buyer	5	4	3	4	4	5	4	5	5	4	5	5	5	5
41	2	1	2	3	1	Purchasing Manager	2	4	5	4	4	4	4	4	4	4	5	4	4	4
63	1	2	4	3	1	Supply Chain Director	45	4	4	4	4	4	5	5	4	4	5	5	5	5
29	1	2	3	3	2	Manager	4	4	3	4	3	4	3	4	4	4	4	4	3	4
40	1	1	4	4	2	Director	15	4	3	5	4	4	3	3	4	3	3	3	4	4
25	2	1	1	2	1	Buyer	2	4	3	3	4	4	4	5	4	5	4	4	5	5
35	1	1	2	2	1	Purchasing Manager	2	4	5	5	4	4	4	5	4	5	4	4	4	4
31	1	1	1	3	2	Buyer	2	5	4	4	4	4	4	4	5	4	4	5	4	4
44	1	1	3	3	2	Senior Procurement Manager	9	5	5	4	5	5	5	4	4	4	5	5	5	4
29	1	1	2	3	1	Buyer	3	4	3	3	4	4	3	4	4	4	3	3	3	3
35	2	1	4	3	2	Pharmacy Manager	11	4	4	4	4	4	4	4	4	3	4	3	3	3
42	1	1	3	4	1	Purchasing Manager	4	4	3	4	5	4	4	4	4	3	4	4	3	4
37	1	2	4	4	2	Director	15	4	4	4	4	4	4	3	3	4	4	5	5	5
39	2	1	1	3	1	Clerk	9	4	3	3	4	3	3	3	3	4	3	3	3	2
33	2	1	2	3	1		1	4	2	2	2	2	2	2	2	1	3	3	2	2

41	2	4	4	4	2	Pharmacy Manager	8	4	4	4	4	4	4	3	4	3	3	3	3	3
38	2	1	2	3	2	Stock Controller	5	3	4	3	4		3	4	3	3	3	4	4	4
25	2	1	1	3	1	Buyer	3	2	2	3	3	3	4	4	3	4	5	4	4	3
40	2	1	1	3	1		2	5	5	5	5	4	5	5	5	4	4	4	4	4
	2	1	2	3	1	Buyer	12	5	4	4	5	4	4	4	5	4	4	4	4	4
47	1	1	4	4	2	Manager	12	4	4	5	3	4	4		3	4	5	4	5	5
44	1	1	3	3	2	Procurement Manager	12	2	2	2	4	4	4	4	3	3	4	4	4	4
39	1	1	3	4	1	Purchasing Manager	3months	4	4	4	4	4	4	4	4	4	4	5	4	4
51	1	1	2	2	1	Buyer	10	3	3	4	3	3	4	4	3	3	3	3	3	3
50	1	1	3	3	1	Supply Chain Manager	28	4	5	5	5	4	3	4	4	3	4	3	4	4
35	2	1	2	4	1	Buyer	6	3	2	3	4	3	4	3	2	3	2	4	3	3
36	2	1	4	4	1	Procurement Manager	7	2	2	2	2	3	3	3	2	2	1	2	1	2
27	1	1	1	3	2	Stock Controller	5	4	4	4	4	4	4	4	4	4	4	4	4	4
27	2	1	4	4	1	Procurement Manager	5	5	5	5	5	5	5	5	5	5	5	4	5	5
36	1	1	1	2	2	Stock Controller	12	4	4	3	4	4	4	5	4	3	4	4	4	4
60	2	2	4	4	1	Procurement Manager	12	4	4	4	4	4	4	4	4	4	3	4	4	4

Appendix C: Turnitin Report

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Appendix D: Declaration for Language Editing



Dynamic Language &
Translation Specialists

Antoinette Bisschoff
71 Esselen Street, Potchefstroom
Tel: 018 293 3046
Cell: 082 878 5183
antoinettebisschoff@mweb.co.za
CC No: 1995/017794/23

Monday, 20 November 2017

To whom it may concern,

Re: Letter of confirmation of Typographical editing

The dissertation *The influence of trust and commitment in the choice of a medical devices supplier in South Africa* by RP LEGOABE (28295110) was typographically edited. The language, referencing and sources were not checked. Final corrections remain the responsibility of the author.

Antoinette Bisschoff

Officially approved language editor of the NWU since 1998
Member of SA Translators Institute (no. 100181)

Precision ... to the last letter

Appendix E: Declaration for Statistical Analysis

Statistical Consultation Services

Tel: +27 18 299 2017

Fax: +27 18-299-2557

Email: faans.steyn@nwu.ac.za

20 November 2017



Privaat sak X6001, Potchefstroom
Suid-Afrika 2520

Tel: 018 299-1111/2222
Web: <http://www.nwu.ac.za>

Re: Ms R P Legoabe, student number: 28295110

We hereby confirm that the Statistical Consultation Services of the North-West University analysed the data involved in the study of the above-mentioned student and assisted with the interpretation of the results. However, any opinion, findings or recommendations contained in this document are those of the author, and the Statistical Consultation Services of the NWU (Potchefstroom Campus) do not accept responsibility for the statistical correctness of the data reported. Kind regards

A handwritten signature in black ink, appearing to read 'H S Steyn'.

Prof H S Steyn

Statistical Consultation Services