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The efficacy of procurement policies in the public health care system in South Africa

Leonel Djomgoue Tchokouagni

WITS Business School

Research report presented in partial fulfilment for the degree of Master of Business Administration to the Faculty of Commerce, Law, and Management, University of the Witwatersrand

April 2021

DECLARATION

I L. Djomgoue Tchokouagni declare that this research article entitled '**The efficacy of procurement policies in the public health care system in South Africa**' participation in source separation of waste' is my own unaided work. I have acknowledged, attributed, and referenced all ideas sourced elsewhere. I am hereby submitting it in partial fulfilment of the requirements of the degree of Master of Business Administration at the University of the Witwatersrand, Johannesburg. I have not submitted this report before for any other degree or examination to any other institution.

Leonel Djomgoue Tchokouagni

Signed at Johannesburg on 30th April 2021

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First year of registration	**2019**
Word count (excluding bibliography)	**19449words**
Date of report submission	**30 April 2021**
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ABSTRACT

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Research report title: The efficacy of procurement policies in the public health care system in South Africa

The capacity for most South African hospitals to purchase ventilators presents a worrying situation in dealing with Covid-19 patients. Parastatals including hospitals are faced with non-compliance issues when purchasing medical equipment and poor evaluation of tenders has also increased. The study sought to assess the efficacy of the procurement policies in the public health care system in South Africa with a view to improve the procurement of ventilators in South Africa.

The study took a case study design in which the researcher collected data from four hospitals in the Gauteng Province. Purposive sampling was employed to draw ten interview participants from the hospitals. Data were analysed using thematic analysis. Findings indicated that the procurement policy of South Africa guide the purchase of mechanical ventilators. The procedures and rules are as articulated in section 217(1/3) of the Procurement Act. The results also revealed that due to the uniqueness of the situation, and several challenges, the purchasing criteria were not one hundred percent effective. The findings also illustrate that the hospitals' procurement process fails to effectively adhere to the five principles of good governance (fairness, equity, transparency, competitiveness and cost-effectiveness. It was recommended that procurement decisions be fairly and openly made, and once the need for ventilators has been identified. Findings show that the tender process must be smoothened while applying the rules as per the demands of the treasury as strictly as possible. An inclusive approach to tender evaluation was recommended as well as widening stakeholder consultations. It was also revealed that the financial delegation of CEOs needs to be increased and reducing bureaucracy since equipment must be purchased quickly.

The study has policy and practical implications. There is a need for policymakers to consider the findings of this study to allow hospitals to quickly procure high-risk medical equipment, in particular mechanical ventilators. Coupled with this, policymakers need to increase the financial delegation to allow hospitals to buy at an emergency the right quality and quantity of mechanical ventilators. From a practical standpoint, this

study fully endorses and prioritises the importance of having an effective criterion for the purchase of high-risk medical equipment during a crisis. Acknowledging the limitations of a study strengthens the trustworthiness of the results, and helps researchers recognise avenues for future research. The primary limitation of the study relates to its generalizability. Future studies may take the form of quantitative and longitudinal studies across the SADC region or expand the research into the procurement procedure of other medical devices.

Keywords:

Procurement: process of locating and agreeing on conditions for obtaining goods, services, or works from a third party, typically through a tendering or competitive bidding procedure.

Efficacy: The capacity to do a task at a satisfactory or expected level

Mechanical Ventilator: medical device that assists or replaces spontaneous breathing by using mechanical means.

COVID-19 Pandemic: A global coronavirus disease 2019 (COVID-19) pandemic caused by coronavirus 2 that causes severe acute respiratory syndrome.

Johannesburg, 30 April 2021

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Figure 1: Conceptual framework

ACKNOWLEDGEMENTS

I am taking this opportunity given to me to express my deepest gratitude to all who have played a direct or indirect role throughout my MBA journey particularly to the following:

- The Witwatersrand university and particularly the Wits business school for have given me this opportunity.

- My supervisor: Mr Tonderai Sibanda for the support, patience, and guidance offered during the completion of this project.

- My fellow classmate who has play decisive roles in the completion of many projects, helped to reach date lines and for their truthful input and informative views on a number of issues related to the projects.

- My parents, brothers, and sisters whose love and guidance are always with me in whatever I pursue.

- My kind, wonderful, and lovely wife, and daughter **Sellina** and **Gabriella Djomgoue** for the support given, allowing, and creating the perfect environment needed to accomplish this task.

Thank you.
Leonel Djomgoue Tchokouagni

1 INTRODUCTION TO THE RESEARCH

1.1 Background

In South Africa, public healthcare institutions are urgently concerned with resolving the acute respiratory challenges due to Covid-19, before turning their attention to optimization of the procurement process. Minister Ebrahim Patel in his national Covid-19 conference addressed in July 2020 estimated that between 25% and 50% of mechanical ventilators in South Africa's public hospitals were broken, unused, or unfit for usage. This illustrates that indiscriminate procurement methods are deployed in the purchase of the ventilators. This is contrary to the needed for the public health procurement system to comply with the five principles of good governance, which are: (1) fairness, (2) equity, (3) transparency, (4) competitiveness, and (5) cost effectiveness (Vabaza, 2016). Following the minister's findings, there is a need to investigate the efficacy of the procurement policies of the ventilators in the public sector

A critical piece of healthcare equipment in current times is the mechanical ventilator. This machine is specifically designed to provided breathing assistance to the patient (who, 2020). Mechanical ventilators are utilised in critical care situations and they are sophisticated microcontroller machines that can support a wide range of medical conditions including acuities, ventilation modes, flowrates, and pressure settings (American_Association_for_respiratory_care, 2006). Respiratory therapists in intensive care units use and manage them under the supervision of a physician. A minor mistake in ventilator settings could result in patient harm or death (American_Association_for_respiratory_care, 2006). To operate these ventilators safely and effectively, there is a need for training and expertise. In the same vein, the high cost of purchasing mechanical ventilators called for a transparent procurement process

Procurement in the public health care sector constitutes more than 20%, of the GDP of many developing countries (Garzaro, 2016). This requires proper regulation (Eyaa et al., 2011) and such colossal amounts of money spent in

public health care procurement create the need for greater accountability and transparency (Sebola et al., 2016). Non-compliance among public entities in their procurement practices triggered a lot of debate on the efficacy of the procurement policies in recent years (Sebola et al., 2016)

The procurement process of critical health care equipment supports healthcare delivery (WHO, 2020). This includes activities related to purchasing and managing inputs, such as demand management, selection and contracting, relationship management, and operational delivery (WHO, 2020). The national department of health oversees medical equipment procurement in South Africa: It advertises, awards, and monitors tenders (Magadzire et al., 2017). The provincial health department provide quantification numbers to the national department of health, which are then combined, and contract suppliers delivered directly to central warehouses and, in some situations, to the public health care facilities in question (Motsoaledi et al., 2015).

Procurement decisions should be guided by principles of transparency and purchasing of the items fit for purpose (Modisakeng et al., 2020). During the procurement of critical equipment in public hospitals, the pressure to contain cost is very high, and clinicians had less input into the process than administrators. The exclusion of clinicians lead to the purchase of equipment not optimally suited for the South African health environment (Modisakeng et al., 2020)

In South Africa, medical equipment costing more than R5 000 must be part of 5-year equipment plan which need to be approved by a provincial equipment committee (Motsoaledi et al., 2015). This has not been practiced with mechanical ventilators where procurement often fails to consider the concerns of all parties involved or worked to resolve their competing interests (Modisakeng et al., 2020). Due to the high mortality rate associated with patients contracting Covid-19, ventilator procurements have not followed normal procedures. The issues of non-compliance were often observed in purchasing health care equipment in South Africa (Nelukalo, 2015).

1.2 Research Problem

Public health care procurement is under more intensive examination than ever before, driven by public and political expectations for service improvements (Eyaa et al., 2011). In South Africa, the procurement of medical equipment such as ventilators has been of particular significance as it was central to the government's service delivery system (Moyimane et al., 2017). In his conference address, minister Ebrahim Patel in 2020 said that the capacity for South African hospitals to purchase ventilators had been identified as an area of worry during these times of covid-19

Although intensive care ventilators require ongoing maintenance and operational cost, the South African public hospitals often purchase ventilators based on the initial acquisition cost price without taking into consideration the total cost of ownership (TCO) (Alhassan, 2018). The purchase of ventilators should be based on issues such as life-cycle cost, service support, and compatibility with existing equipment in the hospital (Hospodková et al., 2019)

The formal procurement process for the purchase of mechanical ventilators in many public hospitals in South Africa has not been followed as reports of non-compliance and poor evaluation of tenders increased (Munzhedzi, 2016). The procurement of medical ventilators in South Africa is centralised and managed by the national department of health. Procurement delays had been observed and, in many cases, ventilators with the wrong technical designs were bought (Modisakeng et al., 2020). This study hypothesize that the purchasing system of critical care equipment, in particular ventilators, needs to be review. The procurement procedure of these lifesaving machines deserves some attention.

1.3 Research purpose

The purpose of the study is to explore and describe the procurement procedure of mechanical ventilators and to ascertain the criteria considered in purchasing ventilators in the public health care system in Gauteng Province in South Africa. The study seeks to determine the efficacy of the

procurement policy in the South African public health care system in the purchase of mechanical ventilators.

This study seeks to assess the efficacy of the procurement policies in the public health care system in South Africa while aiming to improve the procurement of ventilators in South Africa.

1.4 Research Questions

This study seeks to provide answers to the following research questions

1.4.1 Research Question 1:

What is the procurement procedure followed when purchasing ventilators in South Africa's public hospitals?

1.4.2 Research Question 2:

How effective are the purchasing criteria of ventilators in South Africa's public hospitals?

1.4.3 Research Question 3:

In what areas do public health care providers' purchasing departments not comply with the procurement policy?

1.4.4 Research Question 4:

How can the policy compliance in the procurement of ventilators in South African public hospitals be enhanced?

1.5 Delimitations and assumptions

Theories and general principles of procurement in the public health sector are reviewed. The study sought to assess the purchasing criteria of critical

care devices in South Africa so the understanding of public sector procurement is vital.

Data collection was limited to public hospitals in the Gauteng province of South Africa. The assumption was that the identified participants would be truthful in their responses. It was presumed that all-important information would be accessible within the public domain. The hospital-specific papers relating to the procurement of ventilators would be availed by the responsible authorities.

1.6 Significance of the research study

The South African public health care system has been overwhelmed by the Covid 19 pandemic. This has seen people dying of breathing problems and to reduce mortality the government is buying ventilators for use in public hospitals (Truog et al., 2020). The government and procurement managers need to understand the critical purchasing criteria that enable them to purchase efficient devices that will save lives. The study enable the better equipping of the public health care systems such as intensive care units (ICU) with efficient and long-life ventilators.

An effective elucidation of the critical purchase factors used for purchasing critical care equipment was done. Antecedents of the purchase intention of public health care systems in South Africa to maximize the return on investment on critical equipment including mechanical ventilators was explored. This study should help public health institutions to craft sustainable purchasing practices which would in turn, serve to mitigate the effect of current and future pandemics.

1.7 Conclusion

This chapter provided the background to the study. It depicts the research problem, research purpose and research questions. The study's delimitations and assumptions are discussed. The chapter wrapped up with the significance of the research study in the South African public health care

system. The following chapter provides the research and knowledge gap that gave rise to the current study.

2 LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of the literature pertinent to the study. This chapter has three main aims; namely to understand the research problem, to identify the knowledge gap, and to develop a framework for interpreting the research findings. The research problem is discussed followed by the presentation of the research knowledge gap. The variables and theories selected for this study are discussed.

2.2 Research problem analysis

The large-scale public health emergency due to the Covid 19 pandemic has generated large numbers of patients with respiratory illness in a short time. The South African public health care system has been overwhelmed by a surge in the number of patients needing respiratory care (Modisakeng et al., 2020). This has resulted in the urgent need for mechanical ventilators to treat Covid-19 patients with severe acute respiratory failure(Ebrahim et al., 2020).

A mechanical ventilator is a device or machine that is specifically designed to provide ventilator assistance to the patient (WHO, 2020). Many public hospitals in South Africa are in possession of ventilators that have technical specifications which do not comply with safety regulations and are not effective when used for the management of COVID-19 (Malelelo-Ndou et al., 2019). This demonstrates a lack of thoroughness in the ventilator purchasing process as nurses and doctors lament that many ventilators being purchased are substandard and do not live up to their useful economic life (Malelelo-Ndou et al., 2019).

In South Africa, the procurement of medical equipment is of particular significance as it is central to the state service delivery scheme (Moyimane et al., 2017). Practices, decisions, and interventions derailing the procurement function in South Africa's public hospitals do not seem to be treated with due urgency (McQuoid-Mason, 2016). Despite acknowledging challenges in public procurement of medical equipment, the South African Health Sector Strategic Plan (HSSP, 2018) falls short of addressing the need for high-risk

medical equipment like ventilators. The full implementation of best procurement practices is still a contest in the public sector, with the issue of conformity being one of the major worries (Moyimane et al., 2017).

Compliance has been seen as one of the critical aspects of supply chain management at many public hospitals in South Africa. The government is trying to close the gap of non-compliance to ensure efficient and quality public health care delivery to all citizens. The procurement of medical equipment has been one of the elements that utilises more public funds (Mazibuko, 2018).

The procurement process in many public entities in South Africa has not been followed as many have failed to account for public funds (Munzhedzi, 2016). Several flaws and fragmentations in the control, and implementation of the public hospital procurement policy frameworks have been observed recently (Modisakeng et al., 2020). This study aim at recommending ways to enhance policy compliance in the procurement of ventilators in South African public hospitals.

2.3 Research knowledge gap analysis

2.3.1 Marketing factors and purchase of laboratory equipment

A quantitative study was conducted by Alhassan in Amman, Jordan, to investigate the marketing elements influencing laboratory medical supply purchasing decisions in private medical laboratories. Product quality, price, supply speed, personal selling, and country of origin were employed as independent variables in the study, whereas the purchasing decision was the dependent variable (Alhassen, 2018). The findings of the study revealed that all the marketing factors had a statistically significant and strong positive relationship with the purchasing decision of medical equipment. The study concluded that decision-makers must focus on the characteristics of medical laboratory products, especially in terms of the quality, speed of supply, and personal selling effectiveness when purchasing medical equipment. The major limitation of the study is that it focused on the marketing factors leaving

other important factors such as speed to response and after-sales service that need to be considered in the procurement of medical supplies.

2.3.2 Procurement practices and quality of medical devices

Lingg, Wyss, and Durán-Arenas lset out to study the impact of procurement for orthopaedic high-risk medical devices on clinical procedures and outcomes. Data for the study was collected through qualitative interviews with participants from Mexico, Switzerland, Germany, and the UK. Participants were drawn from orthopaedic professionals, government officials, other experts, and social security system managers. Study findings demonstrate developed countries such as Switzerland, Germany, and United Kingdom procurement processes do not match those of developing countries like Mexico. The study shows that there were insufficiencies in procurement laws and practices in Mexico.

The study concluded that in developing countries high-risk medical device regulations are based on insufficiently robust clinical evidence. Follow-up on health technology assessments is inadequate. The lowest acquisition price often guides procurement decisions in developing countries and may not align with the needs of clinical procedures. The study also concluded that procurement processes for orthopaedic high-risk medical devices may have an impact on clinical procedures and outcomes. The study suffers methodological limitations as it uses a qualitative approach to provide responses that may not be generalisable. The study did not include patients or representatives from rehabilitation centres. Future studies need to include representation of stakeholders from both the micro and macro level to enhance the generalisability of findings.

2.3.3 Multi-criteria decision in healthcare

Broekhuizen, Groothuis-Oudshoorn, Janine, Hummel, and IJzerman in 2015 used the Scopus and PubMed databases to explore how uncertainty might be explicitly included in multi-criteria decision analysis and discuss which technique could be useful for healthcare decision-makers. For

methodological details, selected full-text papers were read. Five commonly used ways to quantifying and incorporating uncertainty were discovered in this study: deterministic sensitivity analysis, probabilistic sensitivity analyses, Bayesian frameworks, fuzzy set theory, and grey theory

Because of its low complexity and ease of implementation, the deterministic approach is most likely sufficient for most healthcare policy decisions, according to the study. Despite the vast number of applications revealed in the paper, the authors concede that the list is unlikely to be thorough due to the large quantity of research on multi-criteria decision analysis in various domains. It's possible that studies that didn't include uncertainty in their title or abstract were overlooked.

2.3.4 Medical equipment procurement and prioritization

40% to 70% of medical devices in low- and middle-income countries are broken, underused, or inappropriate for the purpose (Diaconu et al., 2014). They did a systematic study of the literature to determine what product selection or priority approaches are utilized in low- and middle-income countries for medical device and equipment procurement planning. The narrative synthesis revealed that purchase decisions were made using experience-based, needs-based methodologies. The costs of equipment, including maintenance and health requirements, were found to be the most important considerations.

Incomplete budgeting and inadequate consideration of maintenance services and user training during procurement planning, according to the study, are directly linked to unsatisfactory device use. As a result, accurate life-cycle costing estimation and careful consideration of device servicing is critical. The conclusions of the study cannot be generalized due to methodological flaws. Qualitative analysis is better suited to theory formulation than generalisability.

2.3.5 Article 5: Medical technology procurement in Europe: A cross-country comparison of current practice and policy

The paper discussed the procurement of select medical devices across five countries of England, France, Germany, Italy, and Spain based on a review of published and grey literature and policy documents, as well as expert interviews. It was revealed that all countries have introduced various regulatory or policy measures that implicitly or explicitly influence device procurement (Sorenson, 2011). The study findings note that there has been a movement towards more centralized procurement.

The research also noted the establishment of purchasing groups, particularly in England, France, Germany, and Italy, as well as the participation of a variety of stakeholder groups in the procurement process. A common thread running across all national procurement systems was a focus on cost-cutting. According to the findings, basing purchase decisions on a broader set of factors, including quality and health outcomes, may help governments achieve greater value for money and enhance patient access to beneficial technologies. The study's main flaw is that it was only conducted in five developed countries. It cannot provide a general picture of all the medical health systems in another part of the world such as Africa.

2.3.6 Procurement challenges in the South African public sector

The issues that the South African public sector faces were previously examined. Some of the fundamental guiding pillars of public procurement in South Africa were revealed using a conceptual analytical method. The study found that procurement methods in the South African public sector are constrained. The study found that there are insufficient controls and processes for managing bids, that bid committee members are not appointed in accordance with policy criteria, and that there is insufficient motivation for deviating from established procedures (Ambe et al., 2012). These problems

can be linked to a lack of sufficient information, skills, and capacity to a considerable extent.

The article finishes by suggesting competency development through customized training materials and programs, stakeholder involvement in the bidding process, and the use of effective strategic sourcing methods. The methodology of the study is a fundamental flaw. The study relies mainly on secondary data conceptual analysis. The study is based on a review of selected papers, which means that some important literature may be overlooked. The study also looked at procurement in public firms in general, so the conclusions aren't totally applicable to South Africa's public health care system.

2.4 Variables

The study considers the procurement process, the decision criteria on the purchasing decisions, and the challenges faced in the purchase of high-risk medical equipment in public hospitals.

2.4.1 Procurement process

In South Africa, the procurement process goes through three different stages (Nkwe et al., 2015). It starts by recognizing a need in the planning phase, followed by a long procurement process in which requirements are set, suppliers are examined, contracts are evaluated, and a decision is made (Witjes et al., 2016).

2.4.2 Total cost of ownership

The total cost of ownership analysis will be used to assess the criteria for the purchase of critical health care devices in South Africa. Industrial buyers should aim at minimising the total cost of ownership rather than just buying on a low-price basis (Wouters et al., 2005). The adoption of the total cost of ownership in this study will require that medical device buyers consider key

factors which are: maintenance, repair, and operating; quality; price; and service. These variables are to influence the procurement of mechanical ventilators by public health care providers in South Africa.

2.4.3 Procurement policy

Procurement policy aims to govern the way purchases are done in the public sector to continuously meet many challenges and those misconducts that emanate from both inside and outside of the government departments (Singleton et al., 2010). Munzhedzi (2016) identified few issues that are impacting the procurement policy application in South Africa. These are compliance, lowest price wins, lack of resources, political interference, and fraud. Challenges such as unqualified procurement officers, inadequate accountability for government decisions, and lack of transparency were identified in the application of the procurement policy (Uromi, 2014).

2.4.4 Training

As procurements policy and process highly involve interaction with many stakeholders from a different mindset, it is suggested that the training of human capital is an essential factor for the good implementation of policies in a sustainable way (Sarkis, 2010). The training should be ongoing, related to the content and the scope of procurement (Kusi et al., 2014). Continuous training of procurement officers improves the way government tenders are handled (Mahmood, 2010).

2.5 Theories informing the study

The number of organizations embracing best procurement practices has increased (Grob et al,.2014). Scholars such as Pagell et al. (2010) stress the lack of theoretical development in the procurement discipline. The three most frequently used theories in public procurement are the institutional theory, stakeholder theory, and the power dependency theory (Johnsen et al. (2017).

2.5.1 Stakeholder theory

The stakeholder theory emphasizes that the modern organization is affected by a large set of forces (Tate et al., 2014). Many stakeholders can exert pressure on companies, ranging from primary stakeholders to secondary stakeholders. Primary stakeholders include customers, employees, suppliers, and management while secondary includes the local community, the media, the courts, the government, special interest groups, the general public, and society (Tate et al., 2014).

These groups of stakeholders are vital to the survival and success of every organization. Freeman (1984) in Wolf (2013) argue that managers should consider the interests and views who are affected by the hospitals' services. The stakeholder theory is deemed appropriate to the current study as the public hospitals need to consider the interests of all the stakeholders in their purchase decisions. Consultations are needed when procuring critical health care devices.

2.5.2 Institutional theory

Institutional theory suggests that business choices do not always arise from radical economic decisions (Grob et all., 2014). It argued that they are often affected by norms, values, and traditions. furthermore, there are three distinct forms of institutional theory. It consists, of coercive isomorphism, mimetic isomorphism, and normative isomorphism (Wolf, 2013). Institutional pressures could drive companies to operate in a more sustainable manner (Grob et all., 2014).

This is not only limited to compliance with regulations but can also extend to the implementation of sustainable decisions (Sharma, 2010). The institutional theory was deemed appropriate for this proposed study as it can serve to break down procurement criteria into internal and external pressures that influence suppliers' selection of a particular ventilator at the demise of others (Delmas et al., 2011). This provides a lens through which the purchasing of ventilators can be studied.

2.5.3 Power dependency theory

The power dependency theory extends the concept of power between organizations rather than within the organization (Lundberg et al., 2018). The bigger the volume of purchases a buyer has, the higher the supplier dependency is on this buyer (Bratt et al., 2013). Nevertheless, the bigger the number of alternative suppliers, the lower the buyer dependency is on a certain supplier (Ibid.).

Public authorities procure large volumes of goods and services in various industries in many countries, and there are numerous suppliers in a globalized market (Kaye et al., 2012). Public procurement has strong leverage over suppliers and puts it in the buyer dominance position. The power dependence theory has been used in other research to explain purchasing processes (Johnsen et al., 2017). This was primarily in the form of purchasing power where government departments can use their leverage to drive the purchase of strategic equipment (Lundberg et al., 2018). Despite the relevance of this theory in purchasing, it will not be used in this study.

2.6 Research conceptual framework

The model used in this study is developed from stakeholder theory and institutional theory. It examines the efficacy of the procurement policy as used in the procurement of mechanical ventilators in South Africa. This study suggests that the convergence of the procurement process, the procurement policy, the total cost of ownership consideration, and training can be applied to enhance the efficacy of the procurement function. Despite varying circumstances, public institutions are called to follow procurement procedures as defined by the government.

Figure 1 below is a relevant conceptual framework for assessing the efficacy of the procurement policy in the procurement of mechanical ventilators by public health care providers in South Africa.

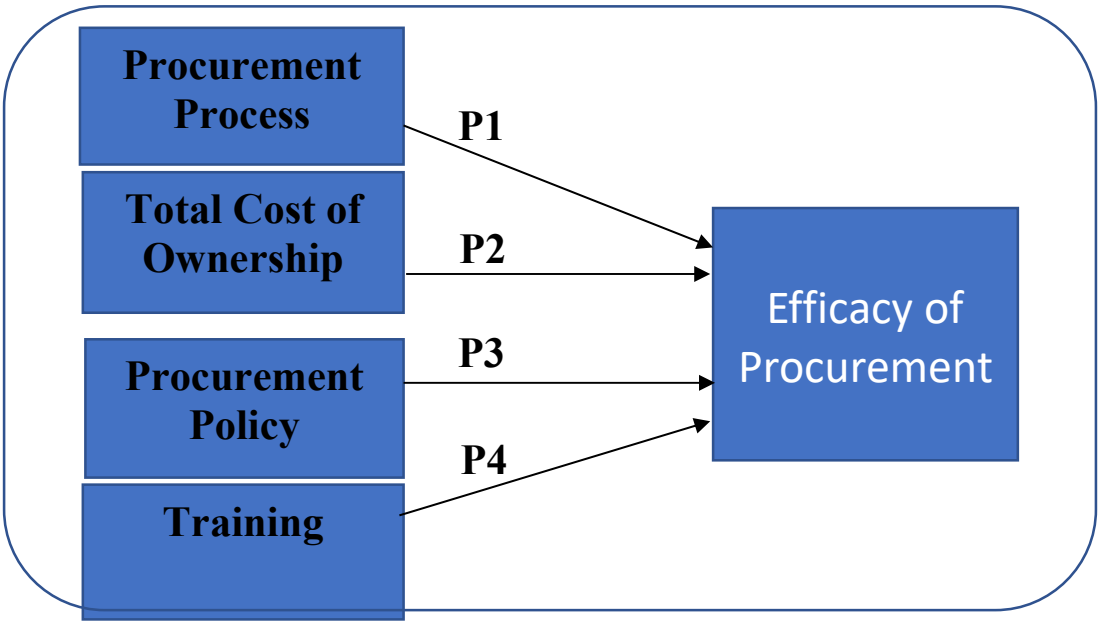


Figure 1: Conceptual framework

Source: Researcher's own compilation (2020)

The quest to buy the right quality medical health equipment in the current circumstances where many people are succumbing to the Covid-19 pandemic remains one of the key challenges of medical health institutions (Modisakeng et al., 2020). Several models of purchasing high-quality medical equipment have been suggested, but there remain challenges in purchasing

medical health equipment in South Africa (WHO, 2020). Malelelo-Ndou et al. (2019) contend that many procedures as outlined by earlier models have led to the purchase of medical equipment that has technical specifications that do not comply with safety regulations, and effectiveness when used for the management of respiratory challenges. This study proposes that the need with be compliant to the procurement policy and careful consideration of the total cost of ownership leads to purchasing the rightful equipment (Modisakeng et al., 2020).

2.7 Propositions

2.7.1 Proposition 1

Much has been written about the public procurement procedures in South Africa and their implication in public purchase decisions (Mazibuko, 2018; Munzhedzi, 2016). The subject remains a controversial one, especially when discussing the need to purchase effective mechanical ventilators in the current Covid 19 environment (Alhassan, 2018). Most researchers would agree that the purchase of mechanical ventilators has to go through sanctioned steps. The controversy that exists is whether public health care workers involved in the procurement of mechanical ventilators consider the procurement procedures set by the government of South Africa (Ambe & Badenhorst-Weiss, 2012). This leads to the following proposition:

Proposition 1: All public hospitals follow the government-approved procurement process when purchasing ventilators.

2.7.2 Proposition 2

The dynamic nature of today's marketplaces is a premium on an organisation's ability to anticipate and respond to customer needs as well as changing pressures (Magadzire et al., 2017). Organisations are therefore called to make decisions that are embraced by their stakeholders (Tate et al., 2014). By using both the stakeholder theory and the systems theory within this Covid 19 environment an effective purchasing criteria can be developed

to enhance the purchase of effective ventilators (Lundberg et al., 2018). There is a need to consider several factors when dealing with industrial and life-saving equipment such as mechanical ventilators (Munzhedzi, 2016). The following proposition is formulated:

Proposition 2: The purchasing criteria adopted by South Africa's public health care system are effective in purchasing mechanical ventilators.

2.7.3 Proposition 3

It was noted that not all public procurement officers can follow the guiding principles of procurement as sanctioned by the procurement policy (Diaconu et al., 2017). The application of the guiding principles of procurement has however been argued to be enhancing good corporate practices and consequently leading to effective purchasing decisions (Nkwe et al., 2015). This leads to the following proposition:

Proposition 3: Public health care providers' purchasing departments are more inclined to comply with all requirements of the procurement policy.

2.7.4 Proposition 4

There are many challenges encountered in the field of procurement within the South African public sector (Modisakeng et al., 2020). These challenges result in non-compliance to procurement policies as instituted by the South African government (Ambe et al., 2012). To institute policy compliance many studies have been conducted but non-compliance is still being witnessed among public departments and the public health care system is not an exception (Modisakeng et al., 2020). As per Sarkis (2010), training of human capital in procurement offices is very important. It has been showing results already in some countries which have decided to put their stuff through ongoing courses and programs to make them aware of what is happening in their field of work and reduce the misconduct in the way they apply the policies (Mahmood 2010). The following proposition was formulated to drive

the effective and efficient implementation and compliance with the public procurement policy:

Proposition 4: Public procurement offices in South African' public health care system could adopt compliance training to enhance the following of policy for procurement when purchasing mechanical ventilators.

2.8 Conclusion

This chapter analysed the problem and illustrated the research knowledge gap. The chapter discussed similar studies including theories used and findings for these studies. The variables of the study were identified. Two theories will guide the proposed study that is the institutional theory and stakeholder theory. A conceptual framework was developed and discussed. The propositions were discussed and then stated. The following chapter discusses the proposed research methodology for the study.

3 RESEARCH STRATEGY, DESIGN, PROCEDURE AND METHODS

3.1 Introduction

This chapter describes the research methodology that was used for the proposed study. The research strategy, the research design, the information collection process, and the information analysis process are discussed. The research design was explorative and qualitative. The chapter also discusses issues of how research ethics was incorporated in the research study. Reliability and validity issues were explored. The chapter concludes by identifying the potential technical and administrative limitations of the proposed research methodology that might affect the study.

3.2 Research strategy

There are three strategies commonly employed in research: qualitative, quantitative, and mixed. This study has adopted a qualitative research strategy. The choice between a qualitative and quantitative research design depends on the aim, focus, and mode of inquiry (Blumberg et al., 2014). Qualitative research is recommended in data gathering tactics because it provides detailed textual descriptions of how people feel about a particular research topic. (Creswell, 2014).

The purpose of this study was to investigate the purchase criteria for mechanical ventilators; hence a qualitative research approach was used. Qualitative approaches consider the complexity of the social and physical environment, allowing the researcher to better investigate relationships and interactions from various angles (Marshall et al., 2014). The employment of qualitative approaches in health systems research has grown significantly more prevalent, with a wide range of cases. Several articles on public health systems have employed qualitative methods (Bonenberger & Aikins, 2016; Smith, 2014; Waweru & Opwora, 2013; Nyamhanga et al. 2012).

3.3 Research design

The research design is a plan, structure, or strategy conducted to obtain answers to the research questions or problems (Saunders *et al.,* 2016). It includes the methods and procedures to be used in collecting and analysing data in answering a specified research problem (Creswell, 2014). There are five generic research designs, namely cross-sectional, longitudinal, case study, comparative, and experimental (Bryman, 2012). In this study, a case study design was adopted as it provided an in-depth analysis of a given phenomenon (Bryman et al., 2015). The study by Lingg et al. (2016) used qualitative case studies to study the impact of procurement for orthopaedic high-risk medical devices on clinical procedures and outcomes.

The researcher adopted the case study design since an attempt was made to answer the descriptive research questions. Descriptive research tries to identify problems and make them explicit and their value is based on the premise that problems can be solved (Koh et al., 2000). Lans et al. (2002) describe descriptive research as research that is restricted to factual registration and has no pursuit for explaining why things happen the way they happen.

3.4 Data collection instrument

Both primary and secondary data was collected. Document analysis and interviews were conducted to enhance data richness. The study has used the interview schedule and the document analysis schedule as the main data collection instruments. The question specified in the interview schedule has been used to identify the area to focus on the document analysis schedule. Triangulation was done with information obtained from interviews and information obtained from document analysis. The instruments were developed using theory and findings from previous research. The schedules are attached as Appendix A.

3.4.1 Interview's schedule

A research data collection instrument is a tool that is used to collect data for a study (Bryman et al., 2015). Two techniques that are commonly used to gather data in business and management research are interview schedules and questionnaires. This study used an interview schedule to gather data. The selection of the interview schedule is due to its efficiency in the gathering of descriptive data (Creswell, 2014).

3.4.2 Document analysis schedule

The aim of conducting a document review was to examine the data to generate meaning and further understanding of the research topic (Sekaran et al, 2013). The researcher conducted an intensive document review to understand the research problem. This review provided a significant source of descriptive and pre-interpreted data and form the foundation for the analysis of the raw data which was collected later (Bowen, 2009). The document analysis schedule was used to guide the information collected which is relevant for this research.

Documents and archival information were examined to create a descriptive framework for how the hospital's present processes and norms are established about legislation and standard-setting bodies. Document review was significant because organisational activities are often recorded within organisations, and they are a key component of comprehending the formal structures and processes that describe hospital administration and the context in which it operates. (Leedy et al., 2013). Document analysis was done by Mazibuko (2018) to analyse the administration of procurement practices in the South African public sector.

3.5 Sampling

Sampling attempts to make inferences or draw conclusions about a phenomenon by examining a representative group of the population. There

are two broad categories of sampling designs, namely probability sampling, and non-probability sampling.

Non-probability purposive sampling was used for this study in the selection of interview participants. Purposive sampling occurs when a researcher selects sample members to conform to some (Cooper et al.,2014), In this study, people involved in the purchase, administration, and use of the ventilators were selected. Participants were drawn from doctors, nurses, financial managers, procurement managers, operations managers, and biomedical engineers working at the selected hospitals.

The study participants were chosen purposively as they are involved in decision-making for the procurement of ventilators and the use of the ventilators. This study had 10 participants. They were selected from Gauteng central hospitals because of their proximity to the researcher who is based in Gauteng. Gauteng Province has only four central hospitals which are George Mukhari, Steve Biko, Chris Hani Baragwanath, and Charlotte Maxeke

3.6 Data collection procedure

3.6.1 Interviews

The necessary preparations were done for data collection. A total of 10 interviews with hospital staff participants drawn from doctors, nurses, financial managers, procurement managers, operations managers, and biomedical engineers was conducted between December 2020 and April 2021.

The interviews lasted between 30 and 45 minutes. A day before the interviews, the researcher furnished the participants with the interview schedule. This stimulated the participants to help them provide in-depth responses and promote credibility in the study (Saunders et al., 2016). This allowed the participants to provide a detailed narrative rather than would have been possible if the topics were raised first at the interviews.

3.6.2 Document analysis

In this study, text documents in the form of policy documents, newspaper articles, and magazine and journal articles about public procurement in South Africa were analysed. The written documents provided critical current and historical data on the procurement procedures and challenges in the public health care institutions in South Africa.

The document analysis schedule guided in identifying the relevant documents which could provide answers to the research questions. The documents were obtained from the national ministry of health and the provincial department of health and the respective hospitals.

3.7 Research population

A population is an entire set of objects that a researcher wants to collect data on for a particular study (Bell, 2016). The population of this study was all staff in central hospitals in South Africa. Central hospitals were chosen because there is interest from the national department of health to change its governance structure. All the government central hospitals in South Africa operate in a similarly. This is quite distinct from the other small hospitals and other local clinics within South Africa. The research population consists of all the staff in central hospitals as shown in table 1

Province	**District**	**Facility**
Gauteng	Johannesburg	1. Charlotte Maxeke JBG Hospital 2. Chris Hani Baragwaneth Hospital
	Tshwane Central Health District	1. Steve Biko Hospital 2. George Mukhari Hospital
Eastern Cape	O R Tambo	1. Nelson Mandela Academic Hospital
Free State	Moteo	1. Universitas Hospital

KwaZulu Natal	EThekwini	1. Inkosi Albert Luthuli Hospital 2. King Edward VIII
Western Cape	Cape Town	1. Tygerberg Hospital 2. Cape Town Groote Schuur Hospital

Table 1: South African Central Hospitals **Source: NDoH (2020)**

The staff in these hospitals were selected as these hospitals receive the highest number of referrals, and generally provide relatively high cost and low volume services and they operate in a similar way (NDoH, 2020). Roman (2018)'s study which was aimed at exploring the determinants of decision space and to investigate how it functions within a central hospital in South Africa used a similar population.

3.8 Ethical considerations

In any research, the researcher is responsible for the integrity of the research process and the dignity and well-being of the participants. An ethics application was done with the Ethics Committee of the Wits Business School. Access was negotiated with the Chief Executive Officers of the selected hospitals and written consent was received from them to proceed with the study. The researcher also applied for permission to get access to the hospital-specific documents. Participants were assured anonymity, which implies that sensitive information was not going to be disclosed.

Before the interviews, all participants signed interview consent forms, which were emailed to them along with an overview of the interview subjects at least 24 hours before the interviews. To protect their identity, research participants were given numbers and the findings were reported anonymously. Because data extracts cannot be connected to individuals, the information provided by the participants remains private. All information gathered for this study was kept private.

3.9 Data analysis

3.9.1 Interviews

Thematic analysis was used to examine the research data. The six steps of thematic analysis were followed (Braun et al., 2006). This entails a movement from the description, in which the data was organised to reveal content patterns, to interpretation, in which the patterns' theoretical meaning and implications were assessed (Patton, 2015). The data from the in-depth interviews' audio recordings were transcribed word for word. Before being interpreted, the transcriptions were double-checked for accuracy and then anonymized (Braun et al., 2008).

Patton (2015) reinforced that the initial reading allows the researcher to familiarise themselves with the data and identify coding categories and look for emerging themes, which is believed to be the core aspect of qualitative data analysis. The coding reduced the data into patterns of meaningful components, identifying supporting evidence to the generated codes from the presented data. Themes were identified and these were grouped with similar groups of information in categories, subcategories, and their corresponding codes, which represent the participants' experiences (Braun et al., 2013).

3.9.2 Documents analysis

Qualitative content analysis was used to examine the documents. It focuses on coding to analyse textual material and identify themes and patterns (Zhang et al., 2009). The analysis of meanings, themes, and patterns in documents is referred to as qualitative content analysis (Bowen, 2009).

The documents' key themes were recognized. The research questions related to the themes. The data was organized into primary themes in this study. Data categorization resulted in the coding of data in the chosen documents. The information was coded by writing words and phrases in the document margins

3.10 Research strengthens

The study's rigour was ensured by several strategies. To enhance data strength, the researcher has used the four trustworthiness criteria namely

credibility, transferability, dependability, and confirmability (Lincoln et al., 1985). Internal validity is like credibility in that it refers to "the data's believability" (Lincoln et al., 1985). Any excellent research must demonstrate that what was discovered is an answer to the questions that were posed in the first place (Quinton et al., 2006).

Data was generated through two research methods, namely interviews and document analysis. The triangulation increase validity, reliability, legitimation, and transferability of the research result (Moon, 2019). External validity is like transferability (Lincoln et al., 1985). It's all about 'analytical generalization' when it comes to external validity (Eisenhardt, 1989). The extent to which qualitative research findings may be transferred is referred to as transferability. In this study, the boundaries of the study were identified and noted (Shenton, 2004). To triangulate and corroborate information and provide complementary viewpoints on the phenomena addressed, the study design relied on two kinds of evidence: a document examination and in-depth interviews.

3.11 Research weaknesses

One of the most significant limitations of this study was its generalizability. In any regard, statistically representative samples of participants are rarely obtained in qualitative research, and some methodologists feel that this is not a requirement of qualitative investigations (Green et al., 2013). If the findings are meant to impact policy or practice, evidence that the research is applicable in other settings is required (Guest et al., 2012). This proposed study only took a sample of participants from Gauteng central hospitals. This has limited the transferability of the findings. The aim of the study was not to generalise but to develop a stronger conceptual understanding of the purchasing criteria of ventilators in South Africa's public health care systems.

3.12 Participation's Demographic Data

The Table 2 below depicts the participants including their gender, position, duties, and years of experience.

Table 2: Participants' particulars

Interviewees	Gender	Position	Duties	Experience With ventilators
Participant 1	Male	Director Supply Chain Management	Procurement of all goods and services, asset management, asset registration and disposal of assets	20 years
Participant 2	Male	Clinical engineer	Management and repairer of medical equipment in the hospital, procurement of medical equipment. Drawing up procurement plans.	20 years
Participant 3	Female	Medical Equipment manager	Making sure that there is appropriate equipment, management, and repairer of medical equipment in the hospital, make sure that people know how to use the equipment. Training on medical equipment. Drawing up specifications. And part of the evaluation committee.	11 years
Participant 4	Male	Head of clinical equipment	Administrative duties in managing portfolio of equipment	10 years
Participant 5	Male	Clinical engineer and technician	manage the maintenance of the devices, manage the technical team that comes to the site to see if the maintenance is done properly.	30 years
Participant 6	Male	Director Supply chain management	Oversee all the elements of SCP. Demand management, Acquisition management, Logistics management, Performance measurement of the Supply chain,	10 years.

Participant 7	Male	Head of ICU	Structure and coordinate all aspects of ICU. Deal with all challenges in the ICU Responsible for cluster hospitals Ensuring that the hospitals purchase effective equipment	More than 14 years
Participant 8	male	Deputy Director Supply chain management	Oversee all the elements of SCP. Overseeing what to purchase, how to purchase and negotiating terms and conditions of purchase	7 years
Participant 9	Male	Clinical engineer	Managing the maintenance of the devices Managing the technical team that comes to the site to see if the maintenance is done properly	15 years
Participant 10	Male	Biomedical engineer	Look after the wellbeing of devices in the hospital and the roll out of service contract for critical devices in the hospital	13 years

Table 2, above, illustrates that only one of the interviewees were females while nine were males. This illustrates that males dominate in leadership positions in the management and administration of public health care systems in South Africa. The positions of the interview participants show that all of them had enough knowledge and experience of public health procurement systems in South Africa. All the participants had more than 7 years of experience dealing with mechanical ventilators in hospitals. This was a plus in the quality of data that was collected. Participants were either involved in the procurement of ventilators in one way or the other, either as end-users or as important procurement parties.

3.13 Conclusion

The research used a qualitative case study design to gather data. The population was all staff at South African district hospitals. The sample was medical, technical, and management staff in Gauteng district hospitals. An interview schedule and document analysis schedule were used for collecting data. This chapter included consideration of the methodological rigour of the study and the ethical considerations.

4 PRESENTATION OF RESEARCH RESULTS

4.1 Introduction

The previous chapter presented the research methodology and design. This chapter aims to report on the study's findings. This chapter presents the findings, analysis and interpretation of the qualitative data collected. Thematic analysis was used to analyse qualitative data. Participants' demographic data are present followed by data that sought to address the four research questions. The chapter wraps with the conclusion.

4.2 Procurement procedure followed when purchasing ventilators in South Africa's public hospitals.

4.2.1 Do you follow a particular procedure when purchasing ventilators as set out in the South African procurement policy?

Because it operates at the intersection of the government's regulatory and purchasing powers, public procurement is a critical government tool for achieving socioeconomic goals. The participants were asked about their purchasing procedure for ventilators. The outcomes of the study revealed that public health care institutions purchase ventilators in a specific and systematic way.

All the participants indicated that the purchase of the mechanical ventilators by hospitals adhere to the procurement procedures as enshrined in the South African procurement policy. This is illustrated in the following interview quotes.

P1:

"Yes we follow a particular procedure……Below R5000 we purchase locally and above R5000 we follow….Tender processes if more than R5000……...Over R500 000……...open tender bases. Ventilators do not follow such a procedure because they are on contact. The process is more complicated. Its difficult to get all the documents in the complex process of acquiring a ventilator. The complex documentation

is not available in the process. Time challenges in the tender process. The tender process can take up to two years before a purchase can be made".

P2:

"There are supply chain processes that are followed when purchasing ventilators Any procurement in the government is governed by the national treasury. According to our procurement plan, we put it on the tender. …Not involved in the evaluation process but other departments are involved"

P3:

"Yes, we follow certain. We have a committee meeting (medical equipment committee). What is needed to be bought including ventilators?.....Secondly, consulting the different departments….look at what is on tender ….consolidate for all the department. We don't just buy something……..we look at the history of the ventilator, after sale back up, training involved, safety of the ventilators. We buy tried and tested equipment".

P4:

"Yes, Identify the need…put that forward to the procurement plan for the next financial year. Make sure that the budget is made for that. Tender process is followed. The ventilators follow tender processes".

P5:

"Yes, there is definitely a set of rules……...we can't just go and buy. We should follow the procurement procedures and contracts in South Africa. Give end users options…..Call suppliers to demonstrate…...End users select their best".

P6:

"Yes. When the demand emanates from the end user. Goods and services that are more than R500 000 in the demand plan are put in the procurement plan. These are put on the tender process. This includes ventilators as some cost around R700 000. We must check their availability on existing contracts……we have to make a note indicating the availability of the ventilators on the existing contracts.

And indicate that we need those ventilators as soon as possible. A normal tender takes at least 90 days including advertising, preparation of specifications, approval.

Once all the specifications are made, we bring in an external watchdog to check the specifications whether we had prepared the tender favouring one supplier. Once they okay it, we can advertise it. Then we get papers from companies which are interested in supplying the machines. We need to check the functionalities of the companies….administrative evaluations that includes checking the potential suppliers' companies, their capacities, whether all the documents have been signed.

We then are left with few who will have made it after the initial screening. We will start looking at the price and functionality. We now have 3 quotes. We may start to negotiate with the three and we will take the three to the adjudication committee. The adjudicators will do the due diligence….they don't just endorse what comes from the evaluation committee. Each committee will have a risk, legal guru, finance, supply chain management person. Where the adjudicators have no knowledge of ventilators, they all knowledgeable people to be part of the committee to advice but the person will not have been part of the evaluation committee.

When they have looked at the documents and satisfied then they will prepare a contract and gets it communicated to the. The adjudicators will come to the selection of one supplier. Only when we have the contract, we can then appoint one of the service providers. However, the process may take more than 90 days in most cases. There will be need to write an extension letter to have the three companies supply the machines on the previously agreed prices."

We follow a certain procedure…when there is an existing contract, we buy them from that contract. When there is no contract and the financial delegation is above R500 000….we have to send it to ….given its urgency,

we have what is called a contingency plan. We write a letter motivating the purchase of the ventilator. There is need to check with the finance department of the availability of funds".

The analysis of the interview data reveals how the administration of procurement of mechanical ventilators is practiced in the South African hospital sector. The findings illustrate that there is a set of rules that are followed in the procurement of medical equipment including mechanical ventilators for COVID 19. The procedures and rules are as articulated in section 217(1/3). That they adhere to the Procurement Act and its regulations. The need for and wide consultations and committees was emphasised by almost all study participants.

This is in line with literature which demands that three committees are needed: bid specifications, bid evaluation, and bid adjudication. The bid evaluation checks the functionalities of the companies and do all the administrative evaluations that includes checking the potential suppliers' companies, their capacities, whether all the documents have been signed. The bid adjudication committee does the due diligence as they don't just endorse what comes from the evaluation committee.

The qualitative results shows that the hospitals use the open procedure or competitive procedure when purchasing medical equipment. However, in special circumstances such as the COVID 19 circumstances, hospitals are allowed to use the negotiated bidding system.

Financial issues were emphasised by nearly all the participants as influencing the procurement of mechanical ventilators. The fact that finances are controlled by the treasury at provincial head office is a challenge in s state of emergency. Participants lamented the low financial delegation as a limiting factor. For instance, any purchase above R500 000 must be advertised and anything below R500 000 can be handled by the hospital but this too has challenges. But the R500 000 is too little when the hospital wants to purchase high valued medical equipment such as ventilators. One

participant indicated that with the current R500 000 limit only one ventilator or 2 can be purchased.

4.2.2 What policy challenges do you encounter in purchasing mechanical ventilators?

The second question aimed at finding out the policy challenges that are normally encountered in purchasing mechanical ventilators for COVID 19. The analysis of findings shows three major policy challenges that are delays in purchasing and delivery, timely availability of financial resources, and the inclusion of people without technical knowledge of medical equipment. This is substantiated by the following interview quotes.

P1:

> *"Longer time frame since the hospitals do not have control over the tender evaluation process……We don't have a say in the tender evaluation process…In purchasing ventilators, there is space for procurement of emergency (in the procurement policy). That can be used to deviate from the normal procurement procedures".*

P2:

> *"There is too much of bureaucracy which may lead to the potential for the handling of contract awards and consequently lack of fair battle in the tender environement".*

P7:

> *"You can't buy outside of the tender….Allowed to buy only for R500 000….we can only buy 1…waiting until there is a tender"*

P10:

> *"Some of the people are not technically knowledgeable in choosing the machines. As they don't have the clinical engineering"*

The interview results illustrates that the financial delegation is too low to allow the immediate purchase of mechanical ventilators in emergency times. More so, it was echoed that some hospitals are allowed to make purchase which are below R500 000, which can in most cases only buy one ventilator. These challenges restrain effective and efficient implementation of the procurement policy when it comes to the purchase of mechanical ventilators for COVID 19. Findings reveal that the procedure should have been clear.

The public hospital financial regulations required that no expenditure would be incurred without necessary procedures and consultations and the subsequent authority to incur such expenditure. In this case, hospitals would have to wait for the relevant consultations, and authority before procurement. This led to unacceptable delays in the purchase of ventilators.

The other respondents indicated that the participation of people without the technical knowledge of mechanical ventilators is a major cause for concern. This hindered the purchase of effective ventilators.

4.2.3 When purchasing the Covid 19 mechanical ventilators decisions should be made quickly to save lives, does policy support this?

The third interview question aimed at finding out if the procurement policy supports the quick purchase of mechanical ventilators to save lives during the COVID 19 pandemic. The analysis of interview quotes reveals that most of the participants indicated that the policy has provisions for emergency and urgent matters. The following interview quotes help to confirm the claim.

P2:

"The policy has provisions for emergency".

P4:

"Fortunately, when COVID took place, we had a tender already which the national treasury extended. Otherwise, we would not be able to buy the machines. Even in pandemics we follow rules and procedures. We would not buy anything above R500 000 without a tender. It was a blessing in disguise".

P7:

"Yes, because there was a tender in force, we asked for extension. The challenge is availability of machinery from the suppliers. We had no time as the suppliers gave us delivery time of 6 months. Yes, we can ask for deviation from the treasury and head office".

P8:

"….there was a Covid fund…special fund that was used specifically for purchasing covid related mechanical equipment. We used that fund to procure equipment that was on the contract".

The results indicated that the policy supported the emergency procurement despite calling for the hospitals to process tenders. However, it was fortunate that some hospitals had tenders that they had advertised, and it was easy for them to ask for the treasury to extend, without this it was going to be difficult for them to buy the ventilators. The results also indicate that even in emergence, hospitals are called to adhere to procurement rules and procedures, and for the COVID 19 it was a blessing in disguise.

4.3 Compliance of public health providers with procurement policies

4.3.1 Can you say you purchased the right quality and quantity of mechanical ventilators for Covid 19?

The first question aimed at finding out if the hospitals purchased the right quality and quantity of mechanical ventilators for use during the Covid 19 era. The following interview quotes were noted from the study participants. Most of the participants indicated that they had the right quality of ventilators. This is illustrated in the following interview quotes.

P1:

"We purchased good quality ventilators because we did not receive any complain from clients".

P2:

"Uhhm every effort was made to obtain friendly ventilators since we wanted to save human life".

P4:

"We had donated mechanical ventilators. However, all were effective in saving life".

P5:

"Yes. There was a high boom on the oxygen levels. We realised that they needed more oxygen than we were used to. Some of the ventilators were not made to last for long …life expectance of just two years. …They can be used for anything, though they were bought for the Covid 19"

P8:

"It was as per the end user's request. We do not buy according to the brand but to the user. However, in this case they considered the brand …they were supposed to choose an equipment that performs up to expectation".

The interviews quotes above illustrate that hospitals had mechanical ventilators that were of the right quality and quantity. There was considerable consensus that ventilators are bought to save life hence the need to purchase right quality in the first place. Three participants indicated that the ventilators are bought following the precise needs of the end-users hence the purchase of medical equipment that performs up to expectation. However, only P5 indicated that some of the purchased ventilators did not last long and some ventilators needed high oxygen levels. This shows that some of the mechanical ventilators did not meet the right expectations.

4.3.2 What critical factors do you consider in the procurement planning for mechanical ventilators?

While many of the participants were involved in the procurement of mechanical ventilators, there was considerable diversity in the critical factors that are considered in the procurement planning of ventilators. The analysis of interview quotes above shows that most of the respondents consider the following criterion factors in making procurement decisions on mechanical ventilators: equipment cost, technology regulatory approval, end-user needs, specialist recommendations, functionality, the necessary backup, other consumables, supplier data. The following were some of the comments made by the participants when asked about the factors they considered in purchasing ventilators.

P1:

"Cost, specialist recommendations, end user needs, history of suppliers"

P2:

"Quality, life support, consumables, history, supplier"

P3:

"Budget, end user specifications"

P4:

"It depends on the medical need; specification is the machine capable of performing up to expectation"

P5:

"What areas do we think we can get the equipment do they transport, do they have back up. Do we have alternatives, do they have any guarantees? Basically, we look at the specification and application of the device. We don't just choose from the paper".

P6:

"Functionality is the most prioritised factor followed by price in purchasing ventilators. When writing the specification, the functionality of the ventilators must be shown to assist the evaluation process. The highest scoring supplier on the functionality will be taken aboard to provide the service".

Equipment cost, end user needs, specialist recommendations, functionality, supplier history, are the primary factors reported as influencing mechanical ventilators procurement decisions.

4.3.3 How effective is your purchasing criteria for the mechanical ventilators for Covid 19?

To evaluate the adequacy of the purchasing criteria of mechanical ventilators in South Africa, participants were asked about their perception of the effectiveness of their purchasing criteria for the mechanical ventilators for Covid 19. The analysis of the data from the semi-structured interviews shows that the majority indicated that despite several challenges, the purchasing was effective. This is illustrated by the following interview quotes.

P1:

"The demand was higher than the supply…. Ventilators' availability was not much of the problem……...the problem was not with the ventilator but oxygen as the flow of oxygen was overwhelmed".

P2:

"Yes, because we purchase the ventilators that went much in as far as Covid 19 treatment is considered".

P3:

"Yes, we go by the hospital's demands. We consult and buy what is preferred. Especially that they are the end users"

P4:

"It's effective. The ventilators are big machines, there are many people involved, the authorisation process is long. It is a complex process to be streamlined. It is likely that decisions take long and information might be lost in the process. However, most of the times we got what we wanted".

P5:

"The first 2 weeks was very effective. The funding was available and then it got dried up. We then had to revert back to normal procedures. It was very frustrating, took time to get want we wanted".

P6:

"Yes. But obvious there were challenges and frustrations as a result of limitation of authority…they are certain things that we can't do. This lack of authority is affecting the swift and quick service delivery of hospitals".

Interview data shows that ventilators were purchased despite the challenges and frustrations from the authorities. Some of the challenges that affected the procurement process were coming from the lack of funding as COVID 19 just came from nowhere as such none was financially prepared for buying medical equipment to deal with the global pandemic. Funding dried up just after two weeks into the initial lockdown.

Coupled with that, participants blamed the long authorisation process in the purchase of mechanical ventilators. In this respect, participants argued that the time between need identification and the actual purchase of ventilators took long. However, at the end of it all, the majority of participants indicated that they bought thy wanted to buy with few exceptional cases.

4.4 Areas public health care providers' purchasing departments do not comply with the procurement policy

4.4.1 Considering the mechanical ventilators for Covid 19, what components of the procurement policy are you finding difficult to comply with?

What sections of the procurement policy that public health care providers' do not comply in the purchase of ventilators?

P1:

"Convincing the Departmental Acquisition Committee that there is a need to deviate from the normal procurement procedures….Need to write a motivation letter supporting the need to deviate from the normal procedure…which is difficult to do…..Availability of the product was a challenge"

P2:

"Speed delivery of medical health equipment"

P3:

"Balancing end user specifications and brands"

P4:

"It is difficult to monitor every activity in the procurement process and some of the decisions are made politically".

P5:

"The absence of a procurement plan since the need for the purchase of additional ventilators for use during the COVID 19 pandemic was accidental".

P6:

"The usage of brands in purchase decision at the expense of end user requirements. Once one buy another brand, you are blamed ….you will end up cornered to purchase a particular brand. It's better to uphold the policy than to be blackmailed. We don't have control over the final decision when it comes to purchasing".

P7:

"The ventilators were not on tender so hospital could not use the already existing contracts with the supplier".

P10:

"72 hours taken by IPS to give quotation after they are loaded its too long which delay service delivery and procurement process".

The time frame of both the tendering process and the logistical information system was the main concern of the participants. The 72 hours delay mention by P10 it's just the beginning of a long process that leads to prepared and submitted of the paperwork to be submitted to the quotation committee (QC). The whole procedure takes about two to three weeks, which affects the services as end users must wait to get their goods.

Since the pandemic just stroke the world, there was an overwhelming need for additional ventilators. In this case, there wasn't any procurement plan. It was therefore, difficult to plan and source the financial resources to meet the needs of institutions. Coupled with this is that certain ventilators were not on tender so existing contracts could not be used to purchase mechanical ventilators.

4.4.2 To what extend do you think the procurement system of mechanical ventilators comply with the five principles of good governance, which are: (1) fairness, (2) equity, (3) transparency, (4) competitiveness and (5) cost effectiveness.

According to the National Treasury's General Procurement Guidelines (2003a) cited in Nelukalo (2015), proper and successful government procurement rests upon certain core principles of behaviour. These are value for money, open and effective competition, ethics and fair dealings, accounting and reporting, and equity. These pillars must be observed to ensure that procurement meets the purpose of South Africa's Public Financial Management Act 1 of 1999 (PFMA).

Study participants were asked of the extent to which their procurement system of mechanical ventilators complies with the five principles of good governance. The analysis of interview data revealed that all the participants agreed to comply with the principles of good governance. However, it can be observed that compliance is at varying degrees. This is illustrated in the following quotes:

P2:

"Those principles are followed….he process complies with the principles"

P4:

"Looking at the tender process….it does meet all of that because we had to post the open tender and invite bids and follow all the processes. Comparison was made of all suppliers on the basis of a set criteria (needs)"

P7:

"They do comply especially if you buy from the tender process. They are open with information, fair and transparent".

P9:

"These features are extracted from the constitution of the country. I should comply with those five pillars…. but it's almost impossible to do that. Once we take one brand instead of another there is no equity, especially when the hospitals need a specific brand. However, we strive to adhere to these principles always……These pillars are mainly applied at the beginning of the procurement process. And usually at the transacting point some of the pillars are not adhered to".

P9:

"Those principle are most definitely followed as the equipment purchase are done under the RT tender and the RT tender make sure that everything complies effectively with those principles of good governance".

All the respondents in the in-depth interviews noted that all the principles of good governance are followed especially given that the tender processes are followed. Information is freely accessible to all, and the choice of a particular

supplier is done openly. Another participant emphasised that the principles are extracted from the constitution of the country hence it will be almost impossible not to comply with them.

Section 217(1) of the South African Constitution mandates that state organs contract for goods and services in line with a fair, equitable, transparent, competitive, and cost-effective approach. However, another participant echoed that claimed that these pillars are mainly applied at the beginning of the procurement process, and usually at the transacting point some of the pillars are not complied with.

4.4.3 What aspects of procurement do you find unique when purchasing mechanical ventilators for Covid 19?

The supply of mechanical ventilators during the COVID 19 pandemic is of profound importance for planning for severe public health emergencies. The procurement of mechanical ventilators for the COVID 19 pandemic is unique given the insurgence of the virus. The participants were asked about the unique aspects of the procurement observed when purchasing mechanical ventilators for the COVID 19 pandemic.

The study participants indicated some unique aspects that affected the procurement process. These aspects include the mismatch between demand and availability, difficulties in complying with delivery terms, unavailability of funds, uniqueness of the procurement contract. This is substantiated by the following interview quotes.

P1:

> *"Ventilators need consumables. The demand and availability were not matched. Although we had the right number of ventilators, consumables were a problem".*

P4:

> *"We had no budget for Covid. We had to revise our budget given the Covid. We had to work out to provide for the Covid ventilators. We were allowed to move money for other things to sort out Covid*

ventilators issues. The policy allowed us to reprioritise. Under normal circumstances we can do that"

P7:

"We couldn't access the ventilators on time…..Demand was higher than the hospital delegation. It was also difficult to procure ventilators given the R500 000 financial delegation".

P9:

"The contract process is unique. It needed urgency and accuracy, when finances were little…..Ventilators are not the same with other medical equipment".

The study participants indicated that the procurement of mechanical ventilators needed to be with the urgency and accuracy needed. The increase in the number of COVID 19 related deaths meant that hospitals needed to prioritise the purchase of mechanical ventilators. However, P4 noted that they could not quickly get the ventilators as demand was high and hospitals had no budget for COVID 19. However, at some hospitals, they were allowed to prioritise the purchase of ventilators given the available little resources. P1 lamented the difficulties in accessing consumables needed for mechanical ventilators to work effectively.

4.5 Enhancing policy compliance in the procurement of ventilators in South African public hospitals

4.5.1 What do you think can be done to enhance policy compliance in the procurement of ventilators in South African public hospitals?

Interview question 11 solicited the technical ways to enhance policy compliance in the procurement of ventilators. The study participants lamented the challenges of the current procurement policy. These challenges included the long-time taken between need identification and the actual purchase decision and delivery of the product, bureaucracy, the political nature of most decisions, and the heavy reliance upon administrators and not specialists. The participants bemoaned the need to deal with the effects of these challenges. This is illustrated in the following interview quotes.

P1:

"They should find a way to reduce time lag as the project are run for three or four years. Otherwise, we would not be able to buy the products on time. Service can be compromised …somebody must speed up the process. The decisions should be apolitical…it's always up and down. Identify the need in time, equipment will not be purchased on time. Orders need to be placed early. Work out relationships with suppliers and not a corrupt one".

P3:

"The biggest challenge is time. It takes years. Procurement not on tender bases as it takes time. Smoothen the tender processes. Work well with supply chain members. Apply the rules as per the demands of the treasury as strictly as possible".

P6:

"So the only thing is to make sure that any procurement decision like a ventilator is managed by the individuals who are going to use them not policy makers per ser. Otherwise we end up getting mechanical ventilators that are of poor quality….the person who prescribe the machine should be the one who buy the product. The end user should be involved in the purchase of the procurement".

P7:

"They must take the end user needs more into consideration. It's not that they don't but the final approval gets done the acquisition council/committee. The approval is made on the very outside of what is needed by the end-users. The end users are not present when the approval is made. The same representation of departments is not seen at the end of the purchasing process".

P10:

"Time frame, the processes are cumbersome, and when we talk of ventilators, we talk of emergence…the process consumes a lot of time hence defeating the urgency need. The processes of addressing emergency requests must be reviewed. As a facilitator, I should have direct communication to the head of department to quickly make a purchase. I can't wait for the committee. Once the head of department okays it, then I quickly make a purchase. The financial delegation

again comes into …..Many a times we find ourselves defeated by these emergences because of the low financial delegations. Increase the finances to at least R5 million".

The interview quotes reveal that when purchasing mechanical ventilators, authorities must give enough financial resources to purchase the right quality as and when needed. The financial delegation needs to be increased to at least R5 million to enable the quick purchase of mechanical ventilators. Participants emphasised the need to consider the end-user needs at each every stage of the procurement process. This may need to be done especially at the final approval stage by the acquisition council/committee.

This is on the background that usually the final decision is made on the very outside of what is needed by the end-users. Participants bemoaned the inclusion of the same representation of departments at the end of the purchasing process. The participant notes that decisions should be fairly and openly, and the need for ventilators should be identified in time, equipment will be purchased on time. This calls for the orders to be placed early. Related to this is the fact that the tender process must be smoothened while applying the rules as per the demands of the treasury as strictly as possible.

4.5.2 What role do you think you can play in ensuring that your hospital can purchase effective ventilators?

The main goal of procurement is to make sure that the right quality and quantity of equipment is purchased as and when needed. The participants were asked what they can do to ensure that hospitals purchase effective ventilators. The analysis of the data from the in-depth interview reported various actions that can be done by the participants: participate in the tender evaluation process, comply with the procurement policy, take time to consider every stakeholder's needs, avoid being corrupt. This is substantiated in the following quotes.

P2:

"Buyers and those who make final approval must not be involved in corrupt behaviours…….There is need to comply with the corporate governance principles […..] they should govern the procurement process"

P3:

"The ventilator must be appropriate […….] Balance the needs of patience, the most advanced ventilators go to the most critical patience"

P4:

"The hospitals should work towards having a committee comprised of end users, clinical engineers, line managers, procurement managers, and finance managers….the decision of what to purchase, how many must be made by the entire group…input from everyone…..that's what should be done"

P7:

"Make me part of the equipment acquisition committee so that we can advise when the hospital wants to purchase equipment. That's where technical teams can come in. In the beginning this wasn't given due recognition ….only the past 2 years technicians have been given due respect in the procurement process"

P8:

"Every action should be governed by the policy. We need to align our processes and ways with what the policy says"

P9:

"The issue of sole suppliers is a vexing one…..There is need to have a pool of potential suppliers".

The need for working committees was emphasised by the participants. The committees are made up of representatives from all the stakeholders that is end users, clinical engineers, line managers, technical teams, procurement managers, and finance managers. This is consistent with the claim that procurement managers should listen and pay attention to all the voices of stakeholders as the more diverse the team of deciders is, it legitimate the

process and make less room for favours and mistakes. The decision of what brand to purchase, how many units, should be made by the entire group.

From the interviews, the compliance issue was the overriding procurement managers should deal with. The need to make unbiased and apolitical decisions was emphasised. One participant explained that those involved in making final approval must not be corrupt. To support this, it was stressed that there must be several potential suppliers and not relying on sole providers who may not be unable to deliver the appropriate supplies.

4.5.3 What changes do you think needs to be done on the procurement policy to suit the current Covid 19 pandemic need for mechanical ventilators?

The supply chain management system was accepted in South Africa in 2003 to promote procurement best practices (Ambe, n.d). However, analysis of interview data revealed some challenges restraining effective and efficient procurement in South Africa's hospitals. The last interview question was aimed at exploring what needs to be done on the procurement policy to suit the current Covid 19 pandemic need for mechanical ventilators. The analysis of the data from the in-depth interview suggests that the increase of the financial delegation, allow for an emergency, centralisation of purchasing decisions is some of the changes needed on the policy. This is illustrated by the following interview quotes.

P2:

> *"The institutional delegation must be increased to R5 millions so as to buy a lot of equipment without going through the tender process…Also the whole process must be scrutinised, specification, documented and can be audited. The current R500 000 is too little for a hospital. This needs to be increased to around".*

P4:

> *"The due diligences have to be done by the head office in implementing a tender, and we are restricted upon what we are to purchase, hence no room for politics and corruption. Most the work is done by treasury when they award a tender. The treasury checks all*

the applicants for specification, maintenance, after sale services, in the tender process"

P5:

"The purchasing decisions are limited by low financial delegation. In this world how many ventilators can be purchased by R500 000. Something needs to be done otherwise the procurement policy is constitutionally wrong"

P6:

"The tender process need to be streamlined to accommodate emergences".

P10:

"Given the huge financial resources needed and urgency of the matter, there needs to be centralisation of the procurement system so that decisions are made by few knowledgeable people".

The interview results above suggest that procurement of mechanical ventilators must be left to the head office. It is argued that procurement could be made faster. This is validated by Ambe (n.d) who claims that a larger extent of centralisation of procurement is needed in the public sector to enhance compliance and avoid corruption. Centralisation reduces the duplication of purchasing effort while allowing for better control and development of specialised expertise of purchasing personnel (Handfieldet al., 2011),

Current financial delegations allow CEOs to spend up to R500 000 for goods and services. According to the participants, this financial delegation is too little, and can hardly buy one mechanical ventilator. Accordingly, the institutional delegation must be increased to 5 million Rands to buy a sizable number of medical equipment without going through the long tender process. This is consistent with the findings from Naidoo (2016) who recommended that hospitals need sufficient budget and delegations to allow them to deal with infrastructural needs.

4.6 Conclusion

The study's empirical research findings were presented and analysed in this chapter. Qualitative insights were employed to support the empirical findings because the study used a qualitative research approach. The chapter began with a description of the demographic information provided by the participants. The study's empirical findings were then presented, analysed, and debated in light of the study's research aims.

5 DISCUSSION OF RESEARCH FINDINGS

5.1 Introduction

The aim of this chapter is to discuss the research findings in relation to the study questions. The research findings are discussed according to the four research objectives of the study. The discussion revolves around empirical review and the theoretical framework.

5.2 What is the procurement procedure followed when purchasing ventilators in South Africa's public hospitals?

Much has been written about the public procurement procedures in South Africa and the subject remains controversial when discussing the purchase of mechanical ventilators in the current Covid 19 environment. The first research question sought to establish whether public health hospitals follow a particular procedure when purchasing ventilators as set out in the South African procurement policy. Findings from the study revealed that hospitals follow a particular procedure as regulated by the procurement policy of South Africa. Every entity has standard procurement procedures with procurement guidelines that relate to how they should acquire those things (Mazibuko, 2018).

Analysis of the first interview question illustrates that the procedures and rules are as articulated in section 217(1/3) of the Procurement Act. The findings further illustrate that ordinarily, the procurement process goes through three different stages starting by recognizing the need (planning phase), followed by a long procurement process in which requirements are set, suppliers are examined, contracts are evaluated, and lastly the decision stage. The findings from the qualitative data analysis show that the procurement process goes through three different stages (Nkwe et al., 2015). It starts by recognizing a need in the planning phase, followed by a long procurement process in which requirements are set, suppliers are examined, contracts are evaluated, and a decision is made (Witjes et al., 2016).

Despite hospitals following guided by the Procurement Act in purchasing mechanical ventilators, it was revealed that three major policy challenges affect the procurement process. These challenges include delays in purchasing and delivery, timely availability of financial resources, and the inclusion of people without technical knowledge of medical equipment. The appointment of unqualified people as bid committee members who do not adhere to policy requirements (Ambe et al., 2011). Skills shortages have been recognized as a major factor in the success of public procurement in South Africa (Sheoraj, 2018),

The process of purchasing ventilators was long and the financial delegation was seen as too low to purchase the ventilators. These challenges restrained the effective and efficient implementation of the procurement policy when it comes to the purchase of mechanical ventilators for COVID 19.

Even though following rules and regulations in the procurement of ventilators, it was established that the policy has provisions for emergency and urgent matters. In the case of COVID 19 ventilators, it was fortunate that some hospitals had tenders that they had advertised thus was easy for them to ask for the treasury to extend, without this it was going to be difficult for them to buy the ventilators.

The analysis of data from the first three interview questions shows that the procurement of mechanical ventilators followed an organised process despite challenges that the effective and timely purchase of mechanical ventilators. Because procurement operations have such a big impact on a hospital's operation and efficacy, it's critical that they're done by qualified people. The personnel adhere to high professional and ethical standards, and they follow sound procedures based on policies and regulations.

Based on the study, the purchasing of ventilators usually involves a process, which includes several different phases and participants. However, the study findings indicate that buying processes differ slightly between hospitals. However, the process is clearer and more structured in central hospitals.

Findings from the study support the need to consider the needs of different stakeholders in the procurement process. A diverse range of stakeholders is involved in the deliberation of potential purchases: clinicians, public health commissioners, researchers, and patients. In this respect, hospitals' procurement decisions are influenced by several stakeholders, and the decision to buy one ventilator is made by three different subcommittees that are bid specifications, bid evaluation, and bid adjudication.

More so, these committees are made of different people representing different sectors that range from primary stakeholders such as customers, employees, suppliers, and management to secondary stakeholders such as the local community, the media, the courts, the government, special interest groups, the general public, and society (Saeed et al., 2017). These groups are important to the procurement process as they make sure that effective equipment is purchase. Consultations are needed when procuring critical health care devices (Tate et al., 2014).

The findings from the interview are consistent with those earlier. It was revealed that the purchase of mechanical ventilators must go through sanctioned steps. In the United Kingdom, it was observed that in the procurement processes of medical equipment clinicians and managers are involved to enhance the procurement and supply chain management practice in the NHS (Sanderson et al., 2015). More so, it was noted that there is substantial attention being given to procurement procedures and regulations in the purchase of high-risk medical devices in the developed countries (Lingg et al., 2016).

The findings on the policy challenges faced by hospitals in the procurement of ventilators concur with the existing literature. Compliance, lowest price wins, lack of resources, political interference, and fraud as challenges faced in the procurement process (Munzhedzi (2016). while it was claimed that unqualified procurement officers, inadequate accountability for government decisions, and lack of transparency in the procurement process are some of the challenges in procurement of medical equipment (Uromi, 2014) and that

compounding the challenges is the fact that most of the equipment comes from outside of the country (Larry et al., 2011).

5.3 How effective is the purchasing criteria of ventilators in South Africa's public hospitals?

The second research question aimed at establishing the effectiveness of the purchasing criteria of ventilators in South Africa's public hospitals. To address research question 2, three interview questions were asked. The first question aimed at finding out if the hospitals purchased the right quality and quantity of mechanical ventilators for use during the Covid 19 era. Most of the participants indicated that they had the right quality of ventilators. The second question explored the factors considered in the purchase of mechanical ventilators. It was revealed that in most cases hospitals consider the equipment cost, technology regulatory approval, end-user needs, specialist recommendations, functionality, the necessary backup, other consumables, supplier data. These results concur with the existing literature: it was observed that the cost of the equipment and the specific recommendations from the user are the main factors affecting the procurement decisions for medical equipment (Diaconu et al., 2014).

The findings suggest that within the emerging countries' medical fraternity, medical equipment purchasing is guided by factors such as availability of consumables, warranties, and the availability of alternative suppliers (Diaconu et al., 2014). The findings donate support to previous research that caution procurement stakeholders not to neglect to consider maintenance, servicing, and user training requirements (Ambe et al., 2012). The need for the input of specialists such as biomedical engineers to ensure improved technology procurement is supported (Smilkstein, 2006).

The last question aimed at establishing the effectiveness of the purchasing criteria. It was established that despite several challenges, the purchasing was effective. The analysis of the three answers from the three questions indicates that the purchasing criteria of the public hospitals are not all that effective in purchasing medical ventilators for the COVID 19 patients.

The results of the study indicate that the procurement of ventilators is guided by the stakeholder theory. Hence the needs of the diverse stakeholders need to be considered in the procurement of ventilators as they have a say or claim in the consequence of decision-making.

The mere nature of public hospitals, as generated and dispensed by the hospital institution, attracts a diverse range of stakeholders with varying political, institutional, and societal goals. Similarly, the findings of the study validate the use of the institutional theory in this study as findings suggest that business choices do not always arise from radical economic decisions but more often institutional pressures drive companies to operate in a more sustainable manner (Grob et al., 2014).

The findings from the study indicated that very few hospitals bought ineffective ventilators during the COVID 19 pandemic. These findings are consistent with literature that claim that in developing and emerging economies, especially Africa states, the procurement criteria of high-risk medical equipment are not effective as it is substantially different from those employed in high-income countries. Consequently, very often equipment that does not meet user needs is purchased. However, other earlier findings support the empirical findings. it was noted that when all due processes are followed, hospitals get medical equipment that is effective (Ambe et al., 2012).

The findings from the study indicate that the decision to buy ventilators is made after careful consideration of several factors. Three major themes emerged - the equipment cost, technology regulatory approval, end-user needs, specialist recommendations, functionality, the necessary backup, other consumables, supplier data. The findings indicated that the participants differed in their perception of the purchasing decision. Their choice of a particular ventilator was influenced by both internal and external factors, and consequently, some participants felt that the ventilators purchased met their quality criteria. These findings are consistent with earlier findings on the purchase of medical equipment.

For instance, Munzhedzi (2016) identified cost, functionality, the user needs as some of the important considerations in the procurement of medical equipment. Similarly, Mazibuko (2018) claims that the availability of financial resources, supplier reputation, and urgency affects the purchase decision in South African hospitals. In Indonesia, Liedes and Liimatainen (2010) looked at the purchasing processes and decision-making criteria in public healthcare, particularly in central hospitals and local health facilities. The majority of acquisition decisions tend to be based on technical attributes, though numerous economic aspects are also considered.

5.4 In what areas do public health care providers purchasing departments not comply with the procurement policy?

The third research question aimed at exploring areas of the procurement policy that hospitals often fail to comply with. The first interview question sought to establish the extent to which the procurement system of mechanical ventilators complies with the five principles of good governance, which are: (1) fairness, (2) equity, (3) transparency, (4) competitiveness, and (5) cost-effectiveness (Vabaza, 2016). The result of the study indicates that when it comes to practice there is no total compliance to the five principles of good governance.

Findings show that compliance is seen in the initial stages, and with the passage of time, not all principles are adhered to. The second interview question sought to find out the unique aspects of the procurement process when purchasing ventilators for COVID 19. Empirical findings show several unique aspects of the procurement process of mechanical ventilators.

These aspects include the mismatch between demand and availability, difficulties in complying with delivery terms, unavailability of funds, uniqueness of the procurement contract. The last interview question sought to make a clarification on the areas that the procurement department often finds difficult to comply with when purchasing COVID 19 ventilators. The findings of the study reveal that the long tendering process was the major

difficulty especially given that the whole process is likely to take more than a year.

The findings from the three interview questions clearly show that public health care providers have difficulties in complying with the procurement policy when it comes to the purchase of mechanical ventilators for the COVID 19 pandemic.

According to the findings of the study, the procurement process fails to effectively adhere to the five principles of good governance. These findings are consistent with earlier findings, for instance, the study by De Lange (2011) revealed stunning results: maladministration, mismanagement, and lack of knowledge are to blame in procurement processes.

Nelukalo (2014) investigated the procurement practices at Victoria Hospital in South Africa. The study findings revealed that the hospital previously had issues of compliance due to poor management systems. In Kenya, Ngugi and Mugo (2013) established that lack of accountability, transparency, and integrity affected the procurement process of health care supplies in the public sector to a great extent.

Investigation into the procurement challenges in the South African public sector established that public procurement has for long been overshadowed by inefficiency, corruption, and disregard of fundamental "value for money" considerations (Ambe et al., 2011). Consequently, this negatively affects the quality of the procurement decisions. It was also observed that not all procurement activities are fair and equitable though the primary aim is to be transparent and open.

Findings of the empirical study also revealed numerous aspects which are unique when purchasing mechanical ventilators for the COVID 19 pandemic which are the mismatch between demand and availability, difficulties in complying with delivery terms, uniqueness of the procurement contract.

Given the urgent and worldwide shortage of mechanical ventilators and other consumables, these findings are predictable. Based on the predicted number of individuals who will contract the disease, the required number of ventilators was expected to far exceed capacity. COVID 19 ventilator procurement necessitated placing huge orders for ventilators, putting pressure on supply chains, many of which are based in countries badly affected by the pandemic.

The uniqueness of the COVID 19 pandemic uniquely influenced the procurement process of ventilators. The COVID 19 pandemic needed special ventilators that were different from the usual and common ventilators. The COVID-19 patients developed acute respiratory distress syndrome (ARDS) that required prolonged mechanical ventilation (Cascella et al., 2020). This meant that even the ventilators' unique specifications needed a stand-alone and unique contract. The findings of the study indicate that the uniqueness of the procurement process of the mechanical ventilators for the COVID 19 poses difficulties in complying with the procurement policy.

5.5 How can the policy compliance in the procurement of ventilators in South African public hospitals be enhanced?

Given the policy compliance challenges and the difficulties in purchasing mechanical ventilators for the COVID 19 pandemic, something needs to be done to enhance policy compliance in South African public hospitals. Three questions were poised to improve the timely and effective procurement of mechanical ventilators. The fourth research question aimed at establishing what can be done to enhance policy compliance in the procurement of ventilators in South African public hospitals. The findings indicate that procurement decisions should be fairly and openly made, and once the need for ventilators has been identified on time, equipment will be purchased on time.

Related to this is the fact that the tender process must be smoothened while applying the rules as per the demands of the treasury as strictly as possible. The second interview question under this research question explored

participants' role in ensuring that their institutions purchase effective ventilators. The findings indicate the need for inclusive participation in the tender evaluation process, increased compliance with the procurement policy, wide stakeholder consultations, and avoiding being corrupt. The last interview question under this research question was aimed at exploring what needs to be done on the procurement policy to suit the current Covid 19 pandemic need for mechanical ventilators.

The findings suggest that the financial delegation be increased, reduce bureaucracy, and allow for emergency purchases without following the long tendering processes, centralisation of purchasing decisions is some of the changes needed on the policy.

These findings are consistent with earlier findings, for instance, Lingg et al. (2016) recommended that procurement processes for medical devices should include specialists, and post-market surveillance data should inform the decision-making process. They also recommended that actors should better align the needs of both procurement and clinical procedures. Similarly, Alhassan (2018) mentions that hospitals should emphasise both technical and qualitative qualities when considering medical equipment.

In South Africa, Mazibuko (2018) recommends that the administration of procurement practice should be enforced and punishable if someone did bypass the rules, in theory, they are but practically they are not enforced as intended. Mazibuko (2018) adds that the public procurement environment should establish a Public Procurement Committees composed of stakeholders from local, provincial, national levels as well as private organisations. This involvement of all these stakeholders will enhance the administration of procurement practices in public hospitals. The involvement of stakeholders in the bidding process was also echoed by Ambe et al (2011). Nelukalo (2014) supports the decentralisation of procurement tender processes as well as promoting good governance.

More so, Nelukalo (2014) admits that to obtain good procurement practices should be strong oversight of the process by the watchdog and this will lead

to good service delivery and enhance governance. In this regard, public procurement should be smooth and cost-effective to promote good governance. The procurement process must not be compromised. There are changes that need to be done to the procurement policy. These changes are consistent with earlier findings, for instance, Nelukalo (2014) advises that the public budget be increased to cater to national disasters. The financial delegation should be increased to allow the hospitals to purchase equipment that is more than R500 000.

5.6 Conclusion

The findings of this study were discussed according to the specific research objective. The findings revealed that hospitals follow a particular procedure as regulated by the procurement policy of South Africa. It was also revealed that in most cases hospitals consider the equipment cost, technology regulatory approval, end-user needs, specialist recommendations, functionality, and supplier data. It was established that despite a few challenges, the purchasing was effective. Findings also revealed that compliance is shown in the initial stages, and with the passage of time, not all principles are adhered to.

6 SUMMARY, CONCLUSIONS, LIMITATIONS, AND RECOMMENDATIONS

6.1 Research process and content summary

6.1.1 Research conceptualisation

Patel (2020) advised that the capacity for most South African hospitals to purchase ventilators presents a worrying issue in dealing with Covid-19 patients. Munzhedzi (2016) acknowledged that most hospitals are faced with non-compliance issues when purchasing medical equipment and poor evaluation of tenders has also increased. Modisakeng et al. (2020) reported delays in the purchase and delivery of medical equipment. In some instances, hospitals are equipped with devices with the wrong technical designs (Patel, 2020). The procurement procedure of these lifesaving machines deserves to be accorded due consideration. Given such a background, the study investigated the procurement of critical care equipment, in particular ventilators.

The research aimed to explore to explore the procurement procedure of mechanical ventilators and to ascertain the criteria considered in the procurement of ventilators in public hospitals in the Gauteng Province in South Africa. In particular, the study sought to determine the efficacy of the procurement policy in the South African public health care system in the purchase of mechanical ventilators.

In particular, the study sought to address the following research questions: (a) what is the procurement procedure followed when purchasing ventilators in South Africa's public hospitals; (b) how effective is the purchasing criteria of ventilators in South Africa's public hospitals; (c) in what areas do public health care providers' purchasing departments not comply with the procurement policy; and (d) what can be done to enhance policy compliance in the procurement of ventilators in South African public hospitals?

The following research proposition was formulated: (a) all the public hospitals follow the government-approved procurement process when purchasing

ventilators; (b) the purchasing criteria adopted by South Africa's public health care system is effective in purchasing mechanical ventilators; (c) public health care providers' purchasing departments are more inclined to comply with all requirements of the procurement policy; (d) public procurement offices in South African' public health care system could adopt compliance training to enhance the following of policy for procurement when purchasing mechanical ventilators.

6.1.2 Conceptual framework

The procurement process, the South African procurement policy, and the purchasing criteria in assessing the efficacy of the procurement policy among the public health care institutions in Gauteng Province, South Africa guided the researcher. Public hospitals are called to follow procurement procedures as defined by the government's procurement policy. It is in the interplay between hospitals purchasing criteria and the need to comply with the procurement policy that the efficacy of the procurement policy was evaluated. The need to be compliant with the procurement policy and careful consideration of TOC allows the purchase of the right equipment (Modisakeng et al., 2020).

6.1.3 Methodology

A qualitative case study design positioned within the interpretivism paradigm was employed to conduct ten interviews with representatives of public hospitals. The study was conducted in Gauteng central hospitals as they are the main referral hospitals in South Africa. The four central hospitals are George Mukhari, Steve Biko, Chris Hani Baragwanath, and Charlotte Maxeke. A purposive sampling technique was used to select ten informants who are involved in decision-making for the procurement of ventilators and the use of the ventilators. The interviews lasted between 30 and 75 minutes.

Document analysis was used to be able to obtain a level of data triangulation. Backed by the participants' interviews. Also, data, such as information from government departments' websites, policy documents, and third-party information were assessed. Primary data were gathered between March

2021 and April 2021. Ethical clearance was obtained from the ethics committee of the Wits Business School. Access permission was granted by the Chief Executive Officers of the case study hospitals. Respondents were assured anonymity. Data were analysed using thematic analysis.

6.1.4 Empirical research results

The first research question sought to establish whether public health hospitals follow a particular procedure when purchasing ventilators as set out in the South African procurement policy. Findings from the study indicated that the procurement policy of South Africa guides the purchase of mechanical ventilators. The procedures and rules are as articulated in section 217(1/3) of the Procurement Act. More so, the results revealed that due to the uniqueness of the situation, and a few challenges, the purchasing criteria were not one hundred percent effective. Most hospitals consider the equipment cost, technology regulatory approval, end-user needs, specialist recommendations, functionality, the necessary backup, other consumables, supplier data.

The findings also illustrate that the hospitals' procurement process fails to effectively adhere to the five principles of good governance which are: fairness, equity, transparency, competitiveness, and cost-effectiveness. Participants put few recommendations forward. It was recommended that procurement decisions be fairly and openly made, and once the need for ventilators has been identified on time. It was agreed that the tender process must be smoothened while applying the rules as per the demands of the treasury as strictly as possible. An inclusive approach to tender evaluation was also recommended as well as widening stakeholder consultations. It was also revealed that the financial delegation of the CEO needs to be increased and reducing bureaucracy since equipment needs to be purchased quickly.

6.1.5 Discussion of research findings

The purchasing of ventilators usually involves a process, which includes several different phases and participants. This is consistent with the policy document. The findings are in line with the stakeholder theory that

underscores the need for stakeholder involvement in the purchase decisions of high-risk medical equipment.

A diverse range of stakeholders is involved in the deliberation of potential purchases: clinicians, public health commissioners, researchers, and patients. (González-Benito & González-Benito, 2006; Tate et al., 2014). The findings from the interview are consistent with earlier findings (Sanderson et al., 2015; Lingg et al., 2016; Alhassan, 2018) which claim that the purchase of mechanical ventilators must go through sanctioned steps.

The findings from the study indicated that some hospitals bought ineffective ventilators during the COVID 19 pandemic. These findings are consistent with literature that claim that in developing and emerging economies, especially Africa states, the procurement criteria of high-risk medical equipment are not effective as it is substantially different from those employed in high-income countries. Consequently, very often equipment that does not meet user needs is purchased.

The findings of the study indicate that the procurement process fails to effectively adhere to the five principles of good governance. These findings are consistent with earlier findings, for instance, the study by De Lange (2011) revealed stunning evidence of incompetence and maladministration by public servants are to be blamed in public procurement processes. Locally, Nelukalo (2014) observed that hospitals in South Africa have issues of compliance due to poor management systems. These were also supported by Ngugi et al (2013) who claim that lack of accountability, transparency, and integrity affected the procurement process of health care supplies in the public sector to a great extent. These findings are not surprising given the critical and worldwide shortage of mechanical ventilators and other consumables.

These findings on possible remedies to the procurement of medical ventilators are consistent with earlier findings, for instance, Lingg et al. (2016) recommended that procurement processes for medical devices should include specialists, and post-market surveillance data should inform the decision-making process. Alhassan (2018) mentions that hospitals should

emphasise both technical and qualitative qualities when considering medical equipment while Mazibuko (2018) recommends that hospitals need to be firmer on the application of procurement practices. Nelukalo (2014) advises that the public budget be increased to cater to national disasters.

6.2 Conclusions

6.2.1 Knowledge gap

To articulate the research knowledge gap, many articles were reviewed. Many of the studies failed to provide a picture as researchers concentrated on the developed economies. Despite acknowledging the challenges restraining effective and efficient implementation of public procurement in South Africa, to the best of the researcher's knowledge, this study is the first of its kind to explore the procurement policy in the face of the COVID 19 global pandemic. It is therefore important to understand the procurement and prioritisation methodologies proposed in the purchase of ventilators for the COVID-19 pandemic.

6.2.2 Research findings contribution to the knowledge gap

The results of the study help to close the knowledge gap. The findings of this study support the improvement of the procurement policy, especially when dealing with mitigating the effects of natural disasters such as the COVID-19 pandemic. International public health organizations such as WHO and other research institutions issue a large body of incomplete and grey guidelines. This study has proposals that support the procurement of effective high-risk medical equipment while complying with the procurement policy. The findings further suggest that the procurement of ventilators in South Africa needs to be given attention as hospitals end up purchasing ineffective ventilators.

6.2.3 Comparison of results to other similar studies

Findings from the study validate both theory and earlier findings. Studies conducted in South Africa and beyond shows that the purchase of high-risk medical equipment, ventilators included should be well regulated. However, issues of non-compliance have been well documented and the same was revealed in this study. Past research has also found that the purchasing of

medical equipment in public hospitals is not all that effective due to issues of compliance and the long tendering processes.

6.3 Limitations

Acknowledging the limitations of a study strengthens the trustworthiness of the results, and helps researchers recognise avenues for future research. The primary limitation of the study relates to its generalisability. The exploratory nature of the study does not support the generalisability of the findings. Saunders et al. (2016) add that the sample mostly does not do justice in terms of representing a group. However, if the intentions are to influence policies or practice, then there must be a suggestion that the research is useful in other settings (Guest et al., 2012).

The findings cannot be generalised to the other province of the country as the study draws its respondent from the four Gauteng central hospitals. Secondly, the research context is geographically limited.

Lastly, the study was cross-sectional in nature. We could have got different results if we had used longitudinal design as it will have the ability to describe procurement processes over a period (Saunders et al., 2016).

6.4 Recommendations

6.4.1 Policy implications

This study has an important implication for policymakers. The supply right quality and quantity of mechanical ventilator it's very important for planning for severe public health emergencies. There is a need for policymakers to consider the findings of this study to allow hospitals to quickly procure high-risk medical equipment, in particular ventilators. Coupled with this, policymakers need to increase the financial delegation to allow hospitals to buy at an emergency the right quality and quantity of mechanical ventilators. The capacity and capability of South African public health systems to provide mechanical ventilation for the COVID 19 patience will be improved.

6.4.2 Implications to practitioners

Mechanical ventilators are necessary tools for nurses and doctors to provide quality intensive nursing care for COVID 19 patience. Ineffective medical equipment and delivered ventilators harm patients and the hospital. It is a barrier for the health system to function properly during the global crisis. This study demonstrates the importance of having an effective criterion for the purchase of high-risk medical equipment during a crisis. The research results illustrate that hospitals need to increase policy compliance, make wider consultations in their purchase decisions. Therefore, the outcome of this research suggests that it is essential for central government hospitals to decentralise dome of the purchasing functions to significantly aid hospitals in getting effective ventilators.

6.4.3 Future research

The present study explored and assessed the efficacy of procurement policy in the public health care system in South Africa in purchasing ventilators for the COVID-19 pandemic. Future studies may take the form of longitudinal studies across the SADC region or perform a quantitative study on the same topic or even expand the scope of the research to look at other medical devices procurement criteria. This wider study will help provide answers beyond the ones obtained from the current study due to its scope. Future researchers need to compare and contrast ventilators procurement processes for under-developed countries as this seems to be an unknown area.

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Appendix A: RESEARCH INSTRUMENT INTERVIEW

A1: Interview schedule

No:	Questions for Participants
1	What is your position in the organization?
2	What are your duties and responsibilities?
3	For how long you have been dealing with mechanical ventilators?
4	Do you follow a particular procedure when purchasing ventilators as set out in the South African procurement policy?
5	What policy challenges do you encounter in purchasing mechanical ventilators
6	When purchasing the Covid 19 mechanical ventilators decisions should be made quickly to save lives, does policy support this?
7	What critical factors do you consider in the procurement planning for mechanical ventilators?
8	How effective is your purchasing criteria for the mechanical ventilators for Covid 19?
9	Can you say you purchased the right quality and quantity of mechanical ventilators for Covid 19?
10	What aspects of procurement do you find unique when purchasing mechanical ventilators for Covid 19?
11	Considering the mechanical ventilators for Covid 19, what components of the procurement policy are you finding difficult to comply with?
12	To what extend do you think the procurement system of mechanical ventilators comply with the five principles of good governance, which are: (1) fairness, (2) equity, (3) transparency, (4) competitiveness and (5) cost effectiveness.
13	What do you think can be done to enhance policy compliance in the procurement of ventilators in South African public hospitals?
14	What role do you think you can play in ensuring that your hospital can purchase effective ventilators?
15	What changes do you think needs to be done on the procurement policy to suit the current Covid 19 pandemic need for mechanical ventilators?

A2: Document Analysis schedule

1	Procurement policy followed when purchasing ventilators in public health care
2	Policy challenges encounter when purchasing mechanical ventilator
3	Quick decision-making policy when purchasing Covid19 mechanical ventilator to save life
4	Critical factors considered in the procurement planning for mechanical ventilators
5	Efficiency of the purchasing criteria for the mechanical ventilators for Covid19
6	Policy procurement regarding quality and quantity of mechanical ventilators for Covid19
7	Uniqueness of procurement when purchasing mechanical ventilators for Covid19
8	Compliance with mechanical ventilator procurement with the 5 principle of good governance namely: (1) fairness, (2) equity, (3) transparency, (4) competitiveness and (5) cost effectiveness.
9	Room of improvement plan in the procurement policy of mechanical ventilators

Appendix B: RESEARCH CONSISTENCY MATRIX

Research questions	Interview questions	Themes obtained
Research question 1: What is the procurement procedure followed when purchasing ventilators in South Africa's public hospitals?	Do you follow a particular procedure when purchasing ventilators as set out in the South African procurement policy?	Procurement procedure in placed but too restricting.
	What policy challenges do you encounter in purchasing mechanical ventilators	Financial restriction
	When purchasing the Covid 19 mechanical ventilators decisions should be made quickly to save lives, does policy support this?	Emergency procurement process in place
Research question 2: How effective is the purchasing criteria of ventilators in South Africa's public hospitals?	What critical factors do you consider in the procurement planning for mechanical ventilators?	Cost, end-user needs, supplier history.
	How effective is your purchasing criteria for the mechanical ventilators for Covid 19?	Long authorisation processes led to delay
	Can you say you purchased the right quality and quantity of mechanical ventilators for Covid 19?	Purchasing of right type of equipment all the time
Research question 3: What areas do public health care providers' purchasing departments do not comply with the procurement policy?	What aspects of procurement do you find unique when purchasing mechanical ventilators for Covid 19?	Prioritise of ventilator over other equipment.
	Considering the mechanical ventilators for Covid 19, what components of the procurement policy are you finding difficult to comply with?	Long processes and inaccessibility to ventilators out of the contract.
	To what extend do you think the procurement system of mechanical ventilators comply with	The compliance is not always at 100%

	the five principles of good governance, which are: (1) fairness, (2) equity, (3) transparency, (4) competitiveness and (5) cost effectiveness.	
Research question 4: How can the policy compliance in the procurement of ventilators in South African public hospitals be enhanced?	What do you think can be done to enhance policy compliance in the procurement of ventilators in South African public hospitals?	Give more financial freedom to Hospitals.
	What role do you think you can play in ensuring that your hospital can purchase effective ventilators?	Avoid corrupt officials.
	What changes do you think needs to be done on the procurement policy to suit the current Covid 19 pandemic need for mechanical ventilators?	Shorten the purchasing procedure and increase financial delegation.

Appendix C: PAG Letter

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Private Bag 3 Wits, 2050
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Reference: Ms Jennifer Mgolodela
E-mail: jennifer.mgolodela@wits.ac.za

12 February 2021
Person No: 1964683
PAG

Mr L Djomgoue Tchokouagni
72 Saint James Street
Ferndale
Randburg
2194
South Africa

Dear Mr Leonel Djomgoue Tchokouagni

Master of Business Administration: Approval of Title

We have pleasure in advising that your proposal entitled *The efficacy of procurement policies in the public health care system in South Africa* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Marike Bosman
Faculty Registrar
Faculty of Commerce, Law and Management

Appendix D: Ethics Clearance certificate

Graduate School of Business Administration
University of the Witwatersrand, Johannesburg

Wits Business School Ethics Committee
Constituted under the University Human Research Ethics Committee (Non-Medical)

Ethics Clearance Certificate

Ethics protocol number: WBS/BA1964683/144
This certificate is only valid with a legitimate ethics protocol number and signed by the Researcher (below).

This certificate is only valid if accompanied by formal permission from the relevant stakeholder(s).

Project title	The efficacy of procurement policies in the public health care system in South Africa
Investigator / Researcher	Mr Leonel Djomgoue Tchokouagni
Nature of Project	MBA (Research Article)
Decision of the Committee	Approved unconditionally
Issue Date of Certificate	2021-02-08
Expiry date	Date of submission of the project report
Chairperson	Prof Anthony Stacey ☎ +27 11 717 3587 +27 82 880 4531 Anthony.Stacey@wits.ac.za

Declaration by Researcher

One copy must be signed by the Researcher and returned to the Chairperson of the Wits Business School Ethics Committee.

I fully understand the conditions under which I am authorized to carry out the abovementioned research and I guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I undertake to resubmit the protocol to the Committee.

Signature

2021-02-08
Date: