Gordon Institute of Business Science
University of Pretoria

RESEARCH PROPOSAL

Exploring medical scheme drug formulary influence on General Practitioners prescribing decisions

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A research project submitted to the Gordon Institute of Business Science, the University of Pretoria in partial fulfilment of the requirement for the degree of Master of Business Administration

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ABSTRACT

The purpose of the study was to explore the influence of drug formulary on General Practitioners (GPs) prescribing decisions. Based on the tri-focal theories namely; Agency, Implementation and Planned Behaviour, the study followed a qualitative methodology. A total of 12 GPs in private practice were purposively selected. Semi-structured face-to-face interviews were conducted over a month in Johannesburg North.

Results of the study confirm that the top four category factors influence most of the GPs. These being; patient factors, external factors, environmental and drug factors. Patient factors included medical aid drug formulary, the drug cost, patients' pathology and affordability. External factors included national treatment guidelines, scientific talks, medical sales representatives and interactions with pharmaceutical companies. Environmental factors included characteristics of GPs such as familiarity and numbers of years in practice. Drug factors included drug efficacy, availability and particularly the drug levies referred to as drug co-payments.

This study has business and policy implications in the way health authorities make economic over clinical decisions. The study proposes a decision-making model and further delineates future research in understanding how GPs prescribe. Academically, it adds to the body of knowledge in healthcare.

Keywords
Medical scheme. Drug formulary. Agency theory. Planned behaviour theory. Implementation theory.

DECLARATION

I, Ntola Matuka declare that this research project is my work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other university. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

Ntola Matuka
Name   Signature

07 November 2018
Date

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CHAPTER 1: INTRODUCTION TO RESEARCH PROBLEM

1.1 Introduction

Prescribing is one of the General Practitioners (GPs) core function in medicine. However, it is also considered to have an economic impact on overall health expenditure. According to Chen, Dong, Shen, Cochran, Wang & Hao (2014) prescription drug expenditure is on the rise and remains high despite the implementation of health reform policies since 2009. Chen *et al.,*2014 suggest GPs prescribing habits primarily drive this trend. Another study stated the Netherlands and the UK, over 60% GP consultations result with a prescription (Kersnick and Peklar, 2006). Globally, GPs contribute a significant percentage to the total capital expenditure (Prados-Torres, Calderón-Larrañaga, Sicras-Mainar, March-Llull, & Oliván-Blázquez, 2009). GPs are the largest speciality in primary healthcare responsible for treating most patients (Council of Medical aid schemes, 2016).

The literature stated consequently that the increasing bill of healthcare expenditures force the health authorities to promote and implement cost containment interventions such as the drug formularies in reducing rising costs in health care (Prados-Torres, Calderón-Larrañaga, Sicras-Mainar, March-Llull, & Oliván-Blázquez, 2009). GPs prescribing decision-making process is complex and influenced by several factors including cost-containment interventions to reduce the cost of prescription drugs (Grant, Sullivan & Dowell, 2013). This research took an exploratory approach to understand the factors that influence GPs prescribing decisions in private practice.

The financial impact of prescription drugs is one of the primary concerns for health authorities and a driver of healthcare expenditure in South Africa (Deloitte, 2014). The increase in expenditure is primarily due to rising hospitalisation and prescription drugs costs (Council of a Medical aid schemes annual report, 2017). Literature highlights the need for improved cost efficiencies including prescription drugs without impact the quality of health and interference with the function of clinicians (Chen *et al.,* 2014).

Although in South Africa, the cost of medicines is not the most significant cost driver, it is a substantial burden. The cost of prescription drugs is relatively the most straightforward area for funders such Medical aid schemes including health ministers to

control the rising costs of healthcare specifically medicine by introducing a policy drug formulary (Council of Medical aid schemes, 2016).

South Africa has two health systems: public and private. The healthcare system has experienced several challenges in trying to operate more cost-effectively and efficiently over the past 15 years (Harrison, 2009). According to Compounded Annual Rate Growth (CARG), Healthcare Expenditure is expected to increase by almost nine per cent annually between 2013 – 2017 (Deloitte Consulting, 2014). The private healthcare sector represents only 16% of the population, and yet it accounts for more 50% of the total healthcare expenditure (Deloitte, 2014). The private healthcare sector is funded through two broad categories: Medical aid schemes insurance which is the largest category of the private health insurance and regarded as non – profit organization (regulated by the Medical aid schemes Act, No. 131 of 1998), and the health insurance which is regulated by long and short-term Insurance Acts of 1998 (Fish & Ramjee, 2007). The Medical aid schemes cater for income earners and their families, and these individuals earn above the tax threshold, this population is about 16% of the total South African society (Mayosi, Lawn, Van Niekerk, Bradshaw, Karim, Coovadia, 2012).

In practice, health authorities such as government and funders like Medical Schemes recognise the need to introduce cost containment methods to influence doctors' choices of treatment directly or indirectly through drug formulary policy. The general practitioner (GP) is a critical decision-maker in the healthcare sector, and in past years many studies have been conducted to understand GPs behaviours better. The South African government in 1996 introduced the National Drug Policy (NDP) to promote rational prescribing and appropriate use of pharmaceutical drugs by medical personnel, secondly increase access of medicines to all South Africans (Department of Health, 2011). Also, the Medicine and Related Substances Control Amendment Act 90 was introduced in 2003 to offer mandatory generic substitution to patients (Deroukakis, 2007).

According to the Medical aid schemes Act of 1998, the Medical aid schemes or administrators are obligated by law to cover the costs of Prescribed Minimum Benefits (PMBs) such as diagnostic tests, medicines and patients support care (Willie & Gantsho, 2012). The PMBs are a set of medical conditions and their treatments including a list of medications. There are 270 PMBs like cancer, asthma, and hypertension recognised by the Council of Medical aid schemes including 27 chronic conditions and acute medical conditions emergency (Willie & Gantsho 2012). The medical aid schemes are obligated by law to develop protocols to cover the costs of diagnosis, medical drugs and care to

manage all PMBs regardless of the type of medical plan the member is on (Willie & Gantsho 2012).

The medical aid schemes drug formulary will include acute, and chronic drug lists (CDLs) managed under the medical aid Act of 1998. The medicines lists will mostly have generic drugs and few originator drugs if there is no alternative substitute generic product. In 2014, a total of 65% accounted for all generic medicines dispensed for patients in private health under medical aid schemes Gray *et al.,* 2014. In another qualitative study, participants were concerned about cost-containment methods like drug formularies that may take precedence over the clinical motives. The GPs were sceptical about the quality of the drugs that are on the drug formularies (Carlsen, & Norheim, 2008).

In addition to preferred medicines lists for both acute and chronic medical conditions, each scheme will create the constant drug amount (CDA) which is a set amount, predetermined from prices of available generic medicine. The CDA is applicable when the medical drug is not part of the scheme drug list, and the member wishes not to follow the scheme medicine lists to treat a medical condition. The funder will pay up to the CDA, and the members or patients will pay the difference in costs of the medicine referred to as co-payments. Depending on socio-economic status, the member may choose to pay the difference in price. Similarly, for the patients who do not wish to accept the generic medicine from the scheme drug lists, the co-payment will be applicable. In many cases, a member of the scheme through the prescribing doctor will not wish to pay the difference in price but opt to follow the schemes medicines or formulary lists.

If the substitution is possible the patient could either accept or refuse the change, the prescriber doctor could also indicate no substitution to a generic medication according to Gray, Santa-Ana-Tellez, Y & Wirtz (2016). Usually, an innovator drug company manufactures an originator drug; these drugs are relatively expensive to discover, develop and bring to market, the companies typically have patents which is typical lasts for a 20-year period to get the return on investment (Medicines Control Council, 2014). In contrast, the generic companies do not spend large amounts of money to manufacture the drugs because the generic companies rely on using the same molecules of the drugs that have expired or lost exclusivity on patents. Because of the low cost of production, the general cost is inexpensive compared to originator medicine.

Medicines Control Council in South Africa clearly states that generic drug should be at least 80% similar in molecular properties of the original drug but may not be the same in structure, identity, on quality, effectiveness, and safety to an already registered reference an existing molecule (Medicines Control Council, 2014). The ministry of health introduced mandatory generic substitution law in May 2003 Gray *et al.,* 2014. The fundamental difference between the originator and generic medicine is the cost, and the difference is an average of 33% (Bangalee & Suleman, 2016). The Intercontinental Marketing Services (IMS) sales below show the impact of some of these changes post implementation of mandatory generic substitution in 2014. The graph illustrates (figure 2) the erosion of innovator or original drugs market share by the generic drugs both from value and unit share.
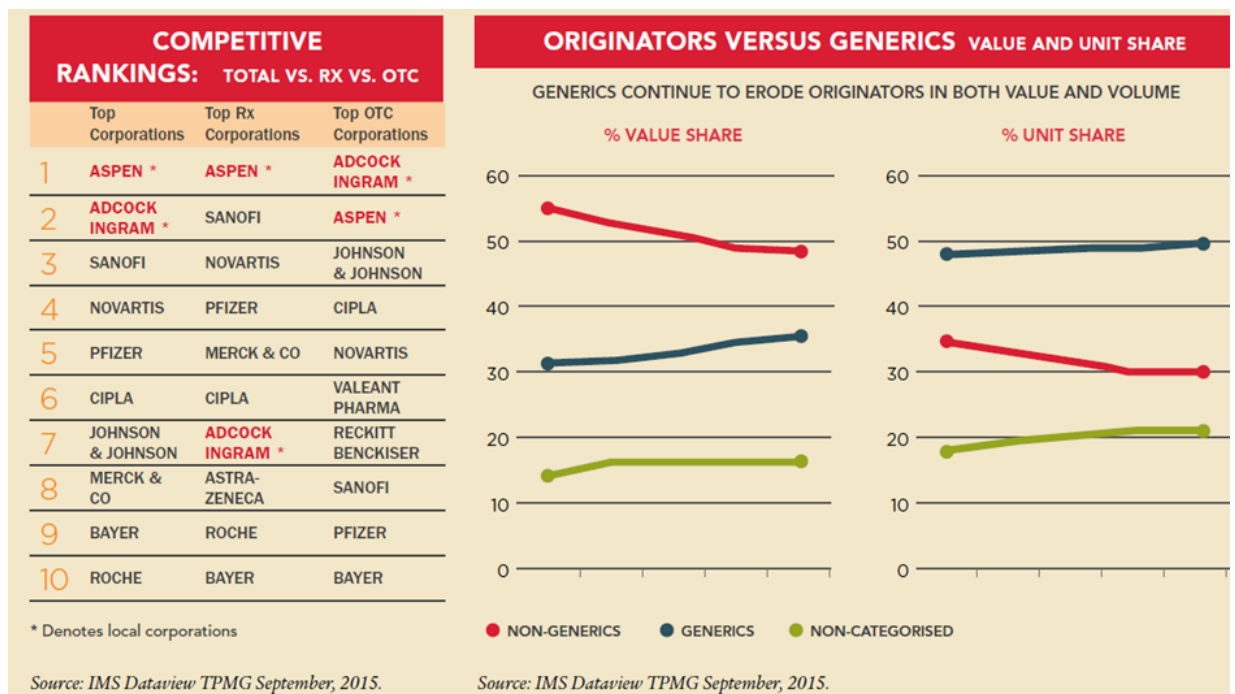
Figure 1: Imperial Health Sales (IMS) showing Market Share of Original (Non – generics) vs Generics drugs regarding unit and value share in the South African Market (Healthcare & Life Sciences Review Report, 2016)

The generic medicines are significantly cheaper than originator drugs because the generic companies rely on existing clinical data from the originator drug companies. Overall the share of generic medicine has increased significantly in South Africa. The New Zealand study demonstrated a switch from an originator to a generic drug is safe, and findings suggest that switching from originators to generic medicine can generally be viewed positively (Lessing, Ashton, & Davis, 2015). The results from the study imply that switching from originators to generic medicine may not impact the patient-health

related-outcomes

These Interventions including patient factors may have an impact on GPs clinical autonomy and other related health-outcomes such as losing control of the disease, as patients may not adhere to taking medication as prescribed by the GP due to possible side effects of the generic drugs. It could also be merely lack of efficacy from some of the generic medicines prescribed by the GPs. Patients may die just not taking what is prescribed by the doctor. These changes in drug formulary policy do impact on what the doctors can prescribe for patients. In instances some instances, GPs will still offer the patient the original drug although there may be co-payments, the difference between the original drug and the generic preferred by patients.

In China, according to Sun, Jackson, Carmichael, and Sleigh (2009) study findings discovered an adverse influence by an introduction of new Medical aid scheme in 2003. Similarly, an evaluation of both internal and external factors which are critical, relevant to GPs prescribing decisions. The study results will assist in explaining and better understanding the decision-making process when it comes to prescribing drugs for patients particularly patients with chronic diseases. Besides, a better understanding of GPs' perceptions and attitudes about factors like the medical schemes the drug formulary, patient and external factors including guidelines.

This research study seeks to explore and better understand the influence of the medical scheme drug formulary on GPs prescribing decisions through tri-focal theories; Agency, Planned Behaviour and Implementation theories.

This exploratory, qualitative study envisages closing the gap in understanding and gaining new insights on factors including the medical aid scheme drug formulary which influences the GPs prescribing decision-making process in Johannesburg North.

1.2   Research purpose

The purpose of this qualitative research was to explore the influence of medical aid drug formulary on GPs' prescribing decisions in private practice. The study makes use of the theoretical framework to pursue new insights to elucidate on how factors like drug formulary influence GPs prescribing decision-making process. Besides, the study will propose a conceptual model which will assist in better understanding and generating new insights on features impact prescribing decisions.

The GPs may no longer have clinical freedom or autonomy in prescribing the drug based on clinical assessment and evidence-based medicine but purely on other factors such as guidelines or cost-containment interventions. More importantly, the research will explain through the conceptual model the influence of drug formulary on patient health-related outcomes.

1.3   Research objectives

This research study purpose was to address the following three objectives:

I.   To investigate the influence of medical aid scheme drug formulary on GPs prescribing decisions in private practice.

II.   To investigate the perceptions and attitudes of general practitioners on factors such as medical aid scheme drug formulary

III. To ascertain the extent to which medical aid scheme drug formulary impacts patients' health-related outcomes such as disease control and adherence.

1.4   Organisation of the study

A summary of each Chapter is provided below to give a brief outline of what can be expected throughout the research study

Chapter One is the introduction of the research study. The introduction states the problem and background literature to the study. The relevant literature to the study is provided in detail.

Chapter Two presents an overview of the credible academic literature and the relevant theories which relate to the factors that affect GPs prescribing decision-making process including the medical aid schemes drug formulary.

Chapter Three outlines the research questions that form the basis of this study. The research questions are divided into three broad categories concerning factors that influence GPs prescribing decisions.

Chapter Four outlines the methodology used to conduct the study, collect and analyse the data. The study methods like sampling techniques, interview technique and how the

sample is recruited into the study.

Chapter Five presents the results of the 12 expert interviews conducted and all interviews were transcribed in Tema app and coded accordingly. Results are coded and grouped into various themes.

Chapter Six the results are discussed in detail to elucidate the data and compared to results from previous studies from literature review. As well to ensure the study meets the research objectives in Chapter One.

Chapter Seven gives a summary of the study outcomes including limitations, the recommendations for business and academic context including implications and considerations for future research.

1.5   Summary of Chapter One

Prescribing medicine is a complex function performed by a qualified medical doctor and poorly understood. Good understanding on factors that influence GPs prescribing decision-making process becomes increasingly important. This research study explores how the medical aid schemes affect GPs prescribing decisions. The study was qualitative and was based on qualitative, semi-structured interviews conducted with GPs. The scope of the research study was limited to GPs in private practice in the Johannesburg North.

CHAPTER 2: THEORY AND LITERATURE REVIEW

2.1   Introduction

This Chapter reviews the relevant literature which relates to the factors which influence GPs prescribing decisions. It critiques the literature review to demonstrate the academic basis for the research.

This exploratory study attempts to elucidate how the medical aid drug formulary influence GPs' prescribing decision-making process. Tri-focal theories underpinned this qualitative study. Agency, Planned behaviour and Implementation theories were used to develop a model that explained how factors like drug formulary influence the GPs behaviour and decision-making process. The selection of various theories was based on several reasons and factors. Theory of Planned Behaviour (TPB) is a useful guiding tool in detecting both contextual, external and internal factors that influence GPs clinical behaviour. TPB relates to the individual, the GP as a medical doctor in a clinical setting. The Agency theory focuses on the principal-agent relationship, doctor as an agent to the patient as a principal (Murshid & Mohaidin, 2017).

Lastly, the Implementation theory was relevant in elucidating certain aspects of the implementation process and outcomes thereof (May, 2013). All three theories have been regarded to be useful in attempting to explain the HPCs prescribing behaviours and decisions (Murshid & Mohaidin, 2017).

2.2   Implementation theory

According to (Nilsen, 2015) a good theory should have a predictive ability and provide a clear explanation of how and why certain relationships lead to specific events like switching from originator drug to generic medicine. The study agrees that the implementation of policies drug formulary should be initiated on a theoretical framework that can comprehend, design and envisage the effects of implementation. (May, 2013) argues that understanding the complex interventions is an essential problem for all stakeholder involved in the healthcare setting.

The study suggests that key stakeholders in health should raise serious, ethical questions and considerations regarding the execution of drug policy particularly health care professionals who make clinical decisions on behalf of patients. Implementation research states that interventions are designed to promote efficient uptake of policy by prescribing clinicians. It further states that evidence-based practices such as guidelines should be routine practice to continuously improve the quality, effectiveness of health services and care (Nilsen, 2015).

Based on a previous study by (Eccles, Grimshaw, Walker, Johnston & Pitts, 2005), the findings suggested that Implementation theory is a relevant framework in primary health care setting where policy interventions influence the behaviour of primary health care (PHC), practitioners. Research findings from previous studies in the United States and the Netherlands estimate about 30% to 40% of the patients do not receive care according to current scientific evidence-based guidelines and between 20% - 25% of care those patients receive potentially harmful including medicines post-implementation of policy by health authorities (Eccles *et al.,* 2005). The implementation framework envisages to understand and evaluate the execution of any process on how other stakeholders are affected by the interventions.

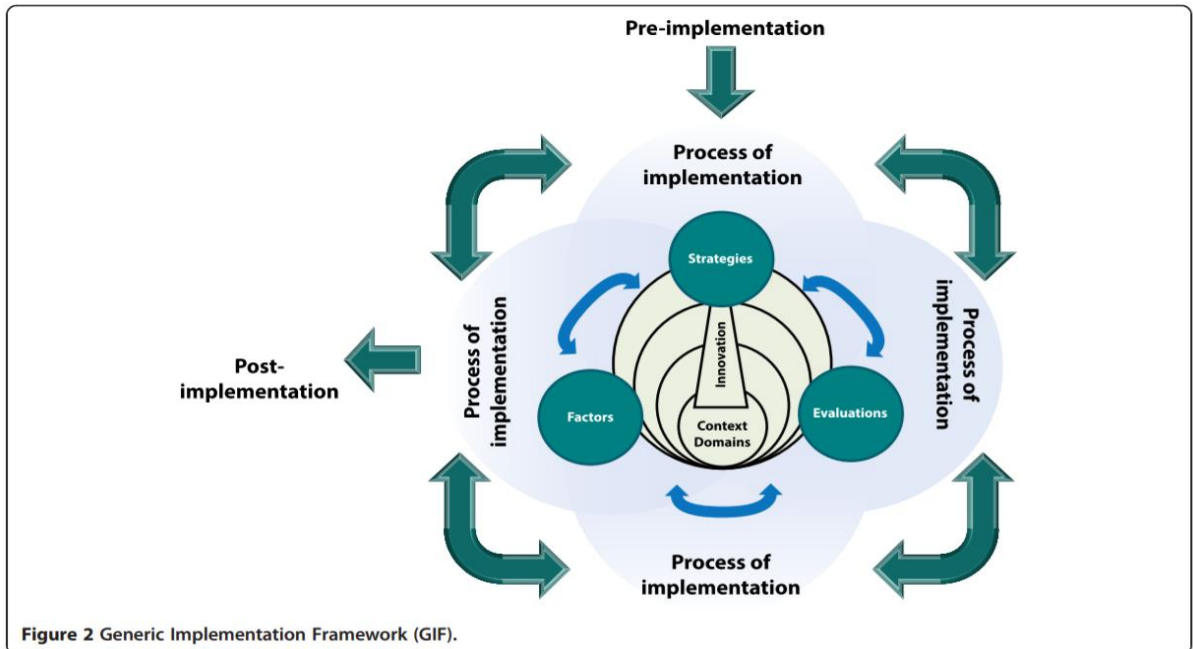Figure 2 Generic Implementation Framework (GIF).

Figure 2: The generic implementation framework for executing any process.

Using Implementation theory, this study intends to contribute to the body of knowledge by developing a conceptual model in understanding how the implementation of

interventions such as drug formulary policy influence GPs' motivation, expectations, beliefs, and needs in a clinical setting.

2.3   The theory of Planned Behaviour

According to Murshid and Mohaidin (2017), prescribing is complicated and involves several factors which affect the decision-making process. These being; drug factors, drug formulary policy, guidelines, cost, pharmaceutical promotions, scientific data, key opinion experts and contextual factors among others. Further, Murshid and Mohaidin (2017) argue that prescribing decision-making process from previous exploratory studies lacks a sound theoretical basis to explain how these factors influence prescribing decisions in healthcare practitioners (HCPs).

The theory Planned behaviour(TPB) has been selected as of the relevant theory to assist in generating the new insights on the factors such as medical scheme drug formulary that influence the GPs decisions prescribing in clinical practice. TPB framework tests the ability of the attitude, perceived behavioural control to predict the intentions and GPs prescribing decisions (Murshid 2005). In the discussion of TPB, Murshid mentioned the individuals as rational actors who process information before making activities or execution any decision.

Furthermore, the theory further states that behavioural achievement depends on the individual's motivation and behavioural control (Godin, Bélanger-Gravel, Eccles, & Grimshaw, 2008). This study leverages on the theory by exploring the internal and externals factors which influence the GPs behavioural control and can envisage intentions. TPB is one of the most useful theories which are appropriate and relevant as a theoretical foundation in explaining factors that influence behaviours or habits of practitioners in health (Kortteisto, Kaila, Komulainen, Mäntyranta, & Rissanen, 2010).

Another study findings stated TPB theory to comprehensively evaluate and link the interventions, creators and executors when compared to other professionals. Both nurses and clinicians showed a positive intention towards the use of clinical practice interventions such as drug formulary inpatient care (Kortteisto, Kaila, Komulainen, Mäntyranta, & Rissanen, 2010).
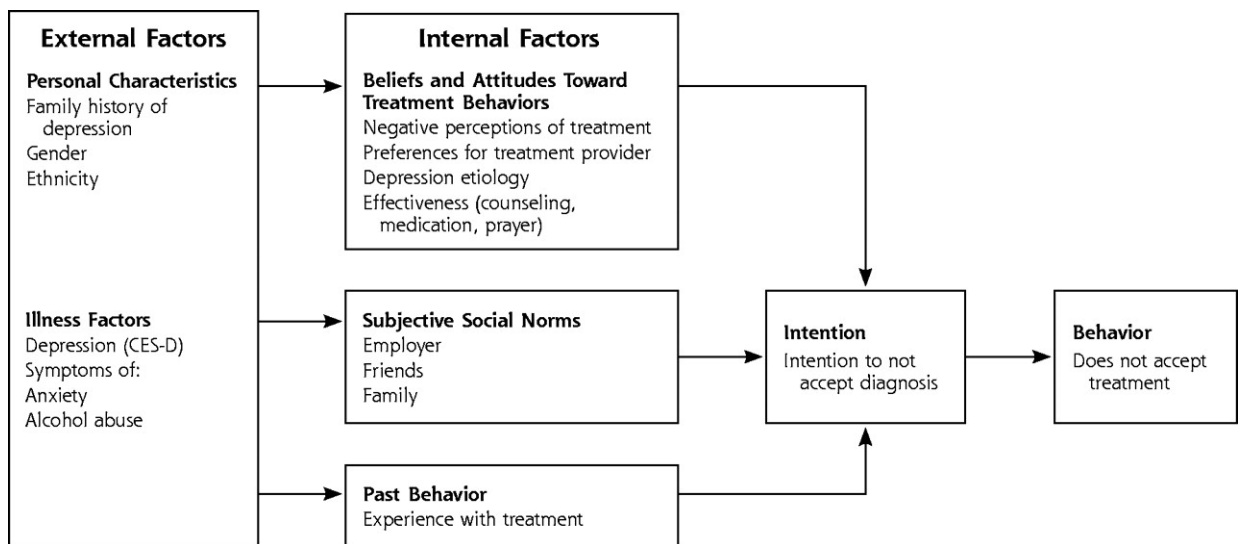
Figure 3: A model explaining the Theory of Planned Behaviour (Ajzen, 1991).

The study envisages the gap in the execution of drug policy interventions in South Africa. This study will deploy TPB to evaluate and understand the impact of interventions in clinical practice. Furthermore, to explore the factors such as attitude and motivation on drug formulary execution. The study agrees that the execution of any process should have principles should of social cognitive theories like TPB which tries to elucidate the GPs behavioural aspects and intentions post-implementation phase. (Paris & Van den Broucke, 2008) found TPB is a reliable, social cognitive and valid framework to predict behaviours and attitudes of healthcare practitioners (HCPs) in the primary health care setting.

This study seeks a complete understanding of the effects of the drug formulary policy on GPs behavioural aspects in clinical practice.

2.4   The agency theory

Jensen and Meckling initially tested the fundamental principle of Agency theory in academic literature by introducing and explaining the first perspective of several objectives (Jensen, & Meckling, 1976). This study selected Agency theory as a relevant framework to analyse and explain the agency problems amongst stakeholders in healthcare. Secondly, it holds relevance to research in health care amongst stakeholders that interlinked and is interdepended because of professional identity (Dadich & Doloswala, 2018).

Professional identity is defined as a keen awareness of one's role and responsibilities within their workplace and strives to do the best as a member of a medical professional (Dadich & Doloswala, 2018).

This theory is relevant because of the two stakeholders (medical aid schemes and the General practitioner) are working interdependently and interlinked in both clinical and managed the healthcare of the patients. The study leverages on the theory to attempt to explain and identify the issues that may exist amongst the different healthcare service providers; the GPs and the medical aid schemes (Murshid & Mohaidin, 2017). It provides qualitative insights on ways in which to resolve the issues that arise among various stakeholders. The agency-principal relationship occurs when the member (patient), regarded as the (the principal) relies on the agent (the medical scheme) to provide health services on behalf of the patient such as treatment costs (Murshid & Mohaidin, 2017).

This study focuses on the two critical agency relationships, the medical aid scheme as an agent and patient as a principal. It should be noted that in this context, the patient (principal) is contracted to the medical scheme (agent). In rare cases, both the GP and the patient serve as principals to the medical aid scheme as an agent. For example, GPs serve designated service providers for medical aid schemes. However, in the second agency relationship, the patient is a principal and the GP as the agent. In the first relationship, the patient as a principal relies on the medical aid scheme to pay for the services delivered by the GP, as the agent to make clinical assessments including prescribing the medication. The patients, in their role as principals, depending on the GP to make clinical decisions including prescribing, acting as the agent, not the funders (Murshid & Mohaidin, 2017).

This study agrees that the GP must make a clinical assessment and prescribe medications. In contrast, the medical aid scheme should pay for the health services provided by the GP and not make any clinical decisions for the GP. The patient (principal) is concerned with the agent not making the decisions (clinical decisions) that are in their best interest of the principal but the agent. According to Nguyen (2011), the challenge with the principal-agent relationship is that the principal (patient) expects the agent as a clinician (GP) to make clinical decisions including prescribing and the patient. Similarly, the principal (patient) expects the health services payer (medical aid schemes) to settle in full the services rendered by the GP (Nguyen, 2011). This relationship in an ideal world should be seamless however in the real world it is not.

Nguyen (2011) argues that the relationship between a GP and the doctor, the patient expects the GPs to act in their best interest when making clinical decisions including optimal management of the diseases which includes treatments. This current study supports this approach because agency relationship occurs when the principle relies on the agent (GP) to make clinical assessments on behalf of the patient. In the second relationship, the patient expects the medical aid scheme to pay for the services provided by the GP. This study argues that issues may arise due to social and economic pressures. These factors will influence the way the GPs prescribe drugs for patients, they may be less effective or not safe for the principal.

While health authorities are implementing cost-containment interventions to reduce the rising bill of healthcare expenditure, in doing so, they are making economic decisions which impact the healthcare providers' clinical decisions. There are serious ethical considerations which need to be factored before executing the cost-cutting measures. Perhaps, authorities can use the robust framework like Agency theory when implementing these measures. Further, it the theory recommends continued engagement and negotiation amongst stakeholders as mitigation to minimise agency problems relationship between an agent and principal (Dadich & Doloswana, 2018).

2.5   Factors that influence prescribing decisions

According to Godin, Bélanger-Gravel, Eccles, & Grimshaw, (2008) findings claimed an array of factors can influence the clinical and prescribing decisions of healthcare professionals significantly. These factors include the individual's motivational tendencies well as socio-economic, political climate, and environmental contexts in which one works in (Godin, Bélanger-Gravel, Eccles, & Grimshaw, 2008). The study agrees with these findings that many factors influence GPS prescribing decisions.

Several prescribing frameworks have been used in previous studies to gain more profound insights on factors which affect how GPs are prescribing decisions. One of the models useful in understandings the influences of these factors is the Raisch framework. It considers several factors which could be direct and indirect factors which influence the GPs prescribing decision-making process (Murshid & Mohaidin, 2017). According to this study findings, the direct factors include direct factors such as the drug formularies, prescribing restrictions and treatment guidelines, while the Indirect factors comprise of promotions by pharmaceutical companies through medical sales representatives

(MSRs). The GPs believed that treatment guidelines were useful and had a positive on them on how they prescribe (Milos, Westerlund, Midlöv, & Strandberg, 2014).

The opinions of colleagues and Key External Experts (KEEs) such as specialists, the scientific data derived from clinical studies which are usually double or single blinded approved by regulatory bodies such as FDA (Murshid & Mohaidin, 2017). These studies results suggest that there are several factors which affect the clinicians' prescribing decision-making process. The model established patient factors that influence the GPs prescribing decision included patient's clinical pathology and clinical assessment including diagnosis were considered with social factors, individual thought and behaviour (Murshid & Mohaidin, 2017).

Drug prescribing is one of the essential medical actions of a general practitioner amongst many other decisions such as diagnosis and management of diseases. The prescribing decision-making process has been described as a complex process that involves several factors from previous studies (Buusman *et al.,* 2007). According to findings from a previous study, five factors were argued to play a critical role in influencing the decision-making process of a GP regarding prescribing. These being; Personal experience, drug cost, dispensing the formulary drug, dispensing methods, experience with a class of drugs in a therapeutic category (Buusman *et al.,* 2007). Several models have been used in the past to understand how factors whether direct or indirect affect GPs prescribing decisions. Riasch's model is a useful tool to investigate how these factors influence prescribing decision-making process (Buusman *et al.,* 2007)

However, a key finding from (Buusman *et al.,* 2007) study informants did not find the drug formulary to be restrictive. In contrast, a study by Prosser & Walley (2004) found that drug formulary does influence the GPs prescribing decision-making process. Prosser & Walley (2004) discovered the drug cost as a secondary factor to clinical effectiveness and safety of the prescription drugs. In many cases, the decisions of physicians are multifactorial. Drug formulary policy implementation by health authorities intended to minimise the use and abuse of prescription innovator (original0 drugs by medical doctors especially the GPs because they are the largest speciality in healthcare across the world. The prescribing decisions of GPs also have influenced by direct methods such as sales promotions including drug formulary interventions (Schumock, Walton, Park, Nutescu, Blackburn, Finley, & Lewis, 2004).

According to findings from (Buusman *et al.,* 2008) study, informants argued that they relied on sales representatives and pharmaceutical industry as a source of information on new drugs, all GPs mentioned the influence of the pharmaceutical industry as the cause of prescriptions (Buusman *et al.,* 2007). Furthermore, the increase in prescription drug costs emerged as a critical and the driver of healthcare expenditure which impacts on operational budgets. Armstrong, Mitton, Carleton, & Shoveller (2008) found that health authorities including medical aid schemes regulate the growing cost of drugs by introducing stringent formulary drugs which are less expensive to original drugs. In this way, the GPs can only prescribe what is available on the medical scheme preferred drug lists. Besides, the results suggested that there is a severe ethical consideration around clinical decision such as the choice of a drug being made by the funders, not the clinician (Armstrong, Mitton, Carleton, & Shoveller, 2008).

The medical schemes usually have the drug formulary committees which determine the drug formulary lists in consultation with other key stakeholders such as key opinion health leaders such as academic professors within the healthcare environment. In another study from Australia, the results suggest that the drug list formulation process included all relevant stakeholders such as pharmacies, doctors, health economists and adoption of such formularies is much more accessible by GPs (Morgan, McMahon, Mitton, Roughead, Kirk, Kanavos & Menon 2006). The formulary lists vary by medical schemes or insurance company, some will have original drugs which are generally very expensive, and some schemes prefer generic medicines of the innovative medicines or substitution drugs.

According to (Morgan *et al.,* 2006) in the UK, the drug formulary will be classified either as positive or negative formulary lists. Usually, the favourable formulary is a preferred list by the National Health Service system. Although in another study in the UK, many GPs from a previous study perceived controls on cost-effectiveness initiatives as direct interference with their professional clinical autonomy of healthcare professionals (Watkins, Timm, Gooberman-Hill, Harvey, Haines, & Donovan, 2004). Prosser & Walley (2000) study found that although GPs do believe that costs are vital when prescribing medical drugs, the costs will be secondary to clinical effectiveness and safety of the medicines. However, there was a considerable variation in the extent of the application and how sensitive the GPs are to cost considerations.

2.6   Drug formulary policy: The global context

Virabhak and Shinogle (2005) study in the United States, stated the implementation of Medicaid drug formulary policy to have had an impact on prescribing decisions of physicians. The study found more than 50% of prescribing physicians have an average third-party prescription share of off-formulary drugs decline by 37.5% after six months' post-execution and after one-year post implementation of the formulary drug policy to minimise prescription of originator drugs (Virabhak, & Shinogle, 2005). In Norway, Sakshaug, Furu, Karlstad, Rønning, & Skurtveit (2007) study found the introduction of the drug formulary policy on statins drugs to treat high cholesterol had a significant impact on physicians prescribing decisions. Almost 40% of the prescribing physicians switched from the originator drug to a generic medicine: atorvastatin to simvastatin post implementation of the drug formulary (Sakshaug, Furu, Karlstad, Rønning, & Skurtveit, S.,2007).

In New Zealand, the government through the national drug policy covers approximately 80% of the pharmaceuticals through the drug formulary policy for permanent citizens (Minhas, Ng, J. Tan, Wu, Pro, Beach, & Con 2016). The review drug committee determined the national drug formulary program and negotiated the best drug prices on behalf of the whole country without comprising factors such as the quality of medicines, clinical effectiveness & safety of the medicines. The innovator drugs are part of the formulary lists. The committee made of pharmaceutical, pharmacies, medical doctors and the government ensured prescription drug costs were kept low over a period. The study found the cost of four main classes of prescription drugs was 51% less expensive compared to counterpart British Columbia (Minhas, Ng, J. Tan, Wu, Pro, Beach, & Con 2016).
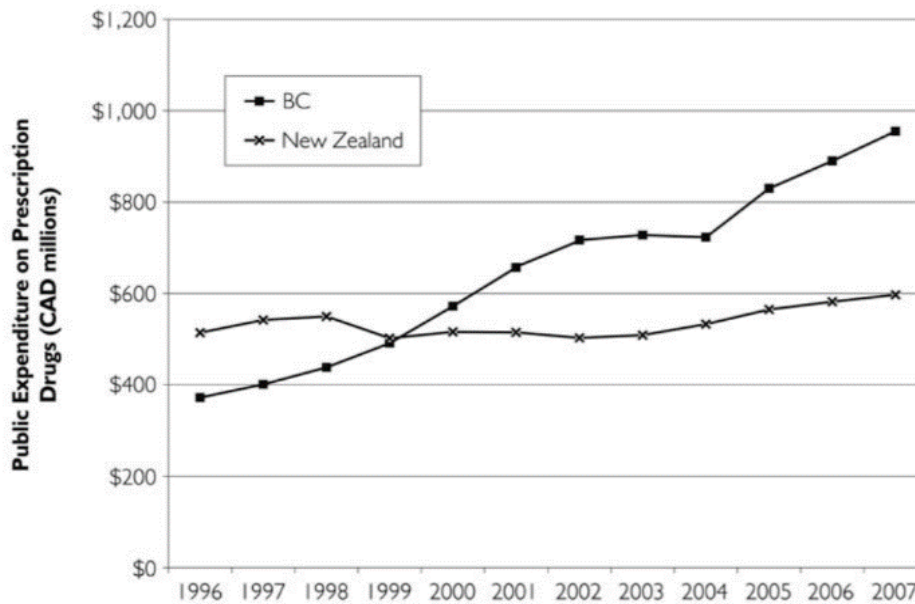
Figure 4: Public healthcare drug expenditures for New Zealand and British Columbia, from 1996 to 2007 (Minhas *et al.,* 2016)

The image above demonstrates drug expenditure pre and post implementation of drug formulary policy in New Zealand. It is evident from this graph that the formulary policy is effective in reducing the cost of drugs. This has impacted on the utilisation of drugs by prescribing physicians.

Secondly, the evidence from the literature review and theory of implementation science illustrate that many governments are adopting drug formulary policy to curb increasing healthcare expenses. The formulary policy in New Zealand, Norway and the United States of America in turn, has influenced the prescribing decisions of physicians. Furthermore, some factors influence the GPs' prescribing decisions such as sales advertising by pharmaceutical sales reps, sponsorships to attend specific local and international congresses and meetings, the efficacy of the drug formularies and cost (Joyce, Carrera, Goldman, & Sood, 2011). Wang and Pauly, (2005) found restrictive drug formulary policy does affect the prescribing behaviour of physicians.

The results of these studies (Joyce, Carrera, Goldman, & Sood, 2011; Wang & Pauly, 2005) from developed markets such as the United States of America suggest that factors like restrictive drug formulary policy implementation have influenced physicians prescribing decisions. The study findings are consistent and suggest the drug policy implementation in various countries such as Newland, Norway and the United States of

America have demonstrated an impact on prescribing behaviours of physicians. These policies seem to influence the way the doctors prescribe drugs to patients.

According to another qualitative study by Carlsen and Norheim (2008), the findings validated the insights from our study. Participants were concerned about cost-containment methods such as drug formularies will influence the clinical motives. The GPs were sceptical about the quality of the drugs that are on the drug formularies (Carlsen, & Norheim, 2008). More importantly, the participants from that study believed that sometimes economic motives tend to be prioritised over clinical motives emerged as a crucial theme. The GPs perceptions about the cost-containment methods believed that the economic decisions outweigh the clinical decisions (Carlsen, & Norheim, 2008).

2.7 The drug formulary policy: The local context

The objective of the medical aid schemes Act 131 of 1998 in South Africa is to promote access to privately funded health care particularly for people with existing medical conditions (Council for Medical aid schemes, 2016). The aim of the Act is not to discriminate against anybody with existing medical conditions and most importantly, affordability for people from previously disadvantaged backgrounds. The medical aid schemes are classified either as an open or closed scheme. Bonita's and Discovery are examples of open schemes which any member of the public depending on affordability can join. In contrast, schemes such as Government Employees Medical Scheme (GEMS), BMW, and Metropolitan are under closed schemes category. Closed schemes imply that only employees & their families of those firms can join. These schemes are not open to the general population (Council for medical aid schemes report, 2017). Both closed and open schemes dominate the privately funded healthcare system. The medical aid schemes fund a total of 81% of the private healthcare system, and 15% is from the private individuals paying out of pocket, and the rest is through medical insurance regulated by long and short-term insurance act (Erasmus, Ranchod, Abraham, Bloch, Carvounes, & Dreyer, 2016).

The medical aid schemes charge differently depending on socio-economic status, age, and risk of the members. The medical aid plans usually range from a simple to a very comprehensive plan depending on the affordability of the member. The members will pay monthly premiums to the medical aid schemes either through the employer or directly to cover the hospital costs, prescribed minimum benefits (PMBs) and day-to-day savings. Usually, the hospital portion has a higher weighting regarding monthly

contribution (Annexure 3). According to NDP, the doctors may still prescribe the originator drug and indicate no generic substitution for members, however, the medical schemes will reimburse the generic version or pay the CDA for the innovator drug. The first study by (Gray *et al.,* 2016) found a quantifiable effect of mandatory generic substitution policy after two years' post-implementation by the ministry of health in May 2003 (Appendix 7). There are other managed care interventions such as the NDP by the health authorities that may have worsened the impact of generic substitution.

The results by (Gray *et al.,* 2016) how that mandatory generic substitution has had an impact on prescribing habits of medical doctors in South Africa. The increase in hospital costs and medicines to treat medical conditions force health authorities like medical aid scheme to adopt strategies such as the drug formulary policy to curb the increasing costs of healthcare (Annexure 2). While the policies such as drug formulary or mandatory generic substitution may seem like effective methods to reduce the rising health care costs and increase access to quality medicines and improved health care, the implementation thereof may cause unintended short and long-term effects such as disease control, mortality, and loss of employment. The result is due to the adoption of drug national drug and formulary policies by health authorities including medical schemes.

The drug formulary policy is regarded as an external guideline which health authorities including medical aid schemes use to regulate the cost of prescription drugs. The implementation of such a policy may influence the prescribing decisions of general practitioners (GPs) but may also affect patients' outcomes concerning safety or possible side effects of the alternative or preferred medicine by funders.

The logical action by Medical aid schemes is to adopt a formulary policy by offering the generic drugs over original drugs for most acute and chronic diseases because generic drugs are significantly cheaper. The mean differential cost between generics and original drugs ranges from 23 – 43%, (Bangalee & Suleman, 2016). The introduction of a drug formulary policy is likely to influence what the patients will receive when the medical doctor prescribes the prescription drug. The patient is likely to receive a preferred or generic drug listed on the Medical aid scheme formulary based on national drug and generic substitution policies. However, very importantly there's very little known about the effects and impact of restrictive drug formulary policy on GPs prescribing decisions and patient-related health outcomes in South Africa. Due to extraordinary pressures on rising costs of health care, the health authorities attempt to control the increasing costs

including the medicine by introducing the policy to regulate increasing health costs to influence what GPs are prescribing for patients. The health authorities in South Africa such as Medical aid schemes tend to prefer generic drugs over originator drugs to manage the cost.

Secondly, the prescribing GP population in South Africa is the largest speciality according to the Council of medical aid schemes report (Council for medical aid schemes report, 2017).

Figure 11: Distribution of healthcare benefits paid from risk pool 2016

Hospitals	41.46%		Radiology	4.45%
Medicines dispensed	13.52%		Anaesthetists	2.32%
Medical specialists	6.86%		Other Health Services	2.18%
Supplementary and allied health professionals	6.14%		Dentists	1.62%
Surgical specialists	5.61%		Dental specialists	0.51%
Pathology	5.27%		Medical technology	0.06%
General Practitioners	5.01%		Ex-gratia payments	0.05%
Out-of-hospital managed care arrangements	4.94%			

The figure 5: The distribution of health care benefits paid by category, dispensed medicines being the second cost driver for medical aid schemes (Council for medical aid schemes report, 2017).

 However, very little is known regarding the GPs' prescribing behaviour in health systems which have a high degree of focus on cost-containment and guidelines such as drug formularies. The execution of the drug formulary policy is likely to influence what GPs can prescribe for patients in South Africa. Similarly, health authorities in many other countries such as Canada and the United States of America have implemented interventions like the drug formularies in attempt to regulate the GPs prescribing behaviour in primary care and to promote rational use of medical drugs (Buusman, Andersen, Merrild, & Elverdam, 2007).

2.8   The role of National Health Insurance (NHI) policy

The South Africa Ministry of Health as a custodian of health policy is embarking on a new journey to introduce the National Health Insurance (NHI) to promote access and quality health care to all South Africans (Surender, Van Niekerk, & Alfers 2016). The

two health systems: public and private do not meet the current needs of most of the population and are deemed to be dysfunctional. The private health system is costly and increasing in cost over time (Annexure 1). The private system is too expensive for the government to fund and only accommodate 16% of the population now while the public system serves the rest of 84% (Surender, Van Niekerk, & Alfers 2016). The NHI green paper findings suggest the two systems are fragmented and costly (Naidoo, 2012). The NHI policy will be to merge the two systems in one health system that will promote equality and accessibility to quality healthcare. The NHI aims to provide access to improved quality health to citizens of the country. The implementation of this health policy will happen over a 14-year period, in phases before it becomes a reality to most citizens (Naidoo, 2012). The government is exploring the financing options to integrate the two systems and the privately owned, privately-operated non-profit medical-schemes into one system.

The implication of the new NHI implementation would mean the Ministry of health would administer financing and purchasing powers including reimbursement of drugs under the NHI Act of 2003 (Surender, Van Niekerk, & Alfers 2016). Secondly, the execution of the policy should have a theoretical basis and will explain the positive or negative impact of policy intervention in primary health care.

2.9   Conclusion

The literature review and theory on the tools like drug formulary policy studies show that cost containment methods have an impact on prescribing behaviours of GPs in countries like Canada, United States, New Zealand and Norway (Carlfjord, Lindberg, Bendtsen, Nilsen, P., & Andersson, 2010). Although in New Zealand Lessing, Ashton & Davis (2015) found generic substitution not to affect patient health related-outcomes. Further, some of the studies have considered the aspects of the theoretical underpinning of interventions such as the theory of motivation. Although, most of the studies lacked the theoretical basis in explaining why and how the interventions impacted the behaviours of prescribing GPs. It is challenging to explain why the interventions such as drug formulary policies have either a negative or positive effect on prescribing GPs (Eccles *et al.,* 2005).

The exploratory study's theoretical basis is on the agency theory, the theory of implementation, the theory of Planned Behaviour(TPB) and Riaschs and Godin's theoretical models to investigate the policy impact in GP in private practice. This research

study proposes the conceptual model which will provide insights on factors that will influence GPs prescribing behaviours. These factors include cost-containment factors such as drug formulary policy may have adverse effects on clinical decisions. The study also explored the beliefs and motivations behind following or deviating against an intervention.

CHAPTER 3: RESEARCH QUESTIONS

3.1 Introduction

This chapter explains and clarifies the research questions which define the research focus. The questions have been formulated based on the literature review conducted and presented in Chapter Two. These three main questions were created to provide the new insights and a better understanding of what factors influence the GPs prescribing decisions.

3.2 Research Questions

Research Question 1: Exploring factors that impact the GPs prescribing decisions in private practice?

Purpose of question: The question seeks to explore which factors may have an impact on prescribing decisions of GPs in private practice.

Research Question 2: What are GPs attitudes and motivations for prescribing drugs which are not the GPs choice of therapy but instead the drugs from funders formulary?

Purpose of the question: The questions seeks to gain an understanding of what drives the GPs to prescribe the drugs listed on the formulary instead of following evidence-based medicines approach.

Research Question 3: What impact could factors including the drug formulary policy have on patient health-related outcomes?

Purpose of the question: The purpose of this question was to determine if interventions such as the drug formulary policy by medical aid schemes impact patient health-related outcomes.

3.3 Conclusion

This chapter presents the three critical research questions which form the basis of the study. By providing answers to these questions, the research study seeks to provide insights into the understanding of how the drug formulary policy influences the GPs

prescribing decisions. The following chapter presents the research methodology that will attempt to answer the research questions in Chapter Two.

3.4   Research interview questions

This section is a summarises the research questions and secondary questions as follows:

Table 1: **Research Questions and interview questions mapping**

Primary research questions	Secondary research questions
Research Question 1: What influence do the medical schemes drug formulary policy has on GPs prescribe decisions?	1.1 What are the main essential factors that you consider when deciding on which drug to prescribe for patients with chronic medical conditions? 1.2 What influence do patients on medical aids with chronic medical conditions have on your prescribing decision? Why? 1.3 What kind of influence do the medical schemes drug formulary has on you when you prescribe drugs for patients?
Research Question 2: What are the GPs attitudes and motivations for following medical schemes drug formulary?	2.1 What motivates you to follow the medical schemes drug formulary? 2.2 What are the chronic medical conditions where you are not prepared to follow the medical scheme prefers? 2.3 In general, what are your attitudes toward medical schemes drug formulary policy?
Research Question 3: What impact could the medical drug formulary policy have on patients' health-related outcomes?	3.1 In your personal experience, has the medical scheme drug formulary policy impacted positively or negatively on the health-related patient outcomes? Please explain 3.2 How has the medical schemes drug formulary policy affected your decisions in choosing the drug based on efficacy and safety? 3.3 How do patients feel about the medical schemes formulary drugs?

CHAPTER 4: RESEARCH METHODOLOGY

4.1   Introduction

This chapter gives an outline of the research design which the study followed to attempt to provide answers in Chapter Three. The study design includes the methodological procedures that were followed to undertake the study and explained in detail below. The research design is a set of guidelines and instructions the study will follow in addressing the research problem (Saunders & Lewis, 2012).

4.2   Choice of methodology

This research study followed an interpretivist method which is defined as a philosophy which promotes the necessity to fully understand the differences or diversity that exist amongst humans (Saunders & Lewis, 2012). The study followed an exploratory and qualitative research approach was because it sought to gain a better understanding and new insights about a topic which was not well understood by the researcher (Saunders & Lewis, 2012). This study aimed to provide new insights to understand the factors such as medical aid scheme better, how these factors impact on GP prescribing decision-making process. The researcher chose this approach because the study focused on the experiences of respondents regarding factors such as medical aid schemes drug policy and its influence on their prescribing decisions.

4.3   Population

The sample of the study was deemed to be relevant, the 12 prescribing GPs in private practice. Some of the prescribing GPs were based in Group Medical practices such as Netcare Medicross, and some practised independently.

4.4   Sample size and method

The research study followed a non-probability technique specifically purposive sampling which is appropriate for selecting a homogeneous sample of the study. Non-probability sampling technique is a variety of sampling techniques used when the researcher does not have a complete list of the population, and the research does not know the chance or probability of each member of the population being selected (Saunders & Lewis, 2012). This research technique was deliberate and allowed the study to sample general practitioners with experience in private practice who would be able to provide insights

related to the study. Furthermore, this method allowed the study to exclude any other practising medical doctor from participating in the study. The exploratory study focused on selecting a small purposive sample size of 12 homogenous, prescribing GPs in the private practice and which allowed characteristics of the research problem to be explored in greater depth.

Table 2. **Summary of participants' characteristics (*n*=12)**

Characteristic	Participants, % (n)
Gender	
Male	50 (6)
Female	50 (6)
Race	
White	50 (5)
Black	33 (5)
Asian	17 (2)
Years in general practice	
5-10	17 (2)
11-20	17 (2)
>20	67 (8)

The researcher sourced the list of registered in GPs and their medical rooms addresses from AstraZeneca Pharmaceuticals (Pty) Ltd. The presumption was that the sample of this exploratory study represents the GP population in Johannesburg and the GPs were relevant as experts to give tentative answers and new insights to the research questions of the study. The researcher defined an expert as someone who has knowledge and understanding of the research problem.

4.5   Unit of analysis

The unit of analysis for this study was the prescribing GPs. The research study collected the data regarding prescribing decisions of GPs in private practice. The researcher defined a prescribing GP as a medical practitioner who is qualified and certified to examine, diagnose and prescribe scheduled medication such to treat medical conditions.

The participants' opinions, perceptions, and attitudes around factors influencing prescribing decisions were determined to be units of analysis for this research study

4.6   Measurement instrument

The research study deployed a non-standardized qualitative interviews approach and made use of an interview schedule (See Annexure E). The interview guide included a mixture of open-ended and probing questions to collect data through semi-structured and in-depth interviews with each participant. The open-ended and probing questions were designed to encourage the interviewees an opportunity to provide a detailed answer, explain their responses and may reveal the attitudes of the respondents.

The respondents' consistency in answering the questions was also pivotal; hence it is essential that the questions must be the same and be asked in the same order. The open-ended and probing questions included words such as what, how and why to provide the consistency in collecting responses from the GPs. The interviewer made use of an audio recorder to collect the data and transcribed the interviews into text. This method helped the researcher to capture and interpret the data accurately.

4.7   Data collecting process

Data collection was conducted through semi-structured face-to-face, in-depth interviews with the purposive sample of the study. The semi-structured and in-depth interviews are mostly used for qualitative research design. The interviews could occur either with an individual or in groups. This research study preferred to follow one-on-one interview approach. The researcher invited the 12 prescribing GPs to participate in the study. The interviews lasted up to 30 minutes to complete. Before the full-blown data collection process, a pilot test was conducted with two GPs that are not part of the study will take place. A pilot test is a useful exercise or tool before the actual collection of data from the sample of the study because any issues that may arise before the actual interviews (Saunders & Lewis, 2012). On completion of the pilot test, the research study conducted interviews with 12 prescribing GPs between 01 September – 30 October 2018.

The researcher requested permission to interview each participant. The researcher set up and secured 30 minutes' appointment with each participant. The interviews took place on different dates, times and venues depending on the availability of each participant. Data collection was done using an audio recorder. The audio device assisted the

researcher in transcribing the data later into text verbatim. The researcher requested permission from each participant before recording the interview. Each participant and the researcher consented by signing the form before the interviews.

Secondly, the researcher informed the respondents that participation was voluntary, and they were not obligated to participate in the study, and they could discontinue at any stage if they wish to. The researcher ensured anonymity by allocating either numbers or symbols to all participants and refrain from referring to respondents by their actual names during the interview and in the study. Also, the respondents were not requested to mention their names during the interviews by the researcher due to sensitive information that was shared to ensure confidentiality. The researcher guaranteed the safekeeping and storage of confidential information. Research data was securely stored on a password protected feature up to 10 years after which it will be permanently destroyed.

The researcher adhered to all the ethical principles of research from both GIBS and the UP-Health Sciences research ethics committees when collecting the data from the GPs to preserve and respect the rights, freedom, and well-being of all the respondents.

4.8   Research Analysis

The analysis of results was based on transcribing all the audio recorded interviews into text data. The study deployed an app called Temi, a software that is usually utilised to record and transcribe the audio recordings from a qualitative study. The qualitative analysis of the data commenced at the end of each interview. The analysis process involved coding and grouping of collected data. The purpose of analysing the data is to establish variances, universal themes, insights and trends (Zikmund *et al.,* 2010). The data collected from the interviews were analysed through thematic content analysis. This method allowed careful analysis of grouping and coding reoccurring Constructs and patterns from the interviews data.

Braun & Clarke, 2006 suggested the following steps in the thematic analysis of data:

Table 3: **Phases of Thematic Analysis (Braun & Clarke, 2006)**

Steps	Process Description
1	Study the data collected to familiarize self, observing specific patterns and themes that emerge from the results
2	Find the initial codes and document the noticeable patterns
3	Aggregate the codes into significant themes that describe the findings from interviews
4	Narrate the generated themes to the data
5	Describe the theme by explaining the significance of each theme
6	Establish the key themes that are critical for the discussion of the data

Emerging factors were identified and grouped into themes a coding framework was developed by both interviewing researchers in collaboration with each other. Analysis continued with continued contrast and further refinement of coding, with the researcher undertaking the coding and crossing the analysis.

Secondly, the researcher allocated the codes to concepts established from the data then into main two main broad categories that included the relevant Constructs and provided some explanations regarding the results: interpreting the findings of the study. The results are discussed regarding the frequency of codes to assist in categorising the Constructs. The results are provided in Chapter 5.

4.9   Data validity and reliability

Reliability and validity are reliable tools to measure which methodology and analysis of the data procedures will yield consistent findings (Saunders & Lewis). Zikmund et al. (2013) refer to reliability in the context of consistency and validity to represent the accuracy which measures the claims accurately (Zikmund *et al.,* 2013).

The interviewer followed the interview guide and asked the same questions to all respondents to achieve consistency and avoid research bias (Zikmund *et al.,* 2010). The researcher tried to focus on the opinions and perceptions of the respondents considering the researcher biases as qualitative research is known to be subjective to different biases

(Zikmund *et al.,* 2013).

4.10   Limitations

There are some limitations to this study. Firstly, the study will take place in Johannesburg, and with a small sample size of about 15 GPs in private practice. The study excludes other prescribing specialities such as medical specialists, cities, and provinces, and this poses a challenge from a geographical perspective.

Secondly, the cross-sectional method is limiting because it is just a "snapshot." Access to the GPs medical rooms is a limitation: the GPs may cancel appointments. Time is a constraint for interviews and the study not long enough. Another limitation is the lack of ranking for most current journal articles.

CHAPTER 5: RESEARCH RESULTS

5.1   Introduction

This chapter gives an outline of the research results which the study will follow to attempt to provide answers in Chapter Three. Several key Constructs emerge concerning the participants' responses regarding the three broad research questions. These constructs were then grouped into thematic categories.

The study followed a non-probability, purposive sampling technique. In total, 12 GPs were recruited to participant in the study based on the criteria interviewed described in chapter four. The GPs were selected as relevant stakeholders to provide new insights regarding the topic in question. All participants had more than three years in private practice. The GPs were working in the Northern suburbs of Johannesburg. Their traits are summarised in Table 1 (n=12).

The first research question sought an understanding of the factors that influence GP prescribing decisions in private practice. The GPs see patients who are mostly affluent; cash-paying patients and patients on medical aid schemes on varies plans with varied demography, black, white, ranging from low – high socioeconomic status, diverse ages and ethnicities of patients.

Table 1. **Summary of participants' characteristics (*n*=12)**

Characteristic	Participants, % (n)
Gender	
Male	50 (6)
Female	50 (6)
Race	
White	50 (5)
Black	33 (5)
Asian	17 (2)
Years in general practice	
5-10	17 (2)
11-20	17 (2)
>20	67 (8)

5.2 Interview informants and results

5.2.1 Results for Research Question 1: What influence do the medical schemes drug formulary policy has on GPs prescribe decisions?

Table 4: **Influence of medical aids drug formulary GPs prescribing decisions**

Ranking	Constructs	Frequency
1.	Restrictive	9
2.	Administrative nightmare	8
3.	Generics	7

The data from the interviews substantiated that notion that the medical aid scheme drug formulary plays a crucial determining factor on GPs prescribing decisions. It was described by many as restrictive and too prescriptive. Many GPs claimed that medical schemes drug formulary influenced what chronic medication being prescribed for patients. Most of the respondents elucidated how the medical aid scheme drug formulary is restrictive and an administrative nightmare. They have argued that prescribing is no longer based on clinical assessment and judgement of the GP but instead based on what it is available on the scheme drug formulary. The medical aid scheme drug formulary is

mainly composed of generic drugs considered to be significantly cheaper and inferior to the original drugs.

"I do not have a choice, you have seen from experience that they will not reimburse what you want and why would you not follow…. gradually you will end up following" GP, 4.
"I am forced to follow the formulary because of the type of plan the patient is on" GP, 9.

"the formulary has got a lot of old drugs, and you would rather write newer, modern drugs, but you are prevented from this purely from a cost point of view," GP,12.

"Yes, it does, of course…already you know you are on plan A. You will get Twynstar vs someone on a plan which will be required to do a co-payment. If I prescribe Twynstar and I need to explain to the patient…you are not going to head you head…so we know already what they will pay for and what they will not pay for…it's more important you do not just look at medical guidelines but also affordability" GP, 12

Many respondents believe that medical aid schemes should design drug formulary based on patients' needs not only costs. One respondent explained the medical aid formulary decision-making process is no longer done by clinical assessment but more on cost-containment measures. Most of the respondents expressed the main reason for following the medical drug formulary because of lack of options and pressure from patients because of affordability challenges. One responded expressed resentment toward the medical aid scheme drug formulary. The participant elucidated with frustration:

"It is too prescriptive and restrictive and described it is an administrative nightmare" GP, 4.

"I do two hours every night of admin every night of my life, so I sit here from eight in the morning until six seeing patients. Then I start. I have just spent my whole lunch hour doing admin. Okay. Then I sit and then I do admin at night I phone patients through results" GP, 9.

"Um, I am doing their PMS and writing their chronic scripts, and you do that for two every night, and you have ten patients that you have got to motivate. People do not have the energy to do it anymore, so these medical aids know that they are going to eventually wear us down to a point where we just become compliant" GP, 9.

"It is onerous, and it is an administrative nightmare. it brings administrative burden to work we do…. you cannot avoid the administrative part, and that is where the resentment comes from" GP, 4.

"So, I send the chronic forms through to the medical aids. They (medical aid scheme) had started him on Triazole, and they said no, Trivan (Anti-retroviral) would be what they recommend for the patient. So, so, so, which I, I do not think it is a good way to practice because you, you are recommending something against what I do, but the ingredients are the same" GP, 14.

These Constructs resonated with many participants of the study. Eight respondents described the drug formulary as time-consuming and too much admin involved. Many claimed to spend more time dealing with medical aids admin. Besides being laborious, participants argued the administrative aspect was cumbersome and a logistic nightmare for GPs. Respondents mentioned other challenges as too many medical aid schemes and a wide range of medical plans to deal with. They described schemes to be involved and difficult to memorise all the different plans and varying formularies rules. One participant described the complexity as the most significant irritation on the planet.

"formularies are not designed on what's best for the patients but for whats the cheaper for the medical aid schemes" GP, 8.

"I have to follow the drug formulary because I want to get paid too" GP, 2.

"Once the medical aid has stipulated that this is the formulary for this category of patients, you are not allowed to prescribe outside otherwise do or not" GP, 4.

"Medical aid scheme dictates…you have to stick to the formulary otherwise the patients will have to pay for the drug themselves" GP, 13.

In contrast, one respondent argued that the drug formulary had had no influence whatsoever on prescribing decisions. The respondent claimed not to follow the drug formulary when prescribing for patients with chronic conditions. This GP argued;

"I will do what is best for the patient not what the medical aid scheme wants" GP, 11.

Although they do follow the formulary, the GPs believe that medical aid schemes do not always choose the drugs based on efficacy but instead on the cost of the drug, in this instance, the GPs believe medical aid schemes choose generics. The one participant described the medical aid scheme drug formulary not based on new guidelines or research, and it is not up-to-date.

" they are inadequate because they purely based on what the medical aid is making money out of. So, 90 percent of them are not up to date. They are not the latest, not the greatest. They are not in the best interest of the patients" GP, 11.

"they are looking at much older generation drugs into diabetes…. for example, the Medscheme drug formulary doesn't include the new generation of drugs like DPP4s, SGLT2 drugs…. not in line with the current national treatment guidelines, they are looking at much older generation of drugs…. they are totally inadequate" GP, 11.

The GPs perceive the generics as inferior and least efficacious drugs to treat the medical conditions. Respondents argued medical insurance companies have interfered with GPs clinical freedom. This suggests that GPs believe their clinical autonomy does not exist anymore. Many respondents insisted that medical aids could do a better job when deciding on formulary drugs and being inclusive. Lack of consultation is another key theme that came out of this research with a relatively low-frequency count. Many believe that there is very little involvement of Health Care Practitioners (HCPs).

One respondent claimed:

"more partnership is needed amongst various stakeholders such as pharmaceutical companies, medical aid schemes and policymakers like government" GP,

Many expressed ethical considerations well by funders when it comes to designing and deciding on which drugs to use for patients.

" the medical aid schemes are trying to treat a patient, whom they have not seen in depth, that is illegal based on what I was at medical school. I am anti-drug formulary, and I have to be autonomous based on my clinical judgment, so nobody can tell what to do with the patient sitting in front of me" GP, 11.

Many respondents have also expressed how the policy has taken power from the as prescribing medical doctor. However, there's one specific respondent who believed medical aid schemes have not influenced on how he prescribes for patients although he did admit that in some cases he would do because the patients want.

"purely patient based, on the pathology of the patient basis…. not based on medical aids"
GP, 11.

This respondent went far admitting although he does not generally follow the medical aid formulary in certain instances where affordability is the critical factor, the GP said he is not going to deny the patient access to available medication which is on the medical scheme drug formulary. In a way, the GP has admitted to sometimes following what has been listed by the medical scheme….

5.2.2   What are the main essential factors that you must consider when deciding on which drug to prescribe for patients with chronic medical conditions?

The results revealed and demonstrated that there four categories of factors that influence on how GPs choose and decides which medical drugs to the prescriber for patients. Most of the respondents mentioned the following several factors to be critical when it comes to prescribing decision-making process.

There were four main categories of that factors that emerge from the data centre to what influence their prescribing decisions; patient factors, product factors, environmental factors, and internal/doctor factors. All the GPs mentioned of these four factors as essential elements to consider when it comes to prescribing decisions.

All the GPs had very similar attitudes regarding these four factors. They expressed strong negative attitudes and demonstrated frustration towards the medical aid scheme drug formularies. For example, one GP described Discover medical aid as having no best interests for patients. The GP was as far as describing dislike for the medical aid scheme.

Table 5: **Results summary table: Factors influencing GP prescribing decisions by thematic categories**

Category	Constructs	Frequency
Environmental Context factors	• **Familiarity**	9
	• **Patient preferences**	8
	• **Experience**	6
	• **Evidence-based medicine**	3
External factors	• **Medical aid schemes**	11
	• **Medical representatives**	9
	• **Drug companies**	6
	• **Treatment guidelines**	4
	• **Discovery**	3
Drug factors	• **Drug cost**	12
	• **Drug co-payments**	10
	• **Efficacy**	7
	• **Availability**	4
Patient factors	• **Affordability**	11
	• **Comorbid conditions**	7
	• **Patient education**	6
	• **Relationship**	6
	• **Compliance**	3
	• **Race**	3

5.2.1.1 Environmental context factors

The environmental context, the clinical setting in which medical doctors prescribe was mentioned during the interviews as one of the critical factors that are critical for prescribing, with respondents reporting that the circumstances in which they operate will determine how and what they prescribe for their patients.

Based on the qualitative research conducted from the 12 study participants, the reoccurring Constructs with high-frequency count were familiarity (nine), patients' preferences (eight), drug companies (six) and medical representatives (three). Many

believe that when they have had a good experience with a reputable company or certain drugs, they tend to stick to the brand or company.

Table 6: **Environmental factors influencing GPs prescribing decisions**

Rank	Constructs	Frequency
1	**Familiarity**	9
2	**Patient preferences**	8
3	**Experience**	6
4	**Scientific information**	3

The most frequent theme was related to environmental factors was familiarity with the drugs from most of the respondents. Majority of the doctors spoke confidently and in detail about how familiarity influences how they make choices. The participants expressed as probably one the significant theme in their history of prescribing in general practice specifically in private practice.

"*I think familiarity is the biggest, what I would have known to have worked in the past…I would imagine every doctor has their favourite medications…. it worked every time, and you are confident in it" GP, 6.*

"the company, reputable company and the relationship you have with the rep and they have you shown you the studies" GP, 13.

5.2.1.2 Product factors
The next set of factors can be grouped that are regarded to influence or affect the GPs prescribing decision-making process. Product factors influence the GP in various steps of the decision-making process. The GPs frequently expressed product factors such as significant determinants of prescribing these being; drug cost, drug co-payments, and availability. The efficacy of the drug was a substantial factor that seems to influence the way GPs prescribe drugs for patients.

Table 7: **Drug factors influencing GPs prescribing decisions**

Rank	Constructs	Frequency
1	Drug cost	12
2	Co-payments	10
2	Efficacy	8
3	Safety	7
4	Availability	4

Drug cost was a single dominant and recurrent theme from all respondents during the interviews. The cost of the drugs is critical determining them to influence the way the GPs prescribe for patient particularly for patients with chronic diseases. Most of the respondents expressed the importance of drug as a critical determinant of how they prescribe.

"If I have got somebody who has no income who has bad blood pressure, I am simply going to put them on water tablets simply because of the cost not necessarily because it is the best thing to give but because it is all they can afford" GP, 9.

"I do think cost has become more of a factor as I have grown older, "Cost is always an issue," GP, 8.

"efficacy and cost are important as well" GP, 13. "Efficacy is not good" GP, 12.

"Cost is a significant factor, and it does make a big difference whether a chronic condition is allowed by the medical aid scheme….it is cost-driven" GP, 7.

Most GPs argued that cost was an essential factor although not the most critical factor that influenced how they prescribe for the patients. These study findings agree with several studies conducted previously (Buusman *et al.,* the study results emphasised that the introduction of medical aid schemes drug formularies have had an impact on how they select drugs for patients. In contrast, one GP that argued cost not be an issue unless the patient makes a request when it comes to factors that influence prescribing decisions.

"I do not look necessarily on the price and never look at how expensive it is or anything like that"

It is possible that the respondents attached importance to the price aspect due to the pressure from patients and focus on drug expenditures by health authorities including medical aid scheme cost-reducing initiatives.

"Availability, some drugs come and go which cause the problem with that…we want to know if it is available for a period without chopping and changing" GP, 7.

This is particularly true for original or innovative drugs from ethical companies. Although it should be noted that many of the General Practitioners did highlight many patients in the environment, they operate come from an affluent background and can afford to pay for many of these drugs. However, one respondent described cost as always being an issue for the patient "cost is always an issue for my patients." One responded cost a significant factor, and that drives their decision-making process.

5.2.1.3 Patient factors

The final set of factors that influence the GPs prescribing decision are patient factors. The two Constructs had the highest frequency were affordability (eleven) and comorbid patient conditions (seven). Second to drugs factors, GPs argued patient factors play a critical role in prescribing decision-making process.

Table 8: **Patient factors influencing GPs prescribing decisions**

Rank	Constructs	Frequency
1	Affordability	11
2	Pathology and comorbid conditions	7
3	Patient education	6
4	Relationship	6
6	Compliance	3
7	Race	3

Based on this reality, GPs argued that patients influence the decision the most. Many argued that patient is the factor with most influence because everything is based on affordability. The prescribing of a specific drug is influenced by the willingness to pay for it by the patient. According to the informants' patient prefer not to pay for drug co-payments especially for chronic conditions. Based on experience, GPs had received complaints regarding drug levies and were not prepared to make any co-payments.

"Let's what medical aid you on and if the drug is covered…if there's a co-payment on that drug and if the patient is on the lower plan of the medical aid, you have to remember many patients are so many other drugs despite what plan they are on…you have to see if they can afford the co-payment…most patients are on more than one drug" GP, 12.

Participants argued patients had put pressure on what to be prescribed. They generally do not like expensive drugs especially if they are already paying for medical aid. In contrast, one GP expressed affordability as no issue particularly for patients from affluent and cosmopolitan areas. Furthermore, he mentioned that patients would require original drugs instead of generics.

Apart from affordability and co-payments, the respondents argued factors like patients demands and preferences to be essential drivers which affect how they decide what to prescribe for the patient. The GPs mentioned these factors to be important because of patients' medical history and experiences with a product and from their circle of influence, be it friend or family member.

"patients come with a shopping list and say I want this and that" GP, 4.

Patients factors have been grouped as direct factors that influence how GPs prescribe for patients. Most of the respondents argued this as probably the most important these factors as unique. These factors include socio-economic factors such as affordability, gender, age, race, existing medical conditions, and literacy or patient education as being critical. However, all of them agreed that affordability as a most critical factor.

"So, let's say you, you are seeing somebody gardener, you know, and he has got a terrible blood pressure. I am going to be putting them onto water tablets simply because of the cost. Okay. Not because it is necessarily the best thing, but because it is all he can afford" GP, 9.

"patient education is vital in medicine for compliance reasons" GP, 12.

"the biggest problem is that we are in a first - third world situation in this country, a lot of the times and prescribing habits it comes down to what the patient can afford" GP, 11.

Many respondents believe affordability is critical because patients must afford to pay for

drugs. Many patients are not willing to pay additional money on drugs especially if they are already paying medical aid monthly. However, it should be noted that there are patients who are willing to pay for the best drugs.

These patients are not prepared to be prescribed generics. Other Constructs that were arising from the interviews included comorbid diseases which many of the GPs said was an essential factor as well because whatever they need to be treated with must have fewer interactions with drugs that patients are taking. Secondly, doctors were concern about the patients' compliance. Participants mentioned this as an issue for patients already other drugs.

"My patient told me that my made was on this drug" GP, 13.

5.2.3   What influence do patients on medical aids with chronic medical conditions have on your prescribing decision? Why?

Secondary questions 1.1: What kind of influence do the medical schemes drug formulary has on you when you prescribe drugs for patients?

This section of the results revealed the theme that emerged regarding factors that influence GPs prescribing decisions.

Respondents agreed that medical aid schemes drug formulary has undoubtedly influenced how they prescribed for patients. Majority of the respondents generally follow on what the medical aid scheme drug formulary. The GPs described the medical aid scheme drug formulary as restrictive and too prescriptive. It did not allow them to exercise their clinical autonomy as prescribing and treating medical doctors based on what they learned from medical school.

"Yes, the influence is there, I have had to change the way I prescribe for patients…it feels like I am controlled by the insurance company instead of looking at what for me professionally is the right medication for my patients, but I have to look at what the medical insurance is prepared to pay for" GP, 7.

"Sometimes experience with a certain medical aid scheme you will get a sense that they will not cover certain drug…you will opt for the drug they do" GP, 4

"It is purely on the cost basis I have to change because it is purely on what the patient

can afford not because it is adequate for that patient…. you have to stick to the formulary… can't exactly get what you want" GP, 12.

Three key Constructs emerged from the interviews, the informants argued that the medical aid formulary is restrictive, comprised of cheaper drugs and mostly has generic medication, hardly any innovative or original products listed. Furthermore, the argued that the decision is a largely cost-driven intervention which has no clinical basis. Many expressed frustrations during the interviews and demonstrated strong resentment towards the medical aids.

5.3   Results for Research Question 2: What are the GPs attitudes and motivations for following medical schemes drug formulary?

Secondary Question 2.1: What motivates you to follow the medical schemes drug formulary?

The interview questions encouraged participants to share their attitudes, perceptions, and motivations about the medical aid schemes drug formulary. Most of the respondents expressed dislike and frustration towards medical aid schemes in general. Many described the medical scheme drug formulary as restrictive. Most of the doctors believed that the formulary was not formulated on evidenced-based medicine but purely cost-driven. Respondents said they had no other options but to follow what is available and listed on the drug formulary.

This question allowed the respondents to provide insights based on their experience with medical aid schemes drug formularies. In most cases, the respondents believe that formulary had an effect and influenced them on how they choose prescription drugs for patients.

" I do not like, and I think it is prescriptive. I think it takes away our autonomy…I understand why it is there…it is an administrative nightmare…it brings administrative burden to what we do" GP 4.

"I am anti formularies, I am supposed to be autonomous and make my clinical judgement…. nobody can tell me what to do with the patient sitting in front of me" GP, 11.

"I will follow simply because I am forced to follow it…you do whatever the medical aid schemes are prepared to pay for it" GP, 8.

"I am quite annoyed by the formulary sometimes…. I prescribe what I feel is appropriate and then go to the formulary but often it is not covered by the medical and changes on a regular basis, it is often I have to change to the patient" GP, 7.

"it is complicated to work around formularies, but it is a complicated thing, we do not like the formularies…we understand there are good generics…the problem in South Africa there is too many generics…. I feel like someone is giving another guideline, I am following the formulary because patients are squeezed…everyone is so squeezed, and much income is taken by the medical…doctors indirectly are forced to follow the guidelines…formulary is forcing you to choose" GP, 12.

"well the only way to be motivated to follow a formulary is because a patient has chosen a certain plan and that plan has a formulary, you get to keep the cost down, and if you do not want to follow drug formulary, patients will have to pay out of pocket" GP, 12.

"I have no choice, you have seen from past incidents that you will not get a particular drug...you will look at their formulary, this is what they will pay for and want to prudent with patients' fund or patients will end up paying levies…you will just have to follow the formulary" GP, 4.

"patients are tied, and doctors are tied...no one is going to win except the medical aids" GP, 12.

Secondary Questions 2.2: What are the chronic medical conditions where you are not prepared to follow the medical scheme prefers?

The purpose of this question was to test if there are any certain chronic conditions where the GP is not prepared to risk the patient lives and follow the medical aid formulary.

Table 9: **Chronic conditions which GPs are not prepared to follow the formulary**

Rank	Constructs	Frequency
1.	**Cardiac or heart conditions**	8
2.	**Psychiatric conditions**	7
3.	**Infectious conditions**	3

In analysing the top three constructs, the highest-ranking construct was the cardiac-related conditions followed by psychiatric diseases and infectious diseases. Most of the GPs expressed that they are prepared to deviate from the formulary especially in cardiac-related patients because of the significant cardiac risk towards mortality. Only two of the respondents did not have conditions in mind. Respondents elucidated:

"Yes, not just the condition, maybe a particular patient with hypertension. I am happy to change with many patients. One might be a hypertensive patient battling with control or side effects profiles…I ask the patient if they would not mind paying the co-payment for a good drug" GP, 7.

"Yeah, coming back to cardiac, in some psychiatric conditions…it must be a transparent conversation with the patient" GP, 4.

"Certain things I do not like…. certain patients have severe diabetes…. mental illnesses…. I do not want to fiddle too much with those patients…not prepared to take the risk…if you do not stick to the formulary patients end-up paying for the drugs themselves" GP, 13.

"Okay, cardiovascular there is a lot of generics…we are prepared to change to certain generics…there is certain drugs I will NOT change, I will not lower myself to that level…certain ARBs do not work for hypertension…efficacy is not good…you know it does not work…cardiac, psychiatry and neurology……there are certain things I do not change….even antibiotics…if they get a certain infection on their finger…I would rather encourage them to co-pay instead of losing the finger because generics do not work" GP, 12

Secondary Question 2.3: In general, what are your attitudes toward medical schemes drug formulary policy?

The purpose of this question was to ascertain GPs attitudes and allow the participants to express their feelings about the medical aid drug formulary fully.

The interview question delved deeper into gaining an understanding of what attitudes GPs have on medical aid schemes. All the participant indicated that they have a negative attitude and perceptions on medical aid drug formulary. Participants explained:

"I do not always like the medical aid scheme formulary…. many conditions are not covered in their formulary" GP, 12.

"they go for the cheapest medication available, very seldom you have will original products on there, and usually with a big levy to with, a good research product and you have to go with the generics" GP, 7.

"It sorts of make you feel like…. they overrule, they decided on what I can give…so it made me feel literally like I am being dictated on" GP 5

The results revealed the GPs attitudes toward the medical aid schemes. The respondents did not express anything positive regarding the schemes except one informant that the attitude towards the schemes is generally positive especially when the treatment given to the patient is appropriate.

5.4   Results for Research Question 3: What impact could the medical drug formulary policy have on patients' health-related outcomes?

Secondary question 1.1 In your personal experience, has the medical scheme drug formulary policy impacted positively or negatively on the health-related patient outcomes? Please explain: Exploring the how the drug formulary has impacted on patients' outcomes.

Table 10: **Impact of drug formulary on patient health-related outcomes**

Rank	Constructs	Frequency
1.	Negative impact	10
2.	Positive impact	2

This section of the results revealed the constructs that emerged on how the medical aids have an impact on patient health-related outcomes. Majority of the participants expressed a negative outlook on how the medical formulary has impacted on health-

related outcomes. Negative impact construct received the highest frequency count of eight. Only two participants mentioned a positive impact.

The GPs believed that medical aid scheme drug formularies had had a minor impact on acute conditions, not chronic medical conditions. The policy has been described not to have had any significant impact on overall patient-related outcomes. However, many respondents expressed and believed the medical aid schemes drug formularies might have had some impact on the GPs and patient disease management goals such as getting the patients to achieve specific outcomes like reducing cholesterol or high blood pressure on certain generics or medications.

"I then later he did not have a good viral load suppression… Um, and I could not do like a resistance study to investigate why…. I mean resistance studies because it is, the viral load had gone down less than a thousand, but it is not completely suppressed and is still complaining of symptoms of sweating at night" GP 5.

"some diabetic patient gets side effects from formulary drugs, and they do not get to the desired goal…they end up on Insulin a lot faster" GP, 9.

"for minor problems has it has had no impact….an example like hyperlipemia, a patient with high cholesterol where you have tried the formulary drug like simvastatin, and you have a sense a patient has good compliance/adherence, but cholesterol has not dropped…the medical aid scheme is not willing to pay for another drug….in this sort of instance it has had a negative impact" GP, 4.

"Some of the plans will not pay for a specific drug depending on what plan he is on… then you need to give a generic of that drug with another product, but then patients receive two medicines instead of one…unfortunately, this is a chronic disease, you now have to take two medicines, but now we have compliance again from doctors' point of view" GP, 12.

"if patients do not get to goal, we have to change to another product…. it has been negative because I am restricted in what I can write…patients had the formulary because they end up on many drugs which have side effects which some of them have" GP, 12.

The GP highlighted how the patient was not able to get to the desired goal because of the medication is chosen by the medical aid scheme. Furthermore, the patient also had experienced side effects of the medication recommended and provided by the medical aid scheme. He highlighted the effects of this by the scheme.

"*the patient is still complaining of symptoms of sweating at night*" GP 5.

According to the GPs, the medical aid schemes drug formularies have hurt patient-related outcomes. However, the positive impact has been highlighted by one GP. The participant described the access to a specific drug despite being viewed as inferior to original drugs still as a positive element of the scheme. The GPs generally have a very negative perception of the medical aid scheme drug formularies. They believe the formulary drugs selected and listed by the medical schemes are inferior and ineffective. The GPs believer the drugs are not chose based on the science but purely on a cost-effectiveness basis.

5.5 Summary of Chapter 5

This Chapter presented the findings which emerged from the qualitative study conducted. Through the exploratory method and data analysis, the four main category factors emerged which influence the prescribing decisions of the GPs; patient factors, environmental factors, external factors, and drug factors. The primary Constructs such as medical aid drug formulary, drug cost, and affordability were after analysis of the data, will be tested against the literature review conducted in chapter two on the topic of exploring medical aid schemes influence on prescribing decisions of GPs in Chapter Six.

In other previous qualitative studies, the findings validated the insights from this study. Participants argued that cost-containment methods such as drug formularies affect their clinical decisions and influence their prescribing. Furthermore, the GPs were skeptical about the quality of the drugs that are on the drug formularies (Carlsen, & Norheim, 2008). The insights from this study suggest that there is a lack of trust in medical schemes as authors of the drug formularies. The participants claimed that the economic motives precede clinical decisions, this affects how GPs make clinical decisions.

CHAPTER 6: DISCUSSION

6.1   Introduction

This chapter presents the results of the research study. It addresses the aim of the research by answering the different research questions with the literature discussed in Chapter Two. The discussion follows the format of the research questions in Chapter Three and how the results were presented in Chapter Five.

6.2   Discussion of Results for Research Question 1

What influence do the medical schemes drug formulary policy have on GPs prescribe decisions?

Secondary Question 1.1: Determining the primary factors which the GPs has to consider in the decision-making process of prescribing.

From analyses of the data, the findings indicate that there are four different category factors which play a critical role in influencing the GPs prescribing decision-making process. These being; patient factors, drug factors, environmental factors, and external factors. Similar findings from previous studies validated the results of this present study that factors such as individual's motivational tendencies as well as socio-economic, political climate, and environmental contexts in which healthcare professionals work in influence their prescribing decisions (Godin, Bélanger-Gravel, Eccles, & Grimshaw, 2008).

The four main categories of factors were patient factors, external factors, environmental factors and drug factors which influence how GPs prescribe medications. In this study cost and affordability were the two primary Constructs with highest frequency count to influence prescribing. Other Constructs from the study included personal experience, patient preferences and familiarity with certain drugs. The previous study found that although GPs do believe that costs are vital when prescribing medical drugs, the costs will be secondary to clinical effectiveness and safety of the medicines (Prosser & Walley, 2000).

The results of this study confirm the findings of another study from the literature review in chapter two revealed similar factors. The prescribing decision-making process has been described as a complex process that involves several factors from previous studies (Buusman *et al.,* 2007). According to this one participant in this study, five factors were argued to be critical in influencing the decision-making of a GP when it comes to prescribing; personal experience, price, dispensing method, side effects, and trial and error between drugs in a particular therapeutic drug class (Buusman *et al.,* 2007).

Majority of the GPs emphasised the cost of drugs and affordability as being two essential and deciding factors regarding prescribing because of patients of dynamic socio-economic context. Price or the cost of the drug was a dominant theme from the participants of the study. They all emphasised how important the price of the drugs was. Second, was affordability to pay for the drug, most of the GPs mentioned the importance of patients to afford the drugs otherwise it is pointless to prescribe the drug the patient cannot afford. Buusman et al. concluded that price was the recurrent theme and primary reason for deciding on which drug to prescribe drugs for the patient (Buusman *et al.,* 2007). The results from this study are consistent and validated by the findings from the previous studies. The influence is driven mainly by changing socio-economic dynamics which participants mentioned during the interviews. The two Constructs were important factors before the effectiveness of the drug.

Though GPs are practicing in private practice, many of their patients are on medical insurance schemes. The cost of the drugs and affordability are key deciding factors regarding prescribing because in some instances patients may be required to pay levies or co-payments. Moreover, regardless of patients coming from affluent and cosmopolitan areas, some many patients were not willing to pay out-of-pocket or additional levies towards treatment prescribed by the GPs especially on the continuous basis. This was important because GPs believe it may interfere with compliance of the chronic medication. However, other factors were not mentioned in the literature review section like patient education (literacy levels), existing medical conditions, among others.

These factors emerged as important factors by most of the GPs as necessary because of drug-to-drug interactions, affordability and possible side effects with what the GP may prescribe for the patient. Other factors included specialists or peers, medical sales representative, and pharmaceutical companies scientific research as essential considerations for prescribing. However, specialists or attending continuing medical education seem to have had an impact on how they prescribe for their patients today.

Similarly, according to Buusman *et al.,* 2007 respondents explained how their colleagues or hospitals they have worked to influence how they prescribe today. Many participants stated that recommendations from the local hospital had a significant impact on their prescribing behaviours. The prescriptions drugs from hospital physicians were rarely changed according to the participants (Buusman *et al.,* 2007). The results of this study are validated once again by literature reviewed in chapter two.

Another factor from this study with high-frequency count included the local or national treatment guidelines, the pharmaceutical, medical representatives. The previous study from another Sweden validates the results of this current study, GPs believed that treatment guidelines were useful and had a positive on them on how they prescribe (Milos, Westerlund, Midlöv, & Strandberg, 2014). Similarly, in this study, most of the doctors expressed the importance of the guidelines as a useful resource. Often mentioned the misalignment of the treatment guidelines and the medical aid schemes drug formularies. The findings are consistent with the findings from previous studies. The participants from one of the studies mentioned regular visits by pharmaceutical sales representatives as a critical factor that influenced prescribing decisions. Many of the participants explained that they regard the medical sales representatives as a source of information on the launches of new drugs. One respondent went as far as mentioning how the rep had influenced them of the one of prescriptions drug (Buusman *et al.,* 2007). Similarly, most of the reps in this study mentioned how reps on some drug had influenced them.

Secondary question 1.2: Assessing the influence of patients on medical aid schemes on GPs prescribing decisions.

The findings of this study validate that medical schemes drug formulary policy does influence the GPs decision-making process regarding prescribing medical drugs for patients (Joyce, Carrera, Goldman, & Sood, 2011; Wang & Pauly, 2005). Also, the results from the interviews validated the literature review that the nature of the medical aid scheme drug formulary is restrictive. These findings suggest that prescribing is a multifaceted concept, there are numerous factors which GPs must consider before prescribing including the drug formulary. GPs expressed that they follow the drug formulary religiously. Most of the GPs agree that the formulary has influenced their prescribing decision-making process significantly.

Furthermore, the GPs claimed the medical aid schemes drug formulary had taken power over GPs clinical autonomy. The results of this present study are consistent with previous where the GPs have emphasised the importance of clinical freedom in prescribing (Buusman *et al.,* 2017). Many of them described this policy as restrictive and prescriptive. The participants mentioned they have no clinical autonomy anymore regarding prescription medication for chronic patients. Most of the GPs merely follow the drug formulary and utilise what is recommended by the medical schemes. Another previous study in Britain supported this view. Many GPs expressed the same sentiments.

The informants said they had no clinical autonomy anymore and mentioned skeptical attitude towards clinical guidelines. The argued health authorities' emphasis on cost-effectiveness might be counterproductive (Watkins, Timm, Gooberman-Hill, Harvey, Haines, & Donovan, 2004). These findings validated the results of this study, most of the GPs described the medical aid scheme drug formulary to be counterproductive. The participants expressed strong resentment and negative attitude towards cost-containment interventions. In contrast, another similar study, participants did not find the formulary drug policy restrictive. Informants did not perceive drug formularies as a restriction of their freedom to choose drugs (Buusman *et al.,* 2017).

Most of the respondents from this current study described the drug formulary in contravention of evidence-based principles and ethics of medicines. The informants believe the medical aid schemes have focused more on health economics over the clinical outcomes. The GPs mentioned generics are preferred class of drugs over ethical drugs, particularly for chronic conditions. These findings are corroborated in what discovered in Chapter Two. The health ministry introduced mandatory generic substitution law in May 2003 Gray *et al.,* 2014. The fundamental difference between the originator and generic medicine is the drug cost, and the difference is an average of 33% (Bangalee & Suleman, 2016). The medical aids schemes have leveraged on this policy by preferring generic drugs over ethical drugs as per national drug formulary policy.

Moreover, the participants described the cost of generics is significantly cheaper compared to originals. Many of the GPs argued this point that medical aid schemes preferred to exercise health economics as the preference over clinical freedom and outcomes by GPs. These findings validate with another qualitative study. The participants were concerned about cost-containment methods such as drug formularies will influence the clinical decisions. Furthermore, the GPs were sceptical about the quality of the drugs that are on the drug formularies (Carlsen, & Norheim, 2008).

The interesting observation is that participants' opinion is that the medical aid schemes have taken a health economics position over clinical decisions. Majority of the GPs argued the effect of this economic decisions has influenced how their prescription behaviour. The participants claimed to follow what is on the drug formularies strictly. One GP claimed not have been influenced by the drug formulary in making clinical decisions including prescribing. Later this participant contradicted this view. The informant argued that indirectly the influence is there because of patients' preferences particularly in low-income brackets patients on cheaper medical aid plans. The GP conceded to follow what is on the formulary based on patients' requests. This does indicate that all the of the GPs interviewed from this study are either directly or indirectly influenced by the drug formulary.

The results of this study substantiate the notion that patient demands, preferences and circumstances influence the prescribing decision-making process. Similar findings from previous studies validate this view, Buusman *et al.,* 2007 found patient demands and requests to be substantial factors to influence prescribing. The results of this study are consistent with the literature review in Chapter Two. There are direct and indirect factors influence GPs prescribing decisions. The direct factors include the drug formularies, prescribing restricting regulation while indirect factors will include factors medical sales representatives, expert opinions, scientific data from clinical studies (Murshid & Mohaidin, 2017). Similarly, in this study, most of the participants argued the same factors play a critical role in their prescribing decisions. The GPs mentioned the drug companies and relationship with medical sales as other important constructs because they rely on these companies on drug information about the new drugs in the market.

The findings verified by a previous study, many informants stated that they used sales representatives as a source of information on new drugs. Only one GP mentioned the influence of the pharmaceutical industry as the cause of certain prescription drugs (Buusman *et al.,* 2007). There was general acceptance of the medical sales representatives and medical education by pharmaceutical companies. Only one participant complained that pharmaceutical companies did not disclose adverse effects of the medications which can be very challenging at times.

Furthermore, the participants mentioned factors such as the context in which they operate as necessary. These factors include influence by colleagues and specialists. Other factors that emerge from this study included patients' pathology, existing medical

conditions as critical factors which influence the way they prescribe. These results are validated and consistent with previous studies concerning this topic.

Secondary Question 1.3: Determining what influence the medical schemes drug formulary has on GPs prescribing decisions.

All participants shared the view that the medical aid scheme drug formulary is restrictive. It was an interesting observation that all GPs anonymously expressed how they did not have a choice but to follow on what the medical aid scheme drug formulary. Majority of the GPs argued they have no longer clinical autonomy when it comes to prescribing. The clinical autonomy is the clinical freedom to choose whatever the GP felt was appropriate to prescribe for the patient.

6.3   Conclusion of Research Question 1

The findings of this study suggest that several factors influence the GPs prescribing decisions. There is no single factor observed to influence the way GPs prescribe. Some factors are more significant than others including patients' factors such as socioeconomic status, affordability, and pathology amongst many. These factors instead interact with another in a non-linear style. From the interviews, in some instances, the one-factor category could have a significant influence on the other factors while others could have less impact on others.

6.4   Discussion of Results for Research Question 2

What are the GPs attitudes and motivations for following medical schemes drug formulary?

Secondary Question 2.1: Assessing what motivates the GPs to follow the medical aid scheme drug formulary strictly.

Theory of Planned behaviour explains and tests the ability of the attitude and perceived behavioural control to predict the intentions and GPs prescribing decisions or habits (Murshid 2005). The results of the present study resonate with the literature provided in chapter two that many GPs with a frequency count of eight expressed both negative and positive perceptions and attitudes towards the medical aid schemes. Theory of Planned

behaviour theory explains and tests the ability of the attitude and perceived behavioural control to predict the intentions and GPs prescribing decisions or habits (Murshid 2005).

Murshid describes attitude as the degree of like or dislike for something which may affect the behaviour to act in a specific way (Murshid 2005). Majority of the participants' attitude and perception were negative about the medical aid schemes. Majority of the participants expressed dislike and resentment towards the medical aid schemes. The interesting observation was frustration displayed by the participants when asked about the medical aid schemes. Majority of the participants' attitude and perception were negative about the medical aid schemes. Majority of the participants expressed dislike and resentment towards the medical aid schemes.

The interesting observation was frustration displayed by the participants when asked about the medical aid schemes. Participants described the drug formularies as restrictive and too prescriptive as pure as cost containment intervention with less effective drugs.

The results of this current study regarding the GPs attitudes and perceptions resonate with results of another previous study. Many GPs perceived control on cost-effectiveness initiatives are the direct interference with their professional clinical autonomy (Watkins, Timm, Gooberman-Hill, Harvey, Haines, & Donovan, 2004).

Furthermore, another previous study with similar findings validate the results of the current study. The participants from that study believed that sometimes economic motives tend to be prioritised over clinical motives emerged as a crucial theme. The GPs perceptions about the cost-containment methods believed that the economic decisions outweigh the clinical decisions (Carlsen, & Norheim, 2008)

Secondary Question 2.2: To ascertain from the GPs if there is any medical condition which will cause them to deviate from medical aid scheme drug formulary

The results suggest that there are certain chronic medical conditions which GPs are not prepared to risk by following the medical aid scheme formulary. The participants were resolute in responses. Many mentioned their past negative experiences with certain drugs from the formulary as the primary reasons for not using these generic medicines in life-threating medical conditions like hypertension and neurological conditions. There were three primary constructs chronic conditions which emerged from the interviews: cardiac conditions including hypertension, psychiatric disorders, and infectious diseases.

When informants were asked why they were not prepared to follow the formulary, most of them merely argued there was an increased risk involved with these categories of patients. Secondly, the majority of the GPs mentioned the generics drugs as inferior drugs to treat these conditions, and the risk is merely high. Most of them mentioned the importance of being able to make clinical decisions without being instructed on which drug to use to treat such conditions.

Participants claimed the past experiences as the primary reason why they were not prepared to follow the drug formulary. According to GPs patients had failed to reach treatment goals due to many reasons because of the lack of effectiveness of the drugs or adverse reactions. These results were validated by the findings from previous studies in the United States and the Netherlands estimate about 30% to 40% of the patients do not receive care according to current scientific evidence-based guidelines and between 20% - 25% of care those patients receive potentially harmful including medicines post-implementation of policy by health authorities (Eccles *et al.,* 2005).

Many GPs were prepared to either motivate for the patient to get a better drug to treat a condition or motivate the patient to pay levies because of the risk involved if they had opted for the formulary drugs. When asked why they would motivate many mentioned how they wanted to do the best for patients.

The results of the study suggest the lack of trust in the formulary drugs as fear and experience where patients had been compromised over economic motives. Three of the participants gave experiences where patients had been prescribed formulary drugs and had failed to meet the management objectives of the conditions. One was an HIV patient who failed to achieve viral suppression on a specific HIV medication. The patient was subsequently changed to drug preferred by the GP because of inadequate response to the drug selected by the medical scheme.

Secondary Question 2.3: Assessing what motivates the GPs to follow the medical aid scheme drug formulary strictly.

The results of the study indicate that most of the GPs mentioned that the current cost regulations interventions influence their prescription decisions substantially. They initiate treatment on chronic conditions purely based according to the med scheme formulary. The GPs are conscious of their Hippocratic oath and the safety of their patients. This attitude is strengthened by a close relationship with patients and frequent visits.

These results resonate with Agency theory, which suggests that the role of the GPs enticement to strong professional identity in medicine. The patients' interests drew attention to influence GPs, and in turn, the GPs become accountable to patients (Dadich and Doloswala 2018). It revealed an agency-principal problem in the second relationship where the patient is the principal and medical is the agent. Theoretically, the findings revealed the role of self-interest in the medical aid schemes by impacting on GPs clinical decisions. The medical aid schemes furthered their interests by making economic decisions over clinical decisions. The patients should take the generics preselected by the schemes the GP treats a specific condition. This self-interest aspect takes away the clinical autonomy of the prescribing GP. Theory can assist in this second relationship to drive organisational change if two parties continue to negotiate.

6.5   Discussion of Results for Research Question 3

What impact could the medical drug formulary policy have on patients' health-related outcomes?

Secondary Question 3.1: Assessing the impact of a medical aid scheme drug formulary on patients' health-related or clinical outcomes.

The data from the interviews revealed that the medical aid drug formulary could cause adverse events on patient health-related outcomes. The main impact is the efficacy of the drugs listed which does not seem to help patients achieve goals easily and quickly. One respondent did highlight a negative impact when a patient on HIV medication did not reach the required viral suppression and patient was immunosuppressed due to the non-responsiveness from the generic medication. This after the GP had prescribed an antiretroviral drug for a patient and the medical aid scheme recommended something else which was listed on their formulary. The generic drug also caused an adverse reaction which resulted in the patient sweating at night.

The only participant whose background and experience did not influence her choice of the industry was due to her drive to make a difference in the economy through skills development of young South Africans. She did this by leveraging industrialisation which was policy focus at the time of venture. It again attests to the discovery theory of opportunities, which states that opportunities often arise from exogenous shocks (i.e., changes in technology, government policy, demographics.) to a market (Alvarez & Barney, 2014).

The results of the study demonstrate that GPs believe that medical aid drug formulary has had more of a negative impact than a positive one. The results suggest that GPs generally have a negative perception regarding the drug formulary. In expressing their views on the impact, many informants did not have a positive perception and associated the medical aid formulary drug with positive outcomes in patient outcomes. They further explained how difficult it is for patients to achieve disease management objectives due to inferior products from the drug formularies. It is evident based on the comments and a high-frequency count associated with adverse outcomes that the results suggest generics from the medical aid drug formulary will not get patients to goal.

Another previous Swedish study results validate these findings, GPs resonate with the results of the current study (Milos, Westerlund, Midlöv & Strandberg, 2014).

Secondary Question 3.2: Assessing how the medical aid drug formulary has affected the GPs prescribing decisions with efficacy and safety.

There is a clear message from the data collected from the interviews that GPs were prescribing decision-making process is significantly influenced on what the medical aid schemes recommend. These results validate previous findings, the drug formulary as a factor that had an adverse effect on GPs prescribing decisions. GPs expressed this as a challenge in exercising their clinical freedom when practising medicine in a clinical setting. The respondents mentioned the drug formulary to be restrictive and prescriptive. They believe the drug formulary has interfered with their clinical freedom in what they should prescribe for chronic conditions.

Secondary Question 3.3: Determining patients' feelings and attitudes on medical aid schemes formulary drugs

The GPs expressed how patients' feelings of frustration, impotence, and unfairness towards the current drug formulary implemented by the medical aid schemes. The feelings of frustration and ineffectiveness result from the fact that GPs are strictly told which generics drugs to prescribe for the patients. Majority of the GPs mentioned that patients had a very negative perception and attitude towards the medical aid schemes.

Most of the GPs described a negative attitude to the drug formulary. They described this policy as having economic motives over clinical motives. This finding supports Carlsen

and Norheim (2008) that drug formularies appear to be economically motivated and narrow-minded Furthermore, GPs expressed concerns around interference with their clinical freedoms as clinicians. There was generally a feeling of dissatisfaction and scepticism from the respondents on drug formulary drugs if medical aid schemes had the best interests of the patients. Majority of the GPs complained lack of proper drugs on the formulary and argued medical aids to only be about economic motives. They explained patients were frustrated with these drugs and often expressed resentment towards the medical aid schemes.

The results of the are consistent with the previous studies conducted on attitudes on guidelines or drug formulary. Findings from Carlsen and Norheim (2008) validate the views of the GPs from this current study, respondents believe economic motives take priority over clinical motives.

6.6 Comparison of the objectives of the study

The objectives of the study were initially set out in Chapter One of this research study. To ensure the study findings match the objectives of the study, each objective has been tabulated below.

Table 11: **Summary of the Objectives met**

Objective 1	How was the objective achieved
Research Question 1: What influence do the medical schemes drug formulary policy has on GPs prescribe decisions?	
To investigate the influence of medical aid scheme drug formulary on GPs prescribing decisions in private practice.	This objective was achieved by conducting semi-structured interviews, and the GPs were able to provide rich insights and information on the influence of medical schemes drug formulary on prescribing decision-making process. The GPs were able to share extensively how the drug formulary has influenced their prescribing decisions over-time. There were four theme categories discovered from the research that influence GPs prescribing behaviours. These being; patient factors, product factors, external and environmental factors. Most of the GPs are agreed under patient factors that medical aid schemes drug formulary has influenced how they prescribe. This theme category was very dominant in most of the interviews. The results suggest that medical aid drug formulary influences GPs prescribing decision-making process.

Objective 2	How was the objective achieved
Research Question 2: What are the GPs attitudes and motivations for following medical schemes drug formulary?	
To investigate the perceptions and attitudes of general practitioners on factors such as medical aid scheme drug formulary	It was established in Chapter Five that most of the informants had a negative perception and demonstrated resentment toward the medical aid schemes drug formulary. Many described the policy as restrictive and over-controlling. The examples of these were provided in Chapter Five, Section 5.3.
Research Question 3: What impact could the medical drug formulary policy have on patients' health-related outcomes?	
Objective 3	How was the objective achieved
To ascertain the extent to which medical aid scheme drug formulary impacts patients health-related outcomes such as disease control and adherence.	In many cases, the majority of the GPs argued that the impact of the drug formulary had been a negative one. Ten respondents out of the 12 GPs claimed the drug formulary to have had a negative impact on patient-health related outcomes. Examples of how the drug formulary provided in Section 5.4. Some example included patient not achieving desired disease management goals such as suppressing viral load in HIV-infected patients.

6.7 Summary of the discussion on Research Questions

In this Chapter, the results from Chapter Five were compared to the literature reviewed in Chapter Two. The objective of this Chapter was to validate the results from this study add to the existing literature. Finally, to compare the results from the existing literature.

The findings of this exploratory study were compared to the objectives that were initially formulated in Chapter One of this research study. It can be stated the study findings met the research objectives in Chapter One. Furthermore, the results of this study cannot be conclusive. Further research is needed to understand the factors that influence the GPs prescribing decisions comprehensively. Much of the results revealed similar factors that affect the GPs prescribing decision-making process. These being; patient factors, product factors, external factors, and environmental factors. However, the extent and importance to which these factors influence GPs prescribing decisions in other areas in South Africa remain to be explored.

CHAPTER 7: CONCLUSION AND RECOMMENDATIONS

7.1 Introduction

Insights into factors that influence the GPs prescribing decisions were generated through data collection (Chapter Five) and analysis (Chapter Six). Based on the findings, analysis and literature review; a conceptual framework was developed. The model links literature discussed in Chapter Two with insights from the findings from previous studies. Based on the findings and the developed model, recommendations for health authorities in the healthcare sector are presented, and future research delineated.

7.2 Principal findings

There were three key findings that were also directly linked to the research questions: Exploring factors that impact the GPs prescribing decisions in private practice; GPs attitudes and motivations for prescribing drugs which the GPs choice of therapy are not but instead the drugs from funders formulary; and factors including the drug formulary policy have on patient health-related outcomes.

The principal findings of the study confirm that the top four category factors influence most of the GPs. These being; patient factors, external factors, environmental and drug factors. Patient factors included medical aid drug formulary, the drug cost, patients' pathology, and affordability. External factors included national treatment guidelines, scientific talks, medical sales representatives and interactions with pharmaceutical companies. Environmental factors included characteristics of GPs such as familiarity and numbers of years in practice. Drug factors included drug efficacy, availability and particularly the drug levies referred to as drug co-payments.

7.2.1 A proposed conceptual framework on GP prescribing habits

Arising from the above findings a model based on the results from the interviews on factors influencing prescribing decisions, social cognitive and behavioural theories were developed. This conceptual framework suggests possible relationships that exist amongst several primary variables related to GPs decision prescribing: patient factors, drug factors, environmental factors, external factors, the perception and attitudes of GP. The framework is restricted to these factors; however, the model can be a useful

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framework for developing and understanding the effects of these factors on prescribing in primary health care. Lastly, there are two variables proposed as moderators; trust and habits which play a role in prescribing.

Although the initial objective of the study was to investigate how medical aid scheme drug formulary influences GP prescribing decisions, it is evident from the data the complexity of prescribing that exists concerning the factors that influence GPs prescribing decisions. The prescribing decision is a complex process which involves several factors which are all critical. Most of the respondents prescribing decisions are multifactorial. The GP must consider several factors when processing prescribing decisions. There is a clear message from findings that suggest there is no single factor that influences GPs prescribing decisions but rather several factors influence medical scheme drug formulary.

Furthermore, it is also evident that although there are several factors involved, the medical schemes drug formulary has influenced the way the GPs are prescribing for their patients. Moreover, the GPs expressed similar attitudes towards medical aid schemes drug formulary respond to information about societal costs, benefits and effectiveness, and that they make trade-offs between them.
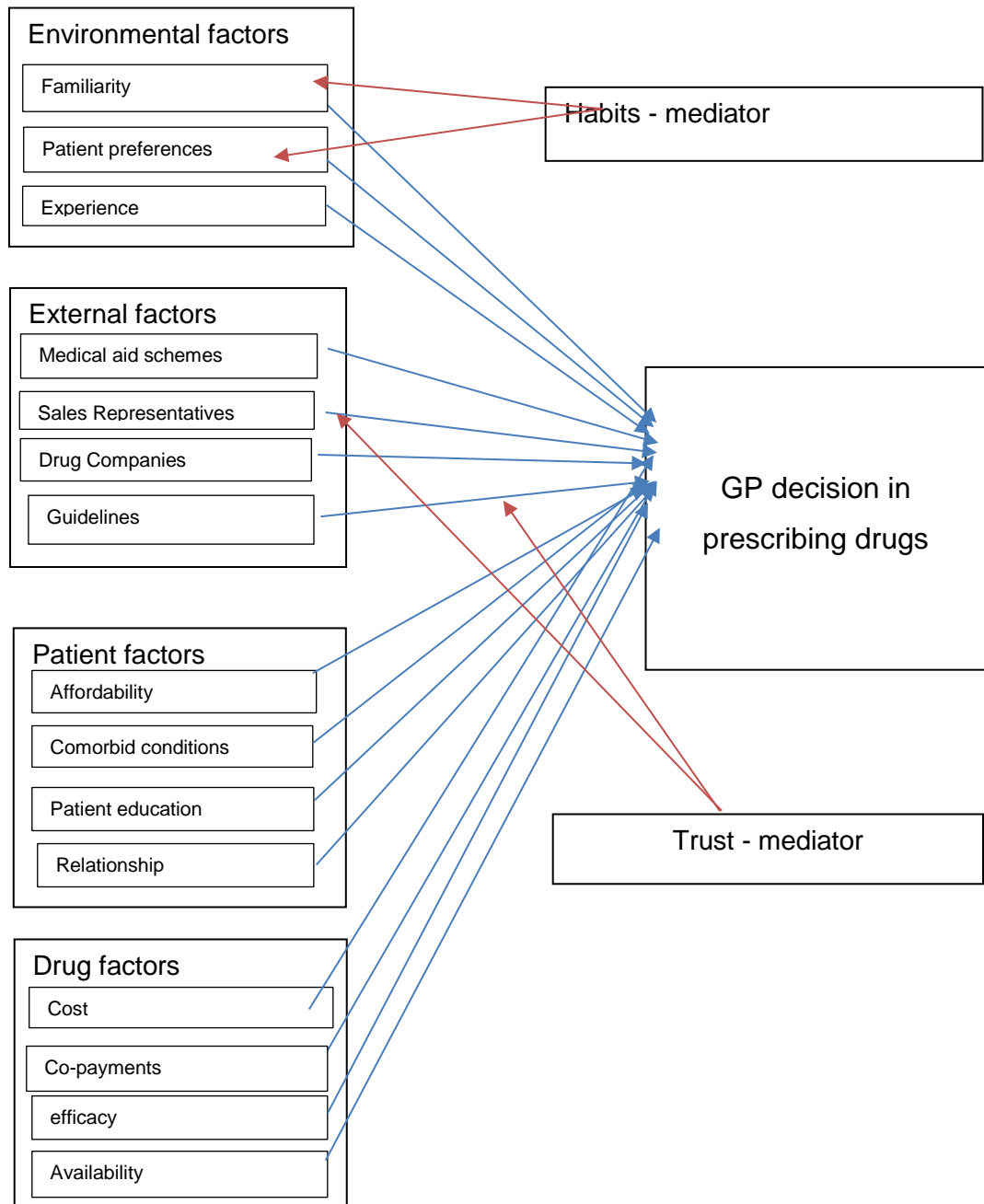
Figure 6: A proposed conceptual framework for GP prescribing habits

7.3 Implications and recommendations

This study was limited to only twelve prescribing GPs in private practice in the northern suburbs Johannesburg and did not consider GPs outside this area. Although the findings of the study cannot be conclusive, the results revealed how the drug formulary impacts GPs clinical decisions in making clinical decisions. The findings suggest that medical aid drug formulary influences GPs prescribing decisions. Future studies should consider ethical considerations on the medical aid schemes should be making clinical decisions when they are not making any clinical assessments of the patients. Secondly, there is the possibility of interference regarding GPs clinical autonomy, the freedom to prescribe the medication based on patient pathology and the risk involved not based on what the drug formulary recommends.

The qualitative approach could be the limitation of the present study in it is both a strength and a weakness. It works relatively well in satisfying the primary objective of the study. The approach aims to increase the understanding of several factors which could influence prescribing decision-making process. However, the challenge with this is, the study may be concluding in revealing the actual behaviour. There are other factors such as bias, with lack of awareness from the participants and the difficulty in wanting to admit, what influences their prescribing habits. Their responses are possibly biased. There is a possible factor such as the effect of universal appeal which could significantly influence their responses. Furthermore, other limitations include specific omission of some critical information from the analyses of the data, despite carefully listening to audio and the original transcripts numerous times.

Future research should include both quantitative and qualitative approaches to increase robustness and triangulate the data collected from the sample about factors influencing prescription decisions. Other approaches could be included such as case studies which involve the investigation of a topic within the real-life context, using multiple sources of the data (Saunders & Lewis, 2012). The various factors that were identified such as the location of the study that influences an individual level should to further be investigated.

These factors suspected to be important as well and may vary depending on the location of the clinical practice. The current study implies that the results revealed that prescribing is very complex and influenced by many other factors like external factors such as national guidelines, scientific talks, the pharmaceutical industry to influence prescribing decisions. Personal experience has been shown to have a significant role with some

GPs which has influenced their prescribing decisions. Accordingly, further research should consider using other theories like complexity theory to assist in determining the influence of factors like such drug formularies on how they influence prescribing decisions. The future research study should perspectives other stakeholders like health authorities like the health ministry, medical aids, guidelines expect to take a more holistic approach. Lastly, the studies should investigate the influence of drug formulary further using existing theories like the theory of implementation to understand this influence better.

7.4   Limitations of the research

The following were identified to be the limitations or weaknesses of the study:

- The sample representative of the GP population in South Africa was too small. Therefore, the study cannot draw any conclusive findings from the twelve interviews.
- The study was conducted in one location, Johannesburg north and not extended to the rest of the country. This study should be replicated in other areas validate the findings of the study
- The focus of the study was only on one factor instead of looking at all factors that influence GPs prescribing behaviours
- The study did not include opinions of other critical stakeholders like the funders and policymakers to give it a more holistic view.

7.5   Conclusion

This study has proposed a conceptual framework based on the analyses of the data from the interviews. The study results suggest that there are possibly numerous factors that play a critical role when it comes to prescribing decisions process. There is a need for further research to validate this framework because of its limitations. Previous similar exploratory studies have developed and proposed similar models.

The results from studies have validated the results of this study. According to Murshid and Mohaidin (2017), several factors affect the way clinicians prescribe for patients.

These being: patient traits, marketing promotions by pharmaceuticals and pharmacists' factors. Although this proposed framework has limitations, it has some positives as well. Some crucial implications for GPs, health authorities, the ministry of health, medical aid schemes and other critical stakeholders in the health sector. The findings of this model could create an opportunity for better collaboration between clinicians and funders in the health environment.

Furthermore, the model could assist in resolving conflicts that exist and resolve the issues around policy design and execution within the health sector. The study findings also suggest that the relationship between GPs and medical aid schemes is not productive. These factors can be further explored and using appropriate theories.

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Appendix 1

<div align="center">(i)   Informed Consent Letter</div>

Dear Sir/Madam,

My name is Ntola Matuka, and I am currently registered for a Master's in Business Administration with University of Pretoria Gordon Institute of Business School (GIBS). The research is on the influence of medical aid scheme drug formulary policy on GPs prescribing decisions in private practice.

I would like to interview you as an expert on the subject matter, the interview is scheduled to last for 30 minutes and will help gain insights in understanding factors that influence prescribing decisions of medical doctors.

Your participation is voluntary, and anonymity is guaranteed. You can withdraw at any time. All data will be kept confidential. You can contact my supervisor or myself should you have any questions or queries. Our details are provided below.

Researcher: Ntola Matuka   Research Supervisor: Prof Lulama Makhubela

Email: 04903286@mygibs.co.za   Email: lulama.makhubela@gmail.com

Phone: 071 543 8872   Phone: 082 728 2951

Signature of researcher: _____

Date: _____

Participant name: _____

Signature of participant: _____

Date: _____

Appendix 2

<u>**Interview schedule**</u>

Introduction and explanation – thank the participant for accepting to participate and allocating time to do the interview.

The researcher will give a brief background and the purpose of the research study. The researcher will read the informed consent letter to highlight confidentiality and anonymity. Furthermore, the researcher will highlight that participation is voluntary, the participant is not obligated to participate in the study, and they may withdraw if they wish to.

Lastly to explain the study aims to gain insights and understanding on the following topic: " The influence of medical schemes drug formulary policy on GPs prescribing decisions."

Research Question 1: What influence do the medical schemes drug formulary policy has on GPs prescribing decisions?

1.4   What are the main essential factors that you consider when deciding on which drug to prescribe for patients with chronic medical conditions?
1.5   What influence do patients on medical aids with chronic medical conditions have on your prescribing decision? Why?
1.6   What kind of influence do the medical schemes drug formulary has on you when you prescribe drugs for patients?

Research Question 2: What are the GPs attitudes and motivations for following medical schemes drug formulary?

2.1   What motivates you to follow the medical schemes drug formulary?

2.2   What are the chronic medical conditions where you are not prepared to follow the medical scheme prefers?

2.3   In general, what are your attitudes toward medical schemes drug formulary policy?

Research Question 3: What impact could the medical drug formulary policy have on patients' health-related outcomes?

3.1   In your personal experience, has the medical scheme drug formulary policy impacted positively or negatively on the health-related patient outcomes? Please explain

3.2   How has the medical schemes drug formulary policy affected your decisions in choosing the drug based on efficacy and safety?

3.3   How do patients feel about the medical schemes formulary drugs?

Appendix 3

23 July 2018

Matuka Ntola

Dear Ntola

Please be advised that your application for Ethical Clearance has been approved.

You are therefore allowed to continue collecting your data.

Please note that approval is granted based on the methodology and research instruments provided in the application. If there is any deviation change or addition to the research method or tools, a supplementary application for approval must be obtained

We wish you everything of the best for the rest of the project.

Kind Regards

GIBS MBA Research Ethical Clearance Committee

Appendix 4

30/08/2018

Endorsedment Notice

Ethics Reference No: Temp2018-01387

Title: THE INFLUENCE OF MEDICAL SCHEMES DRUG FORMULARY POLICY ON GPs PRESCRIBING DECISIONS

Dear Ntola Matuka

The **Amendment** as described in your documents specified in your cover letter dated 23/08/2018 received on 23/08/2018 was approved by the Faculty of Health Sciences Research Ethics Committee on its quorate meeting of 29/08/2018.

Please note the following about your ethics approval:
- Please remember to use your protocol number (**Temp2018-01387**) on any documents or correspondence with the Research Ethics Committee regarding your research.
- Please note that the Research Ethics Committee may ask further questions, seek additional information, require further modification, or monitor the conduct of your research.

Ethics approval is subject to the following:
- The ethics approval is conditional on the research being conducted as stipulated by the details of all documents submitted to the Committee. In the event that a further need arises to change who the investigators are, the methods or any other aspect, such changes must be submitted as an Amendment for approval by the Committee.

We wish you the best with your research.

Yours sincerely

Dr R Sommers; MBChB; MMed (Int); MPharMed,PhD
Deputy Chairperson of the Faculty of Health Sciences Research Ethics Committee, University of Pretoria

The Faculty of Health Sciences Research Ethics Committee complies with the SA National Act 61 of 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 and 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes, Second Edition 2015 (Department of Health).

Appendix 5

17. APPENDIX 5   CERTIFICATION OF ADDITIONAL SUPPORT

(Additional support retained or not - to be **completed by all students**)

Please note that failure to comply and report on this honestly will result in disciplinary action

I hereby certify that (please indicate which statement applies):

- **I DID NOT RECEIVE** any additional/outside assistance (i.e. statistical, transcriptional, thematic, coding, and/or editorial services) on my research report: ....

- **I RECEIVED** additional/outside assistance (i.e. statistical, transcriptional, thematic, coding, and/or editorial services) on my research report
  .... *Editorial Services* ....

If any additional services were retained– **please indicate below which:**

☐   **Statistician**

☐   **Coding (quantitative and qualitative)**

☐   **Transcriber**

☒   **Editor**

Please provide the name(s) and contact details of all retained:

NAME: *PROF LULAMA MAKHUBELA*

EMAIL ADDRESS: *Lulama.makhubda@gmail.com*

CONTACT NUMBER: *082 728 2951*

TYPE OF SERVICE: *Editorial*

NAME: ....

EMAIL ADDRESS: ....

CONTACT NUMBER: ....

TYPE OF SERVICE: ....

NAME: ....

EMAIL ADDRESS: ....

CONTACT NUMBER: ....

TYPE OF SERVICE: ....

I hereby declare that all *interpretations (statistical and/or thematic) arising from the analysis; and write-up of the results for* **my study was completed by myself without outside assistance**

NAME OF STUDENT: NTOLA MATUKA
....

SIGNATURE:
....

STUDENT NUMBER:
04903286
....

STUDENT EMAIL ADDRESS:
04903286@my.gibs.co.za
....