

**FACTORS AFFECTING ANTIRETROVIRAL THERAPY PATIENTS` DATA
QUALITY AT PRINCESS MARINA HOSPITAL PHARMACY IN BOTSWANA**

by

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DEDICATION

This dissertation is dedicated to my husband; Endailalu Shimelis and sons; Ermias Shimelis and Dagmawi Shimelis.

DECLARATION

I declare that **Factors Affecting Antiretroviral Therapy Patients` Data Quality at Princess Marina Hospital Pharmacy in Botswana** is my own work and that all the sources that I have used or quoted have been indicated and acknowledged by means of complete references and that this work has not been submitted before for any other degree at any other institution.



Signature _____

(Hana Tsegaye Tesema)

DATE: November 2014

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ABSTRACT

AIM: This study aimed to explore the factors influencing antiretroviral therapy patients` data quality at Princess Marina Hospital Pharmacy in Botswana.

METHODS: A phenomenological approach was adopted in this study. Specifically, Interpretative Phenomenological Analysis qualitative design was used to explore the factors influencing antiretroviral therapy patients` data quality at Princess Marina Hospital Pharmacy in Botswana. Data were collected using a semi-structured interview format on 18 conveniently selected pharmacy staff. Data were analysed using Smith`s (2005) Interpretative Phenomenological Analysis framework.

RESULT: Five thematic categories emerged from data analysis: data capturing: an extra task, knowledge and experience of IPMS, training and education, mentoring and supervision, and data quality: impact on patients` care. The findings of this study have implications for practice, training and research.

CONCLUSION: Pharmacy staff had limited knowledge of IPMS and its utilisation in data capturing. Such limitations have implications in the context of the quality of data captured.

KEY CONCEPTS: Data quality, patient record, pharmacy, Interpretative Phenomenological Analysis.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immune Deficiency
AHIMA	American Health Information Management Association
ART	Antiretroviral Therapy
BMH	Botswana Ministry of health
CDC	Centre for Disease Control
HAART	Highly Active Antiretroviral Therapy
HIV	Human Immune-deficiency Virus
HIM	Health Information Management
HMIS	Health Management Information system
IPA	Interpretative phenomenological Analysis
IPMS	Integrated Patient Management System
SADC	Southern Africa Development Community
UNIAIDS	Joint United Nations Programme on HIV and AIDS
UNGASS	United Nations General Assembly Special Session on HIV/AIDS
WHO	World Health organization

CHAPTER 1: ORIENTATION TO THE STUDY

1.1 INTRODUCTION

The international community has responded in recent years with unprecedented attention and commitment to the human immunodeficiency virus (HIV) pandemic (Bussmann et al 2006:127). This is because of the increasing global HIV-related morbidity and mortality (World Health Organisation (WHO) 2007:3). The United Nations Programme on HIV and AIDS (UNAIDS) (2010:23) estimated that 33.4 million people lived with HIV globally at the end of 2009. Focusing specifically on Africa, it is not only claimed to be the home of approximately 14.5% of the world's population, it is also believed to house 69% of all people living with HIV and AIDS (UNAIDS) (2010:23). Added to this, Africa accounted for 72 % of all AIDS-related deaths in 2009 (UNAIDS 2010:23). Taking this into account, Africa is hugely affected by HIV and AIDS, with its Eastern and Southern regions being the most heavily hit areas by this epidemic (Southern Africa Development Community (SADC) 2011:1).

The Southern region of Africa has the highest cases of HIV and AIDS relative to the other regions of the world (Kironde and Lukwago 2002:127). In 2009, the Southern region was estimated to have approximately 22.9 million people living with HIV and AIDS, which in essence equates to 40% of all people living with these diseases worldwide (SADC 2011:1). Swaziland and Botswana were reported to have the highest prevalence of HIV and AIDS in 2009 in Southern Africa, with estimates of 25.9% and 24.8% respectively (SADC 2011:1). This is certainly a concern for governments of these countries, and for people in general living in the same. Attempts to address this concern using a range of strategies have been made. An example of these strategies relate to the introduction of antiretroviral treatment (ART).

ART is increasingly made available to people living with HIV and AIDS in the Southern region of Africa (Bussmann et al 2006:127; Bussmann et al 2009:37). The advent of ART has changed the global clinical picture of HIV and AIDS, as it has led to a reduction in morbidity and mortality related to these conditions (Highleyman 2010:13). A once fatal disease has been transformed into a chronic lifelong disease (Colvin 2011:2). Even though this is the case, the quality of life of people living with

HIV and AIDS is noted to be a concern in Southern Africa. Consequently, several ART initiatives were initiated in this region, as it bears the brunt of the HIV and AIDS burden of the world (Kironde and Lukwago 2002:127). The rationale for this is to improve the quality of life for persons with these diseases (Bussmann et al 2006:127). Given that Botswana has a high prevalence and incidence of HIV and AIDS, it makes sense for ART programmes to be increased in this state. This is the case in Botswana. While it is important to scale-up HIV treatment programmes to reach more patients seeking the service, monitoring the quality of care that patients receive and their clinical outcomes is equally important. Given the complexity of modern medicine and HIV-treatment programmes, it is difficult to conduct manual monitoring of the quality of treatment programmes. Taking this into account, Information Technology (IT) is claimed to have a role to play in the monitoring of the quality of healthcare provision, including data related to this (Eduardo and Clancy 2003:12).

The government of Botswana recognised the importance of IT in providing and monitoring patients' care. As a result of this, this government introduced an Integrated Patient Management System (IPMS) to centralise healthcare data. This IPMS is a comprehensive state-of-the-art health-care information technology system used for capturing healthcare data (Bussmann et al 2006:127-131). High quality data is important for planning healthcare decision-making and management of care. The IPMS thus has a role to play in ensuring accurate, comprehensive and timely data. Hedt-Gauthier, Tenthani, Mitchell, Chimbwandira, Makombe, Chirwa, Schouten and Jahn (2012:126) agrees with this by stating that high quality data is critical for managing, monitoring, and evaluating national HIV treatment programmes. High quality data will ensure quality care provision. Acknowledging this, it is essential for healthcare settings to have up-to-date and comprehensive patients' health care information in order to inform care decision-making. Taking this into account it could be argued that patients on ART would benefit from improved data quality. In support of this assertion, Forster, Biggs, Melvin, Walters, Tudor-Williams and Lyall (2006:677) reiterated that accurate clinical data is a prerequisite for high standards of care and monitoring. Even though this is the case, the quality of the data collected in ART treatment programmes is reported by Ronda Epidemiológica (2007:11) to be unsatisfactory, as some data, for instance, during admissions are sometimes not

captured. Patient's data may include types of medication and medication regime. This information is sometimes noted to be missing in patients' data (Cullum, Ciliska, Haynes and Marks 2008). This study therefore focuses on this area of concern, particularly on factors that may influence the quality of data in an Integrated Patient Management System (IPMS) for patients on ART.

This dissertation consists of a number of chapters and subsections. Resumes of each of these are offered here to allow readers to follow and understand discussions on issues presented. Chapter one sets the scene for discussion by providing a background to the study and a rationale for undertaking the same, including the research problem. Chapter two is a review of the extant literature on Integrated Patient Management Systems (IPMS), including their application and usefulness. It also includes a systematic account of the data search strategies used within the review. Chapter three focuses on discussions of the methodological and ethical issues of the study. Also included are discussions on quality issues of the study. Chapter four relates to the findings or results of the study. They are presented here and discussed using extant literature discussed in chapter two. The final section, chapter five offers a resume of the findings and an examination of their implications and recommendations for practice, research and training. This chapter also includes concluding remarks relating to the entire research process.

1.2 THE BACKGROUND TO THE RESEARCH PROBLEM

Sub Saharan Africa makes 9% of the world population and carries two thirds of the total HIV burden of the world, which in essence equates to 22.9 million people living with this condition in this region (WHO 2007:3). As briefly mentioned earlier, Botswana is one of the states in Sub Saharan Africa that is hardest hit by HIV and AIDS epidemic (United Nations General Assembly Special Session on HIV/AIDS (UNGASS) report 2010:4). In 2012, an estimate of 300,000 people with HIV and AIDS was reported to live in Botswana. The population of this state is approximately two million. The adult HIV prevalence of this state is 24.6 %, a rate that is reported in the literature to be the second highest in the world, with Swaziland considered to have the highest (CDC Botswana 2012). There is therefore a need to scale up care provision to address this problem in this state (Botswana) and the Southern region

as a whole. The provision of evidence-based care is an ongoing debate in care services in the developed world and other healthcare providers in developing countries, like South Africa and Botswana (Polit and Beck 2012:25-33). This debate is usually triggered by patients' demand for quality care provision, and professional bodies' quest to ensure that recipients of care are offered the best available care (Polit and Beck 2012:25-33). Such care can be offered if patients' healthcare data are timely and accurately captured, and analysed to inform evidence-based decision-making.

In 2001, the government of Botswana commenced an ART programme with an intention to address the health needs of all its HIV-positive citizens by the end of the year, 2013 (CDC Botswana 2012). Given the high prevalence and incidence of individuals living with HIV and AIDS, Botswana needs a well organised ART patient data management system to capture and generate quality information that in turn can facilitate effective implementation of treatment and care. In agreement with this, Herrmann, McKinnon, John, Hyland, Martinez and Cain (2008:20) highlight that there is a critical need for an effective information management system, particularly in instances where there are significantly high incidence and prevalence of health conditions, such as HIV and AIDS. The rationale for such IT systems, like the IPMS is to generate quality data that will inform care decisions for patients and service related issues, such as the number of healthcare workers needed. Added to this, ART is not a one-off treatment but rather a lifelong one. This means individuals receiving ART need to be followed-up over a prolonged period of time and their clinical records thus serve as important points of reference for dispensing these drugs. Hence, it is critical that dispensers are able to access and retrieve patients' clinical records or data.

The Princess Marina hospital pharmacy uses Integrated Patient Management system (IPMS) for ART patient data management. The IPMS collects huge amount of data and processes these to produce information that is important for evidence-based decision making. This system makes available information about patients to pharmacists during periods of dispensing medication (such as ART) and counselling.

Pharmacists use this information to make important clinical decisions about patients' care. Examples of such decisions could include altering medication regimen and changing appointments' dates. Such decisions can be effectively made with the help of high quality data (Creswell 2009:10). The question now arises, what is high quality data?

High quality data has six key attributes and these include accuracy, reliability, credibility, timeliness, completeness and appropriateness (Creswell 2009:10). Arguably, the degree at which a datum meets each of these criteria determines its quality. High quality data are therefore considered as data that are not only relevant and accurate, but that which are also available in a timely manner to decision-makers for healthcare delivery and planning purposes (Herrmann et al 2008:20). An IPMS is claimed by researchers to capture and generate quality data. Even though this has been noted elsewhere like developed countries (e.g. United Kingdom), this might not be the case in developing states (Foster et al 2006:678). For example, failures to capture patients' data using IPMS in hospitals of developing countries have been reported in a study by Ronda Epidemiológica (2007:11). Such failures have negative implications to the quality of care offered to patients. Yet, the effectiveness of IPMS has not been explored in Botswana since its introduction in 2004 in hospitals of this state. Hence, this study, which explored factors influencing antiretroviral therapy patients' data quality in a hospital in Botswana.

1.2.1 Statement of the Research Problem

Burns and Grove (2005:70-71) define a research problem as "a situation in need of a solution, improvement alteration, a discrepancy between the way things are and the way they ought to be". Princes Marina Hospital is one of the main referral hospitals in Botswana, with the highest number of patients on ART in the country. The IPMS was introduced in this hospital with the view of improving data capturing and management, and quality of care offered to patients. It was noted that the quality of data collected in ART treatment programmes at this hospital were sometimes unsatisfactory, as patients, for instance occasionally complained of not being given medication on time despite the introduction of IPMS. Evidence of adverse drug

reactions has been reported in this hospital. These outcomes could be attributed to lack of knowledge on how to use technology and problems with technology itself, a view acknowledged by Morse (2002:3). While such aspects of provision of care could be a function of a multitude of factors, the exact nature of these factors and their impact on quality care provision are presently unknown. Identification of factors and understanding their impact may influence the accuracy of healthcare data collection and care offered to patients on ART treatment programmes. To date, there are no published studies on IPMS data quality on patients on ART in Botswana.

1.3 AIM OF THE RESEARCH

1.3.1 Research Purpose

The purpose of this study was to explore pharmacy staff's perceptions of factors influencing antiretroviral therapy patients' data quality at Princess Marina Hospital Pharmacy in Botswana.

1.3.2 Research Objectives

The objectives of the study were to:

- Identify and explore factors influencing the quality of data of patients' on ARTs captured by IPMS.
- Explore the impact of factors influencing ART patients' data quality on care provision.
- Offer recommendations to improve the quality of ART patients' data captured by IPMS

1.4 SIGNIFICANCE OF THE STUDY

This study explored pharmacy staff's perceptions of factors influencing antiretroviral therapy patients' data quality in a hospital in Botswana. The study also explored the impact of these factors on patients' care. The outcomes of this study may result in improved understanding of IPMS data quality of patients on ART. It is thus believed that the outcome of this study would enable the researcher to make recommendations to improve patients' data quality using IPMS, with emphasis on patients on ART.

1.5 DEFINITION OF KEY CONCEPTS AND OPERATIONALISATION

The concepts defined below are used in this study.

- **Data:-** is a collection of facts, such as values or measurements. It can be numbers, words, measurements, observations or even just descriptions of objects (Creswell 2009:12).
- **Patient Data:** - This relates to information relating to an individual patient's care and treatment. Examples of these include prescriptions, diagnoses, procedures, physician visits, admission spells or episodes, and laboratory tests (Bussmann et al 2006:127-131).
- **Information:** This relates to pieces of data organised in such a way that allows people to make conclusions or gain knowledge. In other words, information is datum that is meaningful, relevant and organised for a purpose, and presented within a context to increase understanding of patients' health status (Oxford Advanced Dictionary 2000:20).
- **Data quality:** This concerns a perception or an assessment of data's fitness to serve its purpose in a given context (Creswell 2009:12).
- **Health Information System:** This relates to a system that integrates data collection, processing, reporting, and use of the information necessary for improving the effectiveness and efficiency of health services.
- **Health information management (HIM):** This refers to the practice of maintenance and care of both paper-based and electronic health records in hospitals (Oxford Advanced Dictionary 2000:40).
- **ART** Antiretroviral therapy (ART) refers to the treatment of people infected with the human immunodeficiency virus (HIV) using anti-HIV drugs (WHO 2007:43).
- **HAART:** This is the standard treatment of people infected with HIV. This treatment consists of a combination of at least three drugs, often called "highly active antiretroviral therapy" or HAART. This mixture of drugs, HAART suppresses HIV replication (WHO 2007:43).

- **IPMS:** Integrated Patient Management System includes pharmaceuticals management information system (PMIS). It is a system that provides pharmaceutical information to support decision-making process at each level of an organization (CDC Botswana 2012).

1.6 FOUNDATIONS OF THE STUDY

1.6.1 Research Design

1.6.1.1 Paradigm

A paradigm is a worldview or perception that helps researchers to understand phenomena under investigation (Morgan 2007:50). They have a range of assumptions. Healthcare research is generally carried out within two broad paradigms; positivists and naturalistic or constructivist. These fall under quantitative and qualitative methodologies respectively. The researcher of this study opted for a qualitative methodology that is underpinned by a constructivist paradigm that has an ontological assumption of multiple truths or realities. The researcher believes that engaging with healthcare workers who have experience and knowledge of IPMS and work closely with this patient group can understand the realities about issues of data quality of patients on ART and IPMS. These beliefs are consistent with the assumptions of a constructivist paradigm. Hence, it is preferred for this study. Thus one-to-one open interviews were used in this study as data collection methods.

1.6.1.2 Research Design

The study is qualitative in nature, as it adopted a phenomenological approach, specifically Interpretative Phenomenological Analysis (IPA). According to Creswell (2009:43-44), this type of research design enables researchers to explore the knowledge and experiences of study participants of a phenomenon and how they make sense of their experiences of that phenomenon (Creswell 2009:43-44). This suggests that researchers have an active role in the research process to develop understanding of phenomena explored. Researcher using this design should be

aware that participants might not experience the same phenomena in a similar manner given that each context, no matter how similar, may be unique to individuals (Smith 2009:150). According to Sandy and Shaw (2012:66), IPA is a type of phenomenology that emphasis on understanding the meaning of human experiences in relation to a specific phenomenon. IPA stresses that the meanings of phenomenon can be accessed and understood through prolong researcher-participant interactions and the use of a critical questioning style over what the latter say (Sandy and Shaw 2012:66). Adopting these approaches can generate comprehensive insights into IPMS and factors influencing its effectiveness in the context of capturing quality patients' data.

1.6.2 Research Methods

1.6.2.1 Population and Sample Selection Technique

The population universum for this study comprised of all healthcare professionals who work in the study site and are familiar with IMPS. The target population is a subset of the population universum. It is a group about whom the researcher wanted to know more about and from whom the sample was drawn. Specifically, the target population for this study was all pharmacy staff of the study site that were familiar with IPMS.

A sample is a subset of the target population selected to participate in a research study (Polit and Beck 2008:750). The researcher used a criterion purposive sampling to select or recruit participants of the study. Babbie (2010:193) defines this as a type of non-probability sampling in which the units observed were selected on the basis of the researcher's judgment about which units are useful for offering rich information about the phenomenon studied. The judgment for selecting this proposed sampling approach was based not only on participants' knowledge and experience of IPMS and ARTs, but such decision was also based on participants' willingness to participate. In addition to this, participants must have at least two years experience of using IPMS and working with patients on ARTs in order to be selected for participation. The sample of this study was determined by category saturation.

Eighteen (18) pharmacy staff that met the study criteria were purposively selected for participation.

1.6.2.2 Data Collection and Analytical Approach

Data were collected through individual interviews with participants using a semi-structured format. All interviews were conducted in a private room of the study. All interviews were guided by an interview schedule. Data were analysed in line with the Smith's (2009) interpretative phenomenological analytical framework. The stages of this analytical framework are provided in chapter three.

1.7 SCOPE AND LIMITATION OF THE STUDY

The study was conducted in a single site, and used a criterion purposive sampling approach to identify and recruit participants. Pharmacy staff at the study site may be different from those in other hospitals in the context of their experiences and knowledge of IPMS and ART. Additionally, the findings of this study are based on retrospective accounts of experiences of IPMS. Such accounts are subject to memory bias. They are also potentially subject to the social desirability effect, whereby participants might 'police' their responses in order to avoid negative judgments by researchers. Although the findings of the study are not generalisable to the wider population of IPMS and ART, they provided useful insights into understanding issues of data quality relating to IPMS and ART.

1.8 CONCLUSION

This chapter briefly discussed the study background to the problem, problem statement, purpose and significant of the study, research design and methodology, including data collection and analysis. It also included definitions of key terms used in the study. In other words, this chapter has provided a succinct overview of the discussions presented in subsequent sections of chapter three of this dissertation. It is important to note that the chapter provided a clear message of the intention of this

study, and has contributed to the development of insight into IPMS and its application in ensuring the capturing and provision of quality data for patients on ART in Botswana. Such insight requires enhancement. The researcher believes that an extensive review of the literature is a good starting point for enhancing such an understanding. It is therefore imperative to conduct a literature review on this subject, IPMS. The next chapter is a review of the literature on IPMS, ART, and related issues.

CHAPTER 2: LITERATURE REVIEW

2.1 INTRODUCTION

This chapter is a literature review of the extant literature on IPMS, including its utilisation and data quality. A Literature review is a systematic process of identifying, scrutinising and summarising written information about a specific research problem (Levy and Ellis 2006:181). According to Olufemi (2008:5), a literature review is not just a description of what other people have published but a critical discussion that presents insight and an awareness of the different arguments, approaches and theories related to the topic. To achieve this vision in a sound manner, a systematic approach is required to thoroughly search and explore all the sources of literature (Parahoo 2006:342). So, knowledge on the strength or quality of literature sources is implicated in this process. Ellis and Levy (2008:17) state that the work of a researcher should be built on the works of others. By so doing, the literature review helps in minimising chances of duplication. It also increases chances of coming up with new information. Here, a systematic overview of the data search strategies used within the review is clearly articulated. A critical account of the process undertaken is provided. The findings of all the materials analysed are also critically discussed in this review and emergent themes are highlighted. The decision to review specific literature sources was made following a quantitative-qualitative debate.

2.2. QUANTITATIVE-QUALITATIVE DEBATE

Healthcare research is generally carried out within two broad paradigms; positivists and naturalistic, which in essence can be referred to as quantitative and qualitative respectively. There has been an ongoing uncertainty about which methodological (qualitative or quantitative) approach is most suitable for exploring health care issues. Discussions in this context about which methodological approach is superior or inferior have been ongoing for decades, but they tend to focus mainly on rigour, validity and reliability of research studies (Polit and Beck 2004:114).

Historically, researchers have perceived 'scientific methods' of research to consist of only quantitative research. This is because it is founded on a systematic and objective process, deemed to provide a sounder knowledge-base to guide health

care practice than qualitative research (Porter, Millar and Reid 2012:31). On the other hand, advocates of qualitative research claim that this approach is more effective for enhancing people's understanding of human experiences and factors that may influence behaviour, such as utilisation of IPMS (Wertz 2011:79). The same author also states that qualitative research concentrates on discovery and understanding of a subject from all angles, a methodology that is in keeping with the holistic philosophy of nursing. According to Finlay and Gough (2003:79), qualitative approaches regard the use of a subjective approach as a necessity for understanding lived experiences and people.

Acknowledging the discussions thus far, dependence on either qualitative or quantitative research would be inappropriate in the quest to understand factors that may influence the quality of data of patients on ART captured by IPMS. Each paradigm has its own strengths and weaknesses. In combining the two paradigms, the researcher intends to maximise on the strengths of each paradigm and also hopes that the weaknesses of one will be made up for by the strengths of the other. Hence, articles on data quality and IPMS from both paradigms, qualitative and quantitative, were employed or used in this study.

2.3 SEARCH STRATEGY

To ensure that this literature review explored the subject in a sound, inclusive and a reproducible manner, a systematic approach was undertaken to thoroughly search and explore all the sources of literature. Initially, the University of South Africa library was used to search for books and journals that were related to the IPMS, data quality and factors that may influence the same. The use of electronic databases like the Cochrane database, OVID, Medical Literature Analysis and Retrieval System Online (MEDLINE) and HINARI were also used to offer a wider range of literature. The following words and phrases were used as search terms: "antiretroviral therapy", "data quality", "factors influencing" and "integrated patient management system". Each of the search terms were initially used individually, and then combined using Boolean operators AND and OR.

The inclusion and exclusion criteria outlined below were used to guide the literature review process:

Inclusion criteria

- Studies that explored patients` data quality in general.
- Studies that explored quality of patients` data captured by IPMS.
- Studies that examined factors that influence patients` data quality.
- Studies published after the 1990s.
- Studies that were published in English.

Exclusion criteria

- Studies that did not explore patients` data quality.
- Studies that did not explore patients` data captured by IPMS.
- Studies that did not examine factors that influence patients` data quality.
- Studies published before the 1990s.
- Studies published in languages other than English.

2.4. APPRAISAL OF IDENTIFIED STUDIES

After applying each of the above criteria, only 15 articles met the criteria for inclusion in the review. All the papers selected were critically examined. The process of reviewing each study was based on established and validated models of critical appraisal, such as those offered by Depoy and Gitlin (1994:220), Polit and Beck (2004:342) and Lincoln and Guba (1985:132). The decision to use a combination of frameworks is in keeping with guidance from Silverman (2004:234). He stipulated that a mixture of appraisal frameworks must be used for appraising qualitative and quantitative research sources, as these literature sources are inherently different in terms of the quality of evidence they offer.

In essence, the review of individual studies was weighted on the knowledge contribution made to current understanding of IPMS and its utilisation. To be more

specific, the studies were evaluated in terms of their rigour, validity, reliability, dependability and transferability to the practice context (Polit and Beck 2008:232). Further attention was given to the handling of data within each of the reviewed sources, including how well researchers addressed potential limitations of their studies. Several themes emerged during the execution of this review.

2.5 EMERGENT THEMES

The following themes emerged from the literature sources reviewed:

- Quality Data
 - Data accuracy
 - Timeliness of data
 - Consequences of poor data quality
-
- **Quality of data**

Data that are accurate, complete and timely delivered to users play significant roles in health planning, management and decision-making. Accurate data that are utilised in a timely manner constitute quality data (Creswell 2009:10). It is noted in the literature that quality data can result in good clinical decisions, such as timely prescription and administration of medication (Foster, Biggs, Melvin, Walters, Tudor-Williams and Lyall 2009:679). The converse, poor data have been consistently reported in the extant literature not only to lead to poor decision making, but also noted to contribute to time wasting and wasting of resources (Cullum, Ciliska, Haynes and Marks 2008:68-70). Taking into account the issues of poor decision making and wasting of resources, it could be argued that poor data quality is primarily a behavioural problem, not a technological problem. This indicates that the quality of clinical data can be improved by changing people`s attitudes and behaviours toward the need for quality care provision. It is important to recognize that provision of quality of care cannot be achieved in the absence of quality clinical data. So, acknowledging that people`s behaviours are in the main influenced by a range of factors, organisations may therefore need to firstly identify these factors (Hedt-Gauthier, Tenthani, Mitchell, Chimbwandira, Makombe, Chirwa, Schouten, Pagano and Jahn 2012:2). Doing so would enable organisations to develop strategies for enabling users of technology, IPMS, to act as desired. An example of

desired action is timely capturing of patients' data. However, this is not always realised. Thus, to ensure that quality data are captured and utilised, organisations need to develop clear policies and support processes to ensure effective implementation of data capturing technological systems. The utilisation of technological systems, such as IPMS, can promote or ensure reliability, validity and accuracy of data captured (Hedt-Gauthier et al 2012:2).

- **Data accuracy**

One important aspect for improving data quality is to ensure that information or data are accurately captured. Doing this requires adequate skills and knowledge of using support systems, such as the IPMS. Appropriate and adequate skills and knowledge acquisition of the use of support systems may lead to accurate data capturing, which in turn may result in quality care provision. But it must be mentioned that capturing inaccurate data may result in poor data quality and inadequate care provision (Foster et al 2006). This has implications for practice, as poor data quality may lead to inadequate care provision (Polit and Beck 2012:27). Thus, it is important that the right and correct data are captured and reported accurately. This suggests that healthcare staff involved in data capturing and reporting should be trained in the use of support systems. Whilst this is an important suggestion, healthcare workers in many countries using technological support systems are generally not trained in their application. In addition to training, the availability of clear guidelines for the use of support systems, such as IPMS would help in ensuring that healthcare professionals capture accurate data. The evidence-based movement supports this assertion, as it stressed that accurate data provide solution to improving healthcare quality in cost-constrained environments (Polit and Beck 2012:26). It is therefore critical for healthcare professionals to ensure that they capture or document at all times in a timely manner accurate patients' data.

- **Timeliness of data**

Evidence-based practice is a rational approach to providing the best possible care with the most cost-effective use of resources (Melnyk and Fineout-Overholt 2011:200). So, the timely capturing or documentation of patient information using technological support systems like IPMS would enable healthcare professionals to

offer evidence-based care or best available care to patients. Thus, timely capturing of data should therefore be part of an overall data collection strategy that managers can employ to improve the quality of information and care offered to patients. In fact this is the case for this study, as managers of the study site have developed approaches to monitor and ensure effective and timely data capturing using IPMS. Managers of the study site were critically aware that data were needed to make informed clinical decisions. To achieve this, healthcare professionals should be able to access data when needed to make clinical decisions for patients care.

- **Poor data quality: its impact**

The development of information technology has enabled healthcare organizations to collect and store huge volumes of data. However, it is worth stating that huge increases in data volumes are generally associated with great difficulties to effectively manage them (Rolfe 2006:79). It is therefore not surprising to note in the literature that managing and maintaining data quality is an ongoing concern in healthcare settings (Wang and Strong 1996:8). This is because failure to ensure data quality, particularly in healthcare environments could result in serious consequences. Examples of such consequences are inadequate and inaccurate capturing of data that in turn may lead to inadequate and inappropriate care provision, and sometimes deaths (Foster et al 2006; Creswell 2009:10). Thus, some managers in health care environments have taken steps or measures to address these concerns by introducing, for example, information support systems, such as IPMS. Despite this effort, evidence of poor patients' data quality and its impact is still noted in healthcare settings.

Poor quality data can have social and economic impact on healthcare organisations and individuals, including patients and employees (Creswell 2009:11). In relation to employees, there could be lower performance and lowered employee job satisfaction (Wang and Strong 1996:8). With regard to patients, there could be less satisfaction, and inadequate care provision because of inefficient decision-making processes (Wang and Strong 1996:8). In relation to organisations, poor data quality may increase operational costs, as time and financial resources may be spent in detecting and correcting errors (Creswell 2009:11).

2.6 CONCLUSION

This chapter presented an overview of literature related to the subject researched, pharmacy staff's perceptions of factors influencing antiretroviral therapy patients' data quality. The next chapter focuses on the methodology and specific design employed to conduct this research study. Ethical issues are also addressed in this chapter.

CHAPTER 3: RESEARCH DESIGN AND METHOD

3.1 INTRODUCTION

This chapter describes the research design that was used to explore pharmacy staff's perceptions of factors influencing antiretroviral therapy patients' data quality in a hospital in Botswana. This chapter also includes descriptions of the sampling process and sample size, research settings, data collection, data analysis, and ethical issues of the study.

3.2 RESEARCH DESIGN

Polit and Beck (2004:49) describe the research design as a blueprint, or outline for conducting a study. The research design is researchers' overall plan for obtaining answers to research questions guiding studies. Burns and Grove (2005:211) state that designing a study helps researchers to plan and implement a study in a way that help them obtain credible results. Thus, increasing the chance of obtaining information that could be associated with the real situations.

The study is qualitative in nature and it adopted a phenomenological approach, specifically Interpretative Phenomenological Analysis (IPA). This design was adopted in this study for a wide range of reasons. IPA enables researchers to understand people's experiences of specific issues by focusing on their personal perceptions of the same (Smith 2009:20). It enables researchers to develop an understanding of the meaning people attribute to particular situations, which in this case relate to pharmacy staff's perceptions of factors influencing antiretroviral therapy patients' data quality in a hospital in Botswana. According to Creswell (2009:43-44) the purpose of this type of research is to explore knowledge and experiences of study participants. Creswell (2009:43-44) further indicates that participants may not experience the same phenomena given that each context, no matter how similar, is always unique. According to Sandy and Shaw (2012:66) IPA emphasis on understanding the meaning of human experiences through description and interpretation of the same. It stresses that the meanings which a phenomenon hold for people can be understood through active engagement, which in essence

relates to participant- researcher interactions (Smith 2009:19). It is epistemologically assumed that access to these meanings can be possible if researchers adopt both “insider” and “outsider” perspectives (Smith, Flowers and Larkin 2009:90). The stance of “an insider” requires researchers to use their preconceptions to understand individuals` personal worlds and the meaning they attribute to them. In relation to the stance of an “outsider” researchers are encouraged to stand alongside participants and ask critical questions over things they say. Adopting this double hermeneutic approach can generate comprehensive insights into the pharmacy staff`s perceptions of factors influencing antiretroviral therapy patients` data quality in a hospital in Botswana.

3.3 RESEARCH METHOD

3.3.1 Population

Polit and Beck (2004:563) refer to a population as the entire set of individuals who have common characteristics that are sometimes referred to as the “universe”. It is therefore not surprising for De Vos, Strydom, Fouché and Delpont (2011:223) to refer to a study population as a term that sets boundaries on the study units, which are in essence considered as individuals or objects in the universe who possess certain characteristics. In other words, a population is the aggregate or the totality of all subjects or members that conform to a set of specification or characteristics (Babbie 2010:90). In this study, the individuals in the universe, in other words the study population were all employees of Princes Marina Hospital who were working in the its pharmacy department during the research study period. The accessible population was pharmacy staff of the target population who were familiar with IPMS and used the same in the treatment of patients on ART during the study period. It was the population to which the researcher had reasonable access (Johnson and Christensen 2010:257). The sample of this study was selected from this population using the following eligibility criteria.

Inclusion criteria

- Pharmacy staff with knowledge and experience of IPMS and ARTs. This was to ensure that rich information of the subject researched was obtained from participants
- Pharmacy staff with at least two years' experience of using IPMS and working with patients on ARTs. Two years is an adequate period that would allow for professional socialization and knowledge development on the subject researched.
- Pharmacy staff that were willing to participate in the study. This is because willingness to participate will enable participants to share their experiences of IPMS and ARTs.

Exclusion criteria

- Pharmacy staff with no knowledge and experience of IPMS and ARTs.
- Pharmacy staff with less than two years' experience of using IPMS and working with patients on ARTs.
- Pharmacy staff who are not willing to participate in the study

3.3.2 Sampling and Sample Size

A sample is a subset of the population selected to participate in a research study (Polit and Beck 2008:750). This research study employed a criterion purposive sampling approach to select and recruit its participants. This is a non-probability sampling approach in which the units to be observed are selected on the basis of specific or defined eligibility criteria (Babbie 2010:193). The chosen sampling approach, criterion purposive was appropriate for this study because the sample is selected from participants with shared experience of the phenomenon studied (Creswell 2007:20). Hence, the need for a set or specific eligibility criteria critical to inform the sample selection. A meeting was organized for all pharmacy staff to discuss the study. The pharmacy staff were informed during this meeting about the purpose of the study, including its benefits. Added to this, all the staff was invited to participate, and an information leaflet was given to each of them with a note requesting for the

researcher to be contacted with the view to express willingness for participation. All pharmacy staff (25) expressed willingness for participation.

Generally, sample sizes for phenomenological studies are small (1-20 participants) to allow for in-depth exploration of phenomena studied. In IPA studies like this study, the sample sizes are particularly small because of the case-by-case analysis and in-depth of analysis required in each case (Sandy 2013:360). Eighteen participants (18) met the inclusion criteria and were recruited for participation in the study. These participants expressed their willingness for participation by signing a consent form each (see appendix A). The sample size of this study was determined by category saturation.

3.3.3 Data Collection and Analysis

Polit and Beck (2004:32) define data as information obtained during the course of an investigation or study. In this study, data were collected through individual interviews with participants using a semi-structured interview schedule. Individual interviews were adopted in this study as data collection methods for a number of reasons. While the use of language in the form of conversation by participants was considered essential in gaining insight into their perceptions and values of IPMS and ARTs, it provides the opportunity to generate rich data on the subject researched (Polit and Beck 2004:32). Added to this, individual interviews were used in this study because their contextual and relational aspects were seen as significant to understanding people's perceptions (Polit and Beck 2004:32). All interviews were audio-recorded and conducted in a private room of the study site. Participants' consent was again sought and obtained before the interviews were commenced. This was preceded by re-explanations of the purpose of the study, including its benefits. Participants were also informed that they could discontinue the interview process at any time. The interviews lasted from 45 to 60 minutes.

All audio-recorded interviews were transcribed and transcripts were analysed manually using IPA framework of analysis (Sandy 2013:360). The stages of the analytical process are illustrated in figure 1 below (Sandy 2013:360).

Stage 1: Reading and reading transcript to familiarize with participant's account

Stage 2: Making notes of interesting issues about participant's account

Stage 3: Development of emergent themes that capture meaning of participant's account

Stage 4: Searching for connections across emergent themes

Stage 5: Development of a master table of themes containing superordinate themes, sub-themes and quotes from transcript

Stage 6: Development of a single master table of themes from master table of themes of individual transcripts.

IPA stages of analysis

Transcripts were analysed one at a time through these stages. The analysis was conducted in parallel with the interviews until category saturation was achieved. The outcomes of the analysis are five thematic categories listed below. These themes are discussed in chapter four together with excerpts from participants:

- Data capturing: an extra task
- Knowledge and experience of IPMS
- Training and education
- Mentoring and supervision
- Data quality: impact on patients' care.

3.3.4 Ethical Considerations

Redman (2001:4) define ethics as a code of behaviour that is considered correct. Research ethics refers to personal honesty and integrity when conducting a study. It starts with the identification of the study area or subject and continues through to the dissemination of study materials (Burns and Grove, 2008:184). According Poilt and Beck (2008:753), research ethics refers to the system of moral values that are concerned with the degree to which the research procedures adhere to professional, legal and social obligations for the study participants. Ethics is typically concerned with morality, and both the word "ethics and "morality" pertain to the matter of right

and wrong. Anyone involved in scientific research need to be aware of what is proper and what is improper when conducting scientific enquiries (Babbie 2001:62).

3.3.4.1 Protecting the Rights of the Institutions Involved

Researchers have a responsibility to ensure that their research plans are ethically sound and acceptable. But researchers may not be objective in assessing risk or benefit ratios or in developing procedures to protect participants' rights. Thus, it is a standard practice for the ethical dimensions of a study to be subjected to external review, such as that provided by an institutional ethics committee (Polit and Beck 2008:184). The researcher was granted ethical approval and permission to conduct this study at different levels. Permission to conduct the study was first granted by the University of South Africa's (UNISA) Postgraduate Research Ethics Committee (see appendix B). This was followed by permission to conduct the study from the Botswana Ministry of Health's Research and Development Committee, and the Botswana Ministry of Education and Skills Development. Permission to access the study site was also requested by the researcher from the Princess Marina Hospital management team (see appendix C). This team formally granted permission to the researcher to access the study site. The researcher assured all the relevant authorities that confidentiality of participants and the hospital would be respected at all times throughout the study.

3.3.4.2 Autonomy

The right to self-determination is based on the ethical principle of respect for persons. Because human beings are capable of self-determination, or controlling their own destiny, they should be treated as autonomous individuals, who have the freedom to conduct their lives as they choose without external control. In addition, subjects have the right to withdraw from a study at any time without penalty (Burns and Grove 2008:189). Participants were informed that participation was absolutely voluntary, and their rights of not-to-answer any part or all of questions were respected. Study participants were asked to give their written consent to participate in the study. The data collection commenced after participants expressed their

willingness for participation, in other words, after signing consent forms. Participants were informed that they could withdraw from the study at any time.

3.3.4.3 Confidentiality and Anonymity

A research project guarantees anonymity when the researcher himself / herself cannot identify a given response with a given respondent. A research project guarantees confidentiality when the researcher can identify a given person's responses, but essentially promises not to do so publicly (Babbie 2001:64-65). As is evident from the interview, the names of the respondents were not required. As a result, the data were collected anonymously. Study participants were assured that their responses would be kept confidential and that the findings of the study would not be linked to them. Researchers' behaviours before, during and after data collection have the potential of harming respondents (Parahoo 1997:301). In this study, data collection was held in a private room and each study respondent was given a unique identification code, which was used during data entry and their names were not recorded.

3.3.4.4 The Scientific Integrity of the Researcher

Research in all fields is a significant feature of all societies and represents major commitments of researchers. Results and findings from researchers sometimes form the basis of policy development and decisions at governmental levels. Therefore, it is of paramount importance that the research is conducted with integrity, and in accordance with high ethical standards (Babbie 2001:64-65). The researcher of this study maintained professional ethics and scientific conduct throughout the study.

3.3.5 Rigour of the Study

Rigour is a measure of the overall quality of research, reflected in the stages of the research process that include data collection and analysis (Macnee and McCabe 2008:161). Determining qualitative rigour, often called trustworthiness, is an interpretative process, involving researchers' presentation of study reports and the

readers' judgment of the veracity of the same (Porter 2007:80). Although a number of guidelines, such as the Critical Appraisal Skills Programme (CASP) are available for ensuring rigour of qualitative research (Spencer, Ritchie, Lewis and Dillon 2003:14), this study elects to adopt the framework of trustworthiness posited by Guba and Lincoln (1994:106), as it seems to fit in well with the qualitative world of multiple realities and ways of knowing. It includes five criteria; credibility, dependability, confirmability, transferability and authenticity.

Credibility: This study has credible findings as it reflects the experience and perceptions of research participants on IPMS and ARTs (Macnee and McCabe 2008:161). To enhance credibility, the researcher developed rapport and trust with the research participants. Individual in-depth interviews were conducted with participants using an interview schedule as a guide. All interviews were audio-recorded and transcribed verbatim. Some transcripts were taken to some participants to determine their accuracy, and in all cases participants were satisfied. This is what is referred to as member checking. The researcher also had the opportunity for some of the analysed data to be validated by a second researcher. The second researcher carried out validity checks on the master list of themes. This was to ensure that the themes were relevant and evidenced in the data.

Dependability: Dependability refers to the reliability of data over time and the conditions under which it was obtained (Guba and Lincoln 1994:106). Establishing dependability can be seen as a parallel process to that of confirming reliability in quantitative data (Macnee and McCabe 2008:162). Creswell (2009:239) indicates that if credibility is established then dependability is said to have been achieved. In this study, dependability was enhanced by validity checks, use of an interview schedule, and audio recording of all interviews. Dependability was further enhanced in this study by the verbatim transcription and step-by-step analysis.

Confirmability: This refers to a mechanism of ensuring that the data represents information that the participants provided (Macnee and McCabe 2008:162). Adopting verbatim transcription of interview data ensured confirmability. Confirmability also relates to the degree of agreement between two or more researchers about the accuracy, meaning and relevance of data. Notes were taken during interviews and

were compared with transcribed data. Consistency in the two sets of data was noted. Validity checks also helped to ensure confirmability.

Transferability: In this study the researcher described the context of the research, processes involved, such as data collection and analysis. The researcher also provided a detailed report of the study, including its findings. These approaches would allow readers to evaluate the quality of the study and the applicability of its findings in other context (Polit and Beck 2008:539). This is what is referred to as transferability.

3. 4 CONCLUSION

This chapter discussed the methodology undertaken by the researcher. The researcher has employed a qualitative study design. The research methods, including sampling approach, the sample size, data collection and analysis were discussed in this chapter. The ethical issues and rigour of the study were also discussed in this chapter. The ensuing chapter discusses findings of the study.

CHAPTER 4: STUDY FINDINGS

4.1 INTRODUCTION

This chapter presents the study findings that emerged from the data of individual interviews conducted on pharmacy staff at Princess Marina hospital in Botswana. As mentioned in the preceding chapter, the data from these interviews were analysed qualitatively using the IPA framework of analysis. Five thematic categories emerged from data analysis:

- Data capturing: an extra task
- Knowledge and experience of IPMS
- Training and education
- Mentoring and supervision
- Data quality: impact on patients' care.

These themes are discussed below using excerpts from participants' narratives.

4.2 THEMATIC CATEGORIES

- **Data capturing: an extra task**

This theme relates to participants' views of data capturing as an additional and less important role of pharmacy staff relative to care provision. Most of the participants claimed that their main function was to provide patient care, which in this case was related to the administration of ART.

Our main role in this department is to make sure that all patients living with HIV are provided with treatments on time. Patients are our priority in this department. We do not have time to waste on other things.

All participants emphasized that the pharmacy department can be a stressful work environment (Lazarus and Folkman 1984:134), and this was usually the case on Mondays and Fridays. Participants described Mondays and Fridays as the pick periods for the administration of ARTs.

Mondays and Fridays are our busiest days. These are the days most of our patients visit the department to collect their ARTs. So, the responsibility to update patients' data should be given to healthcare auxiliaries.

Some participants reported that the pharmacists made several requests for the role of data capturing to be allocated to healthcare auxiliaries. They attributed such requests to the limited number of pharmacists that were available to address patients' needs. Adopting such an approach to allocate task to healthcare auxiliaries, participants stressed, would help reduce the experiences of stress experienced by pharmacy staff. However, some participants believed that these requests were also a function of lack of / or limited confidence to use the data capturing system, IPMS. The lack of / or limited confidence was attributed to limited knowledge and experience of the use of the IPMS.

Some of us are not trained on how to use the IPMS. However, some of us are trained but not updated. This is the problem, which I think affects the quality of data we capture. So, data capturing should be allocated to the technicians.

- **Knowledge and experience of IPMS**

Some participants repeatedly mentioned during interviews that some pharmacists' knowledge of IPMS was limited, and therefore they lacked confidence in using it to capture patients' data. According to participants, it was for this reason that some pharmacists kept manual records or data of patients on ARTs.

I must admit that I am not confident to use the IPMS. So, I try to record all treatment activities with patients on paper. But I must also admit that I sometimes lose the papers, and this may have a negative impact on patients' care.

According to some participants, some pharmacists were not only unaware of how to effectively capture patients' data, they also experienced huge difficulties with producing reports on patients' treatment activities. Participants emphasized that the latter was a function of limited knowledge of IPMS or a lack of it.

Some staff of this pharmacy department do not know how to report patients' treatments using the IPMS. Some claimed that the amount of reporting involved or required distracted them from doing what matters, patient care.

Even though pharmacists were aware of the value of the timely and accurate reporting of data, participants emphasized, they considered the frequency of reporting tasking. Added to this, participants reported that some pharmacists lacked the technical knowledge of how to use the IPMS. According to participants, it was partly because of this that the pharmacists considered the reporting of patients' data on ARTs, particularly the bimonthly requirement very tasking and stressful (Lazarus and Folkman 1984:134)

- **Training and education**

Training and education were discussed on a number of occasions during interviews as the key factors for improving data quality. Most participants reported that they attended formal training on the application of the IPMS. However, these participants went on to say that they had not attended update workshops on the use of IPMS since when trained on the same.

Most pharmacists have been trained how to use this system, the IPMS. But because of the heavy workload we sometimes do not use it. So, we gradually forget how to use it. We therefore need to be updated periodically.

The above account is certainly an emphasis on the need for training for pharmacists on the application of the IPMS. It was reported by some participants that a minority of pharmacists had not received training on the use of IPMS. This minority, participants asserted, has been noted to experience difficulties with data capturing, as they lacked understanding of the operating system. In addition to formal training, the need for guidelines or information on how to use the IPMS was emphasized by participants. They claimed that the availability of guidelines or information would help improve the quality of patients' data, which according to participants was related to the timeliness and accuracy of data capturing. This is because of the consistency the guidelines would ensure in the use of the IPMS.

It is good to have written instructions or guidelines on how to use the IPMS. They serve as reference points when you forget how to use it. Guidelines or instructions are particularly useful for new staff. Guidelines offer consistency in data capturing and reporting.

While training on the use of IPMS and provision of guidelines were considered significant contributory factors to the quality patients' data, similar significance for data quality improvement was also noted in the transcripts to be associated with knowledge of the use of computers. In addition to the need for guidelines, participants expressed the desire for computer training on how to access and use basic functions of the same.

Not knowing what to do and lack of skills and knowledge of how to use a computer are stumbling blocks. This is a problem for a lot of us, if not all, in this unit. It prevents us from doing what we are meant to be doing.

Participants claimed that computer training would improve data quality in the context of the timeliness, accuracy and reporting of data. Participants repeatedly mentioned during interviews that patients' data quality could be improved by adequate support systems, such as mentoring and supervision.

- **Mentoring and supervision**

Participants were of the opinion that working in the pharmacy department, particularly on the aspect that includes care provision to a large group of patients living with HIV, can be very draining and stressful. So, participants called for the provision of support to staff in the forms of supervision and mentoring to cope with the stress (Lazarus and Folkman 1984:134).

I have to say that supervision and mentoring are essential; they would help us to grow in the way we work with patients and capture data. These support systems constitute forums for learning, coping and defending against anxiety experienced in practice.

Participants stressed that these support systems should not be perceived as luxuries in the pharmacy department. They went on to state that supervision and mentoring should be introduced as integral components of the strategy for effective professional working.

New pharmacists in this department need to be coached into good ways of working. These support systems would help us to achieve this aim. So, senior pharmacists should be trained on how to mentor and supervise junior colleagues.

It is clear from the above excerpts that supervision and mentoring need to be given importance in pharmacy practice. This assertion is based on their role in enabling pharmacists to capture quality data, which in turn would enable them to develop and deliver quality care to patients. It is worth stating that all participants stressed that the pharmacy staff were critically aware of the need to provide quality care to their patients. Despite the level of significance highlighted, few participants noted that pharmacy staff have not been adequately supported in the context of quality data capturing, and they claimed that such limitations have a negative impact on their work with patients.

- **Data quality: impact on patients' care**

There was consistency in the views of a minority of participants with regard to the relationship between quality data and patients' care. They seemed to agree that the availability of quality data would enable pharmacists to offer quality and timely care to patients, including those on ARTs.

I sometimes get frustrated when some of my colleagues fail to make effort to capture and report data on time. Such failures may negatively impact on clinical decisions, like timely prescriptions and administration of medication.

According to some participants, feelings of frustrations were common emotional reactions among pharmacy staff. They attributed these feelings to the occasional absence of data to inform clinical decisions. These participants claimed that not capturing and making data available for use on time are behavioural problems that

can be improved. Hence, participants stressed on a number of occasions that any failure to capture and report data should lead to a meeting or discussion to explore the reasons for the behaviour.

It must be remembered that offering quality care to patients cannot be achieved in the absence of quality data. It is therefore important to have regular meetings to discuss lapses in data capturing, and to learn from the experience.

Further examination of this issue of care provision at interviews revealed the need for pharmacists to always make effort to ensure the capturing of quality data. Participants stressed that patients living with HIV who visited the pharmacy department suffered from a range of physical conditions. Some participants reiterated on few occasions that the incidence of the physical conditions could have been alleviated if patients were offered timely treatments on ARTs. Whilst this might be the case, participants also believed that the physical conditions promoted therapeutic interactions between patients and pharmacists. The focus of pharmacists, participants stressed, was to ensure that patients were provided quality care, which they believed should be informed by data captured using the IPMS. Despite this intention, participants were critically aware that there were barriers to capturing quality data using the IPMS. One barrier to quality data capturing mentioned repeatedly by participants was related to frequent power failures. All participants reported that the IPMS was centrally controlled by the Botswana Ministry of Health's main database. According to participants, this database was powered by the Botswana national grid, which frequently failed to provide power to the study site. The absence of power, participants stressed, made it difficult to capture complete data. Another threats were absence of a backup power system, and participants' limited commitment to data capturing.

Irrespective of the knowledge of IPMS some of my colleagues have are not keen to capture data. This in itself has a negative impact on the quality of data, which in turn may affect the quality of care given to patients.

4.3 CONCLUSION

This chapter has presented the findings of the study that emerged from the data of individual interviews conducted on pharmacy staff at Princess Marina hospital in Botswana. The next section is the final chapter of the study. It focuses on the discussions of the study findings including, limitation of the study and recommendations for improvement.

CHAPTER 5: DISCUSSION, LIMITATION, RECOMMENDATION AND CONCLUSION

5.1 INTRODUCTION

The study findings were presented in the previous chapter. This chapter presents discussions of the research findings within the perspective of the literature reviewed. It also includes descriptions of the study limitations and recommendations on how the study could be improved. The chapter ends with concluding remarks.

5.2 DISCUSSION

There was some degree of consistency among most participants on the view that data capturing was as an additional task to an already busy schedule of the pharmacy staff of the study site. Added to this, data capturing was not perceived by pharmacists as an important role. It was therefore not surprising to note during interview discussions for participants to stress on care provision as the most important role of the pharmacists. This suggests that data capturing, despite its role in enhancing patient care (Hedt-Gauthier et al 2012:2), was perceived as an activity that may distract pharmacists from fulfilling their function of care provision. This assertion was captured in two phrases obtained from an excerpt of a participant: "Patients are our priority in this department. We do not have time to waste on other things."

It is evident from these phrases that the pharmacy department was a busy work environment, and this was particularly the case on Mondays and Fridays. It is critical to note that people are more likely to experience feelings of stress and subsequent burnout if exposed to busy work environments over a prolonged period of time (Lazarus and Folkman 1984:134). Experiences of stress and burnout may have a negative impact on the performance of people, which in this case was related to care provision (Lazarus and Folkman 1984:134). Thus, experiences of stress in work settings may enable people to seek approaches to cope with or alleviate identified sources of stress (Lazarus and Folkman 1984:134). In relation to this study, it was reported by participants that the pharmacy staff made a number of requests for the

role of data capturing to be allocated to healthcare auxiliaries. Whilst this approach may help to reduce stress, it was repeatedly mentioned by some participants that it was the lack of knowledge and confidence on how to use the IPMS that in the main generated stress in the pharmacy staff. Thus, pharmacy staff were reported by some participants to sometimes resort to using pen and paper to capture patients' treatment data. This approach to data capturing has implications of losing patients' data, which in turn may negatively affect the quality of care provision.

All participants claimed that the pharmacy staff were critically aware of the need to provide quality care to patients. It was therefore not surprising for some participants (pharmacy staff) to request for training and education on the use of IPMS. Participants claimed that the provision of training and education would improve both the knowledge and confidence of pharmacy staff on the use of the IPMS in the context of the timely and accurate capturing of patients' data. In addition to formal training, the need for guidelines or information on how to use the IPMS was emphasized by some participants. They claimed that the availability of guidelines or information would not only help to ensure consistency in the use of the IPMS, it would also help to improve the timeliness and accuracy of data capturing (Hedt-Gauthier et al 2012:2). Some participants repeatedly reported the quest of pharmacy staff for quality patients' data during interviews. While this was the case, these participants stressed that the pharmacy staff's lack of or limited basic computer skills, such as how to access the same was a barrier to the timeliness and accuracy in data capturing. Thus, participants reported the need for pharmacy staff to be offered training on basic computer skills. Participants also reported the need for pharmacy staff to be offered support in the form of mentoring and supervision because of the role of these support systems in the acquisition of quality data and quality care provision (McKimm 2003:3).

There was an agreement among participants that providing care to a large of number of patients living with HIV can be very draining and stressful. Supervision and mentoring were considered by participants as effective support systems not only to enable pharmacy staff to cope with the stressful nature of their work environments, but also to deliver quality care to patients (McKimm 2003:3). Taking these functions into account, some participants stipulated for supervision and mentoring not to be

perceived as luxuries, but as important strategies for improving performances of people. Participants therefore advocated for supervision and mentoring to be integrated in the support strategy for staff of the pharmacy department. This intention was based on the role of supervision and mentoring in enabling pharmacists to capture quality data, which in turn would enable them to develop and deliver quality care to patients. The focus of pharmacists, participants stressed, was to ensure that patients were provided quality care, which they believed should be informed by data captured using the IPMS (Cullum et al 2008). But participants reported barriers to data capturing using the IPMS. Examples of such barriers were power failure and commitment to data capturing. Power failure may lead to the use of manual approaches to data capturing like pen and paper that have a number of negative implications, including poor quality care provision.

5.3 LIMITATION OF THE STUDY

Whilst the study has generated insight into the use of IPMS and patients' data quality, it has some limitations. The study was carried out in a single pharmacy department of a hospital. Pharmacy staff of the study site may be different from pharmacy staff of other hospitals in the context of their experiences of the use of IPMS. Additionally, the findings of the study are based on retrospective accounts of pharmacy staff of their experiences of IPMS. Such accounts are subject to memory bias. The findings of this study are not generalisable, but they are transferable to other pharmacy departments where IMPS are used as data capturing tools.

5.4 RECOMMENDATIONS

- Pharmacy staff to be trained on basic computer skills, which may include how to access the IPMS. Doing so would help to improve the timeliness of data capturing. Pharmacy staff also need to be trained on how to use the IPMS. Taking this stance would help to improve the accuracy and quality of data and subsequent quality care provision. It is also critical for update workshops on the use of IPMS to be organized for all pharmacy staff.
- Working in a pharmacy department can be stressful. Hence, there is a need for pharmacists to be offered support not only for them to cope with the demands of

the work environment, but also to improve care provision. Support systems suggested in this study were mentoring and supervision. Each pharmacy staff to be allocated a mentor to ensure ongoing support and professional development.

- Some barriers to the use of IPMS were identified in this study. Apart from lack of knowledge and commitment of pharmacy staff, another barrier identified was power outage. This has a negative impact on the timely and accuracy of data captured. It also hinders the quality of care offered to patients. It is therefore critical for the hospital to secure a backup generator to ensure consistency and continuous supply of power; electricity.
- Further research is needed to explore factors influencing the quality of treatment data of patients on antiretroviral therapy. A methodology that would accommodate a larger sample size is required to develop more insight into this study area.

5.5 CONCLUSION

The main aim of this study was to explore pharmacy staff's perceptions of factors influencing the quality of antiretroviral therapy patients' data captured by the IPMS at a Hospital in Botswana. The study adopted a phenomenological approach, specifically Interpretative Phenomenological Analysis (IPA). A criteria purposive sampling approach was used to select participants of the study. Data was collected from participants using a semi-structured interview format with the help of an interview guide. Data was analysed using IPA framework of analysis. A range of findings emerged from the data analysed. In sum, most of the participants reported that pharmacy staff have limited or lack of knowledge of IPMS. This limitation in knowledge was claimed by participants to result in pharmacy staff's lack of or limited confidence in the utilisation of IPMS for data capturing. It was also revealed in this study that quality data would influence quality care provision. Thus, participants emphasized on the need to ensure timely and accurate capturing of data. But there are barriers to this process. Examples of these include power problems and pharmacy staff' commitment to timely and accurate data capturing.

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APPENDIX A
NURSE CONSENT FORM

Study Title: Factors affecting antiretroviral therapy patients` data quality at Princess Marina Hospital Pharmacy in Botswana

This form is intended to record my consent to participate in the research study as a nurse with a key responsibility for delivering care to service users in this unit. I confirm that I have read and understood the information leaflet given to me. I have also had adequate opportunity to discuss the above study with the researcher and have had all my questions answered to my satisfaction. I understood my part in the study and I am aware that it may be published. I am also aware that no one will be able to identify me with information that I give. I am aware that the interview will be recorded on an audiotape, which will be kept safe in a locked cupboard in the researcher's place of work. Any information obtained from the interview will be treated as confidential and with respect. I am allowed to keep the information sheet so that I may refer to it whenever I wish.

I give my full consent to take part in the study in the way described in the information sheet.

I understand that my participation is voluntary and that I am free to withdraw from the study at any stage.

.....
Name of Nurse

.....
Signature

.....
Date

.....
Name of Researcher

.....
Signature

.....
Date

Copies: - 1. Nurse
2. Researcher

APPENDIX B



**UNIVERSITY OF SOUTH AFRICA Health
Studies Higher Degrees Committee
College of Human Sciences
ETHICAL CLEARANCE CERTIFICATE**

HS HDC/242/2013

Date: 30 October 2013 Student No: 4635-286-4
Project Title: Factors affecting data quality of patients on antiretroviral treatment
at Princess Marina Hospital Pharmacy in Botswana.
Researcher: Hana Tsegaye Tesema
Degree: Masters in Public Health Code: DIS4953
Supervisor: Prof P Sandy
Qualification: PhD
Joint Supervisor:

DECISION OF COMMITTEE

Approved **Conditionally Approved** **D**

**Prof L Roets
CHAIRPERSON: HEALTH STUDIES HIGHER DEGREES COMMITTEE**

?Prof

ACADEMIC CHAIRPERSON: DEPARTMENT OF HEALTH STUDIES

PLEASE QUOTE THE PROJECT NUMBER IN ALL ENQUIRES



APPENDIX C

APPENDIX C

TELEPHONE: 363 2766
 FAX: 3910647
 TELEGRAMS: RABONGAKA
 TELEX: 2818 CARE BD



Republic of Botswana

MINISTRY OF HEALTH
 PRIVATE BAG 0038
 GABORONE

REF NO: PPME-1311811 PS V (320)

11 April 2014

Health Research and Development Division

Notification of IRB Review: New application

Hana Tsegaye Tessema
 UNISA

Protocol Title: FACTORS AFFECTING DATA QUALITY OF PATIENTS ON ANTIRETROVIRAL TREATMENT AT PRINCESS MARINA HOSPITAL PHARMACY IN BOTSWANA

Approval Date: 2 April 2014
 Expiration Date: 2 April 2015
 HRDC Review Type: HRDD Reviewed
 Risk Determination: Minimal risk

Dear Sir/Madam

Thank you for submitting a new application for the above referenced study. The study was reviewed and approved for a period of 1 year effective from the approval date.

This permit does not however give you authority to collect data from the selected sites without prior approval from the management. Consent from the identified individuals should be obtained at all times.

The research should be conducted as outlined in the approved proposal. Any changes to the approved proposal must be submitted to the Health Research and Development Division in the Ministry of Health for consideration and approval.

Furthermore, you are requested to submit at least one hardcopy and an electronic copy of the report to the Health Research, Ministry of Health within 3 months of completion of the study. Copies should also be submitted to all other relevant authorities.

Continuing Review

In order to continue work on this study (including data analysis) beyond the expiry date, submit a Continuing Review Form for Approval at least three (3) months prior to the protocol's expiration date. The Continuing Review Form can be obtained from the Health Research Division Office (HRDD), Office No. 9A 10 or Ministry of Health website: www.moh.gov.bw or can be requested via e-mail from Mr. Kgomotso Motlhanka, e-mail address: kgmmotlhanka@gov.bw As a courtesy, the HRDD will send you a reminder email about eight (8) weeks before the lapse date, but failure to receive it does not affect your responsibility to submit a timely Continuing Report form.

Amendments

During the approval period, if you propose any change to the protocol such as its funding source, recruiting materials, or consent documents, you must seek HRDC approval before implementing it. Please summarize the proposed change and the rationale for it in the amendment form available from the Health Research Division Office (HRDD), Office No. 9A 11 or Ministry of Health website: www.moh.gov.bw or can be requested via- mail from Mr. Kgomotso Motlhanka, e-mail address: kgmmotlhanka@gov.bw . In addition submit three copies of an updated version of your original protocol application showing all proposed changes in bold or "track changes".

Reporting

Other events which must be reported promptly in writing to the HRDC include:

- Suspension or termination of the protocol by you or the grantor
- Unexpected problems involving risk to subjects or others
- Adverse events, including unanticipated or anticipated but severe physical harm to subjects.

If you have any questions please do not hesitate to contact Mr. P. Khulumani at pkhulumani@gov.bw, Tel +267-3914467 or Lemphi Moremi at lamoremi@gov.bw or Tel: +267-3632754

Thank you for your cooperation and your commitment to the protection of human subjects in research.

Yours sincerely

ulumani

For Permanent Secretary

