SELF- MEDICATION PRACTICE AND ASSOCIATED FACTORS AMONG UNDER-FIVE CHILDREN IN BORTOWN, JONGLEI STATE, SOUTH SUDAN

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A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE AWARD OF MASTER OF PUBLIC HEALTH DEGREE IN EPIDEMIOLOGY AND DISEASE CONTROL OF MOUNT KENYA UNIVERSITY

JUNE, 2024

DECLARATION AND APPROVAL

This report is my original work and has not been presented for a degree in any other University or for any other award.

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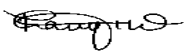
Signature:  Date: 21/06/24

DEDICATION

I dedicate this thesis to my family members who have been pillars of support and inspiration during this study.

ACKNOWLEDGEMENT

I would like to express my sincere gratitude to my supervisors: Dr. Dominic Mogere and Dr. Teresia Ngonjo for guidance and helpful comments and constructive suggestions which have enhanced accuracy and clarity of this research report. I am grateful to BorTown municipality administration for provision of total population of under five-year children. Last but not least, I would like to thank Mount Kenya University in Kenya for giving me the chance to pursue my master degree in epidemiology and disease control.

God bless all of you who helped me with my research report.

ABSTRACT

Self-medication practice has great adverse effects on health of children and has been reported as something common among children under-five years globally. The misuse of pharmaceuticals due to self-medication is a major global public health concern. Parents who self-medicate under-five children risk serious health repercussions for children hence, encourage the likelihood of drug resistance and toxicity. Self-medication has been linked to decreased medicine efficacy, toxicity, mortality, morbidity and worse treatment results. Despite health consequences, self-medication among under-five children in BorTown is on rise. Thus, the study determined self-medication practice and associated factors among under-five children in Bortown, South Sudan. Descriptive cross-sectional design, was used in stratifying the population by location and drawing representative sample using probability proportional to size formula, was utilized. 373 households with under-five children were chosen using simple random selection. In-person interviews using pre-test questionnaire were conducted to compile the research data. SPSS version 25 was used to enter, evaluate and analyse data. Data was summarized using descriptive statistics: mean and standard deviation, and the relationships between variables were determined using inferential statistics-chi-square (X^2). All statistical tests were deemed significant at P-value < 0.05. The data was summarized using descriptive statistics: mean and standard deviation, and the relationships between variables were determined using inferential statistics-chi-square (X^2). All statistical tests were deemed significant at P-value less than 0.05. Self-medication was practiced by 88.3% (n=323/366) of the study's subjects. Women made up the majority (66.4%), and most of the participants (89.3%) were in their 40s and 50s. Farmers made up the vast bulk of the self-medicating population (91.1%). Self-medication was shown to be related to both occupation (p -value 0.008) and age group (p -value 0.005). Having leftover medication from prior treatments was the leading cause of self-medication (98.1%), followed by the low cost of medication (without consultation or laboratory expenses) (97.8%). There was a strong association between predisposing characteristics and self-medication behaviour (P-value 0.000), and participants' subjective impressions of the practice (p-value 0.000). Approximately 37.2% of self-medication medicines came from unused prescriptions, and 34.4% came from local pharmacies. Self-medication was most often driven by diarrhoea (40.7%), followed by fever (20.5%). Antimalarial (36.6%) and antimicrobials (29%) were the main medicines for self-medication. All of the features of self-medication were shown to be statistically connected to the behaviour itself (p-value 0.000). Self-medication, irrational use of medicines and myths on self-medication are public health problems in Bortown. Therefore, this study called for a widespread public health education and promotion for parents and health care providers, and should stress risks associated with parents' self-diagnose of under-five children, indiscriminate use of antimalarial and antimicrobials, inappropriate sources of medicines and wrong perceptions on self-medication.

Key words: Associated factors, self-medication practice, under five-year children, prevalence, perceptions, BorTown

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LIST OF ABBREVIATION AND ACRONYMS

CAM	Complementary and Alternative Medicines
DRC	Democratic Republic of Congo
M	Mean
MKU	Mount Kenya University
MPH	Master of Public Health
OTC	Over the Counter drugs
PI	Principal Investigator
POM	Prescription Only Medicines
SM	Self Medication
STD	Standard Deviation
UNICEF	United Nations Children's Fund
WHO	World Health Organization

CHAPTER ONE

INTRODUCTION

1.0 Introduction

The chapter introduces the study in the realm of background to the study, purpose of the study, objectives of the study, justification of the study, significance of the study, delimitation of the study, limitation of the study, assumptions of the study and operational definition of terms.

1.1 Background to the study

Self-medication (SM) is a public health problem that results to irrational use of drugs all over the world though it is mostly common in developing countries. It is defined as practice in which individual uses medicines without consultation or medical advice from health care providers to relief signs and symptoms as well as treats different common diseases. More specifically, Self-medication (SM) is defined by the World Health Organization (WHO) as "the practice in which an individual selects and uses drugs to treat illness or symptoms that he or she has independently identified." (Chaudhry et al, 2022). Also using medicines from another child in the same family who was previously ill to treat another child who is showing same symptoms as well as reusing left over medicines without following indication and instruction is considered as self-medication practice (Pereira, F.S., et al., 2019). This practice results to irrational use of drugs and medication errors has adverse negative effects on under-five children. Self-care medications (SM) often consist of OTC medications, antimalarial, antibiotics, analgesics, and nutritional supplements. However, prescription-only medications (POM) are also useful in certain scenarios (where patients get them from other sources) (Chaudhry et al, 2022). The indiscriminate use of prescription only medicines is a serious concern due to death related to drugs resistance and economic sabotage as a

result of wasting limited resources on treatment of diseases caused by inappropriate self-treatment (Murray CJ. et al., 2022). Individual, organizational, and contextual elements may all have an impact on the likelihood that someone will really implement SM. Individuals' ages, incomes, gender, highest levels of education, levels of happiness and urgency/severity of symptoms are only few of the factors to take into account. Traditional and online pharmaceutical industry advertising has a significant role in normalizing this practice (Tarciuc et al, 2020). Methods of Self-Medication (SM) include obtaining prescription drugs via legal and illegal channels, utilizing stashes (i.e., leftovers from a medicine cabinet), and following the advice of friends and family members. Depending on the context, there may be both bad and good outcomes from this method (Chaudhry et al., 2022).

SM is a worldwide public health concern. Antibiotics were found to be self-medicated by persons without health insurance at a rate of 91% in Indonesia, a country with a very high prevalence of SM practise (Oleke, 2022). Further, 57% of the study group deemed themselves self-medicated. Many factors contribute to the high prevalence of SM in Indonesia, including subpar medical care, a large uninsured population, a lack of personnel, a lack of transportation, unprofessional healthcare provider conduct, lengthy wait times, and ready access to pharmaceuticals (Alduraibi, 2021). But according to research conducted by Tarciuc, Stanescu, Diaconu, and Diaconescu (2016), 26% of all systemic antibiotics offered in Romanian pharmacies are purchased by customers without a doctor's prescription. A similar study in Parkstan found that self-medication, especially for cough and fever, was practised primarily by parents of high socioeconomic status, and that this had a significant negative effect on health outcomes for children aged 3 to 5. Sweden has the highest rate of SM in the world at 12 percent, followed by Slovakia at 13 percent and Romania at 9 percent, according to a systematic

study done in the Netherlands (Paulo, Bettencourt-Silva & Al-Rifai, 2021). According to yet another review of the available literature, the percentage of people who regularly engage in SM varies considerably across the Asian region, from 23.6% in Bhutan to 50% in Lebanon to 83.3% in Vietnam to 85% in Laos (Kalder, & Kostev, 2022). However, Bong and Tan investigated parents' knowledge and response to paediatric illness in Malaysia (Bong and Tan, 2018)

Due to insufficient and sometimes prohibitively costly healthcare infrastructure, self-medication is commonplace in poor nations. Parents who self-medicate their children under the age of five do so disproportionately often. According to a research conducted in Tunisia, the majority of children (71%) who self-medicated antibiotics for respiratory illnesses did so without seeing a doctor. This trend is alarming since it has been linked to serious health issues (Nasir et al., 2020). Majority of children are in developmental stage with different pharmacokinetic and pharmacodynamics profile compare to adults, making them susceptible to adverse drug reactions and side effects (Blake KV et al., 2019). On top of this, most drugs formulations and doses are meant for adult, leading to off-labelled use in paediatrics (Sachs AN., et al 2018; Sun H., et al 2017).

Drug resistance is a major problem in Nigeria, where studies reveal that over half of parents self-medicate their children aged 1 to 5 years, and a third do so for children aged 5 to 12 years (Awosan et al., 2018). Parental medicine preferences in Angola are similar to those in the United States, ranging from self-medication to a mix of allopathic and herbal remedies. When their kid is unwell, parents may take them to the doctor, but they also want to have access to natural home treatments. Children under the age of five who self-medicate may have both immediate and long-term health consequences. Therefore, it is critical to educate the public on the dangers of self-medication and to

advocate for more effective healthcare policies aimed at children less than five years old (Rodriguez, & Stewart, 2020).

Studies show that as much as 80% of the population in countries like Kenya engages in self-medication. Moreover, the trend of parents in Tanzania utilizing antibiotics like amoxicillin syrup to treat children under the age of 5 is increasing. This is due to several factors, including a lack of awareness and inconsistent attitudes towards antibiotic usage among parents, high expectations of curative results, and the subpar healthcare infrastructure of the country. Even though the World Health Organization's guidelines for self-medication stress the importance of health education and enforcement efforts to prohibit the improper and excessive use of antibiotics, this practice is becoming increasingly problematic in Sub-Saharan countries. Self-medication has several negative effects that are substantial and wide-ranging. It can result in elevated morbidity and mortality due to illness, diminished effectiveness of treatment, increased financial burden on patients, and the production of drug-resistant bacteria that exacerbate health issues. The increasing prevalence of parents practicing self-medication on their children under the age of five is especially concerning and widespread (Nasir et al., 2020). Self-medication on young children can lead to severe health complications and can exacerbate an already dire situation. Improper use of antibiotics can result in a rise of resistance to commonly occurring infections, which in turn makes it harder to cure bacterial illnesses. Furthermore, such situations can also cause a higher rate of ineffective treatment and may lead to the emergence of bacteria that are resistant to antibiotics. Children who receive antibiotics through self-medication are at a higher risk of developing such infections, which can lead to longer hospital stays and more expensive treatments. It is important to raise awareness among the population about the risks associated with self-medication and the proper use of antibiotics. It is important

for governments to take actions to enforce regulations and laws that govern the sale and distribution of antibiotics and improve access to proper healthcare facilities. Healthcare providers should also receive sufficient training to identify signs of antibiotic misuse and offer appropriate guidance to patients. It is only through collective efforts that we can prevent the negative consequences of self-medication and promote the health and wellness of all people (Liu, J., 2020)

Some researches cite health facility located far away from residential area, highly educated individual claiming to have adequate knowledge to read and understand medical literature, availability of stock medications of previous treatment, presence of chronic diseases, less serious ailments, long waiting times, and fear of paying consultation and laboratory tests fee as major factors contributing to self-medication. These have led to high prevalence of self-medication both for adults and children, making it a major public health concern (Nepal et al., 2021). Also, type of illnesses such as diarrhoea, upper respiratory infection as well as malaria among under 5-year children, prompt parents to buy medicines without consultation from health professionals, consequently inappropriate and irrational use of prescribed medications due to high possibility of wrong diagnoses considering the fact that many diseases have similarly signs and symptoms. Only license medical personnel have discretion to make differential diagnose to match diagnose with correct medications (Wang, & Muennig, 2022).

Despite numerous negative outcomes associated to self-mediation such as foetus anomalies and death, it is believed to be easily accessible, cheap and saves money, treat minor illnesses and prevent disease. Also, it improves the capacity of health system by reducing patients' caseloads on health professionals and empowers patients to take care of their own health through self-treatment of minor illnesses that would have wasted

scare resources at health facility (Hughes CM et al 2022; Noone J, & Blanchette CM., 2022). This only happens when it is done correctly even in absence of professional advice of health care providers. However, the consequences of misuse of prescribed only medicines and over the counter drugs especially from drugs sellers who do not have medical background rather venture into medical field as a business are very severer and detrimental to health (Harris, 2020). Therefore, while inappropriate use of over-the-counter medicines results in waste of resources, negative side effects, and unintended drug interactions, it may also hide serious diseases and lead to antibiotic resistance, a growing concern in developing countries due to the rising number of infectious disease cases. (Nasir et al., 2020)

1.1.1 Self-medication practice

Numerous parents within various Communities have been identified to buy medicines without prescription for self-treatment for their-under five children at home during an illness episode (Bong & Tan, 2018). These researches have showed for instance that, parents prefer to purchase medications in pharmacy shops without seeing physicians since it is a convenient and affordable means of mending common ailments like malaria for their kid (Bong & Tan, 2018). Others perceive mild illness does not need health professional prescription, more specifically, with past experience with the medicine (Levin, 2012). Thus, according to the conventional definition, self-medication occurs when primary caretakers (such as parents) procure medical aid for their children independently for the purposes of health promotion, disease detection, and disease treatment. (Levin, 2012). Much of the literature that is available on self-medication has mainly focused on adults. With regard to the fact that children also self- medicate, it is important to come to grips with trends in child self-medication. The health seeking behaviour of primary school children in response to common illnesses was studied in a

rural area of Southern Asia. The research revealed that 24% of the sickness episodes were serious enough to prevent the children from attending school. Furthermore, the study showed that a majority of the children, 71%, did not receive any medical treatment for their illnesses. Among the remaining children, 19% treated themselves with either traditional herbal medicine or western medicine. Adults were involved in providing or facilitating medical treatment for the children in 62% of cases, while children themselves sought medical treatment in 31% of cases without adult involvement. These findings highlight the need for better access to healthcare services and health education for both children and adults in rural communities. They also emphasize the importance of involving children in healthcare decision-making processes and empowering them to take charge of their own health. Overall, the study underscores the significance of understanding the health seeking practices of primary school children in rural areas to address healthcare challenges and improve health outcomes. (Ahmed, et al., 2021)

Among the self-treatments, the proportion of pharmaceuticals increased with age from 44% amongst children above 5 years to 63% among the children below 5 years in Kenya Tarciuc (2020). The drugs that were most commonly used for self-medication were antimalarial, with chloroquine being the most common, followed by painkillers and antipyretics, mainly aspirin and paracetamol. These drugs were sold at most small shops in the village at low prices and readily available by the shopkeeper also to children (Oleke, 2022). Parents used the pharmaceuticals systematically in that, they took them mainly to treat headaches and fever, or cold while they treated abdominal complaints and wounds mostly with herbal medicine (Mageto & Zablon, 2018). Western pharmaceuticals were integrated by the children into medicine patterns shaped within the local medical practice where treatment of illness is regarded as something

everybody can and does with exception of certain complicated, serious illnesses. Available medicines irrespective of their belonging to one or another medical tradition are used in an open and to some extent experimental practice in South Sudan. With increase in age, South Sudanese primary school children take care of a growing proportion of common illnesses and are autonomous agents in the field of health care. (International Organization of migration, 2022)

1.2 Statement of the problem

Self-medication has been reported as something common among parents for children under five years globally. The World Health Organization has confirmed that self-medication is a harmful practice for children under the age of five years because they are more vulnerable. As a result, parents who self-administer medications run the risk of abusing them, which has serious health repercussions for their children and, on the other hand, encourages the spread of drug resistance.

In practice, the South Sudanese government put regulation frameworks to curb self-medication in the country. The government and humanitarian agencies put more effort to hire health workers and establish health facilities in Bortown. As well, humanitarian organizations started numerous educative programs about the side effects and other effects of self-medication for children under five years in Bortown.

However, there is still a significant problem in Bortown with young children being self-medicated, despite attempts and understanding of the dangers involved. Self-medication has been linked to decreased medicine efficacy, greater infection difficulties, higher parent expenses, and perhaps worse treatment results for children. This results in prolonged illness, morbidities, and fatalities. The practice of self-medication among under-five children in Bortown, Jonglei State, South Sudan, presents significant challenges to child health and well-being. Despite efforts to improve healthcare access,

self-medication remains prevalent among caregivers, leading to potential risks such as incorrect dosage, adverse reactions, and delayed appropriate medical care (UNICEF, 2022).

A study conducted by United Nations Children funds in Bortown, Jonglei State, South Sudan, found that 75% of caregivers practiced self-medication for their under-five children, with common medications including antimalarial and antibacterial. Factors such as lack of access to healthcare facilities, limited knowledge about proper medication use, and cultural beliefs contributed to this practice (UNICEF, 2022)

In contrast, research conducted in South Sudan central Equatorial state reported a lower prevalence of self-medication (60%), with different factors influencing caregivers' decision-making processes. Access to healthcare services, education level, and socioeconomic status were identified as significant determinants of self-medication practices. The limited access to healthcare facilities, qualified medical personnel, and financial constraints in South Sudan are known barriers to proper medical care for children. This situation raises concerns about the potential misuse of medications and the associated health risks for young children (Eltayeb et al 2020).

Therefore, self-medication has been determined to be the primary factor contributing to the clinical issue of antimicrobial resistance, toxicity and adverse drugs reactions among children under the age of five in Bortown, with a morbidity rate of 52.7% and mortality rate of 59.7% (International Organization of migration, 2022). If this problem remains unchecked, there will be more expected mortalities and morbidities among children under five years, wastage of resource when parents buy drugs that are no longer effective because of drug resistance, and financial burden to parents for seeking specialized medications for their children.

Understanding the extent, determinants, and consequences of self-medication in this context is essential for developing targeted interventions and policies to ensure the safe and effective management of childhood illnesses in Bortown and similar settings in South Sudan. Although there is a wide variety of a self-medication practice in Bor Town, particularly among those under the age of five, the extent to which this occurs is poorly understood. As a result, it's important to determine self-medication practice and associated among under five children in Bortown, Jonglei State.

1.3 General objective of the study

To determine self-medication practice and associated factors among under five children in Bor Town, Jonglei state, South Sudan.

1.3.1 Objectives of the study

The study was guided by following objectives;

i. To determine self-medication practice prevalence among under five years children in BorTown, South Sudan
ii. To determine factors that prompt to self-medication practice among under five years children in BorTown, South Sudan
iii. To determine characteristics of self-medication practice among under 5 children in BorTown, South Sudan
iv. To determine the parents' perceptions of the self-medication to their under five-years children in BorTown, South Sudan

1.4 Research Questions

i. What is the prevalence of self-medication practice among parents with under five-years a child in BorTown, South Sudan?
ii. What factors prompt self-medication practice among under five years children in BorTown, South Sudan?

iii. What are the characteristics of self-medication practice among under five-year children in Bor Town, South Sudan?

iv. What is the parents' perceptions of the self-medication to their under five-year children in BorTown, South Sudan?

1.5 Justification of the study

Health care is crucial in any community-life set up, especially, to the children under five-years. In developing nations like South Sudan, where access to health care for all citizens has not yet been achieved, self-medication is a serious problem. Self-medication is a prevalent and favoured method of treatment for children in Bortown who are younger than five. Self-medication has been shown through various studies to have negative consequences such as delayed care-seeking, economic loss, drug interactions, and antibiotic resistance. Delayed care-seeking may lead to increased economic loss due to the delay in identifying underlying illnesses and proper treatment. Additionally, self-medication can result in drug interactions that could have been avoided had the patient sought treatment from a medical professional. Misuse of medications, such as antibiotics, may contribute to the development of resistance to treatments. Despite the adverse effects of self-medication and the importance of this topic, there is limited research in Bortown on associated factors with self-medication, especially among under-five children. Furthermore, there is no published study on the cohort of under-five children, despite instances of children being intoxicated in Bortown. Given the current health needs, there is a justified need for further studies on self-medication in Bortown, especially among under-five children to contributes to the body of knowledge on child healthcare in South Sudan and provides valuable insights for future research endeavours and programmatic interventions in similar contexts.

1.6 Significance of the study

The study findings would benefit the healthcare professionals in Bor Town by providing information that would assist health care professionals to provide appropriate health education and promotion as well as create awareness on risks associated to self-medications to general public especially parents of under 5-year children. Further, the parents would benefit from study findings by understanding the contributing factors for self-medication and the risk level of self-medicating for their children. The government of South Sudan would benefit from the study findings by utilizing the findings in developing context specific and relevant policies capable of restricting self-medication practice among parents of under 5 children in Bor Town and the general public at large. Also, humanitarian bodies would benefit by using the data to plan their programs and responses to self-medication programs. Moreover, the study would add to empirical literature hence the scholars, researchers and students would reference for future research scope.

1.7 Scope of the study

The primary purpose of the research was to determine how common self-medication is among parents in Bor Town with young children (those under the age of five). The purpose of this study was to examine the nature of self-medication and the factors that contribute to its use. The study's other objective was to learn how parents view self-medication. The data collected covered a period of three months to reduce the impact of recall bias on the results. Researchers aimed to better understand the frequency with which parents in the study population self-medicate by conducting this study.

1.8 Limitation of the study

The study findings may not be generalized for the whole country because self-medication is personal induced practice and it shows variation according to locations.

Recall bias might have affected this study. This could be minimized in the future by collecting data using medications diary in case parents may keep such diaries

1.9 Delimitation of the study

The study was conducted in Bor Town to determine the associated factors with self-medication practice among under five years children. The study focused specifically on Bortown, Jonglei State, South Sudan, and did not encompassed other regions and states within the country. The study is limited to under-five children, typically aged from birth to five years old. Therefore, the findings may not capture self-medication practices among caregivers of older age groups, which may differ in prevalence and determinants. The study purposively selects Bor Town because the town had influx of migrants as result of inter-communal conflict and floods that left the state with health needs. Further, because of security from the current conflicts, the town was deemed suitable for the study as the researcher would have representative study subjects. The study primarily explored self-medication practices from the perspective of caregivers, such as parents responsible for the health and well-being of under-five children. It does not extensively investigate healthcare provider perspectives and institutional factors that may influence self-medication practices. Consequently, the study may offer limited insights into healthcare system dynamics and provider behaviours related to self-medication. The study was anchored on descriptive cross-sectional research design to enable the study get conclusive findings at one time-point without data manipulation. Other research designs were deemed unsuitable for the present study. Similarly, because of social, political and economic settings, the parents to under five-year children in Bor Town may have characteristics that differentiate them from those of other towns in the state or country; hence, the findings may not be generalizable across board or nationalities.

1.10 Assumptions of the study

The study assumed the parents self-medicate for under five-year children in Bor Town. Further, the study assumed that, other associated factors with self-medication practice not under investigation would not statistically confound the results. The study operated on the assumption that the individuals being targeted for data collection would be available and willing to participate during the designated period. Additionally, it was assumed that participants would answer the questionnaire truthfully, objectively, and accurately based on their own experiences and knowledge regarding self-medication practices. The study also assumed that the research instruments used for data collection would effectively measure the desired constructs.

1.11 Operational Definition of Terms

Associated Factors-These are things connected often in a working relationship

Caregivers-theses include foster parents, grand parents

Characteristics of self-medication-Characteristics of self-medication practice according to this study are sources of self-medication and common signs and symptoms that prompt self-medication

Over the counter drugs- these are medications that can be bought without authorization of health personnel

Parent- This is mother, father, grandparent and foster parent during the study within households in Bortown

Practice-ways in which medicines are used for self-treatment in under 5 children by their parents

Prescription only medicines- these are drugs that cannot be dispensed without authentic written prescription by health care provider

Prevalence- the frequency of occurrence of self-medication or how big is self-medication problem in under five children as induced by parents

Principal investigator-the individual conducting this study

Reason-what motivate parents to treat their children without consulting health care provider

Self-medication- ‘‘use of pharmaceutical or medicinal products by the consumer to treat self-recognized disorders or symptoms without health care provider advice’’ (WHO, 2020)

Under five-years Children-These are children less than five years old of age; 0-59 months.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This chapter present the critical literature review in premises of theoretical foundation, empirical literature review to understand the underpinnings. As well, the chapter present conceptualization framework.

2.1 Empirical literature review

2.1.1 Prevalence of self-medication practice among under five-years children

Prevalence of self-medication varies according to locations, cultural backgrounds and social norms, associated factors. This topic is extensively studied in adults compare to children under 5-year children (Ahmed et al., 2021). For children, self-medication is subjective, based on symptoms and the decision is usually made by caregivers, thus, exposing children to high risks of medical errors and wrong diagnoses (Alonso-Castro et al., 2022). To embrace acceptable public health preventive measures and polices for under 5 children to parents induced self-medication paediatrics, it is crucial to understand prevalence of self-medication and its associated factors to reduce mortality and morbidity (WHO, 2022).

The emergence of infectious diseases pandemic such as Coronavirus (COVID-19) led to panic which resulted to myths and inaccurate dissemination of health information due to fear of getting the disease. Governments all over the world imposed locked downs and interaction restriction measures; thus limiting access to health care services (Makowska M. et al 2020). Hence, increases prevalence of self- medication practice (SM) among different age sets, for example under-5 year children to address emerging health problems (Abdelwahed et al. 2023).

It is reported that over nine million under five children died each year world-wide due to medication errors in which self-medication is a major contributing risk factor (Shotar AM., 2020; Escourrou B et al., 2021; Yewale VN et al 2019). Moreover, it is estimated that 7-70% adult population self-medicate and over 50% irrationally use medicines (Yewale VN et al., 2019). Besides, china estimated that about one-third of children experienced self-medication with antibiotics without advice from health care professionals (Xu J., et al., 2020).

A study done in Mexico shows that medicinal plants and herbs such as Aloe and Chamomile are used to self-medicate children. These herbal formulations are either administered parentally or orally to treat some common symptoms such as indigestion and dermatitis (Alonso-Castro et al., 2022). However, in Nigeria and Uganda, different species of medical plants are preferred to self-treat children (*Anogeissus leiocarpus* use in Nigeria, *Vernonia amygdalina* use in Uganda to treat children*)* (Abubakar U., et al 2017; Nalumansi. P et al., 2019). The worry some part is the amount of accurate dose that should be given to a child considering the fact that children do have immature metabolic system: renal and hepatic system which requires accurate dose calculation using weight and age. Though there are no adverse effects reported with use of herbal medicines, application of garlic on neonates causes blisters and lesions, and thus more studies are need to determine the suitable of topical formulation of medicinal plants on children especially garlic and eucalypts (Malangu, N. ,(2018); Gardiner, P.et al., 2016). Majority of parents who used herbal and alternative medicines cite expensive consultations at health facility and availability of left over medicines at home as main reasons for self-medication (Alonso-Castro et al., 2022)

It is worth noting to mention that other countries such as Finland, Saudi Arabia and Sudan prefer allopathic medicines compare to Alternative and Complementary

Medicines (CAM) to self- treat children (Eldalo A.S, 2018; Siponen, S. , et al.,2019; Eldalo A.S., et al 2018). On the other hand, In Mexico, self-medication prevalence among children stands at 49.6%, and is significantly associated to having more children who are below five years in the same family, having chronic diseases and being unemployed. Most parents self-medicate children because of influence and advice given by parents (Alonso-Castro et al., 2022). Mexican parents prefer conventional medicines compare to alternative and complementary medicines to self-treat children because they have definite dosage form and paediatric formulae; consequently leading to high prevalence of self-medication practice among parents with more than two children in the family and those with chronic diseases (Alonso-Castro et al., 2022)

The study done in Turkey reveals that parents self-medicate under five children (63.5%) due to high cost of consultation fee at health facility, and minor illnesses such as fever and lower abdominal pain. Moreover, others cited having prior experience and high cost of antipyretic, antibiotics and analgesics as driving force to self- treat children, hence leading to high prevalence of self-medication practice (Yusuf Karatas et al., 2023)

Self-medication in China is low compare to other studies done in Africa. This doesn't rule out the fact that self-medication for under 5-year children is still a problem. The results of self-medication in rural areas of China revealed prevalence as 38.2% which is lower than urban (18.7%) (Ge et al, 2021). In another study that featured under 12 years old children regarding self-medication using antibiotics in china, the prevalence is found to be (24.21%) and mostly induced by degree holders especially mothers (Jing Yuan et al 2022) .This difference observed could be due to gap of knowledge of risks associated self-medication and geographical location which dictate life style. Thus, other factors that could be contributing to self-medication among under 5 children need

to be studied (Jingjing Ge1 *et al*, 2021). In 2017, the prevalence of self-medication among under five children in India was 57.04%. (Mathias & Prabhu, 2020)

A study done in the Arab region during Coronavirus (COVID-19) reported self-medication practice as 62%, and Egypt as leading country with 72% and Palestine with least self-medication practice prevalence (40%). The population in Arab region mostly uses analgesics, antipyretics and vitamins without consultation and piece of advice from health professionals; however, a few may consult a nearby pharmacist for health education and information regarding different medications (Abdelwahed et al. 2023)

Findings of study done in Lubumbashi; Democratic Republic of Congo established extremely high (95.8%) self-medication practice. Mothers in DRC opt to treat their children with fever (91.1%) using antimalarial (91%) without advice from health care provider due to high cost in health facilities (84.18%) (Katumbo AM, et al., 2020). This is a major public concern considering the fact many mothers do not know the exact dose since dosing is based on weight and age of the child, hence high chance of toxicity and under dose which may result to poor prognosis (WHO, 2022). Moreover, children have immature liver and renal system such as glomerular filtration rate, making them prone to drugs side effects (Batchelor, H.K. & Marriott, J.F, 2019). Another study on "patterns of Self-medication Practices by Caregivers to Under-five Children in South-Western Nigeria" established that, in understanding the self-medication in the cohorts helps in reducing the health elated complications (Okunola, 2020).

The study in Bameda, Cameroon revealed higher (86.50%) self-medication practice (Kojom, 2018). In many developing countries in Africa, lack of nearby health facilities, economic hardship resulting to financial constraint and accessibility as well as well unavailability of medicines at public health facilities have immensely contributed self-medication practised. (Teke G et al, 2017). On the other hand, availability and easy

accessibility of medical literature and medical apps in Gorgan, north of Iran and other developed countries encourage literate mothers to surf net to treat their children without consultation from health care providers (Aref & Barati, 2021). However, this is contrary to findings of study done in Nigeria where personal experience of previous treatment and advertisement on media in which there was remission of sign and symptoms influences decision of self-treatment among mothers of under-five children (Okunola, 2020).

Another study done in Eretria reported high prevalence of self-medication 79%, and 9% of participants reported having experienced adverse drugs reaction due to self-treatment without support from health care provider using antibiotics, analgesics and antipyretic due to headache and fever. With reported negative consequences of adverse drugs side effects, it is important develop strict policies to regulate selling of prescription only medicines coupled with health education encompassing negative impacts of self-medication on health of individual and economic of the country (Araia et al.,2019)

The study in Barhir Dar, Ethiopia revealed that prevalence of self-medication (58%) is lower compare to prevalence in Eretria (79%). This different could be attributed to different factors such as socio-economic activities as well as policies related to regulation of medicines and health system. In both countries, age and low monthly income as well as being knowledgeable of medicines are significantly associated to self-medication practice (Malede Berihun Yismaw et al., 2023; Araia et al., 2019)

2.1.2 Factors that prompt to self-medication practice in under five years children by parents

It is imperative to understand the motive at which parents administer medications to children without consultation and advice from qualified health care professionals which is term as self-medication practice. Self-medication practices various according to

countries' social, economic, political and geographical location. Health care system disparities and political dispensation play enormous role on prevalence of self-treatment (Zenawi Zeramariam Araia et al, 2019)

When a person feels unwell, the first initiative is to response to signs and symptoms by buying medicines to gain quick relief (Saima Nazir at el, 2015). This situation is usually worst when there is out break due to fear of falling sick. Thus, individuals rush to self-treat though illnesses such as viral diseases e.g. Corona virus which do not have curative medicines rather vaccines and other public health preventive measures such as use of face masks, social distancing, hand washing. Thus, it is important to stress the need to consult health professionals before taking any drugs to minimize risks and medication errors (Abdelwahed et al. 2023). Those individuals believe that it's affordable: no consultation and laboratory fee. On the other hand, low income as well as high academic level is significantly associated to self-medication practice, 76.57% and 63.41% respectively (p=0.001) (Saima Nazir at el, 2015). However, this is different with findings of Arab region which found old age to be associated with self-medication practice (p-value 0.008), chronic illness (p-value 0.015) and having insurance cover that does not support treatment as well as low income that could not support medical laboratory charges, consultation and cost of medicines (p-value 0.001) (Abdelwahed et al. 2023). Moreover, in Turkey, being a work class and attainment of high level of education is significantly associated to self-medication (p-value 0.05) (Yusuf Karatas et al., 2023). Also, having previous experience and advice from friends/neighbours has dubbed patients to buy drugs on their own accord particularly in rural area. However, financial constraint is the main reason for not taking child to the clinic or nearby health Centre to avoid heavy cost of consultation and laboratory tests (Molento, 2020).

Common cold was the main illness where self-medication is practice with antibiotics and decongestant as main drugs (Allam & Amer, 2020).

A study in India revealed that ignorance, poverty, expensive health services at facilities and advertisement of drugs on media have contributed to self-medication practices which actually carry a risk of organ damage to children when overdose occur (Akhtar et al., 2022; Mathias & Prabhu, 2020). Meanwhile**,** China is a developed country, but there is still use of antibiotics and antimalarial without prescription, which is attributed to having knowledge of medicines (Liu, 2020)**.** Further, in China, geographical location plays a role in self-medication practice (Liu, 2020). Also, a study in Mexico opined that, there is high prevalence of self-medication in urban compare to rural areas owing to the fact that many young people who have achieved certain level of literacy for example, high school and college graduates believe that they have adequate knowledge to read and understand medications side effects and therapeutic uses (Sisayet al., 2018). This can as well be compared to developed and under developed countries where, the study done in Bamenda shows the prevalence of antimalarial as 50% and in China and Sudan self-medication with antibiotics stands at 47.8% and 79.5% respectively. (Ge J, et al., 2021; Humaida, 2021)

There are many sources of self-medication but the major source is private pharmacies according to study done in Yaounde, Cameroon (76.88%) (Pemunta et al, 2019). Others reported pharmacist, health care providers as main source of accurate information regarding medications for self-medication though some take advantage to generate profit, hence unethical practice (Abdelwahed et al. 2023; Hamid H et al 2020; Akour A. et al., 2021). However, there are drug vendors and shops who may act as alternative sources though they do not adhere to principle of rational medicine use leading to misuse of drugs. Their aim is to generate profit and fortune. Unfortunately, most parents

who purchase medicines from drug vendors and shops do not have adequate medical knowledge to interpret appropriate dose, making paediatric prone to adverse side effects and toxicity leading to death. This resulted to Overdoses which is very dangerous and has led to death of many children due to drug poisoning. It is reported that accidental poisoning among children under 5 by mothers is 40% in Botswana (Kajinga, 2018). In addition, other documented negative health adverse effects to population especially children are, retarded growth, antimicrobial resistance, waste of public resources as a result of procurement of expensive brands due to resistance as well as hypersensitivity reaction, and death due to toxicity. Thus, the government has obligation to formulate control policies and strictly regulates private pharmacies, vendors and shops to minimized self-medication practice (Pemunta et al., 2019)

According to study done in Eretria, knowledge is the main source of information for medicines use for self-medication. This is usually acquired through reading different medical literatures. Some of the study participants obtained medications from pharmacy as well as left over medicines from prescription. Due to fear of adverse drug reaction, 30% of study participants altered doses without advice from health care providers. Hence, handful of them reported worsening signs and symptoms which resulted to further seeking of advance treatment from health facility (Zenawi Zeramariam Araia et al 2019)

The study in Barhir Dar reported that self-medication is usually triggered by illness that is not serious and the medical urgency of the situation of which many resort to antibiotics to manage health conditions whereas others use analgesics (Berihun Yismaw et al, 2023). This is similar with findings of the study done in Ugandan and Saudia Arabia in which many perceived that there is no risk associated to self- medication when treating minor sickness; hence encourage self-medication to continue to evolve

(Aljaouni ME. et al., 2023; Al-Qahtani AM., 2022; Niwandinda F. et al 2020). This could be attributed to ignorance of warnings in leaflets that are usually enclosed in packaging for health education; thus, the drug control authority with pharmacist should enforced strict measures on obtaining medicines using legal and legitimate prescriptions (Al-Qahtani AM., 2022)

Parents who self-medicate children reported that about 27% of children showed signs and symptoms of adverse drug reactions, which is worst with paracetamol given in high dose, 70mg/kg/day because of immature hepatic system and inappropriate dose (Heard, K. et al 2017). Some children vomit, manifest stomach upset and pain as well as irritability especially with ibuprofen, ambroxol and loratadine (De Vries, T.W.; & van Hunsel, F., 2016; Du, Y. et al 2018; Kantar, A. et al 2020)

Furthermore, in Sub-Saharan countries, self-medication is linked to literacy as study done in Addis Ababa, Ethiopia revealed high prevalence among high school and under graduate students of which ignorance is found as of the driving forces considering the fact that they are more aware of risk associated to self-medication practice (Achalu, 2020). High prevalence of antimalarial and antibiotics in Kenya is an indication of misuse of antimalarial and antibiotics which may result to antimicrobial resistance hence high costly of treatment and mortality. It has been found that advertising pharmaceuticals on media contributes immensely on high prevalence of self-medication practices. The civil population believe they have adequate knowledge to use medications without advice of health care provider; consequently, irrational use of drugs: sub- therapeutic doses, adverse drug reaction and incomplete regimen as well as wrong medications (Mageto & Zablon, 2018).

2.2 Concept of Health seeking practices

Health seeking behaviour refers to what an individual does when he/she falls sick. Health seeking practices are highly complex area incorporating many variables. It is affected by both people's knowledge and understanding of disease causation and by factors such as relative costs direct and indirect of different types of practitioners and facility. Disease and illness are perceived in various ways cross-culturally (Sumathi et al, 2022). In different circumstances the decision to seek medical care lies with an individual's personal and social circumstances. When individuals fall sick, they have to decide on whether to seek assistance from popular, folk, or professional sectors. The context within which they make these choices is determined by several factors, such as the availability of helpers, the need to pay for services rendered affordability of services, and the explanation that patients offer for the cause of their sickness (Gogazeh, 2020).

There are two commonly identified health seeking models that explain the phenomena of health seeking practice; pathway and determinants models. Pathway model has four stages; symptom experience, contact stage, dependent patient role and the recovery and rehabilitation (Pei, 2020). The symptoms stage is where an individual is confronted with a decision about whether or not something is wrong or whether to accept the symptoms as evidence of illness and an individual makes assumptions of the sick role, which comes after a decision has been made to accept the health disorder. In the contact stage, professional assistance is sought. The dependent patient role stage is the stage entered when both the patient and practitioner agree that treatment is necessary (Niroomand et al., 2020). Finally, the recovery and rehabilitation stage are entered when practitioner prescribes medication in attempts to treat the ailment in question. In the determinants model, explanatory variables that are associated with the forms of different health

services are discussed where, predisposing factors that determine choice of medical care or action to be taken during an illness episode, characteristics of the disorder and health services system are put (Sumathi et al., 2022).

2.3 Theoretical foundation

The study is anchored on Health Belief Model (HBM)

2.3.1 Health Belief Model (HBM)

The Health Belief Model (HBM) was established by social psychologists Hochbaum, Rosenstock, and Kegels in the 1950s. However, it was primarily Rosenstock who developed and expanded upon the model in subsequent years, particularly in the context of understanding health behaviours and promoting preventive health practices. The foundational work on the Health Belief Model was published by Rosenstock in 1966 in the article "Why People Use Health Services." Since then, the HBM has been widely used and adapted in various fields; including public health, health education, and healthcare behaviour research (Rosenstock, 1974).

The Health Belief Model (HBM) serves as a pertinent theoretical framework for understanding the factors influencing self-medication practices among parents of under-five children in Bortown, Jonglei State, and South Sudan. The Health Believe Model posits that individuals' health-related behaviours are shaped by their perceptions of susceptibility to health threats, severity of those threats, benefits of taking action to reduce the threats, and barriers to adopting preventive or treatment measures. Additionally, the model considers cues to action and individual self-efficacy as determinants of health behaviour. Applying the Health Belief Model to the study of self-medication practices offers a comprehensive framework for exploring caregivers' decision-making processes and behaviours regarding the management of childhood illnesses (Champion & Skinner 2008).

Parents' perceptions of their children's susceptibility to illnesses and the severity of those illnesses influence their likelihood of engaging in self-medication. For example, caregivers may perceive common childhood ailments, such as colds or minor fevers, as less severe and thus opt for self-medication rather than seeking professional medical care. Conversely, perceptions of more serious illnesses or complications may prompt caregivers to seek immediate medical attention instead of relying solely on self-medication (Champion & Skinner 2008, Kendler, 2019).

Furthermore, parents weigh the perceived benefits of self-medication, such as convenience, cost-effectiveness, and immediate symptom relief, against the potential risks and barriers associated with this practice. Benefits may include the accessibility of over-the-counter medications and the ability to manage minor ailments without the inconvenience of visiting healthcare facilities. Barriers, on the other hand, may include concerns about medication safety, lack of knowledge about appropriate dosage and administration, and fear of exacerbating the child's condition through improper treatment (Champion & Skinner 2008).

Besides, external cues, such as advice from family members, friends, or community members, previous experiences with self-medication, and media influence, can serve as cues to action that prompt caregivers to engage in self-medication practices. Additionally, healthcare provider recommendations or community health campaigns promoting safe medication practices may influence caregivers' decisions regarding self-medication for their children (Champion & Skinner 2008).

Parents' confidence in their ability to effectively manage their children's health and navigate the healthcare system plays a significant role in their engagement in self-medication practices. Higher levels of self-efficacy may lead caregivers to feel more empowered to make informed decisions about self-medication, while lower levels of

self-efficacy may result in greater reliance on self-medication due to perceived barriers to accessing professional medical care (Champion & Skinner 2008).

Applying the Health Belief Model to the study of self-medication practices among under-five children in Bortown, Jonglei State, South Sudan, enable researchers gain insights into the multifaceted factors influencing parents' behaviours and perceptions related to managing childhood illnesses. This theoretical framework provides a structured approach to understanding the complex interplay of beliefs, attitudes, and contextual factors shaping self-medication practices, ultimately informing the development of targeted interventions and policies to promote safe and effective healthcare practices for young children in the community.

Theoretical Framework

Illustration of theory anchoring study objectives

Figure 2.1: Theoretical Framework

Theory anchoring the objectives of the study

Source: Researcher (2022)

2.4 Conceptual Framework

The conceptual framework indicates the relationship between the variables and directs the study by organizing key concepts and variables. The figure 2 below shows the relationship of independent variables, dependent variable and intervening variables of self-medication practice prevalence.

Conceptual Frame work of study variables

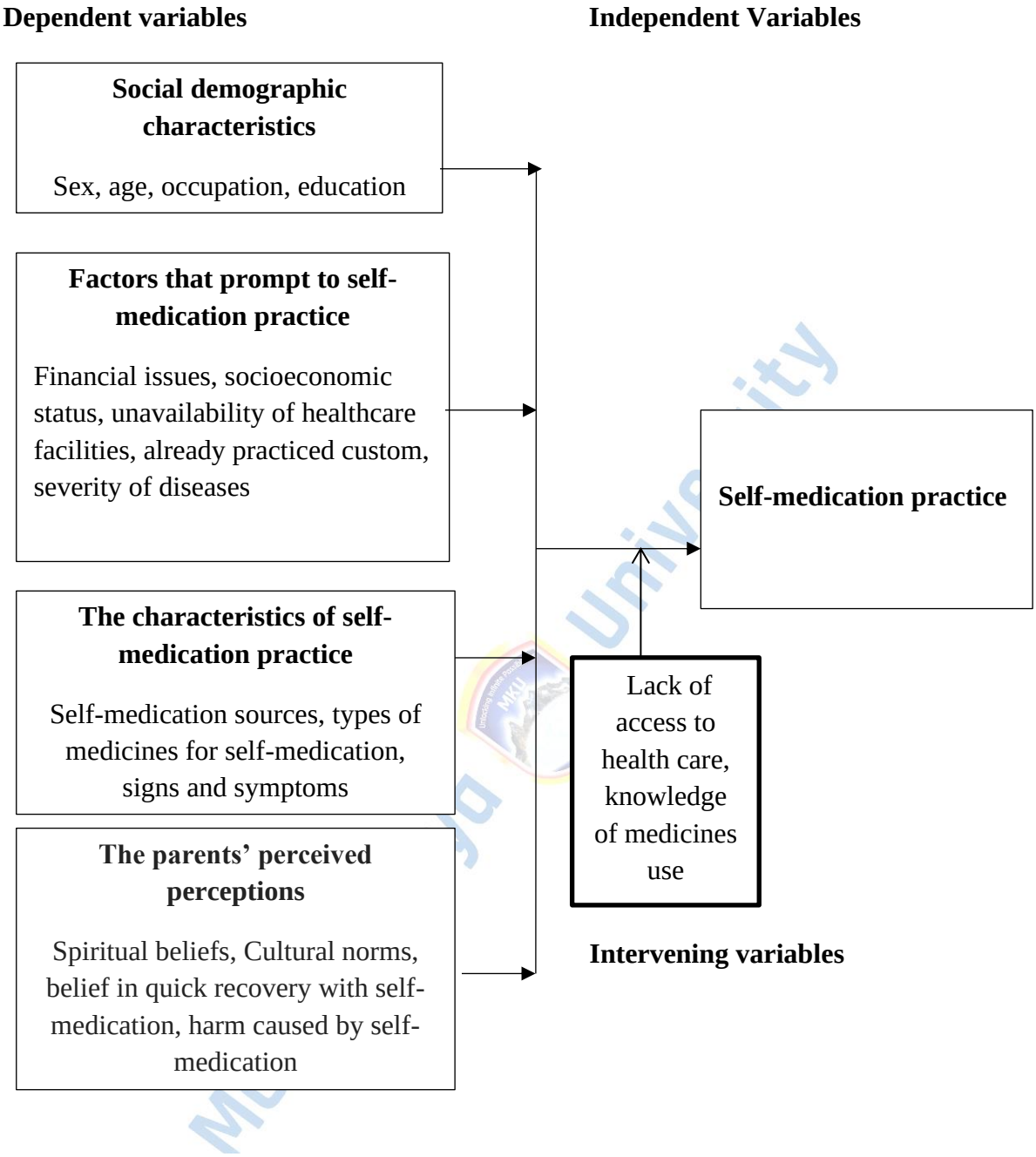

Figure 2.2: Conceptual Framework

Source: Researcher (2022)

From the conceptualization of variables, Prevalence of self-medication practice was measured with number of parents self-medicated for children, frequency of self-medication, Self-medication was operationalized with factors that prompt to self-medication practice such; financial issues, socioeconomic status, unavailability of

healthcare facilities, already practiced custom, severity of diseases. Further, the characteristics of self-medication practice would include sources of self-medication sources, types of medicines, type of disease self-medicated and the parents' perceived perceptions will be measure with spiritual beliefs, Cultural norms, belief in quick recovery with self-medication, harm caused by self-medication.

Recap of literature review

The literature review provided a comprehensive overview of the prevalence and factors influencing self-medication practices among children under the age of five. The prevalence of self-medication varies across different regions, influenced by cultural backgrounds, socioeconomic factors, and healthcare access. Studies highlighted varying rates of self-medication among children under five years old, with some regions reporting alarmingly high rates, such as Mexico and certain parts of Africa. The emergence of the COVID-19 pandemic further exacerbated self-medication practices due to limited access to healthcare services and fear-driven misinformation. Various factors prompt parents to engage in self-medication practices for their children. These include economic constraints, lack of access to healthcare facilities, ignorance, and advertisements promoting self-treatment through media. Additionally, educational level, previous experiences, and advice from friends or neighbours were identified as influential factors. The perception that minor illnesses do not require professional medical attention also contributes to self-medication practices. Private pharmacies were identified as the primary source of medications for self-medication, followed by leftover prescription medicines and drug vendors. However, reliance on these sources poses risks, as they may not always provide accurate dosages or appropriate medications. Moreover, unethical practices by some pharmacies and vendors further exacerbate the problem. Self-medication practices can lead to adverse drug reactions, overdose, and

toxicity, particularly in children with immature metabolic systems. Common adverse effects reported include vomiting, stomach upset, and organ damage. Additionally, misuse of antibiotics contributes to antimicrobial resistance, posing a significant public health concern. The review underscores the importance of developing strict policies to regulate the sale of prescription medicines and promote health education regarding the risks of self-medication. Government intervention is necessary to enforce regulations, ensure proper medication labelling, and improve access to healthcare services, particularly in underserved regions.

CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Introduction

The chapter explains the research methods that were applied to conduct the study. The chapter contains; study location, research design, study population, sample size and sampling techniques, data collection instruments, validity and reliability of the tools, data collection procedure, data management, and ethical considerations.

3.1 Research Methodology

The research methodology refers to the specific approach employed for identifying, selecting, processing, and analysing information regarding self-medication practices and associated factors in children under the age of five by their parents. In this study, interviews were utilized as the primary research methodology to quantitatively collect data based on a set of predetermined questions outlined in the questionnaire. Interviews were chosen as the preferred method for data collection due to their ability to provide direct insights from parents regarding their self-medication practices with their young children. The structured questionnaire ensured consistency and relevance across all interviews, facilitating systematic data collection and analysis. During the interviews, participants were asked a series of questions aimed at eliciting detailed information about their self-medication practices, including the prevalence, motives, sources, and consequences of self-medication. Additionally, factors such as socio-economic status, educational background, and access to healthcare facilities were also explored to understand their influence on self-medication behaviours. The quantitative data collected through interviews were then processed and analysed using appropriate statistical methods. This analysis enabled the identification of patterns, trends, and

associations related to self-medication practices among parents of children under five, providing valuable insights for addressing this public health issue.

3.2 Location of the Study

BorTown is the capital city of Jonglei state in South Sudan and headquarter of municipality. It is located to the east of White Nile and it is located north of Juba and 190 kilometres away. The population estimate of Bortown is 26,782 (world population review, 2021). This population is lower compare to previous years: 29,202 (UNICEF, 2015); due to displacement cause by floods and retracted arm conflict characterised by child abduction, cattle raiding and revenge killing.

3.3 Study Variables

3.3.1 Independent

- ✓ Social demographic characteristics of parents of under five children
- ✓ Factors that prompt to self-medicate under five children
- ✓ The characteristics of self-medication practice among under five children
- ✓ Parents' perceptions of self-medication practice among under five children

3.3.2 Dependant variable

- ✓ Self-medication practice

3.4 Study Design

The research design was descriptive cross-sectional- all parameters regarding the study were taken at the point of admission without manipulation of data.

3.5 Target Population

The study population included parents for under-five year children from household level. Participants in the research were parents who provided care for children under the age of five who were unwell or injured. Families in Bortown were recruited to take part in the research if they had a kid under the age of five living in their home. Research

participants included mothers, fathers, grandparents and foster parents. There were 4,592 families included in the research, all of whom had at least one child younger than five and who had been residents of Bortown for at least six months prior to the study day. Bortown's residential neighbourhoods provided the basis for this total household population with under five-year child as shown in table 1 below

Table 3. 1: Target population in residential areas of Bortown

Residential areas in Bortown	Target population	Percent (%)
Leu-diet	1,253	27
Arek and Malou villages	1,003	22
Nigel and Block-2	1,063	23
Lekyak village	607	13
Hai Panjak and Pan-Liet	666	15
Total	**4,592**	**100**

Source: United Nations Children funds (UNICEF, 2022)

3.5.1 Inclusion Criteria

- All Parents and caregivers with under five-year child
- Parents from Bortown locations
- Parents lived in Bortown for more than six months
- Parents expressed consent to participate in the study.

3.5.2 Exclusion Criteria

An individual was excluded from the study if:

- He/she had denied participation consent
- Parents and caregivers of under 5 with documented mental health problem
- Households with children above 5 years.
- Those absent during study though they meet criteria
- Did not meet the inclusion criteria

3.6 Sampling frame

From each Bortown locations, lists of 4,592 households with under five-years children was obtained (UNICEF, 2022)

3.7 Sample population size determination

A Cochran's sample size determination formula was used;

$\mathbf{n_0 = Z^2pq/e^2}$

Where n_0= sample size

p= 50%- estimated population proportion of success; (Note that 50% was chosen because estimated prevalence was unknown not only in Bortown but also in South Sudan; It reflects assumption that impact was expected in 50% of the population)

e=0.05 margin of error (5%) (The precision of measurement)

Z= 1.96; according to normal reduced centre law when confidence interval is 95%

$n = \{(1.96)^2 (0.5) (1-0.5)\}/ (0.05)^2 = \underline{384}$

However, adjusted formula was used when total population of the study was below 10,000; Thus, $n = \frac{n}{1+\frac{n}{N}}$

Where N_i = the minimum sample size

n = sample size

N = total number of under-5 children

$N_i = 384 / (1+384/4592) = \underline{354;}$

The none response rate is projected to be 5% of the sample size calculated;

0.05 x 354=<u>19</u>

n=354+19; n=373

3.8 Sampling Procedures and techniques

The study employed a stratified sampling approach based on geographical locations. Probability Proportionate to Size formula was utilized to obtain representative samples

from each stratum, calculated as Sample size/Population size x Stratum population (as shown in Table 3.2). For household selection, a simple random sampling method was employed. The population was defined, and sample size was determined using Cochrane's formula. A list of households with children under five years old was compiled, and participants were randomly selected using a lottery method. This approach ensured that every respondent had an equal chance of being included in the study.

Table 3.2: Bortown's locations Sample proportions of the Study

Residential areas in Bortown	**Target population**	**Sample size per stratum**	**Percent (%)**
Leu-diet	1,253	1253/4592 ×373 = 102	27
Arek and Malou villages	1,003	1003/4592× 373 =82	22
Nigel and Block-2	1,063	1063/4592 x 373=86	23
Lekyak village	607	607/4592 x 373=49	13
Hai Panjak and Pan-Liet	666	666/4592 x 373=54	15
Total	**4,592**	**373**	**100**

Source Researcher (2022)

3.9 Construction of Research Instruments

The study used questionnaires (interview schedule) to collect data and was developed in line with study objectives. The questionnaires were deemed suitable for the present study because they collected data in a short time, less costly and, were the best to collect data without data manipulation.

3.10 Pretesting of Research instruments for Validity and Reliability

3.10.1 Piloting the Instrument

A pilot study is a small-scale version or test run conducted in advance of a larger investigation (Truong, 2017). The significance of the pilot test cannot be understated because it enables the researcher to detect and correct any ambiguous, unclear, poorly designed, or inappropriate questions prior to posing them to respondents in a major study. To assure the accuracy of pilot research, a 1 to 10 % sample size is acceptable.

The study pre-tested the data collection tools at Rajaf-Sherikat because; the town is one of the same characteristics with Bortown in the country and experience self-medication practice among under five children by parents. The study sampled 18 parents observing the inclusion criteria from, which is 5% of 373 respondents for the pilot study (Tseng, & Sim, 2021). There was active involvement of the first author-principle investigator during enhancement of the data collection tool to guarantee that the actual study captured valid, reliable and error-free data. Validity and reliability of tools are not determined by pilot testing; rather, pilot testing enhances or improves validity and reliability (Mbugua & Omagwa, 2017).

The 18 participants for piloting study were sampled using simple random sampling technique. Out of 18 questionnaires administered by enumerator, 16 were accurately answered without any changed suggested. The 2 questionnaires that were incomplete were discarded and thus, were not included in the analysis. The percentage of respondents that filled out the survey was 89.1%, and the reliability test using Cronbach's alpha coefficient (r) was 0.752, putting it in the excellent reliability range. In conclusion, the pilot research indicated that the questionnaire (tool) and the overall study were doable.

3.10.2 Instrument Validity

Both concept and content validity were used in the research. The survey was broken up into three sections to improve construct validity. In the first section, participants provided basic demographic information such as their gender, age, country of residence, religion, marital status, level of education, profession, and monthly income. Questions were added in Part 2 to evaluate the research variables, and in Part 3 to gauge the participants' impressions of their own self-medication. For that matter, each segment had close connections to the conceptual framework of this study (Kothari et al., 2020).

Before the final stage of data collection, the questionnaire's content validity was also rigorously evaluated to ensure that the questions were relevant, straightforward, and not objectionable.

During piloting, 16 participants verbally confirmed that the questionnaire was clear, meaningful and relevance and therefore, no adjustment suggested

3.10.3 Instrument Reliability

The research investigated the internal consistency of data collection through the utilization of Cronbach's Coefficient Alpha. The objective was to ascertain the presence of correlations between items on the same test and the comparability of scores derived from multiple items intended to evaluate the same fundamental construct (Kothari et al., 2020). The Cronbach's alpha coefficient (r) is a metric that ranges from -0 to 1 (Adeniran, 2019). A reliability threshold of Cronbach's alpha coefficient (r) of 0.7 or higher is considered to be acceptable (Taber, 2018). A pilot study was carried out, and the Cronbach's alpha coefficient was determined to be 0.752, indicating good reliability and internal consistency of the data collection tool.

3.10.4 Testing of Normality

To determine if the response variables score dispersion is regularly distributed or not, normality tests are utilized (Mishra et al., 2019). The results of a normality test offer support or a framework for choosing between parametric and non-parametric methods for statistical analysis. To determine if the scores on the dependent variable were regularly distributed, the researcher used the Shapiro-Wilk statistic. A significant level [Sig-Value] more than or equal to 0.05 is judged non-significant-dependent variables' scores are regularly distributed whereas less than 0.05 is judged significant-dependent variables distribution does not adhere to the assumption of normality.

The piloting study result showed that Shapiro-wilk statistic was less than 0.05 which

means dependent variables do not adhere to assumption of normality. Therefore, we chose non- parametric method-Pearson Chi-square for statistical analysis in the main study

3.11 Data Quality Assurance

Data quality was ensured through working with 5 trained research enumerators who were required to consenting of participants, data collection and entry. Additionally, the study pre-tested questionnaire to ascertain that all pages were printed, and all questions were correct and clear before data collection. Standard operating procedures were followed strictly and results were recorded using appropriate format. The collected data were checked for its completeness, accuracy, and clarity at the moment of data collection every day by principal investigator. Double counting and tallying during data analysis and processing and electronic copy of the data was protected through password to only access by the researcher.

3.12 Data Collection Methods and Procedures

The study strictly followed the inclusion criteria. The principal investigator and the research enumerators held regular meetings to ensure that the study adhered to quality control measures. The research enumerators were given thorough training on the study objectives, including ethical considerations when interacting with study participants. The data collection procedures were closely monitored to minimize the risk of errors and omissions. The study also obtained a permit for data collection before the actual exercise. The data collection exercise took place from the 6th to the 13th of February 2023 and lasted for a period of seven days. The strict adherence to quality control measures and ethical considerations during data collection will help ensure that the study's findings are reliable and valid.

3.13 Data Analysis Techniques and Procedures

The information gathered was double-checked to make sure it was comprehensive and accurate before being input into SPSS window version 25 for analysis. Statistical approaches were used to investigate the connection between numerical data that had been coded and research questions pertaining to the variables under study. Categorical characteristics of the respondents were shown as frequencies and percentages, while continuous features were displayed as means with standard deviations. The chi-square (X2) test was used to analyse the correlation between the variables, with a p-value of less than 0.05 indicating statistical significance. Overall, this analytical approach allowed for a thorough exploration of the data, enabling the researchers to draw meaningful conclusions about the variables under investigation.

3.14 Ethical Consideration

Ethical issues were of the highest significance in carrying out this inquiry. The following safeguards were established to ensure the participants' safety: First, the participants were given a thorough explanation of the study's goals, both orally and in writing, so that they would know what to expect and they were assured confidentiality of their data. Second, before to beginning the research, written agreement was sought from all participants to ensure consenting, voluntary participation as well availability of consent information form to be signed prior data collection. Third, the Institute of Public Health at Mount Kenya University's Ethical and Research Committee granted ethical approval and provided an introduction letter. Fourth, participants were given complete freedom of choice about their participation in the study and were free to resign from the research at any moment with no repercussions. Last but not least, all participant information was treated as strictly academic and never released to the public.

Researchers were able to get the data they needed to conduct their study in a responsible and ethical way because to the measures they took to protect participants' privacy.

3.15 Dissemination of Results

The final findings of the study would be disseminated to MKU School of public health and Jonglei State ministry of health as well as Bortown municipality

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.0 Introduction

In this chapter, the study findings are presented in a way that aligns with the research objectives. The results are carefully interpreted and discussed with reference to the relevant literature that was reviewed in the earlier stages of the study. The chapter also includes information on the response rate and reliability of the study's results. The socio-demographic characteristics of the study participants are summarized and presented visually in frequency tables and figures. Descriptive statistics were used to provide an overview of the respondent's profile and self-medication behaviour. Additionally, the relationship between self-medication practice and other variables was assessed using either Chi-square or Fisher's exact Test, depending on whether the cell value of a specific variable violated any assumptions.

4.1 Response Rate

Table 4.3: Response rate of study participants in Bortown

Questionnaires administered	Response rate	Non-response rate	Comment
373	98.1% (n=366)	1.9% (n=7)	Representative

Source: Researcher (2022)

Out of the 373 questionnaires, n = 366 questionnaires were returned completely filled out, resulting in a response rate of 98.1% as shown in table 4.3 above. This high response rate could be attributed to simple design of questionnaire, the research permit which stated that it was for academic purposes only and the consent form which grantee respondent privacy and confidentiality as well as not being farming season, so many care givers were at home during study period

4.2 Reliability Test of all constructs

A reliability test was performed by use of Cronbach's coefficient Alpha to determine the internal consistency and the dependability of the data collection instruments. The Cronbach's alpha coefficient was 0.752 which is termed as good and reliable (Taber, 2018). Hence the research tool was fit, reliable and feasible for study without any adjustment.

4.3 Respondent Socio-demography profile

4.3.1 Gender of Respondents

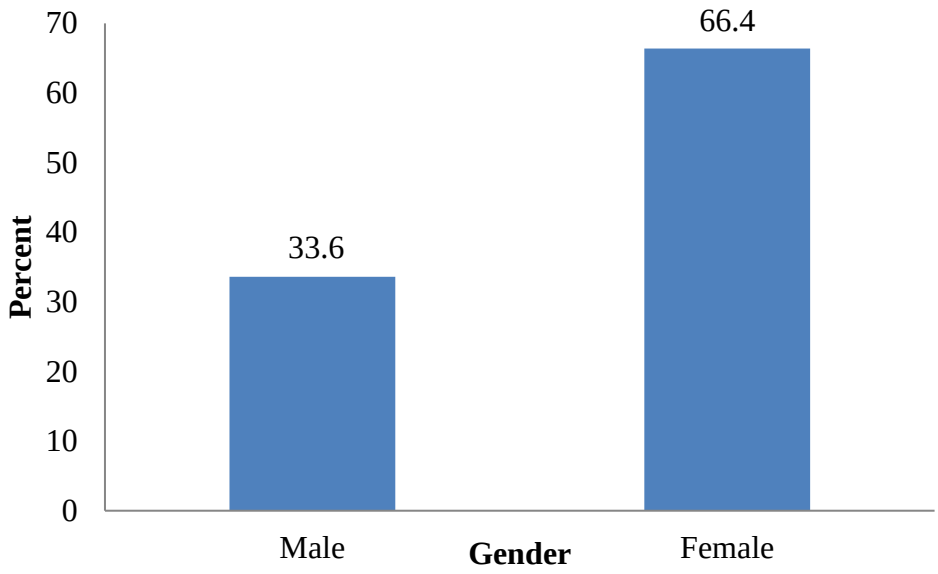

Figure 4.3: Gender of the respondents in Bortown

The study established the group participant that majority were female respondents (n=243, 66.4%) and male were 33.6% (n=123) as shown in figure 4.3. Gender variable was important in the present study because the researcher determine if the self-medication use was different for male and female. This is similar with studies done in south-western Nigeria and Bameda Cameroon with more female respondents (okunola, 2020; Teke *et al.*, 2017). This different of gender could be attributed to societal setting

where men spend most of their time outside home, may be working or playing communal games such as dominos or ludio with friends while study being conducted

4.3.2 Age

Table 4.4: Age category of study participants in Bortown

Age	Frequency	Percent
Less than 18	8	2.2
18-39	147	40.2
40-59	203	55.5
60 and above	8	2.2
Total	366	100.0

Source: Researcher (2022)

The study determined the age category of the participants. The results in table 4.4 show that majority of the respondents were aged between 40-59 years (n=203, 55.5%). This was followed by 18-39 (n=147, 40.2%). This study contradicts with most of the previous studies where many respondents were between the ages of 30-39 years (okunola., 2020; Jingjing Gel *et al*, 2021). This contradiction may be explained with regard to societal norm of Dinka tribe: living as extended family and elderly parents especially mother-in-law acting as care givers of under-five year children after weaning a child

4.3.3 Religion

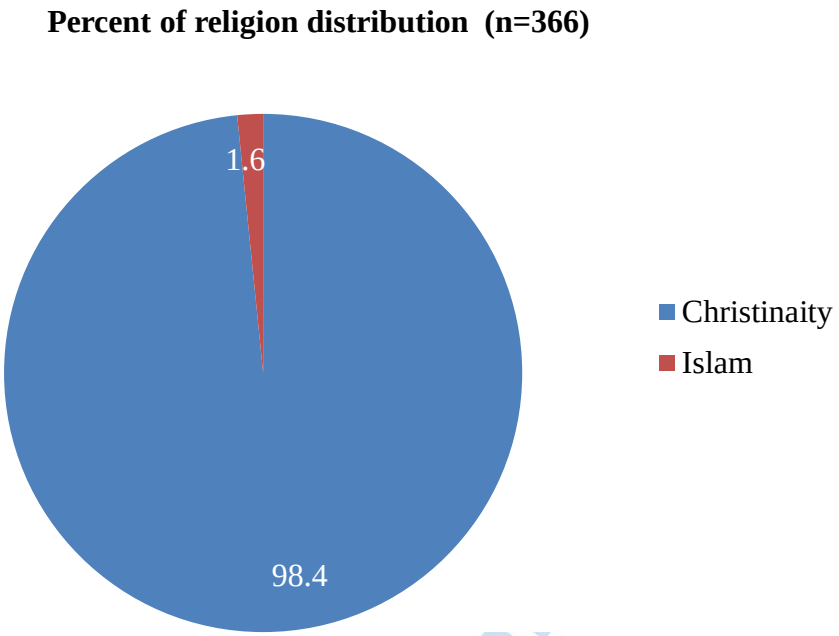

Figure 4.4: Religion status of parents of under-five children in Bortown

Source: Field data (2022)

The findings showed that the majority of the study subjects were Christians (n=360, 98.4%) while only 6 (1.6%) were Muslims as shown in figure 4.4 above.

4.3.4 Education level

Table 4.5: Education level of parents of under-five children in Bortown

Education level	Frequency	Percent
None	69	\18.9
Primary school	208	56.8
Secondary school	66	18.0
Graduate	19	5.2
Post-graduate	4	1.1
Total	**366**	**100.0**

Source: Researcher (2022)

The majority of the respondents have completed primary level of education (n=208, 56.8%) whereas post graduate has the lest respondents (n=4, 1.1%) as shown in table 4.5

4.3.5 Main occupation

Table 4.6*:* Main occupations of the study participants in Bortown

Occupation	Frequency	Percent
Farmer	146	39.9
Business person	76	20.8
Employee	53	14.5
Housewife	51	13.9
Cattle keeper	14	3.8
Fisherman	26	7.1
Total	**366**	**100.0**

Source: Researcher (2022)

The study found that majority of the participants were farmers (n=146, 39.9%) while only 14 (3.8%) were cattle keepers as shown in table 4.6

4.3.6: Marital status

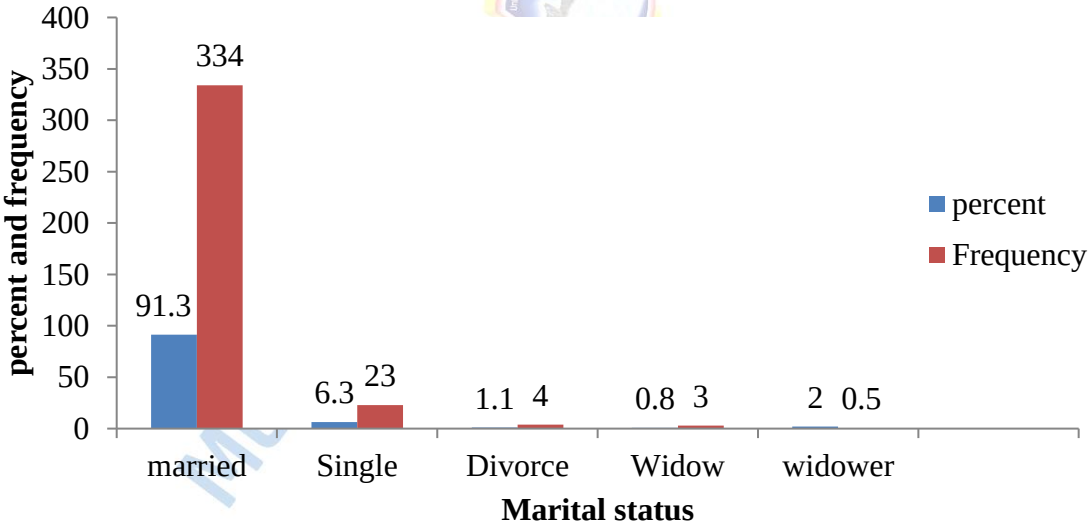

Figure 4.5: Marital status of respondents in Bortown

Source: Researcher (2022)

The study determined the marital status of the respondent and majority are married (N=334, 91.3%) as shown in figure 4.5

4.3.7 Monthly income

Table 4.7: Monthly income of respondents in Bortown

Monthly income	Frequency	Percent
Less than 30,000	20	5.5
30,000-69,000	132	36.1
70,000-100,000	169	46.2
Above 100,000	45	12.3
Total	**366**	**100.0**

Source: Researcher (2022)

The study determined the monthly income in South Sudanese Pounds of the respondents of which majority has monthly income of 70,000-100,000 South Sudanese pounds (n=169, 46.2%) as shown in table 4.7

4.4 Prevalence of self-medication practice

The first objective was to determine the prevalence of self-medication among the five year children in Bortown, Jonglei state, South Sudan.

Table 4.8: Prevalence of self-medication among under 5 children in Bortown

Proportion of self-medicated	Frequency	Percent
Yes	323	88.3
No	43	11.7
Total	**366**	**100.0**

The prevalence of self-medication among under-five children by parents in Bortown, South Sudan was found to be 88.3% which is quite high as shown in table 4.8. According to previous studies reports, the prevalence varies from 18%-98%; for example, 91.4% in Nigeria (Ayamolowo et al., 2018) and 86.5% in Cameroon (Kojom et al, 2018). These differences could be due to geographical location and socio-economic activities which dictate life style of individuals. This raise a serious health concern not only in Bortown but also the whole world since children do not choose to be self-medicated rather parents despite children susceptibility to side effects of medication.

Despite numerous negative outcomes associated to self-mediation such as foetus anomalies and death, it is believed to be easily accessible, cheap and saves money, treat minor illnesses and prevent disease as well as improves the capacity of health system by reducing patients' caseloads on health professionals and empowers patients to take care of their own health through self-treatment of minor illnesses that would have wasted scare resources at health facility (Hughes CM et al 2022; Noone J, & Blanchette CM., 2022). However, this only happens when it is done correctly even in absence of professional advice of health care providers. Nevertheless, the consequences of misuse of prescribed only medicines and over the counter drugs especially from drugs sellers who do not have medical background rather venture into medical field as a business are more severer and detrimental to health (Harris, 2020). While inappropriate use of over-the-counter medicines results in waste of resources, negative side effects, and unintended drug interactions, it may also hide serious diseases and lead to antibiotic resistance, a growing concern in developing countries due to the rising number of infectious disease cases (Nasir et al., 2020). Additionally, the study established the association between the prevalence of self-medication and socio-demographic characteristics of the respondents as shown in table 4.9

Table 4.9: Association between the social demographic characteristics and self-medication

Socio-demographic characteristics		Self-medication prevalence		Chi-square value	P-value
		Yes (%)	No (%)		
Gender	Male	106 (86.2)	17 (13.8)	(1, n=366) =0.496	0.481
	Female	217 (89.3)	26 (10.7)		
Age-group	Less than 18	4 (50.0)	4 (50.0)	(3, n=366) = 12.694	0.005
	18-39	132 (89.8)	15 (10.2)		
	40-59	179 (88.2)	24 (11.8)		
	60 and above	8 (100)	0 (0.0)		
Religion	Christianity	317 (88.1)	43 (11.9)	(1, n=366) =0.069	0.793
	Islam	6 (100)	0 (0.0)		
Education level	None	61 (11.6)	8 (11.6)	(4, n=366) = 2.444	0.655
	Primary	185 (88.9)	23 (11.1)		
	Secondary	59 (89.4)	7 (10.6)		
	Graduate	15 (78.9)	4 (21.1)		
	Post-graduate	3 (75)	1 (25.0)		
Occupation	Farmer	133 (91.1)	13 (8.9)	(5, n=366) = 15.768	0.008
	Business person	69 (90.8)	7 (9.2)		
	Employee	45 (84.9)	8 (15.1)		
	Housewife	46 (90.2)	5 (9.8)		
	Cattle keeper	8 (57.1)	6 (42.9)		
	Fisherman	22 (84.6)	4 (15.4)		
Marital status	Married	293 (88.9)	37 (11.1)	(4, n= 366) = 3.702	0.448
	Single	18 (78.3)	5 (21.7)		
	Divorce	3 (75.0)	1 (25.0)		
	Window	3 (100)	0 (0.0)		
	Widower	2 (100)	0 (0.0)		
Monthly income	less than 30,000	17 (85.0)	3 (15.0)	(3, 366) = 2.682	0.443
	30,000-69,000	120 (90.9)	12 (9.1)		
	70,000-100,000	149 (88.2)	20 (11.8)		
	100,000 and above	37 (82.2)	8 (17.8)		

Source: Researcher (2022)

The findings on table 4.9 indicated that only occupation (P-value = 0.008) and age (P-value=0.005) factors were found to be significantly associated with self-medication . This is contrary to other studies which found high academic level and low income (P=0.001) to have association with self-medication practice (Saima Nazir at el, 2015; Molento, 2020). However, similar with study in Bameda, Cameron where occupation was associated with self-medication (Teke *et al.*, 2017), and in Arab region where old age was statistically significant (p-value 0.008) (Abdelwahed et al. 2023). The practice of self-medication was higher among female (89.3%) than in male (86.2%), among the respondents under the age of 40-59 (88.2%). Similarly, the study established that, parents with primary education are reported to be self-medicating for under-five years than other level of education in Bortown, South Sudan which contradicts with study done in Asmara, Eretria and Barhir Dar, Ethiopia where those with high academic level practice self-medication than those with low academic qualification (Malede Berihun Yismaw et al., 2023; Araia et al., 2019). Additionally, married respondents had higher self-medicating prevalence whilst those with 70,000-100,000 Sudanese pounds were reported yes than other earners in Bortown. However, the difference was not significant. The study in Arab region found chronic illness (p-value 0.015) and having insurance cover that does not support treatment as well as low income that could not support medical laboratory charges, consultation and cost of medicines (p-value 0.001) to be significantly associated with self-medication (Abdelwahed et al. 2023). Moreover, in Turkey, being a work class and attainment of high level of education is significantly associated to self-medication (p-value 0.05) (Yusuf Karatas et al., 2023) but no significant association according to this study.

4.4.1 Doses

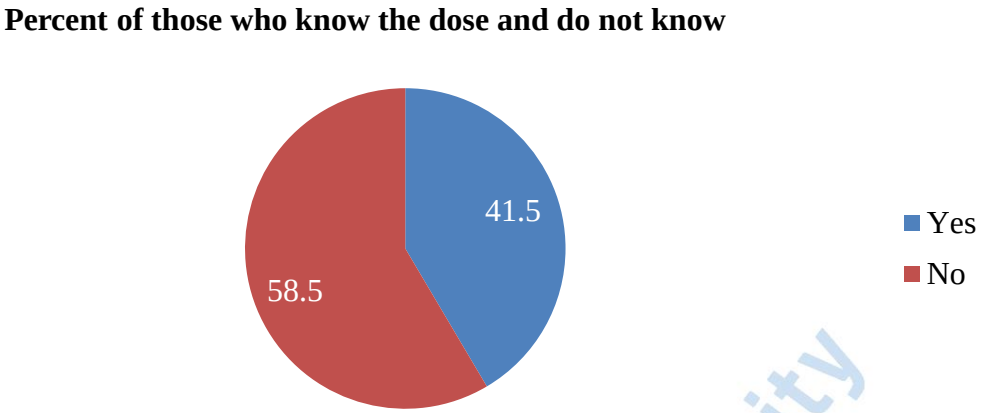

Figure 4.5: Those who know/do not know doses to administer to under- five children

Source: Field (2022)

Majority (n=214, 58.5%) who self-medicated, did not know the right dose to give to their under-five child as shown in figure 4.6 above. This study results are in line with previous studies which found out that many mothers do not know the actual dose to give to their children considering the fact that dosing in under five years children is based on weight and age (WHO, 2022; Kajinga, 2018; Löscher et al., 2020). Previous studies confirmed occurring of adverse reactions and toxicity in some children being self-medicated (Heard, K. et al, 2017). This could be due to overdose, drug toxicity or wrong medicines or inaccurate diagnoses. Others even make it worst by adjusting does without consulting and seeking advice from qualified health professionals such as pharmacists, medical officers and/or nurses to obtain accurate dose and correct medicines that are safe and effective. Moreover, according to previous, 9%-27% of parents who induced self-medication in children reported adverse drugs reactions: vomiting, dizziness, fainting and irritability. For children given high dose (70mg/kg/day) of paracetamol, the level of toxicity sharply increases due to immature hepatic system which is responsible for metabolism, pharmacokinetic and

pharmacokinetic of drug in the body (Araia et al., 2019; De Vries, T.W. & van Hunsel, F., 2016; Du, Y. et al 2018; Kantar, A. et al 2020; Blake KV et al., 2019). On top of this, most drugs formulations and doses are meant for adult, leading to off-labelled use in paediatrics, thus, increasing risks of drugs poisoning (Sachs AN., et al 2018; Sun H., et al 2017). This irrational use of medicines increases risk of toxicity and death in under five as well as antimicrobial resistance. Therefore, should be discourage and educate the general public on proper self-medication procedures.

4.4.2 Expiry Date

Table 4.10: Study participants who check expiry date against those who do not check

Response	Frequency	Percent
Yes	87	23.8
No	279	76.2
Total	**366**	**100.0**

Source: Researcher (2022)

The study sought to know if respondents checked the expiry date before giving medicine to their children. With majority reported hardly check the expiry date of self-medicated drugs for their under-five children (n=279, 76.2%) as shown in table 4.10 above. This was the similar findings in Lubumbashi (Katumbo et al., 2020). The consistency of findings could be attributed to geographical location of both countries being in Sub-Saharan Africa as under developed and conflict affected nations: consequently, inadequate health education and promotion. Further, the study determined the association between those read expiry date with right dose. The chi-square found that checking the expiry date or not is associated with self-medication (χ^2 (1, 366), 15.194; P-value-0.000).

4.4.3 Frequency of self-medication

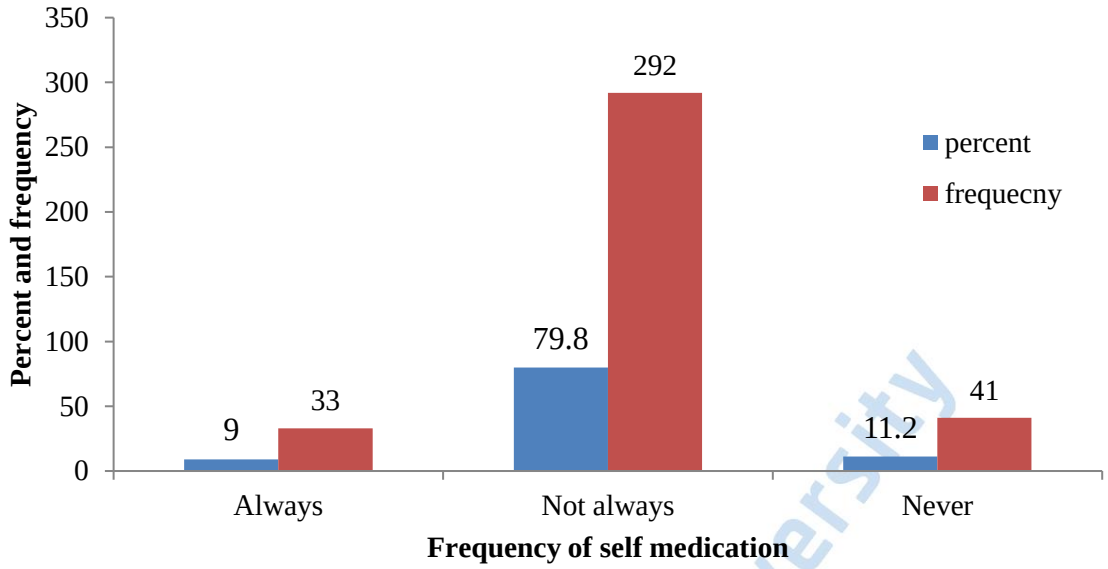

Figure 4.6: Frequency of self-medication in Bortown

Source: Field Data (2022)

The study determined that majority of the respondents did not always self-medicate under five years in Bortown, South Sudan as shown in figure 4.7 above.

4.4.4 Harmful side effect with self-medication practice

Table 4.11: Harmful side effects of self-medication

Harmful side effect	Frequency	Percent	Chi-sqaure	p-value
Death due to drug intoxication	109	29.8		
Drug poisoning	194	53.0	(χ^2 (3, 366),	P-value-
worsening signs and signs and symptoms	30	8.2	22.533;	0.000).
None	33	9.0		
Total	**366**	**100.0**		

Source: Researcher (2022)

Majority of the respondents reported to know that drug poisoning as the harmful side effect of self-medication (n=194, 53.0%) followed by death due to drug intoxication (29.8%) as shown in table 4.11. The study established that harmful side effect was

associated with self-medication (χ^2 (3, 366), 22.533; P-value-0.000). Similarly, previous studies had reported same findings- the consequences of misuse of prescribed only medicines and over the counter drugs through self-medication practice are severe and lethal to health: loss of resources, adverse drug interaction, foetus anomalies and antimicrobial resistance, a growing concern in developing countries to increase in prevalence of infectious diseases (Harris, 2020; Nasir et al., 2020). Despite adequate knowledge of adverse effect of self-medication practice, the prevalence is overwhelming high according to this and previous studies (Kajinga, 2018; Harris, 2020). This consistency in self-medication practice in light of well-known harmful effects could be attributed to geographical location and socio-economic activities, ignorance as well as socio-demography profiles of individuals which dictate life style of various communities

4.5: Factors that prompt to self-medication practice

The second objective of the study determined the main factor prompted parents to self-medicating under-five year child.

Table 4.12: Reasons to self-medication for under-five children by parents in Bortown

Reason prompted to self-medication	Frequency	Percent
It is cheap (No laboratory and consultation fee)	91	24.9
Health facility far from home	79	21.6
Too long waiting time at public hospital	15	4.1
Availability of stock medicines at home from previous treatment	106	29.0
Severity of illness	7	1.9
Advertisement on Media	8	2.2
Recommendation from Neighbor/Friend	26	7.1
None	34	9.3
Total	**366**	**100.0**

Source: Researcher (2022)

Majority of the participants recorded availability of stock medicines at home from previous treatment as the main reason prompted to self-medication for under five children (n=106, 29%); followed by it is cheap-no consultation (n=75, 24.9%) as shown in table 4.12. Nevertheless, factors that prompt parents to self-medicate under-five children vary according to country where study was conducted. This study had similar findings like some previous studies conducted (Katumbo et al., 2020; Tarciuc et al., 2020). Majority of parents in Mexico who used herbal and alternative medicines cite expensive consultations at health facility and availability of left over medicines at home as main reasons for self-medication (Alonso-Castro et al., 2022).This is the same scenario in Bortown though they use conventional medicines for self-medication. However, a study done in North Iran, China and Eretria revealed that availability and easy accessibility of medical literature and medical apps in Gorgan contribute immensely to self-medication of under-five children (Aref & Barati, 2021; (Zenawi Zeramariam Araia et al., 2023; Xu J., et al., 2020) whereas in Nigeria, the decision to self-medicate under five children is majorly influenced by advertisement on media and personal experiences based on previous treatment (Okunola, 2020). These differences could be explained with different in access to social media and knowledge gape as well as educational level

4.5.1 Association between contributing factors and self-medication practice

Table 4.13: Factors promoting self-medication in under five children by parents in Bortown

Factor for self-medication	Self-medication practice		Fishers' exact test	p-value
	Yes	No		
It is cheap (No laboratory and consultation fee)	**89 (97.8)**	**2 (2.2)**		**0.000**
Health facility far from home	**75(94.9)**	**4 (5.1)**	**(7, 366) = 159.950**	
Availability of stock medicines at home from previous treatment	**104 (98.1)**	**2 (1.9)**		
Severity of illness	**7 (100)**	**0 (0)**		
Advertisement on Media	**8 (100)**	**0 (0)**		
Recommendation from neighbor/Friend	**25 (96.2)**	**1 (3.8)**		
None	**1 (2.9)**	**33 (97.1)**		

Source: Researcher (2022)

The study found that contributing factors were associated with self-medication practice as shown in table 4.13. Other studies have similar findings though percentages varies as per factor which could be due to locations and/or conditions facing study population prompting self-medication. Recommendations from friends, ignorance and previous experience of stock medicines have mislead many parents to purchase medications on their own accord to self-medicate young ones especially in rural areas. However, financial constraint forced many to avoid cost associated to laboratory and consultations (Molento, 2020; Akhtar et al, 2022; Mathias & Prabhu, 2020; Achalu, 2020)

4.6: The characteristics of self-medication practice

The third objective was to determine the characteristics of self-medication among parents with under-five children in Bortown, South Sudan. The study determined where mainly the respondents buy or get drugs to treat their children as shown on table 4.14 below

Table 4.14: Sources of drugs for self-medication of under five children in Bortown

Source of drugs	Frequency	Percent	Ch-sqaure	p-value
Community pharmacy	126	34.4		P-value-
Left over from prescription	136	37.2	(χ^2 (4, 366),0.000).	
Drug vendor	18	4.9	60.782	
Health Facility	54	14.8		
Neighbor	32	8.7		
Total	**366**	**100.0**		

Source: Field data (2022)

The study found that the main source of medications was left over from prescription for self-medication in Bor Town, South Sudan (n=136, 37.2%), followed by community pharmacy at (n=126, 34.4%) as shown in table 14. This study results are relatively similar with the one of Yaunde Cameroon-community pharmacy (76.88%) (Pemuntaet al., 2019). Other studies mentioned drug vendors and shops as cheap alternative sources to treat common illness such as malaria. These drug shops and vendors have informal training and do not follow principle of rational dispensing of medicines because they venture into medical practice as business to make fortune out of parents who have inadequate knowledge about medicines use (Chaudhry et al., 2022; Kajinga, 2018; Bong & Tan, 2018; Oleke, 2022). The recommendable main sources of medicines are community pharmacy and health facility which is relatively contrary to this study finding where left over prescription is the main source of drugs for self-medication. This demonstrates irrational drugs use in Bortown. Current study established that the source of medication was associated with self-medication (χ^2 (4, 366), 60.782; P-value-0.000).

4.6.1 Signs and symptoms that compel parents to self-medicate under-five children

The study sought to know what signs and symptoms made parents to self-medicate their children as shown in figure 4.8 below (n=366)

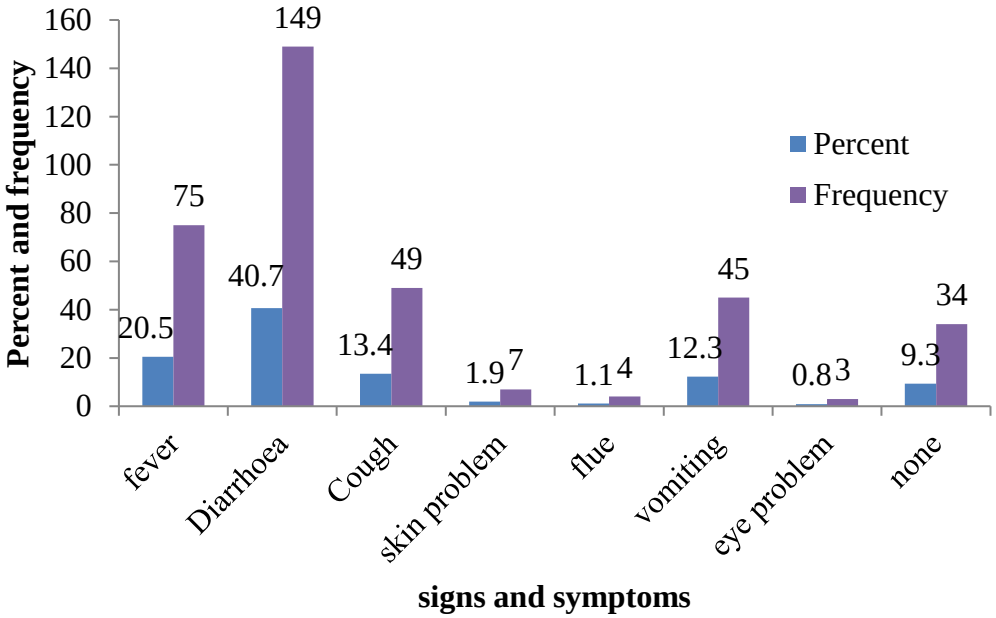

Figure 4. 7: Signs and Symptoms compel parents to self-medicate under-five children

Source: Field data (2022)

The study found that diarrhoea (N=149, 40.7%) was main common sign (s) and symptom (s) that made the respondents to self-medicate children; followed by fever (n=75, 20.5%) and cough (n=49, 13.4%) as shown in figure 4.8. This is similar with DRC where mothers treated their children with fever (91.1%) using antimalarial without advice from health facilities due to high cost in health facilities (Katumbo et al, 2020). Also, the study done in Turkey agreed with findings of this study; parents self-medicate under five children because of high cost of consultation fee at health facility, fever and lower abdominal pain, and having prior experience and high cost of antipyretic, antibiotics and analgesics, hence leading to high prevalence of self-medication practice (Yusuf Karatas et al., 2023) . Other studies reported that diarrhoea and malaria prompt

parents to self-medicate under five children without consultation from health care providers hence irrational use of medicines due to high possibility of wrong diagnoses considering the fact that many diseases have same signs and symptoms (Wang, & Muennig, 2022; Oleke, 2022; Mageto & Zablon, 2018). This relative consistency in findings of main sign and symptom for self-medicating under-five children could be attributed to geographical location and tropical climate condition shared by Bortown in South Sudan and Lubumbashi in DRC. Common signs and symptoms were associated with self-medication practice (χ^2 (7, 366), 263.326; P-value-0.000).

4.6.2 Types of medicines for self-medication for under five children by parents

Table 4.15: Common medications use to self-medicate under-five years children in Bortown

Medication	Frequency	Percent	Chi-square	P-value
Antimalarial	134	36.6	(χ^2 (7, 366), 228.523	P-value-0.000).
Antimicrobial	106	29.0		
Cough Syrup	36	9.8		
Antipyretics	39	10.7		
Multivitamins	7	1.9		
Antiemetics	8	2.2		
Anthelmintics	6	1.6		
None	30	8.2		
Total	366	100.0		

Source: Researcher (2022)

The results revealed that antimalarial was the commonly used medication for under-five child in Bor Town in South Sudan (n=134, 36.6%) as shown in table 4.15. This is consistent with findings of previous studies done in Saudia Arabia, Democratic Republic of Congo (DRC), and Kaimbu county in Kenya (Katumbo et al, 2020; Allam & Amer, 2020; Mageto & Zablon, 2018). Using antimalarial for self-medication is a point of concern because it is not over the counter medicines but prescription only medicine (POM) and thus, could lead to irrational use that may result to resistance,

toxicity, waste of limited resources due to wrong medication on wrong diagnose such as treating flue with antimalarial and decongestants (Allam & Amer, 2020). In addition, antimicrobial (n=106, 29%) are the 2nd highest used medications by parents to self-medicate under five children in Bor Town; which could lead to antibiotic resistance, a major concern currently in the world due to emerging infectious diseases. The indiscriminate use of prescription only medicines is a major concern due to death related to drugs resistance and economic sabotage as a result of wasting limited resources on treatment of diseases caused by inappropriate self-treatment (Murray CJ. et al., 2022). Besides, China is a developed country but still uses antimalarial and antibiotics without prescription (Liu, 2020)**,** thus, a growing problem of irrational use of antimalarial and antimicrobial need to be addressed**.** The analysis established that there was an association between the type of medication and self-medication practice (χ^2 (7, 366), 228.523; P-value-0.000).

4.7. The parents' perceptions on self-medication for their children

Respondent rated their agreement to statements relating to perceptions towards self-medication for under-five years child on a 5-point Likert scale as shown on table

Table 4.16: Perception of the parents on self-medication practice for under five children

Statement	1	2	3	4	5	M	STD	Chi-square; p-value
I belief in quick recovery with self-medication than from health professionals in health facility	4%	13%	35%	43%	5%	2.6749	4.959	(χ^2 (15, 366), 43. 248;
Illness is caused by spiritual being hence, even if self-medication no harm	0%	16%	40%	40%	4%	2.678	4.6102	P-value-0.000)
Self-medication is harmless to under 5 years children	4%	26%	37%	34%	0%	2.9972	6.8631	
Self-medication is acceptable with illness with the same signs and symptoms of previous illness	5%	29%	34%	30%	2%	3.0575	7.6164	
TOTAL						3.0	1.2622	

Key: 1 -Strongly disagree; 2- Disagree; 3- Medium; 4-Agree; 5-Strongly Agree

Source: Researcher (2022)

The findings show that respondents agreed to the most of the perceptions. Similarly, out of 366 respondents, 159 (43%) of them had reported they believed in quick recovery with self-medication than from health professionals in health facility. When the respondents were asked for illness is caused by spiritual being hence, even if self-medication is used, no harm, equally, 40% of the agreed and were medium with the agreement. Majority of the respondents had medium (37%) perception that self-medication is harmless to under 5 years children whilst 34% of them agreed was harmless. Finally, self-medication is acceptable with illness with the same signs and symptoms of previous illness were in agreement with respondents (34%, 30%). The

findings were inconsistency with many studies conducted on self-medication and perceptions where adults are more vulnerable to the practice of self-medication due to their, knowledge of drugs, easy access to Internet, wider media coverage on related health issues, ready access to drugs, level of education, and social status (Katumbo et al., 2020)

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction

This chapter provides a summary of the main findings of the study, organized according to the research objectives. The prevalence of self-medication practice is discussed, as well as the socio-demographic characteristics of the study participants. The factors associated with self-medication are also presented, along with the characteristics of self-medication and the perceptions of parents regarding self-medication in under five children. Furthermore, the chapter condenses the significant findings of the study, highlighting the most important and relevant results. Finally, the chapter concludes with a set of logical, specific, attainable, and relevant recommendations that are based on the study's findings. These recommendations are intended to provide guidance to healthcare practitioners and policymakers in developing effective interventions aimed at reducing the prevalence of self-medication practices and improving the overall health outcomes of the population.

5.1 Summary of the Results Findings

The major purpose of this research was to examine the prevalence of self-medication and the variables that may contribute to it among children less than five years old in Bortown, South Sudan. The association between self-medication prevalence (the dependent variable) and a number of factors (the independent variables), such as demographics, motivations for self-medication, practice characteristics, and parents' views were examined. Chi-square analysis was used to determine the significance of the relationship between the variables, and all findings were judged to be significant when the p-value was less than 0.005.

A total of 373 people were randomly chosen for this research, however only 366 completed and returned questionnaires, making response rate 98.1%. Cronbach's alpha, a measure of internal consistency, was used to determine the study's reliability, and it was determined to be 0.752, suggesting that the data was trustworthy and consistent.

Self-medication prevalence was reported as 88.3 percent. Sixty-six percent of the participants were women, and among those aged 40 to 59, self-medication was more common among women (89.3%) than men (86.2%). Participants' major stated occupation was farming (39.9%). Results showed that self-medication was substantially linked to both age and profession (P-value 0.005 and P-value 0.008) respectively.

Most people who self-medicate do so because they have leftover medication from a prior course of treatment (98.1%), followed closely by the fact that it is inexpensive (97.8%) due to the lack of costs associated with seeing a doctor or a lab. Pearson Chi-square analysis revealed a connection between self-medication and the following factors: (P-value 0.000).

Most respondents (37.2%) said they get their medicines via unused prescriptions, followed by drugs from a community pharmacy (34.4%). Self-medication was most often used to treat diarrhoea (40.7%), followed by fever (20.5%). Antimalarial (36.6%) and antimicrobials (29.0%) were common medicines for self-medication. All self-medication characteristics were associated with self-medication (p-value 0.000). The research also found a correlation between self-medication and factors such as understanding the appropriate amount to administer to a kid under the age of five and whether or not the prescription had expired. (p-value 0.000)

The views of parents on their children's self-medication were measured on a 5-point Likert scale, and the results were analysed using chi-square. With an average score of 3.0 and a standard deviation of 1.3, the research found that most participants agreed

with the impressions measured. There was a statistically significant correlation between parents perceived thoughts and self-medication. (p=0.000)

This research found health issues in Bortown, including self-medication, incorrect views, unsuitable drug sources, and illogical drug use, and it subsequently recommended for comprehensive health education and promotion that emphasizes the hazards connected with these issues.

5.2 Conclusion

The prevalence of self-medication among under-five children was alarmingly high at 88.3%. This finding underscores the need for targeted interventions to educate caregivers on the risks associated with self-medication in this vulnerable population. The association between self-medication and socio-demographic characteristics revealed that occupation and age were statistically significant factors, indicating potential areas for focused interventions. Furthermore, many caregivers lacked knowledge of the correct dosage for medications, highlighting the importance of education and access to reliable healthcare services. The low rate of checking expiry dates further emphasizes the need for increased awareness of medication safety practices. Common reasons for self-medication included cost considerations, distance to health facilities, and the availability of leftover medications at home. These factors reflect systemic challenges in healthcare access and affordability, suggesting the need for policy interventions to address these barriers. The types of medications commonly used for self-medication included antimalarial and antimicrobials, raising concerns about antimicrobial resistance and the appropriate use of prescription medications. The prevalence of self-medication for common childhood illnesses such as diarrhoea and fever underscores the need for targeted health education campaigns to promote proper healthcare-seeking behaviour. The study also revealed parental perceptions towards

self-medication, with many respondents expressing beliefs in the efficacy and safety of self-medication practices. Addressing these misconceptions through targeted health education and awareness campaigns will be essential in promoting appropriate healthcare-seeking behaviour. Therefore, the findings of this study highlight the urgent need for comprehensive public health interventions to address the high prevalence of self-medication among under-five children in Bortown, South Sudan. These interventions should focus on improving access to affordable healthcare services, enhancing medication safety practices, and promoting awareness of the risks associated with self-medication.

5.3 Recommendations

a. Jonglei state ministry of health, WHO, UNICEF, health care providers and non-governmental organizations implementing health programs in Bor Town should collaborate to create comprehensive public health awareness and strengthen health education and promotion on rational medicines use and risks associated with self-medication practices in under five children

b. Jonglei state ministry of health should strictly regulate policies that govern drug vendors, drug shops and pharmacies to adhere to principle of rational drugs dispensing and good dispensing practices as recommended by WHO to promote accurate dissemination of health information and correct myths related to self-medication, minimize antimicrobial and antimalarial resistance, economic lose, morbidity and mortality related to irrational use of medicines

c. Jonglei state ministry of health should work with private sector to harmonize consultation and laboratory fee to increase affordability and accessibility of health services. This will encourage population in Bortown to seek treatment from health facilities rather sort to left over from prescriptions

5.4 Further Scope of Future Study

An occasional study is recommended to future researchers to explore the extent and trend of irrational use of medicines in relation to self-medication in Bor Town

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APPENDECIS

Appendix I: Informed Consent Form

Title: SELF-MEDICATION PRACTICE AND ASSOCIATED FACTORS IN UNDER FIVE CHILDREN BY PARENTS IN BORTOWN, JONGLEI STATE, SOUTH SUDAN

Sponsor: **Bior Daniel**

Principal Investigator: **Bior Daniel**

Address**: Mount Kenya University.**

Introduction

This consent form contains information about the research named above. In order to be sure that you are informed about being in this research, we are asking you to read (or have read to you) this Consent Form. You will also be asked to sign it (or make your mark in front of a witness). We will give you a copy of this form. This consent form might contain some words that are unfamiliar to you. Please ask us to explain anything you may not understand.

1. **Reason for the Research**

You are being asked to take part in research to determine associated factors with self-medication practice among under five-years children by parents

2. **Your Part in the Research**

The researcher or research assistant (s) will identify himself/herself to you, after which you (he/she) will be required to fill a detailed questionnaire through an interview. This will be a private and confidential exercise. You will be required to fill the interview schedules or guide only after you have accepted and signed the consent form.

3. **Possible Risks**

There is no risk associated with participation in this study.

4. **Possible Benefits**

Although this study has no immediate advantages, the information you provide will be useful in understanding self-medication practice in regard to factors under investigation in Bortown.

5. **If You Decide Not to Be in the Research**

You are free to decide if you want to be in this research. You are not coerced in participating into the study.

6. **Confidentiality**

We will protect information about you and your taking part in this research to the best of our ability. You will not be named or your personal data be captured in any reports.

7. **Compensation**

You will not be paid, since the participation is voluntary.

8. Staying in the Research

Your participation in this research is voluntary and you will not be victimized by not taking part in the study. You are also free not to answer questions which you are not free with (no coercion).

9. Alternatives to Participation

You do not have to participate in the research in order to receive any promotions or any financial related benefit whatsoever.

10. **If You Have a Problem or Have Other Questions**

You are free to ask any other question related to the study during your participation.

11. **Your rights as a Participant**

This research has been reviewed and approved by Mount Kenya University Scientific Ethics and Review Committee.

PARTICIPATION AGREEMENT

The above document describing the benefits, risks and procedures for the research titled; '*Self-Medication Practice and Associated Factors in under Five Children by Parents in Bortown, Jonglei State*, South Sudan', has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participation.

Date _____ _____

Signature or mark of the participant

I certify that the nature and purpose, the potential benefits, and possible risks associated with participating in this research have been explained to the respondent in a very understanding manner and veracity

Date: …….. Researcher/enumerator signature…….

Appendix II: Questionnaire

Dear Respondent,

Your help in filling this questionnaire will be highly appreciated, and assist to achieve objectives of this study. Please, provide honest response, as this information will be kept confidential and use for research purposes only.

Instructions: DO NOT write your name on this questionnaire. Please, Mark with tick (✓), and do not give more than one answer for each section. The researcher will explain self-medication using local dialect. The child refer herein should be below 5 years of age

Section one: Social demographic Characteristics

1. Gender of the respondent: ***(select one only)***

□ Male □ Female

2. Age of respondent in years …….

3. What is your religion? ***(Please tick one)***

□ Christianity □ African traditional religion □ Islam □ Hinduism □ Judaism

4. What is your completed level of education? ***(Select one only)***

□ None □ Primary school □ Secondary school □ graduate □post-graduate

5. What is your **main** occupation? ***(Tick one appropriately)***

□ Farmer □ Business person □ employee

□ Housewife □ cattle keeper □ Fisher Man

□. Others. Specify…….

6. Marital Status: ***(select one only)***

□ married □ single □ Divorce □ others. Specify…….

7. Monthly income in South Sudanese Pounds …… (Indicate in numbers)

SECTION TWO: PREVALENCE OF SELF-MEDICATION PRACTICE

1. Have you ever treated your child (self-medicated) without help of a health care provider for the last 3 months? ***(If yes, go to question 2, but if no, go to question 5)***

□ Yes □ No

2. Did you know the dose to give to your child?

□ Yes □ No

3. Did you check the expiry date before you give medicine to your child?

□Yes □ No

4. How frequently do you self-medicate for your child?

□ Always □ Not always □ Never

5. Which harmful health side effect of self-medication do you know? (***Select one only)***

□ Death due to drug intoxication □ drug poisoning

□ worsening of signs and sign symptoms □ none

SECTION THREE: FACTORS THAT PROMPT TO SELF-MEDICATION PRACTICE

What is the **main** factor prompts you to self-medicating for your child? ***(Select one only)***

□ It is cheap (no consultation and laboratory fee)

□ Health facility far from home

□ too long waiting time at public hospital

□ Availability of stock medicines at home from previous treatments

□ Severity of the illness

□ Advertisement on media

□ Recommendation from neighbour/friend

□ already practiced custom

□None

SECTION FOUR: THE CHARACTERISTICS OF SELF-MEDICATION PRACTICE

1. Where do you **MAINLY** buy/get drugs to treat your child? ***(Select one only)***

□ Community pharmacy □ Left over from prescription □ Drug vendor □ Health facility

□ Neighbour □ Others. Specify…

2. Which sign and symptom do you **mainly** self-medicate your child? ***(Select one only)***

□ Fever □ Diarrhoea □ Cough □ skin problem

□ Flue □ vomiting □ eye problem □ others. Specify…

3. Which medication do you **mainly** use for self-medication when your child fall sick ***(Select one only)***

□ Antimalarial □ antimicrobial □ Cough syrups

□ Antipyretics □ Multivitamins □ Antiemetics

□ Anthelmintics

SECTION FIVE: THE PARENTS' PERCEPTIONS ON SELF-MEDICATION FOR THEIR CHILDREN

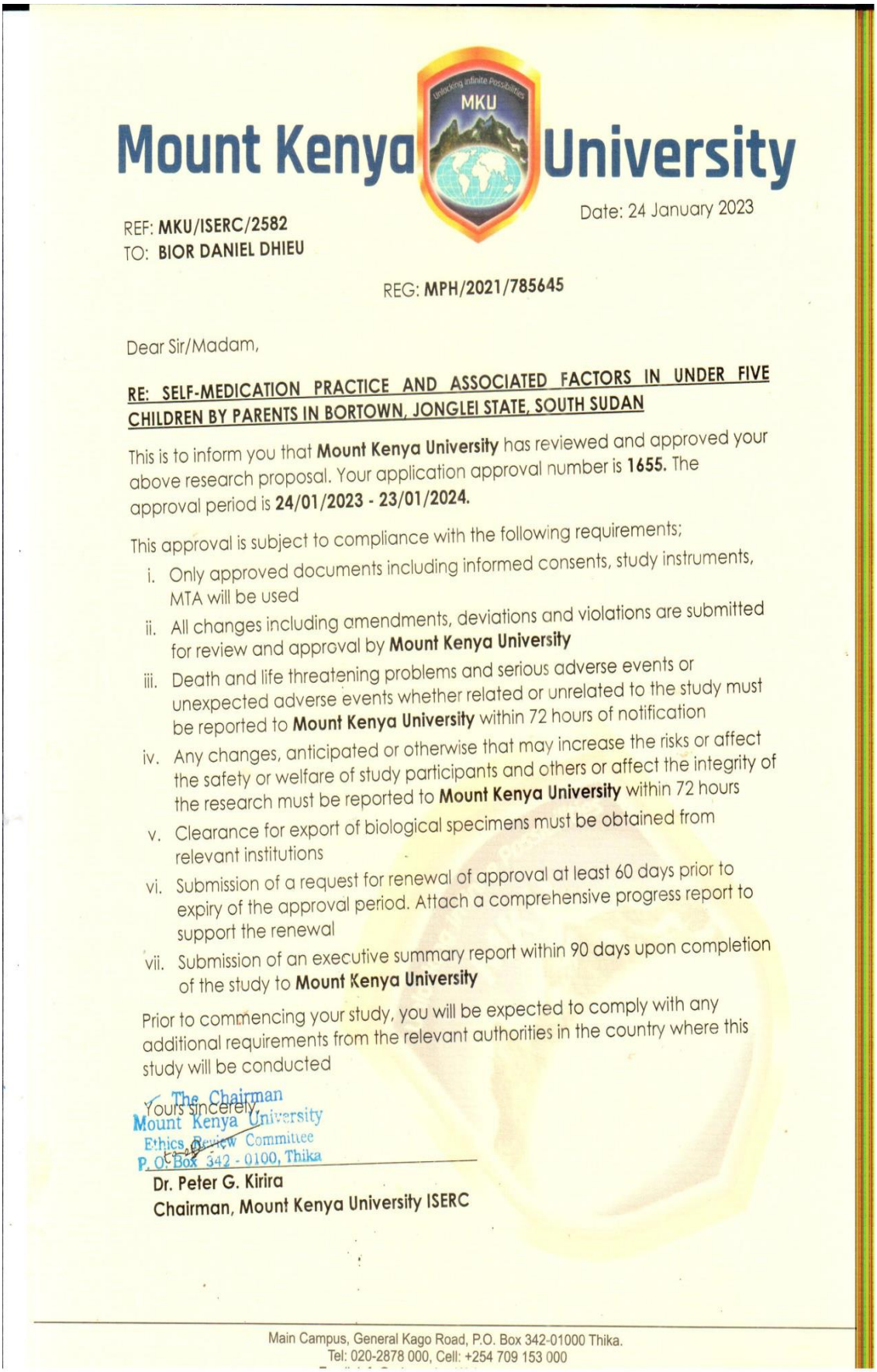
1. Rate your agreement to these statements relating to your perceptions towards self-medication for under five years child. ***(Use the 5-point Likert scale to circle one response appropriately)***

1 -Strongly disagree (SA) 2- Disagree (D) 3- Medium (N) 4-Agree (A) 5-Strongly Agree (SD)

Statement	5	4	3	2	1
I belief in quick recovery with self-medication than from health professionals in health facility					
illness is caused by spiritual being hence, even if self-medicated no harm					
self- medication is harmless to under 5 years children					
self-medication is acceptable with illness with same signs and symptoms of previous illness					

Thank you!

Appendix III: Ethical Clearance Certificate



Mount Kenya University

REF: MKU/ISERC/2582
TO: BIOR DANIEL DHIEU

Date: 24 January 2023

REG: MPH/2021/785645

Dear Sir/Madam,

RE: SELF-MEDICATION PRACTICE AND ASSOCIATED FACTORS IN UNDER FIVE CHILDREN BY PARENTS IN BORTOWN, JONGLEI STATE, SOUTH SUDAN

This is to inform you that **Mount Kenya University** has reviewed and approved your above research proposal. Your application approval number is **1655.** The approval period is **24/01/2023 - 23/01/2024.**

This approval is subject to compliance with the following requirements;

i. Only approved documents including informed consents, study instruments, MTA will be used
ii. All changes including amendments, deviations and violations are submitted for review and approval by **Mount Kenya University**
iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to **Mount Kenya University** within 72 hours of notification
iv. Any changes, anticipated or otherwise that may increase the risks or affect the safety or welfare of study participants and others or affect the integrity of the research must be reported to **Mount Kenya University** within 72 hours
v. Clearance for export of biological specimens must be obtained from relevant institutions
vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal
vii. Submission of an executive summary report within 90 days upon completion of the study to **Mount Kenya University**

Prior to commencing your study, you will be expected to comply with any additional requirements from the relevant authorities in the country where this study will be conducted

Yours sincerely,

The Chairman
Mount Kenya University
Ethics Review Committee
P. O. Box 342 - 0100, Thika

Dr. Peter G. Kirira
Chairman, Mount Kenya University ISERC

Main Campus, General Kago Road, P.O. Box 342-01000 Thika.
Tel: 020-2878 000, Cell: +254 709 153 000

Appendix IV: Introduction Letter

Mount Kenya University

DIRECTORATE OF GRADUATE STUDIES

MPH/2021/785645

31st January,2023

National Commission for Science Technology & Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete,
P.O Box 30623- 00100
NAIROBI, KENYA

Dear Sir/Madam,

RE: BIOR DANIEL DHIEU – REGISTRATION NO. MPH/2021/785645

The purpose of this letter is to introduce the above named student who is pursuing **Master of Public Health** in the department of **Epidemiology and Biostatistics** in the school of **Public Health.**

The title of the research is **"Self-Medication Practice and Associated Factors in Under Five Children by Parents in Bortown , Jonglei State, South Sudan."**

It has been cleared by the University's Ethics Review Committee (Certificate attached) and now has to proceed to the field to collect data between **February, 2023 and April, 2023.**

Any assistance accorded to the student will be highly appreciated.

Thank you.

Mount Kenya University
P. O. Box 342 - 01000, THIKA
Office of the Director
Graduate Studies

Dr. Samuel M. Karenga, Ph.D
Director, Graduate Studies
Enc.

Appendix V: Research Permit

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **186289**

Date of Issue: **02/August/2023**

RESEARCH LICENSE

This is to Certify that Dr.. Bior Daniel Dhieu of Mount Kenya University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Nairobi on the topic: SELF-MEDICATION PRACTICE AND ASSOCIATED FACTORS IN UNDER-FIVE CHILDREN BY PARENTS IN BORTOWN, JONGLEI STATE, SOUTH SUDAN for the period ending : 02/August/2024.

License No: **NACOSTI/P/23/27873**

186289

Applicant Identification Number

Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)

Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. The license any rights thereunder are non-transferable
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

Appendix VI: Plagiarism Report

SELF- MEDICATION PRACTICE AND ASSOCIATED FACTORS AMONG UNDER-FIVE CHILDREN IN BORTOWN, JONGLEI STATE, SOUTH SUDAN

by Bior Daniel Dhieu

Submission date: 25-Jun-2024 12:22PM (UTC+0300)
Submission ID: 2408380654
File name: Bior_Daniel_Dhieu_Final_Thesis.docx (5.12M)
Word count: 20905
Character count: 122678

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