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IMPLEMENTATION OF THE POLICY ON THE USE OF CHLORHEXIDINE IN UMBILICAL CORD CARE IN GHANA: PERSPECTIVES OF MIDWIVES

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MAY, 2025

DECLARATION

DECLARATION

Candidate's Declaration

I declare that, this thesis submitted to the School of Nursing and Midwifery, University of Ghana in partial fulfillment of the award of the Master of Philosophy in Midwifery. This thesis has never been submitted either in whole or part for award of any degree in this university or elsewhere.

Bagoniah Theresa A 28/05/2025

(Student Name) Signature Date

Supervisor's Declaration

I hereby declare that the preparation and presentation of the project proposal were supervised in accordance with the guidelines on supervision of dissertation laid down by the School of Nursing and Midwifery, University of Ghana.

Prof Charles Ampong Adjei 29/05/25

(Principal Supervisor) Signature Date

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(Co-Supervisor) Signature Date

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DEDICATION

This work is sincerely dedicated to my family, especially my supportive husband who encouraged and inspired me throughout the conducting of this study.

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I want to express my heartfelt gratitude to the Almighty God for the good health, and determination to complete the thesis.

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LIST OF ABBREVIATIONS

CBR……Crude Birth Rate

CHX……Chlorhexidine

CHG……Chlorhexidine Gluconate

EGM……...East Gonja Municipality

GHS……Ghana Health Service

GSS……Ghana Statistical Service

LMIC……. Low-Middle Income Country

MOH……...Ministry of Health

NMR……...Neonatal Mortality Rate

NICU……Neonatal Intensive Care Unit

SGH……...Salaga Government Hospital

WHO…… World Health Organization

ABSTRACT

A newly cut umbilical cord can be a pathway for bacteria that can cause newborn sepsis and death. The Ministry of Health, through the Ghana Health Service, introduced a policy to replace methylated spirit with 7.1% chlorhexidine gluconate in umbilical cord care. This study used an exploratory descriptive design, involving 23 midwives purposefully sampled from the Salaga Government Hospital. The study aimed to explore the perspectives of midwives regarding the implementation of the policy on the use of chlorhexidine in umbilical cord care. The data collection strategy was structured interview guide. The analysis of the data gathered yielded four main themes and eight sub-themes. The findings showed that midwives' practices regarding chlorhexidine use involved the application technique of chlorhexidine, chlorhexidine application at home setting, and education on chlorhexidine given to the mothers before discharge. The participants believed that the use of chlorhexidine in cord care had significantly reduced the number of cord sepsis cases recorded in the neonatal intensive care unit. Some of the challenges expressed by the participant were that the mothers apply chlorhexidine in the baby's eye and continue to mix chlorhexidine along with tetracycline eye ointment.

The study concluded that chlorhexidine was used by participants in the hospital setting. It is recommended that midwives establish good rapport with patients to promote trust between them and the patients to reduce the chances of patients going home to apply other substances apart from chlorhexidine. Also, midwives should constantly remind management about the limited availability of chlorhexidine in the hospital for supply. Finally, future studies could use a quantitative approach to address the challenges confronting midwives' use of chlorhexidine in the hospital.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

Globally, neonatal mortality, which refers to the death of newborns, is a significant issue in the majority of low- and middle-income countries (LMICs) (WHO, 2022; Yasmeen, 2023). Consequently, reducing neonatal mortality rates (NMR) is rapidly emerging as a crucial objective in the public health agenda (WHO, 2018b). An innovative and potentially life-saving solution for the management of infant umbilical cords is currently being introduced and implemented worldwide (Israel et al., 2024). The application of this medication, containing 7.1% chlorhexidine digluconate, with a delivery of 4% free chlorhexidine (CHX), serves the purpose of preventing infection in the newborn by applying it to the freshly cut umbilical cord. The product can be made into a gel or a drink (WHO, 2016; Yasmeen, 2023).

It has been found that chlorhexidine can have different effects depending on the setting (Mallick, Yurkovich & Allen, 2019; Barría, 2024). Based on the evidence we have now, chlorhexidine only seems to be useful in places where there are high rates of neonatal mortality and home births (Olubiyi et al., 2023), which are also usually places with low rates of facility births (UNICEF, 2019). However, since infant mortality rates are still rising, chlorhexidine's usefulness in high-mortality situations could be very helpful. Chlorhexidine gluconate (CHG) is often used to clean the skin before treatments because it is an antiseptic and disinfectant that can be put on the skin (Israel et al., 2024).

Products on the market have a wide range of CHG concentrations. Some are water-based liquids, while others contain alcohol, most often isopropyl alcohol.

Babies are treated with a lot of different antiseptics, and there is not enough good-quality proof to show which one is safest for them (Israel et al., 2024). A review of the literature suggests that CHG is usually well tolerated in full-term babies when it is used to clean the mother's vaginal area, care for the umbilical cord, and clean the whole body. There are, however, many accounts of chemical burns that happened after CHG was used, so caution is still needed (Astatkie et al., 2022; Israel et al., 2024). There is no doubt that chlorhexidine is a useful tool in the fight against death from newborn infections. It is not a "game-changer," though, as it is presented. Because chlorhexidine is cheap and easy for lawmakers and funders to use, it may take scarce human and financial resources away from more appropriate and effective interventions, which could lower the number of babies who survive (Callaghan-Koru et al., 2019; Clarke & Webber, 2018; Draiko et al., 2021). Instead, people should focus on putting first things first to strengthen weak health systems and make it easier for people to get effective, long-lasting care for newborns. It might be more of a "game-changer" to put money into systems-based neonatal care treatments than to focus on just one intervention. So, instead of focusing on one uncertain "game-changer," we might want to change the rules of the game (Latha et al., 2017; Olubiyi et al., 2023).

There are big differences in how neonatal antiseptics are used, and there are no national standards in the United Kingdom (UK). Almost all units use antiseptics before a procedure to kill germs on the skin and sometimes to bathe newborns, but there are differences in the practice (Draiko et al., 2021). It is hard to say for sure how safe it is to

use antibiotics on newborns, so lower amounts of antibiotics are used in this group than in adults. There is a possible chance that this will not work as well as it should against microorganisms and that resistant mutants could be selected. The practice of cleaning the umbilical cord with different substances is prevalent in numerous nations across sub-Saharan Africa and South Asia, as shown by Ochoga et al. (2020). Chlorhexidine, a substance used to care for the umbilical cord, has been designated as an essential item for promoting the health of newborns by health ministries. The implementation of this initiative is currently being expanded to encompass the entirety of Bangladesh, the Democratic Republic of the Congo, Ethiopia (Ochoga et al., 2020), Kenya, Liberia, Madagascar, Malawi, Mozambique (Ochoga et al., 2020), Nigeria, and Pakistan (Ochoga et al., 2020; Olubiyi et al., 2023).

Additionally, Chlorhexidine can be administered via existing healthcare facilities, during the process of childbirth, and postpartum. Additionally, it may be administered within the initial days and weeks of infancy as a component of fundamental infant care (Herrick et al., 2017; Mainalia et al., 2018). It is also available for purchase in retail establishments like pharmacies, distributed by individuals employed in public venues or community settings (e.g., traditional birth attendants), or provided by community health professionals who engage in conversations with pregnant women (Ochoga et al., 2020). Ensuring appropriate care of the umbilical cord after birth and the initial week of life, particularly in areas with poor cleanliness, is crucial in preventing life-threatening sepsis and cord infection. Hence, reducing preventable newborn mortality (Coffey & Brown, 2017).

Chlorhexidine is often used to clean the skin by making it hygienic and germ-killing. Often, it is used to clean a baby's skin and umbilical cord before an interventional treatment in neonatal care. That being said, if too much chlorhexidine is used, which could happen if a spatula is not used or is the wrong size, the extra chlorhexidine could pool under the baby. There are many reports of skin reactions associated with chlorhexidine use on the skin of newborns. These reactions range from erythema (extreme redness) to chemical burns, sores, and skin breakdown (Draiko et al., 2021)

In 2018, the Ministry of Health (MOH) and the Ghana Health Service (GHS) made chlorhexidine the normal topical cord antiseptic. This was done because the WHO said it should be. The Ghana Health Service (2018) says that chlorhexidine digluconate 7.1% gel should be put on the umbilical cord daily until the cord falls off and the wound heals completely. Because of this, chlorhexidine digluconate 7.1% has been added to the list of necessary medicines for Ghana. However, since the policy implementation started in 2018, there don't seem to be any ongoing efforts to assess how well the policy has been carried out and find any problems that might be present (Ayete-Nyampong & Udofia, 2020). Aside from Ghana, not many studies in the rest of Africa have looked at chlorhexidine in the foetal cord (Ara et al., 2021; Ochoga et al., 2020). Most research on how chlorhexidine affects the time it takes for the umbilical cord to be separated has been done in Asia (Ara et al., 2021; Yasmeen, 2023). A study was conducted to examine the practices of midwives on chlorhexidine gel on cord. This study suggests that the use of chlorhexidine gel in cord care among mothers has improved compared to previous studies. Some participants used unhealthy cord care practices, including herbal

preparations and hot water, implying a need for further interventions to address misconceptions (Olubiyi et al., 2023). A study was conducted to assess the level of practice of using CHX among mothers in Rivers State, Nigeria. They were asked if they knew that chlorhexidine gel could help avoid infections in newborns and whether they had ever used it. Only a few of them said they did, and only 9.6% said they used it. It was found that poor knowledge was strongly linked to poor use of CHX in cord care (Aitafo, West & Okari, 2021).

Similarly, in Kenya, healthcare workers started using Chlorhexidine in healthcare facilities in 2016 (McGovern et al., 2018; Barría, 2024). A study in Bungoma County showed that participant workers were very open to using CHX in cord care (McGovern et al., 2018). The authors revealed that chlorhexidine could save lives in infant cord care.

1.2 Problem Statement

Globally, health experts have revealed that one of the main causes of neonatal fatalities within the first week or two of life is sepsis (Olubiyi et al., 2023). The basis of neonatal sepsis is often attributed to the use of different substances for the umbilical cord care of people from diverse cultural backgrounds (Ozigbo & Onotume, 2024). Nonetheless, evidence-based procedures for caring for the umbilical cord have a significant chance of reducing infant infection-related morbidity and death (Israel et al., 2024).

Studies have explored knowledge and use of chlorhexidine gel in umbilical cord care among postpartum women in Enugu, Southeast Nigeria (Israel et al., 2024), umbilical cord care knowledge and practice among caregivers in Yenagoa, Bayelsa State, Nigeria (Juliana & Esther, 2024) and perceptions about umbilical cord care practices

among mothers (Yasmeen, 2023). All of these investigations revealed that patients' understanding of the use of chlorhexidine gel for umbilical cord care was lacking.

Additionally, the studies above concentrated on only mothers and most of the authors employed a quantitative approach to the studies (Dessalegn et al., 2022; Israel et al., 2024; Owusu et al., 2023). The perspectives of midwives, who play a critical role in cord care, on the use of chlorhexidine have not been much studied. This paucity of studies has resulted in limited information on the practice of chlorhexidine use in umbilical cord care, the perceived benefits of using chlorhexidine in umbilical cord care and the challenges that confront midwives with the use of chlorhexidine in umbilical cord care. In addition to socioeconomic and cultural issues, the quality of available information on umbilical cord care is impacted by the low number of research studies on the use of chlorhexidine in cord care and the variety of cord care techniques (Israel et al., 2024).

Midwives are the key implementers of the policy on the use of chlorhexidine for umbilical cord care. It is therefore imperative that the perspectives of midwives are empirically laid to bare so as to unearth challenges confronting its use in the clinical setting. This will help policy makers make informed decisions to modify areas of implementation and shape the practice of chlorhexidine use for effectiveness, efficiency and better neonatal outcomes.

In Salaga Hospital, chlorhexidine is used for preoperative skin preparation to reduce the risk of surgical site infection. It is also used as hand sanitizers. In the hospital, staff also applied it to clean and disinfect wounds. The concentration used in the hospital is 0.5%, 1% and 2% depending on the nature of the task to be performed.

1.3 General Objective

The main objective of the study was to explore the perspectives of midwives regarding the implementation of the policy on the use of chlorhexidine in umbilical cord care in the Salaga Government Hospital (SGH).

1.4 Specific Objectives

The specific objectives of the study were as follows:

1. To identify the practice of chlorhexidine use in umbilical cord care by midwives in SGH
2. To explore midwives' perceived benefits of using chlorhexidine in umbilical cord care in SGH
3. To determine the challenges faced by midwives regarding the use of chlorhexidine in umbilical cord care in SGH

1.5 Research questions

1. What are the practices of midwives' regarding chlorhexidine use in umbilical cord care?
2. What are the midwives' perceived benefits of using chlorhexidine (CHX) in umbilical cord care by midwives?
3. What are the challenges that confront midwives with the use of chlorhexidine in umbilical cord care?

1.6 Significance of the study

The dissemination of the findings of this study will help to inform policymakers about the benefits, as well as the challenges, of implementing the policy of chlorhexidine use in umbilical cord care in Ghana. Also, the findings will provide information to health

care workers who are often involved in the use of chlorhexidine on their clients especially midwives.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides a review of studies on the utilization of chlorhexidine for umbilical cord care. The presentations in this chapter are based on empirical and theoretical reviews. The empirical review is based on subheadings related to the study research questions. These subheadings include practices regarding chlorhexidine use in umbilical cord care, benefits of using chlorhexidine in umbilical cord care and challenges with the use of chlorhexidine in umbilical cord care. The study then draws on empirical reviews to put the review in context.

Although the study considers the review comprehensive, it acknowledges that the literature search was not exhaustive. To compensate for this, multiple sources and databases were utilised for the literature review.

2.2 Practice of Chlorhexidine Use in Umbilical Cord Care by Midwives

The practice of using chlorhexidine, whether in the form of digluconate or gluconate, is a broad-spectrum antiseptic that effectively combats the primary process responsible for infant sepsis (WHO, 2019). Chlorhexidine (CHX), which was initially developed in 1950, has found widespread application in various domains including hand

hygiene, preoperative body baths, wound management, cosmetic products, health, general disinfection, and veterinary medicine (Muthwii, 2017; Zaman et al., 2021). Experts revealed that formulations often consist of water-based, alcohol-based, oil-based, or powdered substances, which are applied topically to the skin of adults, infants, and newborns to help in the reduction of infection among newborn cords care (Mukunya, 2017; Agu et al., 2022). Empirically, there have been several applications in terms of its use, especially among health experts in the clinical environment.

For example, large-scale studies have shown that Chlorhexidine (CHX) can be used to prevent and treat neonatal sepsis in health facilities. In a community-based study in Nepal by Lamichhane et al. (2019), the authors found that newborn deaths were 24% lower in the group that received CHX compared to the group that received dry cord care. The effect on death rates was greater for babies whose cords were cleaned within 24 hours of birth with chlorhexidine. The authors revealed that this life-saving liquid or gel antiseptic and disinfectant was used to treat infections. The authors found that healthcare workers used chlorhexidine to improve newborn health outcomes.

A study was conducted to examine the practices of midwives on chlorhexidine gel on cord. This study suggests that the use of chlorhexidine gel in cord care among mothers has improved compared to previous studies. Some participants used unhealthy cord care practices, including herbal preparations and hot water, implying a need for further interventions to address misconceptions (Olubiyi et al., 2023).

Also, a study found that cord infection remains a significant cause of death among neonates in the developing world. The prevention of cord infection using the appropriate cleaning agent is key to ensuring the neonates stay free and safe during the postpartum

period. This study was conducted to assess the awareness and use of chlorhexidine gel (CHG) in the prevention of neonatal sepsis among nurses and midwives in selected health facilities in Abeokuta. The descriptive study utilised a purposive sampling technique and a questionnaire derived from a literature review to collect data from 42 respondents in three selected health facilities in Abeokuta. Findings revealed that while 31% were aware of the recommendation favoring the use of CHG for cord care, only a few understood that the recommended strength for umbilical cord care is the aqueous solution or gel delivering few chlorhexidine. The prevention of umbilical cord infection should centre on the meticulous care of the umbilical cord with the use of chlorhexidine (CHG) which is the recommended cleaning agent.

Additionally, Israel et al. (2024) found that evidence-based procedures for caring for the umbilical cord offer a significant chance of reducing newborn infection-related morbidity and mortality. This study investigated the knowledge and use of chlorhexidine gel for umbilical cord care. At the Poly General Hospital Asata, Enugu, 191 postpartum mothers were chosen by simple random sampling and participated in a cross-sectional descriptive survey. Regarding the usage of chlorhexidine gel in umbilical cord care, more than half did not know much. Most had previously utilised chlorhexidine gel for umbilical cord care, but just a small percentage had done so for their most recent child. Both educational status and knowledge of chlorhexidine use for umbilical cord care were found to be significantly associated with its use. There was poor knowledge of chlorhexidine gel use for umbilical cord care among the participants. In this demographic, the use of chlorhexidine gel is still not at its best. To maximize its

understanding and application, healthcare professionals should keep disseminating information on the use of chlorhexidine gel in umbilical cord care.

Similarly, in Kenya, healthcare workers started using Chlorhexidine in healthcare facilities in 2016 (McGovern et al., 2018; Barría, 2024). A study in Bungoma County showed that participant workers were very open to using CHX in cord care (McGovern et al., 2018). The authors revealed that chlorhexidine could save lives in infant cord care. It was also strongly supported as a safe, effective, and inexpensive way to help prevent neonatal sepsis.

In a related development, the WHO added CHX to its list of important medicines in 2013. In 2016, Kenya's Ministry of Health put out instructions saying that 4% CHX should be used for cord care in health facilities (McGovern et al., 2018). As a result of the policy, millions of babies born in Kenya benefited from the use of CHX in cord care by health workers (McGovern et al., 2018; Quaye, 2019).

In addition, there have been practices of using chlorhexidine in cord care in various fields. Hodgins (2017) published the findings of a study indicating that 4% CHX gel was effective in cord care practices in health facilities. The author revealed that participants were using Chlorhexidine in cord care. Similarly, a study conducted in Kathmandu examined 653 infants in a hospital environment. The results showed that 24 hours after treatment, liquid CHX reduced the frequency of samples testing positive for germs by 64%, while gel CHX reduced it by 86%. The authors concluded that there was sufficient evidence to support the utilisation of a 4% CHX product (7.1% CHX digluconate) for cleansing the umbilical cord as a means to reduce the mortality rate

among newborns in areas characterised by poor hygiene and a high incidence of newborn deaths (Ambale, Ngatia & Nthusi, 2019; Yasmeen, 2023)

A study was conducted to assess the level of practice of using CHX among mothers in Rivers State, Nigeria. These participants were sampled from a well-baby clinic. They were asked if they knew that chlorhexidine gel could help avoid infections in newborns and whether they had ever used it. Only few of them said they did, and only 9.6% said they used it. It was found that poor knowledge was strongly linked to poor use of CHX in cord care (Aitafo, West & Okari, 2021). A similar study with 42 women found that 31% knew that chlorhexidine gel was recommended for caring for the umbilical cord, but only 23.8% had ever used it (Ikperite et al., 2020).

In a related development, healthcare professionals in the northern Nigerian states of Bauchi and Sokoto have notably increased their use of chlorhexidine gel for the care of newborns' umbilical cords. In Sokoto, it rose to about 34.6% among healthcare workers. In Bauchi, it rose from 0.7% in 2012 to 2.4% in 2013, and then to 21.5% in 2015 (Abegunde et al., 2017). However, little is known about the knowledge level of people, in general, about the use of chlorhexidine gel in cord care practices.

A study conducted by Ara et al. (2021) found that a total of 116 individuals, including 60% of the sample, were aware of the utilisation of chlorhexidine gel for cleansing the umbilical cord. Approximately 83.6% of individuals who were aware of it recognised it as an antibiotic gel employed for cleansing the umbilical cord of newborns and preventing infections in infants. Of those surveyed, most were aware that it is applied to the stump and surrounding skin (52.6%) and to the umbilical cord after birth (74.1%). The study found that about 61.2% of the participants who were aware of the usage of

chlorhexidine for umbilical cord cleaning correctly recognised that it should be applied once daily for a minimum of seven days. The majority of individuals were aware of the necessity to cleanse their hands before applying chlorhexidine gel to the umbilical cord. The majority (77.6%) of the individuals who knew about chlorhexidine had extensive knowledge about it. Only 47.1% of the participants surveyed possessed extensive knowledge about the use of chlorhexidine gel for umbilical cord care, whereas a somewhat larger proportion of participants had little knowledge.

A study examined individuals who had utilised chlorhexidine gel for umbilical cord care. Out of the total number of individuals, 89 (46.1%) had previous experience, but just 49 (25.7%) had utilised it for their most recent child. Out of the individuals who utilised it accurately, 12 did so within the initial 24 hours of the infant's life, with approximately half of them using it within the first hour after birth (51.7%). The majority of individuals (76, 85.4%) practised hand hygiene before usage, and it was revealed that about 44.9% applied the gel to both the stump and the surrounding skin. The majority of the participants spread the gel using their fingers and most allowed the cord to air dry after gel application. Only 58.4% discontinued gel application once the cord was detached. The study found that 60.7% adhered to the recommended duration of 7-14 days for using the chlorhexidine gel (Agu et al., 2022).

According to a study carried out by Callaghan-Koru et al. (2019), it was found that the timing of chlorhexidine gel application for umbilical cord care after birth and the duration of its use before cord detachment were significant factors indicating delayed cord detachment in the study group. Consequently, participants who applied chlorhexidine gel immediately after childbirth (within one hour) experienced a delayed

separation of their umbilical cords compared to women who used the gel for extended durations. Roba et al. (2020) conducted a comprehensive examination and statistical analysis on the impact of administering 4% chlorhexidine gel to the umbilical cord stump of newborn infants in economically disadvantaged nations. It was discovered that the application of this gel reduced the duration required for the chord to detach by around 2.5 days in the hospital and 2 days in the community.

The authors revealed that the outcome of this study may decrease maternal inclination to utilise chlorhexidine gel, despite evidence indicating that infants experience improved outcomes when it is administered promptly, particularly within the first 24 hours following delivery (El Arifeen et al., 2012). The potential cause for mothers opting for alternative materials for cord care, despite evidence supporting its efficacy, could be attributed to the observed delay in the detachment of the umbilical cord. An analogous investigation conducted on healthcare experts revealed that the utilisation of chlorhexidine gel on the umbilical stump results in a prolonged healing duration due to the sustained moisture, hence impeding the healing process (Opanga et al., 2022).

The World Health Organisation (WHO) advises utilising dry cord care for optimal outcomes as an alternative to approved substances (WHO, 2017). However, the act of maintaining cord dryness following the application of chlorhexidine gel did not significantly indicate a delay. According to a comparable study, healthcare professionals have reported that the application of chlorhexidine gel to the umbilical cord results in moisture accumulation, so impeding the healing process and the detachment of the cord. They expressed a preference for using methylated spirit. A health education programme aimed at raising the use of chlorhexidine in umbilical cord care was suggested as a way to

improve use and lower the bad effects of inadequate umbilical cord care, like sepsis (Ara et al., 2021). Research from the past has shown that a supportive and educational nursing intervention plan can help mothers learn more about using CHX gel to manage their umbilical cords (Osuchukwu et al., 2021).

The new formula for umbilical cord care contains a higher concentration of the active component, 7.1% chlorhexidine digluconate (CHX), compared to other solutions. This increased concentration can effectively prevent cord infections and newborn sepsis. Over the course of the last decade, CHX use has experienced rapid growth, transforming from a mere concept into a global triumph in the field of healthcare. Currently, CHX is utilised in many countries in South Asia and sub-Saharan Africa as a crucial component of neonatal care (WHO, 2017). These countries include Bangladesh, Democratic Republic of Congo, Ethiopia, Kenya, Liberia, Madagascar, Malawi, Mozambique, Nepal, Nigeria, Pakistan, and Sierra Leone. It is anticipated that in the future, the intervention will persist in preventing the deaths of numerous infants (WHO, 2017).

It is strongly advised against applying a solution containing 7.1% chlorhexidine digluconate to the ears or eyes due to its potential to inflict significant harm (WHO, 2022). Irrespective of the primary receptacle and formulation employed, it is imperative that the individuals and organizations responsible for chlorhexidine in umbilical cord care initiatives, as well as those administering the medication to carers, adhere to the appropriate procedures to ensure its proper utilization (Coffey, Hodgins & Bishop, 2018). The transformation of CHX, from an underutilized antiseptic for cord care to a globally used solution for saving infants' lives, owes its success to the diligent efforts and

collaborative endeavours of numerous individuals and organisations across various locations (Coffey, Hodgins & Bishop, 2018)

Simultaneously, effective leadership and seamless coordination by these individuals and collectives will ensure a successful implementation and constant practice of health care workers using CHX in cord care. Programmes will have a longer duration if they are grounded in factual information and guided by the country's requirements (Ara et al., 2021)

However, at certain stages in policy formulation, social norms of people, beliefs and practices would hinder effective utilization even in health facilities. This is because mothers and community members would still want to hold to their practices regarding the care of newborns. For example, mothers continue to use hot water and shea butter to apply to the cord in the Brong Ahafo region of Ghana. Community members still believe that refraining from any modern intervention on the umbilical cord would reduce the force associated with removing the cord. Additionally, this practice if not adhered to may also cause discomfort for the mother who must stay indoors until the cord stump naturally detaches (Coffey, Hodgins & Bishop, 2018). Researchers looked at how African women care for their newborn cords after giving birth and found that in most East African countries, babies' cords were applied with saliva and herbs for at least three days (Coffey, Hodgins & Bishop, 2018; El Arifeen et al., 2012). Others found that babies' cords were cared for by applying a local preparation to them every day (Ogunlesi, 2012). This is thought to protect them from the evil eye and other bad signs and help them grow.

Even more so, a strong link existed between what women at Poly General Hospital, Enugu knew about chlorhexidine gel and how often they used it, considering their cultural beliefs (Mainalia, Kunwarb & Dhakalc, 2018). The authors found that when it came to using chlorhexidine gel, participants with more knowledge were more likely to do so than participants with less knowledge. This was based on their cultural belief and practices. This means that as more participants learn about how to use chlorhexidine to clean the foetal cord, more of them will likely do so if they abandon their cultural practices (Mainalia, Kunwarb & Dhakalc, 2018)

The 17th Expert Committee on the Selection and Use of Essential Medicines was convened by the World Health Organisation (WHO) in 2009. In a community-based, cluster-randomized experiment conducted, it was determined that the utilisation of a 4% CHX solution (containing 7.1% CHX digluconate) for umbilical cord care resulted in a substantial reduction in the mortality rate of neonates. This was sufficient to have the product and its utilisation included in the WHO EMLc. However, at that time, there was no 4% CHX product available in the market. Therefore, based on the recommendation of the expert review committee, the decision was made to list 20% CHX (digluconate) with instructions to dilute it for the purpose of umbilical cord care. Upon the release of the 2009 WHO model list, PATH and the US Agency for International Development corresponded with the WHO expert review group, expressing concerns regarding the lack of clarity in the indication. They recommended that the wording be modified to specify the use of 4% CHX for the care of a baby's umbilical cord. When queried about this matter, the World Health Organisation (WHO) stated that it would be reevaluated during the next review of the Essential Medicines List (EML) in 2010–2011 (WHO, 2017)

It is crucial to have a precise understanding of the proper usage of 4% CHX for umbilical cord care due to the common confusion between the quantities of free chlorhexidine and chlorhexidine digluconate (Osuchukwu et al., 2021). Nepal is the sole country that has included CHX in its national essential medications list, specifically at a rate of 4% for umbilical cord care. It is included in certain national lists of essential medicines. Certain locations lack adequate resources for the proper management of an umbilical cord. The regulatory agencies of Bangladesh and Nepal have classified CHX for umbilical cord care as a medicinal product, based on the events that have occurred in these countries. Consequently, the product must be duly registered with the appropriate regulatory authority in each respective country (Muriuki et al., 2017).

Additionally, Sazawal et al. (2016) studied 307 mothers in an urban slum in Kenya. They found that while most mothers (91%) knew it was important to be clean when cutting the cord, only 28% knew it was also important to be clean when tying the cord and to use chlorhexidine. Up to 79% of women were scared to touch the cord that was not fully healed and only 52% knew how to properly care for the cord after giving birth with traditional practices.

To help rural mothers have access to CHX, topical solutions containing 4% chlorhexidine are readily accessible and can be found under several brand names and generic names. They are frequently employed for healing injuries and mothers should be educated on the potential nature of using them on the cord. Even in advanced countries, following the discontinuation of hexachlorophene in the 1970s, CHX gained popularity for its use on babies in the United States and other regions. To reduce the occurrence of staphylococcal epidemics in nurseries, it became common practice in many healthcare

settings to bathe babies using solutions containing CHX (Mainalia, Kunwarb & Dhakalc, 2018). A study in a primary care centre in Nairobi, Kenya's capital, found that surgical spirit, chlorhexidine, and antimicrobials were the most popular cleaning products used (O'Brien & Kipkoech, 2023)

The World Health Organisation (WHO) has endorsed CHX as an effective antibacterial agent for cord care, particularly as a safer alternative to hazardous cord care techniques (WHO, 2022). In recent times, a large number of infants have undergone cleansing using CHX in various methods, including full-body and umbilical cord washing, without any reported adverse effects (Roba et al., 2020). No adverse health effects have been associated with the absorption of CHX in infants, and the observed levels of absorption do not appear to have any significant clinical implications.

Evidence from various countries indicates that cultural traditions frequently signify the period following childbirth in Africa affecting the use of CHX (WHO, 2022). To ensure the effectiveness and timeliness of postnatal care, it is crucial to comprehend these concepts and procedures and build the capacity of healthcare workers to educate mothers on the use of CHX. In numerous regions of Africa, there exist cultural practices dictating that women and infants should remain indoors during the initial month following childbirth and this often hinders the practice of using CHX on the cord (WHO, 2017). Visitors refrain from touching infants especially when the cord has not fallen. Mothers or infants experiencing illness during the period of isolation frequently delay seeking professional medical assistance and this could even affect how CHX is applied even if the mother was supplied. However, children who are ill typically succumb within a few hours, and delaying treatment can have lethal consequences (WHO, 2017).

Several studies have linked good cord habits with many parenting behaviours that are important for child growth (Tamma, Aucott & Milstone, 2010). An investigation by Waiswa et al. (2008) into what postnatal mothers in Uganda knew about good practices for newborns that could keep them healthy showed that 60% of the mothers did not know anything about using chlorhexidine, while 40% of the mothers said that taking care of the cord and oiling it regularly was enough to keep the newborns from getting infections.

Stewart, Gapp, and Harwood (2017) say that most parents who are very traditional may not want to take sick newborn babies away from home and do not want to apply chlorhexidine. This could be because of traditional beliefs like the belief that people with "bad eyes" can give illnesses to the baby when they see it, the fact that the baby is not yet a person and parents or caretakers shouldn't expose them too soon, or practical issues like not having access to health facilities or roads.

Additionally, researchers have looked at chlorhexidine cord washes as a way to lower the risk of umbilical cord infections, sepsis, and newborn deaths (Bhutta et al., 2014). Topical chlorhexidine umbilical cord washes have been shown to lower neonatal mortality rates in studies by El Arifeen et al. (2012) where it was found that, for a considerable amount of time, CHX cord care has been the most effective method for taking care of the umbilical stumps of the majority of newborn babies. Chlorhexidine should be applied to the umbilical stump immediately after birth in home births and in locations where there is a high risk of infant mortality (more than 30 deaths per 1000 live births), according to the new WHO standards (WHO, 1998). Donors and advocacy groups have expressed their desire for chlorhexidine to be utilised widely and for projects to be rapidly implemented across the world (USAID, 2012).

It is estimated that medical conditions that affect newborns are responsible for the deaths of more than one million infants around the world each year. This accounts for more than a third of the overall number of deaths. In several locations, infections constitute the primary cause of infant mortality, and in regions where there is a high rate of infant mortality, infections are responsible for around half of all newborn fatalities and could be reduced if proper adherence is taken seriously in the area of CHX use (Lamichhane et al., 2018). When microorganisms are present on the stump of the umbilical cord, they are the root cause of many of these disorders (Mainalia, Kunwarb & Dhakalc, 2018). Chlorhexidine digluconate could be used against the primary factors that lead to infections in newborns (Kibira et al., 2017). There have been recent community-level randomised controlled trials conducted in Pakistan, and Bangladesh that have demonstrated that the application of a chlorhexidine product with a concentration of 4% (7.1% chlorhexidine digluconate) to the umbilical cord can save lives (Kibira et al., 2017)

Dozens of companies around the world make goods with chlorhexidine in them, with concentrations ranging from less than 1% to 20% (Turyasiima et al., 2020; Osuchukwu et al., 2018). Chlorhexidine digluconate is cheap and easy to get on every area where people live (Osuchukwu et al., 2021). It is used to make a number of different chlorhexidine finished products. What you need to make a product to clean the stump of the umbilical cord (4% free chlorhexidine or 7.1% chlorhexidine digluconate) (Tamma et al., 2010). It stays fresh for a long time, does not need to be kept cold, and is very simple to use no training needed and no tools needed. Because of these things, it can be used for care in a hospital, a health centre, or at home. Few other low-cost interventions have

shown such promise for quickly lowering the death rate of newborns in so many places (Ayub Kalufya, Ali Seif & Masoi, 2022).

There have been attempts to improve the cleanliness of the umbilical cord by promoting "dry cord care," but these have not always worked in all situations (Turyasiima et al., 2020; Osuchukwu et al., 2018). Millions of mothers around the world still really want to put something on their babies' stumps from the umbilical cord (Muriuki et al. (2017). They use a wide range of traditional and non-traditional substances, such as edible oils, ash, dirt, and faeces, when there is not a product that come highly suggested (Opanga et al., 2022). Where consumer research has been done, mothers have shown a strong underlying need for an antiseptic like chlorhexidine and have also shown they know how to use it properly (Kibira et al., 2017). There have been several benefits associated with the use of chlorhexidine in cord care in health facilities (Kleinhout et al., 2021).

A study was conducted to examine chlorhexidine in umbilical cord care. The findings of this study revealed that a little more than one-half of postpartum women attending the postnatal clinic in the study setting had poor knowledge about chlorhexidine use in cord care. This may be due to too much inaccurate information on cord care from significant others, such as mothers-in-law and other community members in the study setting. A majority had heard of chlorhexidine gel, of which their information source was chiefly through a health professional, and this emphasises the key and central role that healthcare providers play in providing evidence-based information. Similarly, in a recent study, Mohammed et al. revealed that 35.1% of participants had poor knowledge of

standard cord care concerning the use of chlorhexidine gel and methylated spirit, among others (Olubiyi et al., 2023)

2.3 Benefits of using chlorhexidine in umbilical cord care

The use of chlorhexidine has resulted in several benefits which are documented especially in empirical studies (Olubiyi et al., 2023). The World Health Organisation (WHO) indicated that all babies, whether they are born in a hospital, at home, or in a humanitarian setting, should have their umbilical cords kept clean with the application of chlorhexidine because of the benefits associated with its use. Using clean, germ-free blades and ties, keeping the stump clean and drying completely with a clean cloth after getting wet are all parts of proper cord care (WHO, 2022). Keeping the umbilical cord clean after the application of chlorhexidine is enough to keep it from getting infected. But when traditional harmful chemicals are put on the cord, it leads to infections. Chlorhexidine digluconate (CHX) is a broad-spectrum antiseptic that comes in different strengths. It has been used safely for over 40 years for a wide range of health-related tasks.

There have been benefits associated with the use of chlorhexidine. All the applications of chlorhexidine in cord care in Nepal, Bangladesh, and Pakistan have all yielded results. Also, in a study by Semrau et al. (2016) to examine the benefit of using chlorhexidine in cord care, the authors found that chlorhexidine helps lower neonatal deaths. The results showed that the use of chlorhexidine helps in the reduction of neonatal infections among newborns.

The study further found that, even though chlorhexidine applications to the cord did lower neonatal mortality rates in South Asia, they did not do so greatly in Zambia

among newborns. Chlorhexidine treatments on the cord do not seem to help newborn babies in places where most births happen in hospitals and where the death rate for newborns is low (<30 deaths per 1000 live births) (Semrau et al., 2016).

Similarly, a lot of success has been made around the world in improving the health of neonates with the use of chlorhexidine. A study by Osuchukwu et al. (2021) found that newborns were protected from infections with the use of chlorhexidine in cord care practices. The study also found that babies whose cords were applied with chlorhexidine were healthy. And such, it is because, chlorhexidine is an antiseptic that works against many types of perinatal infectious microbes because it tightly binds to their cell walls and throws off their osmotic balance (Mohammad et al., 2021). For many years, people have used it to wash their hands, clean their teeth, and for medical reasons, like cleaning the umbilical cord and vaginal tube (Chizoma et al., 2020). Chlorhexidine has been studied a lot as a way to avoid vertically acquired (intrapartum) neonatal infection because it is safe, works well, and does not cost much to purchase (Chizoma et al., 2020)

However, a lot of babies are born with help in Burkina Faso, and the country does not want to use chlorhexidine in the community because it goes against their policy of encouraging births in hospitals (Muriuki et al., 2017). If Burkina Faso were to start using chlorhexidine, it would only be used in hospitals and not in people's homes. Several countries said they needed to go on a study tour to another country to help build support for chlorhexidine and see how it has been used in other countries to help them make plans for when they start using it (Ayub Kalufya, Ali Seif & Masoi, 2022).

A study found that the way chlorhexidine is used in NICUs is very different from one another. When the participants in NICUs, where asked about chlorhexidine use, they said they used CHX but there were significant differences in how it was limited based on cord applications (Tamma et al., 2010). It is in the best interest of governments and health care providers, especially in developing countries like Ghana, to do similar studies or national polls to ensure that people can make smart decisions and follow policies like using chlorhexidine.

A study in Uganda found that using chlorhexidine on the stump of the umbilical cord at birth was okay as an extra step rather than as a replacement for other medicines. So, they said that if chlorhexidine was used on a larger scale, it should be thought about how to fit in with local views and practices without losing any of the intervention's effectiveness (Woday Tadesse et al., 2021).

Also, a study in Kenya found that healthcare workers were likely to be okay with using chlorhexidine to clean newborns' cords in places where there were a lot of newborns who got sick or died from cord infections (Muriuki et al., 2017). A meta-analysis revealed that using chlorhexidine on the umbilical cord significantly reduces the risk of newborn sepsis and cord infections. Applying chlorhexidine to the cord lowers the risk of infection by 32% compared to dry cord care or normal cord care. Additionally, the study found that when compared to dry cord care, applying chlorhexidine to the cord significantly lowers the incidence of serious cord infection/sepsis by 77% (Draiko et al., 2021).

Many parents who adhere to traditional beliefs may be hesitant to take sick newborns to a hospital because of things like the belief that people with "bad eyes" can

spread diseases like "Asram" to the baby, the fact that a baby is not yet a human being and that carers should not expose them too soon, and practical issues like a lack of medical facilities or roads leading to them. Unfortunately, most critically ill babies with sepsis, which could have been prevented by the application of chlorhexidine on the cord, do not make it to hospitals in time due to the enormous challenges of transporting them (Turyasiima et al., 2020; Osuchukwu et al., 2018).

Additionally, a study was conducted by Osuchukwu et al. (2021) among 42,356 pregnant women. The average number of registrations per cluster was 436.2, with a standard deviation of 65.3 per cluster. Among these women, 37,856 experienced live births and 723 experienced stillbirths. The majority, 63·8%, gave birth in a hospital. A total of 18,450 newborns in the chlorhexidine group and 19,308 babies in the dry cord care group were monitored from birth until day 28 or until their death. Within the first 24 hours after birth, the majority of the infants in the chlorhexidine group received topical application of chlorhexidine. The mortality rate of infants was lower in the chlorhexidine group (Osuchukwu et al., 2021)

Additionally, studies have shown that some mothers used things that could be dangerous, like saliva, ash, and soil on the cord with limited knowledge of the use of chlorhexidine. The suggested cord care was done by mothers who had at least three prenatal clinic visits. Most mothers took the recommended steps to care for their babies' cords, but some practices that could be harmful were noted. To get the most out of umbilical cord care, pregnant women should be encouraged to go to prenatal clinics (Kassahun, Wakgari & Abraham, 2019). Some of these methods, like using herbs, cow dung, ghee, and saliva, are likely to cause infections. Sadly, most of these bad ways of

caring for the umbilical cord are found in countries with some of the highest rates of newborn deaths in the world (WHO, 2022).

In a different study carried out in Zambia, people had different views and ways of caring for umbilical cords rather than using chlorhexidine. The World Health Organisation says that dry cord care should be used, but it wasn't generally done in Southern Province, Zambia. The study concluded that policymakers and programme implementers should use a cultural health systems model that includes all stakeholders to work with existing cultural beliefs and practices to make evidence-based interventions like chlorhexidine use more effective (Semrau et al., 2016). Therefore, in the first few weeks of life, a baby's umbilical cord care is very important, and bad umbilical cord care has been linked to infections (Mohammad et al., 2021). An umbilical cord infection, also known as omphalitis, can stay in the cord itself or spread to other parts of the body through the blood (Muriuki et al., 2017).

Most of the time, the cord falls off between 5 and 15 days after birth with normal care. In places where clean cord care isn't used, pathogenic organisms settle on and attack the cord. In the first week after giving birth, the World Health Organisation (WHO) says that the umbilical cord stump should be cleaned every day with 4% chlorhexidine (7.1% chlorhexidine digluconate aqueous solution or gel, delivering 4% chlorhexidine). This should only be done in places where harmful traditional materials, like animal dung, are commonly used on the cord (Ayub Kalufya et al., 2022).

Also, a study found that only a few mothers used chlorhexidine in cord care. The results showed that most participants had used chlorhexidine gel for umbilical cord care at least once, and a small percentage had used it exclusively during their most recent

delivery. This research's percentage of mothers who used chlorhexidine gel to care for their umbilical cords was a bit lower and this could potentially affect mothers' use of chlorhexidine in cord care (Abhulimhen-Iyoha & Ibadin, 2012).

2.4 Challenges that midwives face with the Use of chlorhexidine in umbilical cord care

Despite the benefits associated with the use of chlorhexidine in cord care, there have been several challenges associated with the use of chlorhexidine in cord care. One of the major challenges that have confronted health workers in Tanzania with the use of chlorhexidine is the limited supply in health facilities (Sazawal et al., 2016). This has compelled mothers to resort to the use of other substances such as saliva, herbs and clay during cord care. According to the World Health Organisation (WHO), chlorhexidine should be exclusively employed in certain instances as an alternative to the conventional noxious substance, such as cow dung, for treating the stump. Various rigorous investigations and meta-analyses have consistently demonstrated that the utilisation of chlorhexidine significantly reduces the incidence of non-neonatal mortality, but the use has been met with challenges which often include limited availability (Callaghan-Koru et al., 2019).

A study on the usage of chlorhexidine has shown that mothers' ignorance has forced them to utilize other drugs on the cord (Sharma & Kulkarni, 2020). However, Chlorhexidine, being a bisbiguanide, is an antibiotic with a wide range of effectiveness against both gram-positive and gram-negative microorganisms. It is gentle on newborns'

delicate skin, while simultaneously damaging the cell membrane of bacteria. This increases their permeability and effectively eliminates the germs upon contact (WHO, 2022). Chlorhexidine gel is recommended as a cost-effective and very beneficial measure to reduce mortality rates, even for premature or underweight infants when applied effectively. In some settings, the limited availability of chlorhexidine coupled with mothers' lack of knowledge has compelled them to use other substances on the cord (Kleinhout et al., 2021).

According to Osuchukwu et al. (2021) in Nigeria, one of the challenges that affected the use of chlorhexidine in cord care was the lack of directions in terms of how it should be used. As a result, the authors revealed that Nigeria's healthcare system has incorporated chlorhexidine gel cord care into its "package of high-impact child survival interventions". This intervention will be implemented in both community and healthcare settings.

Similarly, Muriuki et al. (2017) revealed that participants had identified limited knowledge of using chlorhexidine in cord care as one of the challenges in the health facility. The authors revealed that the elevated infant mortality rate may indicate a lack of sufficient knowledge regarding the utilisation of CHX gel for cord management. Opanga et al. (2022) revealed that women's lack of knowledge regarding CHX gel is significantly influenced by factors such as childbearing and absence of formal education However, applying chlorhexidine (CHX) to the umbilical stump every day during the first week of life is advised for babies delivered at home in areas with a high neonatal mortality rate (>30 deaths/1000 live births) (Opanga et al., 2022).

A study also discovered that participants' understanding of the use of chlorhexidine in cord care was influenced by education. It was found that the majority of persons (68% of them) who did not have any formal education were involved in the usage of illegal drugs in cord care. According to the findings, the majority of mothers and carers who have completed at least some degree of formal education make use of approved dressings like methylated spirit. It was also revealed that mothers who do not have a formal education were more likely to use non-sanctioned dressings while they are caring for their children's umbilical cords.

However, in a study that involved analysis of data, the effect of chlorhexidine use on cord care was found to be minimal. The study found that when compared to dry cord care, the use of chlorhexidine was observed to reduce the incidence of cord infections by a relatively lower rate. However, the use of soap and water to clean the chord did not provide any further protection against infections. In addition, the research discovered that applying chlorhexidine to the cord within twenty-four hours results in a reduction of the NMR by thirty-four per cent. In addition, it has shown that it is essential to begin applying chlorhexidine to the umbilical cord at the appropriate period following the delivery of the baby (Mullany et al., 2006)

According to the findings of Semrau et al. (2016), chlorhexidine was responsible for one specific occurrence of ocular exposure and eight different instances of local skin irritations. Additionally, research has indicated that women in several low- and middle-income nations employ dry cord care as against the use of chlorhexidine because of the cost associated with the purchase (Ikperite, Ope-Babadele & Ojo, 2020). For instance, a

study conducted by El Arifeen et al. (2012) found that 8% of mothers reported that they refrained from applying any substances to the cord scar, allowing it to dry naturally.

Similarly, a community-based study in Nigeria by Agu et al. (2022) included 9741 newborn children. Chlorhexidine plus handwashing (2165), handwashing only (2578), chlorhexidine only (2312), and dry cord care (2165) were the four groups that were separated from one another. The persons who participated in the study were compared before and after the study began. Teams that were responsible for gathering data and putting plans into action were concealed. The number of instances of omphalitis and NMR was one of the most important findings revealed by the study. In comparison to dry cord care, the use of chlorhexidine was observed to reduce the risk of omphalitis by 42% and the risk of non-muscle rheumatic reflex by 38%. On the other hand, washing your hands does not alter either risk. The authors concluded that although chlorhexidine was effective, it was accessible to the mothers at all times.

Hodgins et al. (2010) examined 42,356 pregnant women on the use of chlorhexidine in cord care. Among the participants who gave birth were put into groups. All of the newborns in the chlorhexidine group, which included 18 450 (99·7%) of the live births, and the dry cord care group, which comprised 19 308 (99·8%) of the babies, were monitored until day 28 or until they passed away. Chlorhexidine was applied to 16 660 (90%) of the infants in the group that received chlorhexidine during the first twenty-four hours of their birth. The infant mortality rate was the same in both groups. The authors concluded that the application of chlorhexidine to the umbilical cords of newborn babies did not result in a substantial reduction in the mortality rate of newborns. Similarly, in Pakistan, although considerable reductions were observed in other countries

with the use of chlorhexidine in cord care, the application of chlorhexidine to the umbilical cord did not appear to be of any significant assistance to newborn infants in regions where the majority of births take place in hospitals and the infant mortality rate is low (Soofi et al., 2012). The study found that the use of chlorhexidine was not associated with a reduced risk of infant mortality in any of the pre-defined stratified analyses.

In a national survey conducted by Tamma, Aucott and Milstone (2010) on the use of chlorhexidine, the survey found that the outcome did not exhibit significant variation when the examination was limited to infants who had been exposed to chlorhexidine within the initial twenty-four hours in some of the findings. When chlorhexidine was utilised, there were adverse events that were documented. Eight of the patients experienced local skin irritation of grade 1, and one of them had ocular exposure of degree 2, which did not need them to go to the hospital. Neither unintended ingestion nor contact dermatitis, nor anaphylaxis was reported by any of the individuals. The use of chlorhexidine did not result in a reduction in the mortality rate of neonates.

Additionally, a study found that participants were not using chlorhexidine because it was not effective in reducing infection in newborns. The authors found that participants did not know very much about how to use chlorhexidine gel to care for an umbilical cord. There was no statistically significant correlation between the amount of education of the participants and their levels of knowledge on the use of chlorhexidine gel to care for the umbilical cord. The percentage of persons who had ever used chlorhexidine gel for umbilical cord care was rather low. About a few of the participants revealed that they had used it for their most recent child with little results because of the delay of the cord falling. Both the degree of education and the understanding of its application for

umbilical cord care were shown to have a significant relationship with the utilisation of chlorhexidine among participants (Hodgins et al., 2010)

More so, Israel et al. (2023) found that individuals who took part in a study had a limited understanding of how to properly apply chlorhexidine gel to care for the foetal cord. The usage of chlorhexidine gel is still not the best option for this particular set of individuals because their knowledge of it is still low. To get the most out of chlorhexidine gel, medical practitioners should continue to discuss the many ways in which it may be utilised in the treatment of umbilical cords. Additional considerations need to be taken into account if chlorhexidine gel is utilised for the treatment of umbilical cords (Israel et al., 2023)

According to the World Health Organisation (WHO), it is recommended to provide newborns with proper care by keeping their umbilical cords clean and dry. Additionally, in areas with a high rate of neonatal mortality, it is advised to apply chlorhexidine gel to the umbilical stump daily during the first week of the baby's life. This would help reduce mothers' use of other substances on the cord always (Zaman et al., 2021)

A study found that mothers, carers, and healthcare workers still don't know where to find it, how to use it correctly, or the benefits that come with it. Policies that can improve the spread and use of CHX for umbilical cord care are still not being put into action very well (Aitafo, West & Okari, 2021). It has also been said that the packaging of the different chlorhexidine goods isn't always clear, which makes it hard to tell what strength the formulation is. Simple steps are needed to stop newborn deaths in low- and

middle-income areas, and research from South Asia suggests that chlorhexidine could be a good one (Aitafo, West & Okari, 2021)

Draiko et al. (2021) found that barriers that affected the use of chlorhexidine included carers not knowing much about CHX, cultural practices and taboos on cord care, CHVs not getting enough training on CHX, carers not knowing how to use CHX, long stockouts, and communities not knowing much about CHX were identified. Healthcare workers said that the Ministry of Health was not doing a good job of getting the CHX standards out there and that they were not available in the Kenya Medical Supplies Authority (KEMSA) or the Mission for Essential Drugs and Supplies logistic management information system, which made it hard to get (Draiko et al., 2021). Advocacy is needed to get people to use CHX, and communities need to learn more about it. The supply chain also needs to be managed to make more CHX available (Draiko et al., 2021)

A study was conducted on the use of chlorhexidine among mothers. The study found that there was limited use of chlorhexidine among mothers because of low knowledge among healthcare workers. Because healthcare workers were not having enough knowledge, the study found that mothers who had two babies were much less likely to use standard cord care methods that could be harmful.

Similarly, another study also found that mothers were not using chlorhexidine at home because of limited knowledge of its use. Compared to mothers who gave birth at a hospital, mothers who had their last child at home were more likely to use standard cord care methods that could be harmful. The reason for this might be that mothers who gave birth at home were following social norms or didn't know the health risks of putting

possibly harmful substances on the stump of the umbilical cord (Draiko et al., 2021). O'Brien and Kipkoech (2023) say that to improve umbilical cord care methods, people should be encouraged to go to prenatal clinics. Topical antiseptics can be used on the umbilical cord stump in places where there are a lot of infections or where hygiene is not good. Even though these suggestions have been made, many women around the world are still using different traditional methods to care for their babies' cords. Therefore, Hill et al. conducted a study which found that individuals who experienced delayed detachment of their newborns' umbilical cords resorted to using drying solutions to expedite the process (Hill et al., 2010). Additionally, Mukhtar-Yola M demonstrated that the variations in the duration required for cord separation could be attributed to non-recommended cord care techniques. Parents who adhered to the prescribed cord dressing practices had newborns whose umbilical cords were 4 days away from detaching from the stump and this affected the use of chlorhexidine in cord care (Mukhtar-Yola et al., 2011).

In January 2014, the World Health Organization released a revised guideline on umbilical cord care. In compliance with the new instruction, the Ghana Health Service and the Ministry of Health carried out a thorough investigation of the use of chlorhexidine digluconate 7.1% gel for cord care. The recently introduced chlorhexidine digluconate 7.1% gel can serve as a substitute for methylated spirit, a long-standing choice for cleansing the umbilical cord (GHS, 2019). Despite the recommendation of using methylated spirit for treating the umbilical cord, it is believed that mothers and carers choose to employ unauthorized drugs for this purpose.

To reduce the likelihood of neonatal sepsis resulting from an infected umbilical cord stump, it is imperative to adhere to appropriate cord care protocols. The implementation of evidence-based practices for umbilical cord care presents a significant opportunity within the field of public health to reduce the incidence of infections and mortality among infants (Khan et al., 2015). It is widely believed that the umbilical cord serves as the physical and mental connection between the mother and the baby throughout pregnancy. Through this configuration, nutrients and oxygen can be transferred from the maternal bloodstream to the foetal bloodstream, while waste products can be eliminated from the foetal blood (Basta & Lipsett, 2020).

It is advisable to employ antiseptic chemicals in locations with high infant mortality rates and inadequate hygiene conditions (Agu et al., 2022). Among the antiseptics are topical medicines, methylated spirit, silver sulphadiazine, gentian violet, iodine, and chlorhexidine. In areas where it is common, the use of chlorhexidine digluconate (CHX), which releases chlorhexidine for umbilical cord care, has been shown in randomised clinical trials to considerably lower the risk of newborn illness and death (Ara et al., 2021; Roba et al., 2020).

Also, through a technical consultation process, the World Health Organisation (WHO) recently made changes to its global standards on postnatal care for mothers and babies. The new standards talk about when and what kind of postnatal care mothers and babies should get, with a focus on settings in low- and middle-income countries that don't have a lot of resources (WHO, 2017). They go along with other recommendations on infant, mother, and newborn health (Mallick, Yourkavitch & Allen, 2019) and the kind of

healthcare worker who can safely carry out important maternal and newborn healthcare interventions (Chizoma et al., 2020), all of which were made using the same process.

In places where newborn deaths are low, the World Health Organisation (WHO) recommends dry cord care, which means doing nothing to the cord. However, antiseptics should be used in places where there are a lot of newborn deaths and bad hygiene (Chizoma et al., 2020). These include topical medications, silver sulphadiazine, methylated spirit, gentian violet, iodine, and chlorhexidine (Mohammad et al., 2021). The best ways to care for the umbilical cord could lower the number of newborn deaths that could have been avoided due to sepsis (Mohammad et al., 2021).

Also, in a study carried out by El Arifeen et al. (2012) on chlorhexidine use in cord care. The authors found that chlorhexidine performed significantly better than other treatments in terms of reducing the mortality rate of neonates. However, the study found that limited availability of chlorhexidine hindered effective utilization among participants. When stratified investigations were conducted, the newborn death rate did not decrease considerably however in samples that were administered chlorhexidine. Where modest treatments are required, chlorhexidine may be an effective method for preventing the mortality of newborns. Chlorhexidine, on the other hand, did not reduce the incidence of infant mortality in Zambia, where hospitals were responsible for 63% of births and the death rate for newborns was only 14.1 deaths per 1000 live births (El Arifeen et al., 2012).

A study found that participants sampled in a study used products that were not suited for treating the umbilical cord instead of chlorhexidine. When the participants were asked, it was revealed that cultural factors and limited supply hindered its effective

use among the participants. The results of the study indicated that the choice of dressing for the umbilical cord was significantly influenced by several factors. These factors included the level of education, the place of delivery, the relationship with the individual who suggested a particular dressing, and the number of days it takes for the umbilical cord to fall off. During the treatment of the umbilical cord, it is very necessary to make use of only permitted chemicals to reduce the amount of newborn mortality that is caused by infections that might have been avoided. It is necessary to provide extra health information to persons in the community, as well as healthcare professionals working at lower tiers of the healthcare system, particularly about the treatment of newborn cords (Israel et al., 2023).

In a related development, the selection of materials for umbilical cord care in this study was based on criteria such as cost, availability, user-friendliness, efficiency, and the responder's information accessibility. Based on the World Health Organisation (2019), socioeconomic obstacles may lead to delayed decision-making on chlorhexidine, hence raising the risk of problems and mortality in babies due to cord infections.

In a study that assessed the challenges of CHX in cord care, it was found that a limited supply of CHX affected the way participants utilized it. To address this issue, the study suggested utilizing community organising and testimonials from mothers who reported rapid healing of their umbilical cords and effective management of infections (Dhingra et al., 2014). This is due to the potential for individuals' perceptions of extended periods of separation to reduce the likelihood of widespread acceptance of the intervention during subsequent attempts to expand its implementation (Dhingra et al., 2014)

According to the World Health Organisation (WHO, 2022), it is recommended to apply chlorhexidine (4%) to the umbilical cord stump of newborns delivered at home in areas with a neonatal mortality rate (NNM) higher than 30 per 1000. This should be done daily during the first week of the baby's life. Furthermore, it is recommended that infants delivered in hospitals or low neonatal mortality (NNM) environments receive meticulous care about maintaining clean and dry umbilical cords. The instructions stated that the use of CHX has the potential to reduce or supplant traditional practices, such as the use of noxious substances like cow dung (Opanga et al., 2022). Two studies conducted in Africa on umbilical cord cleansing during home births yielded no significant advantages in terms of reducing mortality rates (Dhingra et al., 2014).

During gestation, the umbilical cord serves as a vital connection between the mother and the developing foetus, ensuring their survival. However, the cord is severed after birth, and the remaining part could serve as a potential entry point for systemic diseases such as bacteremia to enter the body. If not adequately addressed, this could result in NNS (Painter, 2019). Potential risk factors for omphalitis (infection of the umbilical cord), neonatal tetanus, and sepsis including maternal illness, premature or prolonged membrane rupture, unsanitary delivery environment, low birth weight (<2500 grammes), or a previous umbilical catheterization. The predominant bacterial pathogens responsible for this sickness include Staphylococcus aureus, group A Streptococcus, Escherichia coli, Klebsiella pneumoniae, and Proteus mirabilis (Fazly Bazzaz, et al., 2021).

Therefore, chlorhexidine liquids in water are most stable when the pH is between 5 and 8. Above pH 8.0, chlorhexidine base forms crystals, and as the pH level drops, the

compound's activity slowly decreases because it is less stable. Chloroaniline is made when something is broken down by water. The amount is small at room temperature, but it grows when heated above 100°C, especially when the pH is high (Mohammad et al., 2021)

Because of this, it is important to do similar studies in our setting so that our policy decisions can be based on facts. It is not clear why so many Indian mothers seemed to follow the suggested method compared to mothers in other LMICs, but it is interesting to note that mothers who had a skilled attendant help them give birth were twice as likely to use dry cord care as compared to the use of chlorhexidine (Aitafo, West & Okari, 2021). Like in the Indian study, all of the mothers in our study said they had given birth in a hospital and there was available CHX. This may explain why so many of them used chlorhexidine (Okpaleke, Ndikom & Bulama, 2019). Healthcare professionals are supposed to start proper cord care at the hospital with the use of chlorhexidine and make sure that mothers keep up with it after they leave the hospital (Ohaja & Anyim, 2021).

Noncompliance with standard cord practices is often incomplete, resulting in an annual mortality rate of 40% for children under the age of 5 (Fazly Bazzaz et al., 2021). Multiple research projects have identified various elements that influence human conduct with the use of CHX. Challenging socio-economic and social variables, stemming from intricate traditional customs, have hindered communities from adhering to WHO guidelines regarding the care of infant umbilical cords with the use of CHX. These common problems exacerbate the difficulty for women in acquiring knowledge about conventional methods of caring for their umbilical cords with the use of CHX. The

majority of women rely on their grandparents, mothers, and other family members or relatives for assistance during pregnancy and postpartum (care of newborns). According to O'Brien and Kipkoech (2023), research indicates that home birth and the consumption of dangerous chemicals are prevalent in low-income nations with a significant risk of cord infection.

Similarly, a study found that twenty-nine thousand seven hundred and sixty newborn children were divided into three groups for a cluster randomised controlled trial (RCT) that was carried out in Bangladesh. To be more specific, 10,329 newborns were given repeated chlorhexidine cord cleansings, 9,423 children were given a single chlorhexidine cord washing, and 10,088 infants were only given dry cord care. In the first step of the process, the author started by analysing the degree of similarity that existed between the participants in each of the three groups. Both the people who participated in the study and the people who conducted the research were not anonymous. One of the most significant discoveries made by this research was the newborn mortality rate, which is defined as the number of infants that died during the first 28 days of their lives for every 1000 live births.

It was determined that an analysis was carried out for both the primary outcome, which was NMR, and the secondary endpoint, which was omphalitis. To determine the risk of newborn mortality rate (NMR), a comparison study was carried out between the groups who followed dry cord care and the groups that utilised chlorhexidine for cord washing, both in multiple and single applications. The research showed that washing the umbilical cord with chlorhexidine numerous times reduced the amount of redness or pus

by 42 per cent and the amount of severe redness with pus by 65 per cent when compared to not applying any therapy on the cord.

Comparing the group that received dry cord care to the group that received chlorhexidine, the group that received chlorhexidine had a substantially lower risk of newborn mortality rate (NMR). However, the use of repeated chlorhexidine cord washing did not result in a decrease in the incidence of nuclear magnetic resonance (NMR). The research that was carried out by El Arifeen and colleagues (2012) was unable to find any negative effects that chlorhexidine may have.

Similarly, Osuchukwu et al. (2021) found that participants identified a lack of CHX as a challenge. The survey consistently observed that CHX coverage was inferior to the gold standard among the participants in terms of its availability. The proportion of participants who answered "don't know" was substantial among the participants.

In a related development, participants cited a limited supply of CHX in clinical settings as a major setback. The majority of the participants said the limited supply affected their usage of CHX in the clinical environment. Participants cited the need to make CHX available for use at all times to help in the reduction of the challenges associated with the usage. Similarly, participants sampled in a study cited limited knowledge in the area of CCHX use in cord care. It was found that the majority of the participants did not know about the use of CHX and hence did not use it well in cord care. The majority of women reported that they were either not informed or unaware of the substance applied to their baby's umbilical cord by the health workers in the health facilities (Osuchukwu et al., 2021).

Coffey, Hodgins and Bishop (2018) found that participants indicated that CHX was not effective in cord care their perception. The study found that chlorhexidine that was administered at the cord did not meet the expectations of participants. The participants also identified limited knowledge in terms of how to use CHX and apply it to the cord. This was a major challenge that confronted the participants at the time. The author of the study adopted a technique that was double-blind to test the hypothesis that the baselines of the individuals who participated in the study could be compared. Initially, the incidence of umbilical cord infection was reported to be one case per one hundred live births even among participants who revealed in the findings. Although participants had limited knowledge of CHX, the effectiveness of the cord was not doubted (Coffey, Hodgins & Bishop, 2018)

Hodgins et al. (2010) found that it is recommended that chlorhexidine be applied to the cord of a newborn as soon as possible after delivery, preferably "within the first six hours" of life to reduce infection. This could be done if health workers work to improve the knowledge of mothers on cord care with the application of CHX. In various experiments, it has been applied to the skin anywhere from once per day to several times over seven to fourteen days as part of the testing process. At the same time as antibiotics are used to treat infections that are already present, chlorhexidine therapy is a strategy that is not only inexpensive but also has the potential to prevent bacterial colonisation from developing into bacteremia in the first place. The safety of chlorhexidine for infants has been the subject of a significant amount of investigation. Participants revealed that the limited availability of CHX affects the use of it in most studies (Opanga et al., 2022)

Therefore, the umbilical cord is what links the baby to the placenta that is already implanted in the mother. Without it, intrauterine life would not be complete. The placenta is tied off at birth, and the stump should fall off in 5 to 15 days (Opanga et al., 2022). During this time, the baby can get an illness through the cord. There is a need to be the best way to care for babies' umbilical cords during their first week of life. This will help keep babies from getting infections. The opinions and experiences of these stakeholders and healthcare providers (nurses or midwives) on how to handle and care for the cord are needed to make progress towards putting the best practices into action around the world (WHO, 2022).

In addition to the care of the cord, studies have also found that the relationship between the mothers or caretakers and the individual who recommended a specific style of caring also affects the use of CHX in cord care (WHO, 2022). Therefore, nurses have been identified primarily as being responsible for selecting the acceptable messaging on the use of CHX in cord care. Therefore, a proper message to mothers on the use of CHX in cord care would lead to proper adherence among mothers in cord care. In contrast, improper messages on CHX to mothers would lead to less use leading to limited knowledge (WHO, 2022)

Additionally, a study conducted in Western Uganda found that participants identified that chlorhexidine was not effective among the participants who were sampled in terms of cord care. This finding suggested that participants could have limited knowledge of CHX. The study found that newborns, representing 99.7% of the total, were allocated to the chlorhexidine group within the first 28 days after delivery, whereas those infants, representing 99.8% of the total, were assigned to the dry cord care group.

Investigations were carried out using both the intention-to-treat analysis and the per-protocol analysis. At first, the author attempted to do a comparative analysis of the individuals who participated in the study. The use of chlorhexidine-based cord care did not have any significant influence on the rate of infant death or sepsis based on the results (Turyasiima et al., 2020)

It is important to state that, when people have limited knowledge of CHX, it could create the opportunity for them to explore other alternatives as a means to care for the cord. For example, Nigeria has a lot of different practices and ideas about how to care for a newborn's umbilical cord, which shows that this is something that people have always wanted to do. In the southern part of Nigeria, people use olive oil, engine oil, red toothpaste, and mentholatum. In the northern part of Nigeria, people use herbs, salt, and even cow dung (Okpaleke et al., 2019) to help the body heal, stop infections, and/or shorten the time it takes to separate the umbilical cord. These different ways of caring for the umbilical cord are caused by the amount of good information that is available on the subject, as well as cultural and social factors. In Nigeria, plans have been made to get more people to use chlorhexidine to help in the reduction of sepsis.

Sazawal et al. (2016) in a survey found that, Chlorhexidine did not lower infant mortality in newborns where most babies were born in hospitals and the death rate for newborns was low. The study found that, there were no differences between the newborn babies that took CHX and those who took normal substances. The group that received chlorhexidine included 18,015 infants, whereas the group that received dry cord care contains 18,896 newborns.

There has been a conclusion reached about the first and second phases of this study. Different interventions were given to three different groups of children during the first part of the research project. These interventions included chlorhexidine, a placebo, and dry cord care techniques. There was not a significant difference in the newborn mortality rate (NMR) between the group that received chlorhexidine and the group that received dry cord care (Sazawal et al., 2016). When compared to the group that received dry cord care, the group that was treated with chlorhexidine saw a reduced incidence of omphalitis. This meant that, the use of chlorhexidine is good in reducing infection in newborn care.

Sometimes sepsis in newborn could be linked to other causes with limited permission from cultural settings. Fazly Bazzaz et al. (2021) found that, omphalitis and serious systemic infections may be caused by dirty conditions during birth and care of newborn babies. A lot of steps have been taken to lower the risk of neonatal infections. These include encouraging good hygiene (like washing hands before and during delivery and while caring for newborns), using clean birth kits, and cleaning the baby's skin and the skin of the mother during labour with antiseptics like chlorhexidine (Fazly Bazzaz et al., 2021)

The literature review is a crucial component of every research endeavour, spanning from its inception to its conclusion. The chapter provided an overview and outlined the particular goals of this investigation. The literature study revealed many studies completed by different researchers in different regions on the use of chlorhexidine for umbilical cord care. The majority of authors employed questionnaires and interview guides in their investigations, utilising both qualitative and quantitative methodologies.

The research demonstrated that many factors could impact the practice of midwives regarding the utilisation of chlorhexidine in umbilical cord care. The study also recognised insufficient information as a barrier faced by midwives when using chlorhexidine for umbilical cord care. Furthermore, it is important to analyse the advantages of utilising chlorhexidine for umbilical cord care in relation to the decrease in infection rates.

CHAPTER THREE

METHOD

3.1 Introduction

This chapter presents the study setting, study design, study population, sample size and sample procedure. Additionally, data collection instrument, data collection procedure, methodological rigour, data analysis, and ethics are discussed under this chapter

3.2 Study Setting

The study was carried out in the Salaga Government Hospital, located in the East Gonja Municipality. It is situated in the southeastern part of the Savanna Region of Ghana

The area is next to the Mion District and the Tamale Metropolitan Assembly in the north, the Central Gonja District in the west, the Nanumba-North, Nanumba-South, and Kpandai Districts in the east, and the Brong-Ahafo Region in the south.

The district has a land area of 8,340.10 square kilometres, which accounts for approximately 11.95 per cent of the entire landmass of the Northern Region. This makes it the largest district in the country (Service, 2013). The district's Total Fertility Rate is 3.61. According to GSS (2010), the General Fertility Rate is the second highest in the region, with 98.4 births per 1000 women aged 15 to 49 years. At 22.7 per 1000 people in the population, the crude birth rate (CBR) is current. Though 44.9 per cent of the district's migrants were born inside the same region, over 47.0 per cent are migrants from other regions. 5.62 crude deaths per 1000 people in the district are reported by GSS (2022).

3.3 Research design

The study was conducted using an exploratory descriptive qualitative design. Exploratory descriptive qualitative design is often used to explore a scenario that has not been well studied among the participants in a given setting (Foster et al., 2024). Given the fact that the use of chlorhexidine in umbilical cord care in the Salaga Government Hospital especially among midwives was not studied in any empirical nature, this study design was considered appropriate.

3.4 Philosophical underpinning

The study employed the constructivism approach for the study. The constructivism approach is used to assert that people construct their understanding and knowledge of the world through experiencing things and reflecting on those experiences (Lloyd & Gifford, 2024).

The use of constructivism enabled in-depth data to be collected from participants to help answer the research questions on chlorhexidine in umbilical cord care (Sutton & Austin, 2015). The participants provided in-depth responses based on the research questions because the data collection on chlorhexidine in umbilical cord care was flexible and focused on obtaining rich data (Shava et al., 2021).

However, using a constructivist approach to collect data from participants on chlorhexidine in umbilical cord care provided data that was based on the subjective opinions of participants (Mogashoa, 2014). As a result, this made the findings difficult to be generalized among other districts in terms of the use of chlorhexidine in umbilical cord care. Also, the use of a qualitative approach to collect data was not statistically

representative (Adom et al., 2016). That meant that a smaller number of the participants were sampled to gather the responses.

The advantages of using the constructivist approach to collect the data on chlorhexidine in umbilical cord care included the ability to probe for more responses from the participants. The use of the constructivist approach made the data-gathering processes easy because the cost of sampling a large number of participants whose responses may not have been relevant to the study was not considered. Therefore, the constructivist approach was considered ideal for this study (Sutton & Austin, 2015).

3.5 Study Population

The study population involved registered midwives who were available at the study setting at the time of the study. The study considered the following inclusion and exclusion criteria for the participants.

3.5.1 Inclusion Criteria

1. A practising midwife at the Salaga Municipal Hospital with at least one year of work experience.
2. Midwives working in the labour ward or Child Welfare Clinic
3. Midwives that were willing to participate in the study.

3.5.2 Exclusion Criteria

1. Midwives not actively involved in direct postnatal care, such as those in administrative roles
2. Midwives who have not been trained or exposed to the use of chlorhexidine

3.6 Sample Size

The sample size involved 23 midwives who were sampled from the study setting. In qualitative studies, usually, smaller number of participants is often used to conduct the study based on data saturation. Houghton et al. (2013) revealed that provided data saturation is reached with the participants a smaller number of study participants is often used. For this particular study, data saturation was reached with the 20th participant. However, three more participants were interviewed in order not to miss out on some relevant information.

3.7 Sampling Method

This study used a purposive sampling method to recruit the study participants in the study setting (Creswell, 2012). The study used a purposive sampling technique to ensure that participants with in-depth knowledge of chlorhexidine use in umbilical cord care formed the study participants. This enabled the study to explore participants' views on practices related to the use of chlorhexidine use in umbilical cord care, the benefits of using it in cord care and the challenges participants encountered in using chlorhexidine in umbilical cord care in the Salaga Government Hospital.

3.8 Data Collection Instrument

A structured interview guide was designed and used for the primary data collection from the participants. The data collection tool collected data on the demographic data of participants. These included the age, marital status, certificate obtained, unit and parity of participants. The tool was also used to collect data on practices related to the use of chlorhexidine use in umbilical cord care, the benefits of using it in cord care and the challenges participants encountered in using chlorhexidine in

umbilical cord care in the Salaga Government Hospital. Probing as a technique was used to gather the data from the participants. This method enabled the study to solicit for responses from the participants in the research questions categorized.

3.9 Data Collection Procedure

The researcher after obtaining ethical clearance from the Navrongo Health Research Centre and the Ghana Health Service met the management of the hospital to inform them about the study. The principal midwife assisted in recruiting study participants. All midwives in the selected unit who were willing to participate in the study were invited to do so in a quiet room to avoid unnecessary disturbances. The benefits of the study, as well as possible risks and inconveniences, were explained to the participants before the interviews. All interviews were scheduled among the midwives at a convenient place within the hospital. Each interview session lasted for 30 to 45 minutes.

3.10 Data Analysis

The data was analysed using content analysis. Content analysis is a systematic method used to interpret textual or visual data to uncover patterns, themes, or meanings. It involves coding the data into categories and analyzing the relationships between these categories to understand communication (Shava et al., 2021).The recorded tapes of the interviews were transcribed verbatim followed by the establishment of patterns, themes or meanings eventually drawn and outlined in a tabular form. The texts were used to present the results using the contents that were derived from the data. The content analysis provided enough information to help answer the research questions. The researcher used the letter "P" to represent participant in the results. For the content analysis, the data was coded into keywords relevant to the research, after that the codes

were categorized based on commonalities. The themes that emerged were identified and analysis was carried out. As stated by Carlson (1998).

3.11 Methodological Rigor

Methodological rigor in research refers to the precision and thoroughness applied throughout a study. It ensures reliability, validity, and objectivity in the research process, encompassing careful planning, data collection, analysis, and reporting (Johnson et al., 2020).

In qualitative research, methodological rigor is mostly established through four criteria transferability, credibility, dependability, and reflexivity (Johnson et al., 2020).

Transferability refers to the extent to which the findings and interpretations derived from a study are applicable and relevant to other study settings beyond the study setting (Drisko, 2024). This study could be transferable to settings where midwives play a crucial role in neonatal care, especially in low-resource environments where the use of Chlorhexidine for umbilical cord care is being promoted as a public health intervention.

Equally important in establishing trustworthiness of a qualitative research is ensuring the credibility of the study. Credibility establishes whether the research findings represent plausible information drawn from the participants' original data and is a correct interpretation of the participants' original views (Adarkwah et al., 2024).

All procedures were explained and each step taken was clearly outlined. To ensure credibility in this work, data triangulation was taken into consideration where multiple theories, data sources and observations were used to gain complete understanding of the phenomenon. Member checking was also used to allow participants

to clarify what their intentions were, to correct errors and to provide additional information where necessary.

Also, ensuring dependability adds to the rigor of a qualitative research. Dependability refers to the degree of consistency, reliability, and stability of findings and interpretations throughout the research process (Ahmed, 2024).

The researcher ensured that all relevant information about the steps of the study was explained, and the findings were clearly explained for easy reading. Dependability was ensured by establishing a clear and well-documented research design, including detailed descriptions of the study's purpose, methods, and data collection procedures. This transparency allows for potential replication and verification of the research process by other researchers.

Finally, the trustworthiness of this study was ensured through reflexivity. Reflexivity involves critical reflection about the position you are taking as a researcher and how you have taken this stance into account in your research (Bieler et al., 2021). The study participants were allowed to openly express their perspectives on the subject matter, both explicitly and implicitly, as the researcher approached the problem with great care by analyzing her conceptual grasp of the topic through a clear lens. The researcher's own beliefs and ideals had no role in deciding how to gather data. The researcher continually examined her potential impact and biases on the work through self-reflection and self-awareness.

3.12 Ethical Consideration

Ethical approval was obtained from the Navrongo Research Centre and the Ghana Health Service (NHRCIRB527). A letter was written to the management of the Salaga

Government Hospital to seek permission to use their facility to recruit the study participants. Verbal consent was obtained from the study participants before each interview session started and was recorded. Only identification codes were used for data analysis throughout the study. Results were presented using pseudonyms to avoid any possible identity disclosure. Participation was voluntary and participants were not subjected to any physical harm.

CHAPTER FOUR

STUDY FINDINGS

4.1 Introduction

The analysis of the data from the participants is presented in this chapter. The findings presented are based on the themes and sub-themes that emerged from the interviews. The presentation of the findings is in line with the study objectives. This study was conducted among 23 midwives in the Salaga Government Hospital in the Savannah Region of northern Ghana. The study aimed to explore the perspectives of midwives regarding the implementation of the policy on the use of chlorhexidine in umbilical cord care, benefits and the challenges encountered by midwives in the use of chlorhexidine in umbilical cord care.

Table 1: Background Characteristics of Participants

Respondent	Position	Age	Level of Education	Experience	Unit
Participant1	Staff midwife	30	Degree	7	Labour/maternity
Participant 2	Staff midwife	42	Degree	6	CWC
Participant 3	Staff midwife	38	Degree	7	Labour/maternity
Participant 4	Staff midwife	36	Degree	8	Labour/maternity
Participant 5	Staff midwife	27	Diploma	4	CWC
Participant 6	Staff midwife	27	Diploma	3	CWC
Participant 7	Senior staff midwife	43	Degree	9	Labour/maternity
Participant 8	Senior staff midwife	35	Degree	10	CWC
Participant 9	Midwifery officer	33	Diploma	1	Labour/maternity
Participant 10	Midwifery	36	Diploma	1	CWC

	officer				
Participant 11	Midwifery officer	33	Diploma	5	CWC
Participant 12	Midwifery officer	35	Degree	6	Labour/maternity
Participant 13	Midwifery officer	25	Diploma	2	CWC
Participant 14	Midwifery officer	29	Diploma	3	Labour/maternity
Participant 15	Midwifery officer	30	Diploma	5	CWC
Participant 16	Midwifery officer	26	Diploma	4	CWC
Participant 17	Midwifery officer	26	Diploma	3	Labour/maternity
Participant 18	Midwifery officer	26	Diploma	2	Labour/maternity
Participant 19	Midwifery officer	38	Diploma	7	CWC
Participant 20	Midwifery officer	29	Diploma	3	Labour/maternity
Participant 21	Senior midwifery officer	35	Degree	11	Labour/maternity
Participant 22	Senior midwifery officer	34	Degree	11	Labour/maternity
Participant 23	Senior midwifery officer	34	MPhil	15	CWC

4.2 Main Themes and Sub-themes

This study was conducted to explore the perspectives of midwives regarding the implementation of the policy on the use of chlorhexidine in umbilical cord care. The analysis of the data revealed four major themes and eight sub-themes. These themes are summarized in Table 2. All names of participants attached to the verbatim quotes are fictitious.

Table 2: Summary of Themes and Sub-themes Derived from the Data

S/N	Themes	Sub-themes
1.	Practices of midwives regarding chlorhexidine use in Salaga Government Hospital.	a. Techniques of application b. Application of chlorhexidine at the home setting. c. Education on chlorhexidine before discharge.
2.	Perceived benefits of chlorhexidine	a. Reduced cases of neonatal sepsis b. Superior efficacy than methylated spirit.
3.	Challenges to the use of chlorhexidine	a. Delay in falling of the cord. b. Mothers' wrongful application of chlorhexidine.
4.	Measures to improve the use of chlorhexidine.	a. Need for continuous professional development of midwives on the chlorhexidine policy. b. Increased education for mothers on chlorhexidine use. c. Increased access to chlorhexidine.

4.3 Practices of Midwives Regarding Chlorhexidine Use in SGH

Midwives are at the fore and centre of a successful implementation of the policy on chlorhexidine use for umbilical cord care in Ghana. The use of correct and effective practice in applying chlorhexidine by midwives is pivotal to the success of the policy. Therefore, the first objective of this study was to explore the practices of midwives at the Salaga Government Hospital in their use of chlorhexidine for umbilical cord care.

Interactions with the midwives indicated that their practices with the use of chlorhexidine centered on three main areas namely: the technique of application, application of chlorhexidine at the home setting, and education on chlorhexidine given to the mothers before discharge. These three broad areas of practice, which are considered the sub-themes under this major theme are presented next.

4.3.1 Techniques of Application

When participants were asked to describe the techniques, they used to apply chlorhexidine to the umbilical cord, two things became apparent. First, almost all participants mentioned effective hand washing and the use of gloves as part of the application process, indicating the essence of proper hand hygiene in this procedure. However, when it came to the application itself, participants differed in their approaches. While some took a top-to-bottom approach in applying the chlorhexidine gel, others chose to start from the base towards the top of the cord.

P01, who used the top-to-bottom approach, described her technique as follows:

"So, I will wear my gloves and then I will create a small hole on top of the chlorhexidine, and I will hold the cord together with the cord clamp. I will pour the chlorhexidine gel on top of the cord and then use my hands to spread it to the other side of the base of the cord and allow it to dry" P01.

Similarly, P4 also described her application technique which was not very different from that of P1 but was more detailed:

"The gloves used by the midwife for delivery are often changed and the chlorhexidine is opened in the presence of the mother. Then we pour it (chlorhexidine) on the palm by holding the cord clamp itself. We then use our gloved hands to scoop it and then we apply it on the stamp. Then the rest is applied on the skin surrounding the stump and we apply the rest on the cord. We then leave it to dry before clothing the baby" P04.

Many other participants used the same technique in the application process. In contrast, other participants explained that they usually use a bottom-up approach when

applying the gel to the cord. For example, P3 described her application technique as follows:

> *"Normally, I tell them about the procedure and introduce the chlorhexidine to the mother because it is a new thing. After which you ask for the consent of the mother. Then I wash my hands and hold the cord with the clamp and then I put the chlorhexidine at the base of the cord and spread it upwards. I also apply it at the clamp because it could also be hiding microorganisms. Then, I expose the area to dry" P03.*

Similarly, another participant also explained briefly that she usually starts from the base and applies towards the tip of the cord. She also emphasized the need for proper hand washing and gloving before applying the gel. Her narration is captured below:

> *"Before we apply it, we wash our hands, wear gloves and we open the gel and use one of our fingers to smear the cord to the upper part of the clip" P04.*

4.4 Application of Chlorhexidine at the Home Setting

Another issue that became prominent about midwives' practices of chlorhexidine application was the application of the product to the umbilical cord beyond the labour ward. Usually, the chlorhexidine gel is applied by midwives in the labour ward shortly after the baby is born and the cord is cut. Thereafter, the mother is educated to continue the application at home. However, under certain circumstances, midwives often continue to apply chlorhexidine to the umbilical cord even after the baby and mother are discharged from the hospital. In most cases, this happens during follow-up home visits or when the mother attends a post-natal clinic.

The participants explained that the need to apply chlorhexidine in the client's home or at the child welfare clinic often arises when the midwives realize that the mother had failed to comply with the teaching on chlorhexidine use for umbilical cord care. P7 explained:

> *"Yes. I did mention home visits. During homes visits when you realize that the mother has applied a different thing, you clean it and apply chlorhexidine. At the homes, we request to see the chlorhexidine and when the mother brings it, looking at the quantity left, you will know whether she is using it or not. If the mother uses shea butter or Pepsodent, you will see particles on the cord area. So, if she is not using it, we will clean it and apply the chlorhexidine and intensify education on the use of it." P 07*

A Participant from the child welfare clinic also added that other times, it is because a woman delivered at home and came to the hospital for obstetric evaluation and management and chlorhexidine is applied as part of the routine interventions for the baby. Her explanation is captured below:

> *"Yes. It mostly happens during the postnatal. When they come and you realize that they did not deliver in the ward, that is where you introduce chlorhexidine to them. At the CWC, when you detect that they delivered at home, you ask them what they have been using on the cord, and you then introduce them to chlorhexidine and let them know that it is the recommended drug for the baby cord care". P06*

P8 from the labour ward concurred with her colleagues and explained that they usually carry the chlorhexidine gel with them during their routine follow-up

home visits and apply it to the umbilical cord in cases where the mothers were not using it. She stated briefly:

"Yes. During home visiting, we go with the chlorhexidine, and we use it. Also, at the child welfare clinic when we realize that they have delivered at home, we apply it". P08

Similar responses were provided by all the other participants regarding the use of chlorhexidine in the home setting.

4.4.1 Education on Chlorhexidine before Discharge

A very critical component of quality patient care in all spheres of clinical services is patient teaching. Effective patient teaching can be the difference between complete recovery and repeated hospitalizations. This fact was not missing from the midwives involved in this study as far as their practice of chlorhexidine use for umbilical cord care is concerned. Interactions with the midwives showed that, beyond applying chlorhexidine to the baby's umbilical cord, the midwives also took the pain to provide relevant health education to the new mothers and their families on the need to continue using chlorhexidine for cord care at home as well as other measures to prevent cord infections. The health education given to the mothers by the midwives covered several areas including a demonstration of the correct technique to apply chlorhexidine, the need to avoid bathing the baby during the first few days, and caution against applying certain unapproved substances to the cord.

A participant from the labour ward explained that health education is usually not limited to only the new mother, but also her husband and other family members present in the hospital at the time of the delivery. She described the process as follows:

"I demonstrate how the chlorhexidine is supposed to be applied to the husband and the mother. If they came with any relative of the husband, I call them and demonstrate it for them to see. I also educate them not to bath and rather top and tail the child till the cord falls off. I also tell them not to use any other concoction in addition to what I give them until the cord falls off". Midwife 01

In the words of a participant from the labour, the pre-discharge patient teaching usually covers everything from the correct technique to use in opening the chlorhexidine tube, proper hand washing, and correct application. This was how she put it herself:

"We tell them that before they open the chlorhexidine, they have to wash their hands. When their hands are washed, they should use the lid of the chlorhexidine to create a hole on the chlorhexidine to open. With their washed hands, they should apply it on the cord and let it dry before positioning the baby to lie down". P 05

Another aspect of the pre-discharge education for mothers had to do with alternative approaches to cleaning the baby instead of bathing them during the first few weeks while the umbilical cord was healing. To this end, a participant provided the following instructions:

"She should use a towel to top and tail the baby so that the cord does not get wet. When the cord gets wet, it can interfere with the activity of the cream. So, we ask them to top and tail the baby. Also, we tell them to make sure their hands are clean after topping and tailing of the baby before they apply the gel on the cord. We also tell them not to put the diaper on the cord". P01

Some participants also went further to teach the mothers about the signs of cord infection and encouraged them to report immediately to the hospital if any of those signs occurred. P10 from the child welfare clinic indicated that she often tells the mothers that:

"...if they discover discharge or foul smell from the cord, they should report to the nearest health facility". P10

A participant from the labour ward also explained that as part of her pre-discharge education, she often advises the mothers:

"If they think there is something wrong like infection or foul smell, they should report to the facility. When they see redness around the cord, they should report immediately". P11

4.5 Perceived Benefits of Chlorhexidine

There was consensus among the participants concerning the benefits of using chlorhexidine in umbilical cord care. The benefits of chlorhexidine as perceived by midwives fell into two broad categories as presented below:

4.5.1 Reduced Cases of Neonatal Sepsis

It was found that the number of cord sepsis cases reported in the community and the neonatal intensive care unit (NICU) had decreased dramatically when chlorhexidine was used in cord care. One participant explained that before the introduction of chlorhexidine use for umbilical cord care at the hospital, the incidence of neonatal sepsis was very high in the hospital, particularly in the number of cases recorded at the neonatal intensive care unit (NICU). However, following the introduction of chlorhexidine, the number of neonatal sepsis cases had drastically reduced. Her expression is quoted below:

> "*The effect is that, right now when you enter the NICU you wouldn't see any baby with cord sepsis. Those days we used to record neonatal sepsis daily about 3-4 cases, but since the onset of chlorhexidine use, hardly do we record case of neonatal sepsis. Even if we do, it's always a referral case but not from the baby we have delivered, so the impact is good …*" P 10

Another participant indicated that the positive effect of chlorhexidine on umbilical cord health extended beyond the hospital to the community. She explained that cord sepsis was a very common sight in the community before the introduction of chlorhexidine. Many women used to bring their newborns back to the hospital on account of cord sepsis. However, following the introduction of chlorhexidine, there has been a drastic reduction in the number of newborns developing cord sepsis, except for the few whose mothers fail to use chlorhexidine. This was what she had to say:

> *"It has helped in reducing cord infection. Previously, cord infection was always common among babies in the community. Clients bring their babies back with cord infection but since we started using chlorhexidine it has reduced except for those who go home and decide not to use it…" P11*

4.5.2 Superior Efficacy than Methylated Spirit

Many of the participants contended that chlorhexidine had superior efficacy compared to methylated spirit which was previously the antiseptic of choice for cord care in Ghana. For example, P12 asserted that the use of chlorhexidine has resulted in a lower incidence of cord sepsis compared to when the methylated spirit was being used. She said:

"*What I know about it is that previously we use spirit in dressing the cord but now its chlorhexidine that is being used for cord dressing and with chlorhexidine, complications like cord sepsis have reduced as compared to methylated spirit used previously" P12*

The same opinion was upheld by another participant in the following remark:

"*...yes, it's a good practice because previously, the NICU used to record a lot of cord sepsis cases but since methylated spirit was replaced with chlorhexidine, the number of cases of cord sepsis reduced drastically" P01*

4.6 Challenges to the Use of Chlorhexidine in Umbilical Cord Care

When asked if they encountered any challenges in implementing the policy on chlorhexidine use in cord care, participants were unanimous in their response that there were significant challenges to the use of chlorhexidine cord care. The challenges described by participants fell into one of two broad categories: delay in falling off of the cord and wrongful application of the product (chlorhexidine). These two broad categories became sub-themes under the major theme of challenges to the use of chlorhexidine.

4.6.1 Delay in Falling of the Cord

Participants explained that when you apply chlorhexidine to the cord, it generally takes longer for the cord to fall off. This delay interferes with certain cultural beliefs and practices of the people around the Salaga enclave. For example, the people perform the naming/outdooring ceremony of the baby on the seventh day after delivery. However, the ceremony cannot be performed until the cord has fallen off. Therefore, if

the cord does not fall off by the seventh day, the naming ceremony cannot be performed. This is explained further by P13, a thirty-five-year-old midwife:

"*Some mothers use cow dung, pepsodent, herbs and many other funny things with the aim that the cord will fall off early. Where some of us are working, by the seventh day of birth, most people would've named the child. Per their culture, you cannot name the child when the cord is still intact. So, they would do everything possible to allow the cord to fall off. P 13*

Participants also explained that it is considered a bad omen for the father or grandfather to see the baby before the cord has fallen off. Unfortunately, when chlorhexidine is applied to the cord, it can take up to two weeks before the cord falls off. Therefore, people usually resort to the use of other unorthodox substances on the cord to hasten its fall. This is what one midwife had to say about the issue:

> *"Okay, for the chlorhexidine those who use it correctly, don't come back with cord infection. But in our setting, they always want the cord to fall off early. You know the chlorhexidine can take up to two weeks before the cord falls off. Sometimes, if you are lucky it takes a week. But here, they are always in a hurry for the cord to fall off. …." P15*

Some also hold the belief that the father cannot eat solid food until the cord has fallen off. Consequently, many women in these communities prefer to apply other products such as toothpaste, various herbs, and cow dang to the cord to make sure it falls faster. Concerning this challenge, this is what P14 had to say:

"They usually say when you apply the chlorhexidine, the cord doesn't fall off early, some of them per their tradition, if the cord of a baby doesn't fall off the father cannot eat solid food. Also, per the tradition, they feel that if the cord doesn't fall off, they are not able to do the naming ceremony. So mostly, they put herbs on it so that the cord can fall faster…." P14

4.6.2 Mothers' Wrongful Application of Chlorhexidine

Another major challenge associated with the use of Chlorhexidine as revealed by the participants was inappropriate use of the product whereby mothers applied it in the baby's eyes instead of the umbilical cord. This application error arose because parents confused another product – tetracycline eye ointment with chlorhexidine. After all, the two products are commonly given together in the hospital after delivery. However, one is meant for the eyes and the other for the cord. Unfortunately, some mothers end up confusing the two and applying chlorhexidine to the eyes. This usually results in painful eye irritation often requiring brief hospitalization. In the following narrations, participants throw more light on this issue:

"We encountered a lot, some you give education and apply the gel in front of the mother or other relatives to see, so that they can apply it when they get home, they still go home instead of the cord, they apply it in the baby's eye. I have witnessed a lot of cases where they bring the baby back crying, and you ask them what they kept in the baby's eyes, and they tell you that it's chlorhexidine. P17

P18 from the child welfare clinic also provided a similar explanation and suggested that inadequate discharge education by some midwives could be contributing to this challenge.

"Some of the challenges you know this hospital we give chlorhexidine along with tetracycline eye ointment. Some midwives will just give both without telling the women the difference. So, there was an instance when a mother applied chlorhexidine in the baby's eye and the eye got infected, we had to tell her the difference. There is a picture on the chlorhexidine, and we used it to educate her, so for now that is the main challenge" P 18

This finding is further corroborated by the following narration from a participant who suggested that the mistake usually emanates from the mother's/family's decision to keep the tetracycline eye ointment which is supposed to be used only once and discarded. She explained that the family usually holds on to the tetracycline. They feel it should not go to waste because they paid for it, often ending up confusing it with the chlorhexidine gel.

> *"…when you educate them and they go home, some of them mistakenly apply it on the baby's eye. So, when they come back to the hospital, we interview them and just a few will tell the truth that they thought it was meant for the eyes. Because normally we give the two together; tetracycline ointment and chlorhexidine gel even though the tetracycline ointment has to be used once and then stopped, but because they have bought it or it's not free, they won't throw it away. They continue using it and they tend to make mistakes" P19*

4.7 Measures to Improve the Use of Chlorhexidine in Umbilical Cord Care

Given the numerous challenges confronting the use of chlorhexidine in cord care as identified by the participants, the researcher sought to find out from them the

measures that could be put in place to promote the use of chlorhexidine in cord care. Participants provided various recommendations that they believed could assist in improving chlorhexidine use for cord care. Their responses were grouped into three sub-themes under this major theme as listed below:

1. Need for continuous in-service training for midwives on the chlorhexidine policy.
2. Increased education for mothers on chlorhexidine use.
3. Increased access to chlorhexidine.

4.7.1 Need for Continuous Professional Development of Midwives on the Chlorhexidine Policy

Many of the participants recommended that, for the policy to be more successful, there should be continuous professional development for midwives on the policy. It was revealed that apart from the initial orientation that was provided to some selected midwives when the policy was first introduced in 2018, no subsequent training workshops have been organized for midwives on the policy. This situation, the participants believe, does not augur well for the successful implementation of the policy. Some of the participants noted that, although in-service training was essential for all midwives, it was particularly important for newly qualified midwives. One participant made this recommendation as follows:

> *"I think what the policymakers can do is that we need continuous in-service training because every year we get new staff even though we take them through, but it won't be as effective as an organized in-service training, where they see demonstrations and a lot of things about the product. So, if there can be regular in-service training, not for the new ones only but for the old staff as well, because sometimes the older staff too may tend to forget and make mistakes" P19*

A participant from the labour ward also had something similar to say:

"I also think that there should be in-service training of midwives on the proper use of chlorhexidine" P20

On her part, P21 from the CWC also recommended that continuous professional development should also target midwives working in remote communities where the use of unorthodox practices in umbilical cord care is more common. She stated as follows:

"...there should be more education and training of more midwives especially those at the remote places who refer cases to the hospital" P21

4.7.2 Increased Education for Mothers on Chlorhexidine Use

Another recommendation that featured prominently among all the participants was the need to intensify public education and sensitization on chlorhexidine use. They suggested that such education should commence during the antenatal period and be reinforced throughout pregnancy and delivery. When elaborating more on education for mothers, P22 suggested that chlorhexidine application should be added to the routine health education topics in the ante-natal care booklet to ensure that midwives include it in their education during pregnancy. She also recommended the use of demonstration and return demonstration when teaching pregnant women about chlorhexidine application to promote understanding. Her views are captured below:

"I think that when the woman is pregnant and she starts with antenatal care, the education on chlorhexidine use should start from the ANC level and even in their ANC booklet they have a lot of educational topics that they educate them on" P22.

In agreement with P22, another participant stated that education on chlorhexidine should ideally commence during the antenatal period and should be incorporated into the overall birth-preparedness strategy for pregnant women. She expressed her views as follows:

"...we need to intensify education on the use of chlorhexidine, and it should start from the ANC. With the ANC, there is a stage we call birth preparedness so we can leverage this stage to talk about chlorhexidine use for them to make informed decisions before child delivery. When we start from here, by the time they come to labour, they would have been abreast with its use". P19

Some participants also suggested that, beyond the education provided to pregnant women during antenatal care, it will also be helpful to organize public fora and symposia on radio, television, and public durbars to sensitize the general public on the benefits of using chlorhexidine and the harmful effects of using unapproved products to dress the cord. One such suggestion came from P11 who stated as follows:

"*We need to give more education on chlorhexidine use. Some clients lack the knowledge because when you educate them, they go home and do otherwise so there should be enough education which can be in the form of public durbar, radio stations and also individuals in groups" P11*

Others also suggested grouping mothers and identifying one who knows the use of the chlorhexidine to lead them in the education process before they are discharged.

Also, when they come to maternity and they are being discharged, where I did my clinical, sometimes when they are been discharged, they will group all the

mothers and then select one. That person will sit in the middle of them and educate the rest of the mothers on how to care for the cord. I think proper demonstration on how to use chlorhexidine and education is very important, this will all help". P22

4.7.3 Increased Access to Chlorhexidine Use

Intermittent shortages of chlorhexidine gel in the hospital and perceived high cost of the product in chemical and pharmacy shops were identified by some participants as possible barriers to the effective implementation of the policy on chlorhexidine use for cord care. Therefore, many of the participants suggested that the government should ensure a consistent and adequate supply of the product in all hospitals and also subsidize the price to make it affordable to all Ghanaians. One participant lamented that when there is a shortage of chlorhexidine at the facility, they are compelled to supply methylated spirit to the mothers. This situation creates confusion and mistrust among the mothers regarding which product to use for umbilical cord care. She expressed these concerns as follows:

"There should be a regular supply of the drug. When we request for it, we should be able to get it in time. Also, the cost should be reduced so that everyone can buy. If we have it in abundance and we don't have to prescribe it for our clients to buy, they will use it. The chlorhexidine should always be in the system so that we don't run short of it and ask our clients to go back to methylated spirit. That way, we would be confusing them which can lead to mistrust". P05

Some participants suggested that the product should be supplied to all new mothers free of charge. This could be done by integrating chlorhexidine into the essential medicines list of the national health insurance scheme. The participants contend that financial constraints should not constitute a barrier to the use of chlorhexidine for umbilical cord care. One participant made the following remark regarding the issue:

"It should be supplied in larger quantities to the health facilities. It should be readily available in the system and given freely to the women. This way, they would use it and become used to it. If they are to buy and they don't get it, they would buy other things. If chlorhexidine can be integrated into the national health insurance system to be given for free, that would be fine". P23

In agreement with her colleagues, P11 at the CWC also commented as follows:

"My recommendation is that, regardless of one's financial status, everyone should be able to get chlorhexidine for their babies. So, GHS should liaise with the ministry of health to ensure that it is always supplied in larger quantities for all clients to be able to get some". P11

CHAPTER FIVE

DISCUSSION

5.1 Introduction

The study presents the discussions based on the findings of the study. The discussions centred on sub-themes that emerged from the data that were gathered concerning the study objectives. Various sub-themes that were very relevant to the study were used in the discussions. The discussions with some of the findings either agree or disagree with some reviewed articles that were presented in this study. Key deductions were derived from the discussions and infused with the discussion.

5.2 Practices of Midwives Regarding Chlorhexidine Use in SGH

The study looked at the procedures around the use of chlorhexidine by midwives in the study setting for umbilical cord care. When it comes to cord care, midwives in a clinical setting utilize chlorhexidine to lower neonatal infections. Examining the practices of midwives in terms of how they use chlorhexidine in umbilical cord care would enable possible identification of gaps in the area of cord care to facilitate interventions for midwives (Mukunya, 2017). The use of correct and effective practice in applying chlorhexidine by midwives is pivotal to the success of the policy. Interactions with the midwives indicated that their practices with the use of chlorhexidine centred on three main areas namely: the technique of application, application outside the ward setting, and education on chlorhexidine given to the mothers before discharge (Quaye, 2019).

From the results, the use of chlorhexidine was guided by the availability of the policy in the hospital. This underscores the need to provide policy documents that guide interventions that are implemented in our health facilities. This also demonstrates that the

techniques employed by the midwives in the study setting are in line with the standard established by the Ghana Health Service and the Ministry of Health Ghana (GHS/MOH, 2018).

This finding from the study agrees with Zaman et al. (2021) where it was found that participants used chlorhexidine in health facilities and indicated that it was effective against infection in cord care. In this study, the proper techniques in the application of chlorhexidine have been adequately described. This indicates that the midwives are knowledgeable in the use of the chlorhexidine.

When participants were asked to describe the techniques, they used to apply chlorhexidine to the umbilical cord, two things became apparent. First, almost all participants mentioned effective hand washing and the use of gloves as part of the application process, indicating the essence of proper hand hygiene in this procedure (Israel et al., 2024). The importance of the umbilical cord in newborn care has prompted several sets of guidelines for its treatment from national and international groups including the policy implementation of the use of chlorhexidine. Consistent with previous reports from this region and others, including Uganda, Tanzania, Ghana, Nigeria, Benin, and Nepal, the majority of the midwives in the research utilised chlorhexidine solution to clean the umbilical cord in health facilities (Hill et al., 2020).

However, in other settings, Gebremedhin, Berhe and Gebrekirstos (2016) found that mothers continue to use other substances to apply on the cord of newborn babies in Ethiopia. It is important to state that, a policy in terms of the use of chlorhexidine may not be well appreciated with mothers because of cultural and social orientations (Foster et al., 2024).

Proper emphasis on its use especially during home visits by midwives would help reduce herbs and other substances used in cord care. Whilst mustard oil and chewed rice have different uses in different parts of the world, using them all at once is worrying in cord care by mothers with little information on chlorhexidine (Yasmeen, 2023). While there has not been a thorough investigation of these chemicals' negative effects, the risks of infections they can cause to newborns have been well recorded. Empirical data suggests that newborns are put at risk for tetanus when unsanitary things like soil, saliva, and cow dung are applied to the umbilical cord stump (Mallick, Yourkavitch & Allen, 2019; Masaba & Mmusi-Phetoe, 2020).

A very critical component of quality patient care in all spheres of clinical services is patient teaching. Effective patient teaching can be the difference between complete recovery and repeated hospitalizations (Moraa, Mweu, & Njoroge, 2019a). This fact was not missing on the midwives involved in this study as far as their practice of chlorhexidine use for umbilical cord care is concerned. The health of mothers and infants is inextricably linked to traditional community and household care practices (Masaba & Mmusi-Phetoe, 2020). Many factors contribute to the delay in seeking medical attention for a newborn cord infection, including a lack of knowledge about the seriousness of certain diseases, cultural practices that keep the mother and baby separate, a fatalistic mindset, superstition about bad spirits, and financial constraints. (McCord, Fieldhouse & El-Naggar, 2019)

Additionally, the study found that chlorhexidine was effective in terms of cord care practices as participants confirmed that it has reduced the rate of cord infection cases reported to the facility by postpartum mothers.

The finding from the study concurs with the study carried out by Ambale, Ngatia and Nthusi (2019) where it was found that chlorhexidine was effective in terms of cord care in Kangundo Level 4 hospital. The findings confirmed what the participants assessed about the use of chlorhexidine in cord care. Therefore, the policy implementation of chlorhexidine use in cord care could improve midwifery practices in the area of expanding upon the established remedies through current mechanisms to improve neonatal health. The main obstacle is getting the word out about good practices for newborn health, or "what works," to the people who need it most namely, mothers, other primary carers, and healthcare providers and incorporating neonatal health care into preexisting programmes for mother and baby care.

Chlorhexidine is recommended for use in poor country cord care due to the inclusion of freshly published research that strengthens the level of evidence (Pakpahan, Anggraini & Yunola, 2022). Reducing neonatal and infant mortality to an acceptable level is not feasible unless midwives have sufficient information on newborn risk indicators and are ready to adhere to policy changes and implementations (Osuchukwu et al., 2021).

This is because addressing these risks is the first step in providing all-encompassing newborn healthcare. The World Health Organisation (2012) report revealed that reducing neonatal mortality in impoverished nations may not be possible without addressing concerns about healthcare workers' awareness of infant health care. It is well recognised that a child's well-being and future success are entirely reliant on the care and attention given to them before, during and immediately following birth. A

midwife's primary responsibility has always been caring for the infant, regardless of her mother's socioeconomic status, level of education, or other factors (Ara et al., 2021)

5.3 Perceived Benefits of Chlorhexidine

There was consensus among the participants concerning the benefits of using chlorhexidine in umbilical cord care. It was revealed that the use chlorhexidine in cord care had significantly reduced the number of cord sepsis cases recorded in the neonatal intensive care unit (NICU) as well as the community (Mohammad et al., 2021).

Based on the findings, participants identified several benefits associated with the use of chlorhexidine in cord care.

This benefit of the use of chlorhexidine in umbilical cord care has been established in previous studies. For instance, Tamma, Aucott and Milstone (2010) found that among participants sampled in a national survey, chlorhexidine was identified as effective in umbilical cord care thus, reducing infection. Again, Sharma and Kulkarni (2020) found that, chlorhexidine was effective in umbilical cord care among babies whom it was applied. The similarity of the participants in terms of the findings could be linked to the potency nature of chlorhexidine in umbilical cord care especially in health facilities leading to the policy implementation.

Participants further revealed that chlorhexidine had superior efficacy compared to methylated spirit which was previously the antiseptic of choice for cord care in Ghana.

This study's result is in line with that of Agu et al. (2022), who found that chlorhexidine effectively reduced the incidence of cord infections in the study's sample population. Care provided to newborns by midwives determines the newborn's health and survival rate on a global scale. Many communities and settings fail to provide the

continuity of care necessary to reduce newborn mortality because maternal and child health interventions pay insufficient attention to neonatal care (Coffey, Hodgins & Bishop, 2018). Most maternal and neonatal fatalities happen in the first week of life, when there is the most lack of care, typically occurring at home and without any involvement with the official health system (Chizoma et al., 2020).

Additionally, the study found that one of the benefits of using chlorhexidine in umbilical cord care was a low rate of babies admitted to NICU with various infections. This finding from the study agrees with McCord, Fieldhouse and El-Naggar (2019) where it was found that current and modern practices on the cord of newborns led to a reduction of sepsis. However, Mohammad et al. (2021) found that mothers' use of substances on the newborn led to infection. The use of chlorhexidine in the management of umbilical cords leads to a lower risk of cord infection.

Infection especially among newborns delivered at home often comes from traditional methods of caring for umbilical cords which involve using items like rags, lanterns shoots, powder, ash or charcoal, and red sand. The use of contaminated cow dung and other improper methods for umbilical cord care increases the risk of infection, especially newborn tetanus, which is detrimental (Braun & Clarke, 2019). Discouragement of these dangerous compounds and teaching women the proper material for umbilical cord cleansing should be prioritised in health education programmes (Herrick et al., 2017).

The World Health Organisation released a new guideline for the treatment of umbilical cords. Following this new order, the Ghana Health Service and the Ministry of Health performed a comprehensive operational study on the usage of the 7.1%

chlorhexidine digluconate gel for cord care. Chlorhexidine digluconate 7.1% gel, a recently authorised product, has largely supplanted methylated spirit, an established method of umbilical cord care (WHO, 2014).

To fully harvest the benefits associated with the use of chlorhexidine in cord care, midwives need to educate mothers comprehensively about the policy. This is because it was found that, mothers did not have knowledge about it and could change its use in the house for other non-medically approved products. This showed that mothers who visited the postnatal clinic had a limited understanding of the role of chlorhexidine in this procedure. This could be because many mothers in the research, including mothers-in-laws and other members of the community, provided incorrect information on cord care. It is important to note that most people learned about chlorhexidine gel via a healthcare provider, highlighting the essential role that healthcare providers play in disseminating evidence-based information, especially in the area of using proper care techniques for cord care (Draiko et al., 2021)

The assertion is supported by Semrau et al. (2016) where it was found that participants may reduce their usage of chlorhexidine gel as much as they should have inadequate awareness of basic cord care about its use. Joint analysis of studies found that compared to dry cord care, several administrations of chlorhexidine significantly reduced the incidence of omphalitis proving its benefits in its use (Waiswa et al., 2008). When compared to dry cord care, the risk of omphalitis is reduced when chlorhexidine is used (Githinji, 2018).

5.4 Challenges to the Use of Chlorhexidine in Umbilical Cord Care

The study examines the challenges that confronted midwives with chlorhexidine use in umbilical cord care in the hospital. It was found that several challenges confronted midwives' use of chlorhexidine use in the umbilical cord in the study setting. Participants explained that when you apply chlorhexidine to the cord, it generally takes longer for the cord to fall off. This delay interferes with certain cultural beliefs and practices of the people around the Salaga enclave. For example, the people perform the naming/outdooring ceremony of the baby on the seventh day after delivery. However, the ceremony cannot be performed until the cord has fallen off. Therefore, if the cord does not fall off by the seventh day, the naming ceremony cannot be performed. This finding from the study disagrees with Okpaleke et al. (2019) where it was revealed that in Nigeria, Ibadan among mothers with nenates were not using chlorhexidine because it was not available for use at the time.

Additionally, the study also found that midwives' use of two substances sometimes confused mothers leading to poor implementation. This finding from the study disagrees with the study carried out by Callaghan-Koru et al. (2019) where in Bangladesh participants were informed of the use of chlorhexidine in cord care.

There appear to be differences in terms of the findings of the current study and that of the Callaghan-Koru et al. study. This could be due to differences in terms of the geographic location of the places that were used for the study coupled with the participants probably sampled for the study. However, the finding appeared to be similar to Ayete-Nyampong and Udofia (2020) where in La Dade Kotopon Municipality, Ghana mothers applied ointment on the cord of newborns. The challenges midwives faced in

terms of cord care concerning policy implementation would help mothers reduce stressful hospital visits. This is because efforts to improve infant health provide significant socioeconomic benefits for mothers. These benefits include reduced costs for the mother's health care, the ability to have the family size she wants and more time to work.

Similarly, the study found that another major challenge associated with the use of chlorhexidine as revealed by the participants was inappropriate use of the product whereby mothers applied it in the baby's eyes instead of the umbilical cord.

This application error arose because parents confused another product – tetracycline eye ointment with chlorhexidine. After all, the two products are commonly given together in the hospital after delivery. However, one is meant for the eyes and the other for the cord. Unfortunately, some mothers end up confusing the two and applying chlorhexidine to the eyes. This finding from the study disagrees with Aitafo, West & Okari (2021) where in Port Harcourt, Nigeria participants did not apply chlorhexidine to the eye.

5.5 Measures to improve the use of Chlorhexidine in Umbilical Cord Care

Given the numerous challenges confronting the use of chlorhexidine in cord care as identified by the participants, the researcher sought to find out from them the measures that could be put in place to promote the use of chlorhexidine in cord care. Participants provided various recommendations that they believed could assist in improving chlorhexidine use for cord care. The capacity of mothers to identify potential danger indicators in their newborns is crucial in the fight against neonatal mortality (Quaye, 2019).

This is especially true when it comes to meeting the basic needs of healthy newborns, going above and beyond for babies with low birth weights, and ensuring that unwell babies have access to high-quality emergency treatment (Herrick et al., 2017).

Many of the participants recommended that, for the policy to be more successful, there should be continuous professional development for midwives on the policy.

It was revealed that apart from the initial orientation that was provided to some selected midwives when the policy was first introduced in 2018, no subsequent training workshops have been organized for midwives on the policy. This situation, the participants believe, does not augur well for the successful implementation of the policy.

Therefore, an adequate understanding of newborn danger indications among mothers is essential for reducing baby and neonatal mortality to a manageable level. This is because addressing these risks is the first step in providing all-encompassing newborn healthcare (Astatkie et al., 2022).

Additionally, it was found that all the participants were of the view that there is a need to intensify public education and sensitization on chlorhexidine use. They suggested that such education should commence during the antenatal period and be reinforced throughout pregnancy and delivery. These participants pointed out that the only way to overcome this challenge was to make points to make education. Therefore, evidence suggests that chlorhexidine helps prevent neonatal cord infection/sepsis and lowers mortality when used for newborn umbilical cord care in underdeveloped nations, with a level of evidence ranging from low to moderate (Yasmeen, 2023). It is reasonable to suggest that chlorhexidine cord treatment be a mandatory component of critical infant care.

CHAPTER SIX

SUMMARY, CONCLUSION AND RECOMMENDATIONS

6.1 Introduction

This chapter contains the summary, conclusion and recommendations of the study.

6.2 Summary of the Study

Chlorhexidine digluconate has been included in the published Ghana essential medicines list. However, since the policy implementation began in 2018, there appears to be no ongoing efforts to evaluate the extent to which the policy has been successfully implemented and unearth potential challenges therein. Beyond Ghana, few studies in the rest of Africa have examined the use of chlorhexidine in the umbilical cord. Meanwhile, evidence for policy implementation is necessary for stakeholders to identify any gaps in implementation so that the efforts of stakeholders can be better coordinated to align the policy for chlorhexidine implementation in Ghana.

The study was conducted to explore the perspectives of midwives regarding the implementation of the policy on the use of chlorhexidine in umbilical cord care. The study was guided by the following objectives:

1. To explore the practice of chlorhexidine, use in umbilical cord care by midwives
2. To explore the benefits of using chlorhexidine in umbilical cord care by midwives
3. To determine the challenges that confronted midwives with the use of chlorhexidine in umbilical cord care
4. Measures to improve the use of chlorhexidine in umbilical cord care

The highlights of the findings of the study concerning each objective are presented below.

6.2.1 Demographic data of the participants

The study collected data from 23 participants. The participants had been practising for five years on average. More than half of the participants (n = 13) had a diploma in midwifery and only one participant had a master's degree

6.2.2 Practices of Midwives Regarding Chlorhexidine Use in Salaga Government Hospital

1. Midwives are at the fore and centre of a successful implementation of the policy on chlorhexidine use for umbilical cord care in Ghana. The use of correct and effective practice in applying chlorhexidine by midwives is pivotal to the success of the policy. Therefore, the first objective of this study was to explore the practices of midwives at the Salaga Government Hospital in their use of chlorhexidine for umbilical cord care.
2. When participants were asked to describe the techniques they used to apply chlorhexidine to the umbilical cord, two things became apparent. First, almost all participants mentioned effective hand washing and the use of gloves as part of the application process, indicating the essence of proper hand hygiene in this procedure. However, when it came to the application itself, participants differed in their approaches. While some took a top-to-bottom approach in applying the chlorhexidine gel, others chose to start from the base towards the top of the cord.

6.2.3 Perceived Benefits of Chlorhexidine

1. It was revealed that the use of chlorhexidine in cord care had significantly reduced the number of cord sepsis cases recorded in the neonatal intensive care unit (NICU) as well as the community. One participant explained that before the introduction of chlorhexidine use for umbilical cord care at the hospital, the incidence of neonatal sepsis was very high in the hospital, particularly the number of cases recorded at the neonatal intensive care unit (NICU).
2. Another participant indicated that the positive effect of chlorhexidine on umbilical cord care extended beyond the hospital to the community. She explained that cord sepsis was a very common sight in the community before the introduction of chlorhexidine. Many women used to bring their newborns back to the hospital on account of cord sepsis. However, following the introduction of chlorhexidine, there has been a drastic reduction in the number of newborns developing cord sepsis, except for the few whose mothers fail to use chlorhexidine

6.2.4 Challenges to the Use of Chlorhexidine in Umbilical Cord Care

1. Participants explained that when you apply chlorhexidine to the cord, it generally takes longer for the cord to fall off. This delay interferes with certain cultural beliefs and practices of the people around the Salaga enclave. For example, the people perform the naming/outdooring ceremony of the baby on the seventh day after delivery. However, the ceremony cannot be performed until the cord has fallen off. Therefore, if the cord does not fall off by the seventh day, the naming ceremony cannot be performed.

2. Participants also explained that it is considered a bad omen for the father or grandfather to see the baby before the cord has fallen off. Unfortunately, when chlorhexidine is applied to the cord, it can take up to two weeks before the cord falls off. Therefore, people usually resort to the use of other unorthodox substances on the cord to hasten its fall

6.2.5 Measures to improve the use of Chlorhexidine in Umbilical Cord Care

1. Many of the participants recommended that, for the policy to be more successful, there should be continuous professional development for midwives on the policy. It was revealed that apart from the initial orientation that was provided to some selected midwives when the policy was first introduced in 2018, no subsequent training workshops have been organized for midwives on the policy. This situation, the participants believe, does not augur well for the successful implementation of the policy. Some of the participants noted that, although in-service training was essential for all midwives, it was particularly important for newly qualified midwives.
2. Another recommendation that featured prominently among all the participants was the need to intensify public education and sensitization on chlorhexidine use. They suggested that such education should commence during the antenatal period and be reinforced throughout pregnancy and delivery.

6.3 Conclusion

It was revealed that the use of chlorhexidine in cord care had significantly reduced the number of cord sepsis cases recorded in the neonatal intensive care unit (NICU) as well as the community. Intermittent shortages of chlorhexidine gel in the hospital and perceived high cost of the product in chemical and pharmacy shops were identified by some participants as possible barriers to the effective implementation of the policy on chlorhexidine use for cord care. Therefore, many of the participants suggested that the government should ensure a consistent and adequate supply of the product in all hospitals and also subsidize the price to make it affordable to all Ghanaians. Some participants suggested that the product should be supplied to all new mothers free of charge. This could be done by integrating chlorhexidine into the essential medicines list of the national health insurance scheme.

6.4 Recommendations

1. Midwives should establish good rapport with patients to promote trust between them and the patients to reduce the chances of patients going home to apply other substances apart from chlorhexidine.
2. Midwives should constantly remind management about the limited availability of chlorhexidine in the hospital for supply.
3. A further study could be done using a quantitative approach to gather data from participants in terms of how to address the challenges confronting midwives' use of chlorhexidine in the hospital.

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APPENDICES

Appendix A: Ethical Clearance

OUR CORE VALUES
1. People-Centered
2. Professionalism
3. Team work
4. Innovation
5. Discipline
6. Integrity

My Ref: Umbilical cord care/06/2023
Your Ref:

GHANA HEALTH SERVICE
Your Health · Our Concern

Navrongo Health Research Centre
Institutional Review Board
Ghana Health Services
Post Office Box 114
Navrongo, UER

Mob: +233-591152102
E-mail: irb@navrongo-hrc.org
2nd June 2023

Nursing and Midwifery Training College,
P.O Box SL 98,
Kpembe -Savannah Region.

ETHICS APPROVAL ID: NHRCIRB527

Dear Miss Bagoniah,

Approval of Protocol titled "Implementation of the Policy on the Use of Chlorhexidine in Umbilical Cord Care in Ghana: Perspectives of Midwives"

I write to inform you that the Navrongo Health Research Centre Institutional Review Board (NHRCIRB) has reviewed your protocol and is happy to grant you approval. The following documents were reviewed and approved;

- Study Protocol version 2.0 dated 6/03/23
- Participant Information Sheet and Informed Consent Form version 2.0 dated 6/03/23
- Focused Group Discussion Guide version 2.0 dated 6/03/23
- CV of Investigators (Miss Bagoniah Ayeritigida Theresa, Dr. Charles Ampong Adjei)

Please, note that any amendment to these approved documents must receive prior NHRCIRB approval before implementation. This approval expires on **1st June 2024.**

The Board wishes you all the best in your study.

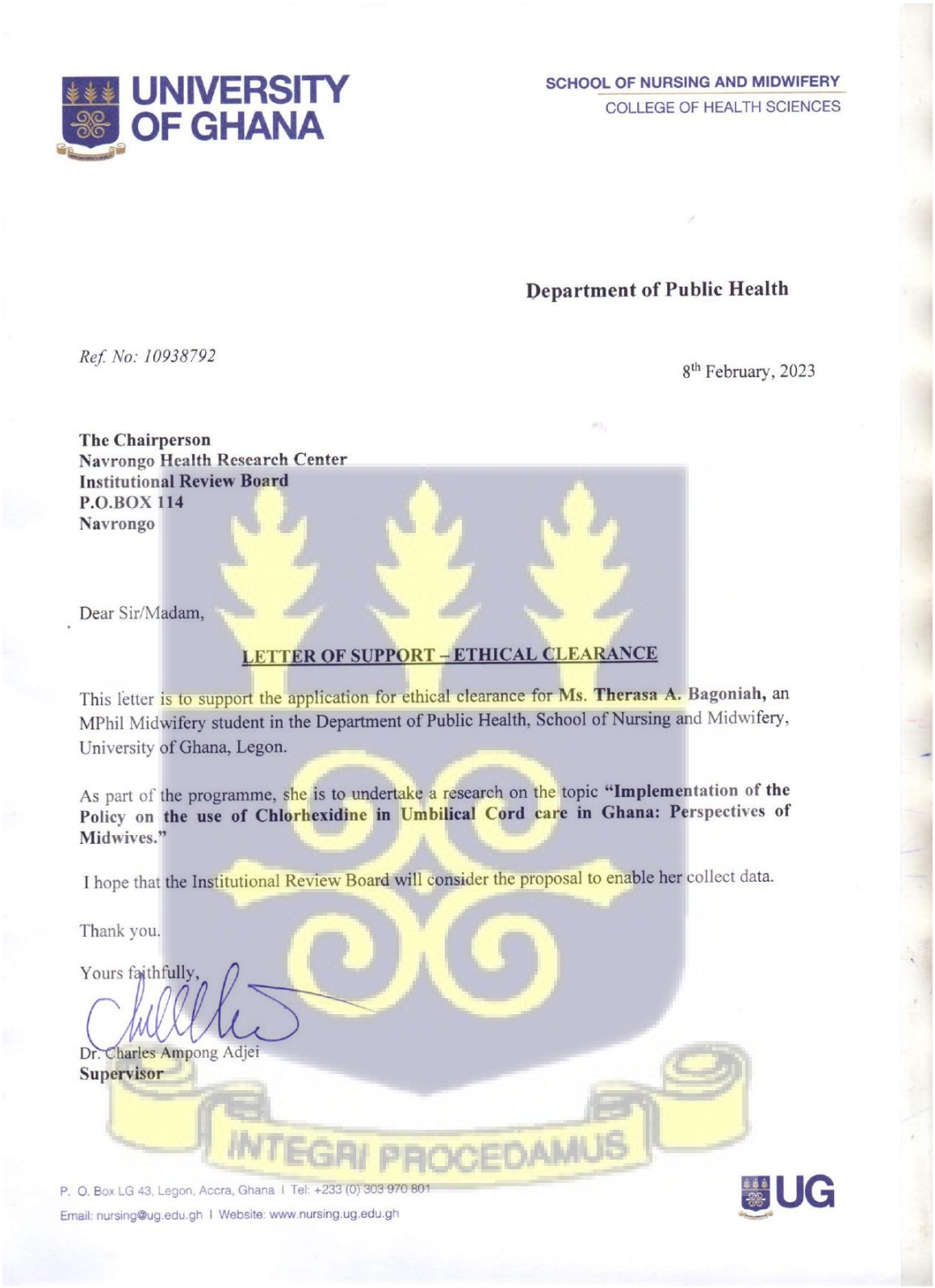
Sincerely,

Dr Nana Akosua Ansah

(Vice-Chair, NHRCIRB)

Cc: The Director, NHRC - Navrongo

Appendix B: Introduction Letter from Supervisor



UNIVERSITY OF GHANA

SCHOOL OF NURSING AND MIDWIFERY
COLLEGE OF HEALTH SCIENCES

Department of Public Health

Ref. No: 10938792

8th February, 2023

The Chairperson
Navrongo Health Research Center
Institutional Review Board
P.O.BOX 114
Navrongo

Dear Sir/Madam,

LETTER OF SUPPORT – ETHICAL CLEARANCE

This letter is to support the application for ethical clearance for **Ms. Therasa A. Bagoniah,** an MPhil Midwifery student in the Department of Public Health, School of Nursing and Midwifery, University of Ghana, Legon.

As part of the programme, she is to undertake a research on the topic **"Implementation of the Policy on the use of Chlorhexidine in Umbilical Cord care in Ghana: Perspectives of Midwives."**

I hope that the Institutional Review Board will consider the proposal to enable her collect data.

Thank you.

Yours faithfully,

Dr. Charles Ampong Adjei
Supervisor

INTEGRI PROCEDAMUS

P. O. Box LG 43, Legon, Accra, Ghana I Tel: +233 (0) 303 970 801
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UG

Appendix C: Introductory Letter from Administrator

UNIVERSITY OF GHANA

SCHOOL OF NURSING AND MIDWIFERY
COLLEGE OF HEALTH SCIENCES

Ref. No: 10929692

8th February, 2023

The Chairperson
Navrongo Health Research Center
Institutional Review Board
P.O.BOX 114
Navrongo

Dear Sir/Madam,

LETTER OF INTRODUCTION – ETHICAL CLEARANCE

I write to introduce to you **Ms. Therasa A. Bagoniah**, an MPhil. Midwifery student at the School of Nursing and Midwifery, University of Ghana, Legon.

The Scientific Review Committee of the School has approved the thesis topic: **"Implementation of the Policy on the use of Chlorhexidine in Umbilical Cord care in Ghana: Perspectives of Midwives."**

As part of the school's requirement, the student is required to obtain ethical clearance before embarking on data collection.

I hope that the Institutional Review Board will consider the proposal and grant her ethical clearance to enable her to undertake the study.

Yours faithfully,

Charles A. Klutse
School Administrator

INTEGRI PROCEDAMUS

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UG

Appendix D: Consent Form

CONSENT TO PARTICIPATE IN A RESEARCH STUDY

Background: I am a student at the School of Nursing and Midwifery, University of Ghana, offering a Master of Philosophy in Midwifery. I am conducting a research study titled "Implementation of the policy on the use of chlorhexidine in umbilical cord care in Ghana: perspectives of midwives" A qualitative study in Salaga government hospital".

The purpose of the study is to explore the perspectives of midwives regarding the implementation of the policy on the use of chlorhexidine in umbilical cord care.

This study is strictly for academic purposes.

Informed Consent

Before taking consent: Do you have any questions on this study? Yes [] No [ ]

If there is a Question: ……

Participant's Consent

I…….. having fully understood the study after a thorough explanation, hereby consent to be a participant.

Signature/thump print of participant: ……

Date: ……..

Interviewer's statement

I, ……have explained this consent form to the participant in the language he/she understands including the purpose, potential risk and benefits, right to refuse and the confidentiality of this study and he/she has freely agreed to be a participant of this study. Signature of interviewer: ……

Date: ……..……

Appendix E: Interview Guide

PROPOSED FOCUS GROUP DISCUSION GUIDE

MPHIL THESIS RESEARCH:

TOPIC: IMPLEMENTATION OF THE POLICY ON THE USE OF CHLORHEXIDINE IN UMBILICAL CORD CARE IN GHANA: PERSPECTIVES OF MIDWIVES

The purpose of this interview is to explore the perspectives of midwives regarding the implementation of the policy on the use of chlorhexidine in umbilical cord care. The interview is only to know about your perception, the benefits and the challenges of the use of chlorhexidine in umbilical cord care.

I therefore humble request you to share your experiences and ideas.

Code Number…….. Date of Interview……

Interview Number……..

SECTION A

Demographic information section

1. Age in years ……..
2. Academic qualification
   ……
3. Current rank ……..
4. Years of midwifery practice …….
5. Current ward/unit …….
6. Marital status……..
7. No. of children…….

SECTION B

Discussion questions

1. Tell me what you know about chlorhexidine use.
2. What can you tell me about the policy on the use of chlorhexidine for umbilical cord care in Ghana?
3. What is your opinion about the implementation of chlorhexidine use in this hospital?
4. What is the state of chlorhexidine use currently?
5. What has been the impact of chlorhexidine use for umbilical cord care?
6. What challenges have you encountered in your efforts to integrate chlorhexidine in umbilical cord care?
7. How can the policy on chlorhexidine use be made more successful?
8. Please do you have any more experiences you wish to share on this issue?

Thank you for your time and contributions.