UNIVERSITY OF CAPE COAST

FEVER MANAGEMENT IN CHILDREN 0 – 5 YEARS: A SURVEY OF THE KNOWLEDGE, BELIEFS AND PRACTICES AMONG NURSES IN THE CAPE COAST METROPOLIS OF GHANA

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BY

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Thesis submitted to the School of Nursing and Midwifery of the College of Health and Allied Sciences, University of Cape Coast, in partial fulfilment of the requirements for the award of Master of Nursing degree

MAY 2020

DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my own original research and that no part of it has been presented for another degree in this University or elsewhere.

Candidate's Signature:..... Date:.....

Name: Lawrencia Antoinette Aidoo

Supervisors' Declaration

We hereby declare that the preparation and presentation of the thesis were supervised in accordance with the guidelines on supervision of thesis laid down by the University of Cape Coast.

Principal Supervisor Signature:..... Date:.....

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ABSTRACT

Fever remains the commonest problem presented to hospitals in Ghana, and nurses are at the fore front of the care of children. Despite this, very little empirical evidence exists on fever management by nurses in Ghana. This study therefore sought to assess the knowledge level on fever, beliefs about fever and childhood fever management practices among nurses in the Cape Coast metropolis Employing a quantitative cross-sectional survey design, data on knowledge level on fever, beliefs about fever, presence of fever phobia and fever management practices of respondents was collected from a sample of 173 nurses, using a questionnaire. SPSS version 24 was used for data analysis. Frequencies and summary statistics were used for descriptive data, while inferentially, Chi Square test, Fisher's Exact test, Phi and Cramer's V, as well as, binary Logistics regression were used to test for significant associations. Most respondents (66.5%) had poor fever knowledge. Almost all respondents (96.5%) were of the erroneous belief that fever is non-beneficial. Majority of respondents did not have fever phobia. Most nurses (80.9%) combined sponging with the administration of antipyretics in managing fever in children. Health authorities must prioritize Paediatric nursing specialty training, CPD trainings on childhood fever management practices. MOH should update, unify and simplify the fever management protocols in the country for health facilities and professionals.

KEYWORDS

Childhood Fever

Cape Coast

Fever

Fever management

Ghana

Nurses

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DEDICATION

This thesis is dedicated to my mother - Madam Elizabeth Esi Filson, and my late father - Mr. John Atta Aidoo

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LIST OF ACRONYMS

CCTH	Cape Coast Teaching Hospital
GHS	Ghana Health Service
IRB	Institutional Review Board
MoH	Ministry of Health
UCC	University of Cape Coast

CHAPTER ONE

INTRODUCTION

Background to the Study

Fever is considered one of the oldest, best observed manifestations of disease (Dixon, Deehan, Dickson, Miller, & Pegnam-Mason, 2006). Fever refers to an elevated body temperature above normal daily variation (Barbi, Marzuillo, Neri, Naviglio, & Krauss, 2017) or when the body temperature is higher than what is deemed normal for the measurement site (above 38.0ºC in the rectum, over 37.8ºC in the mouth, and above 37.5ºC in the axilla) (Adeboye, Yusuf, & Ige, 2017; Ministry of Health Ghana [MoH], 2015).

Fever is a common complaint, which is usually related to an infection of viral, bacterial or parasitic origin. However, it has also been established that fever may be a valuable guide to the diagnosis and severity of infections (MoH, 2015). Fever above 38°C in children and adults often needs urgent attention, especially if the patient is restless or delirious (MoH, 2015).

Childhood fever is the most common cause of hospital visits, reportedly accounting for nearly 40% of hospital visits for children aged under 6 months, and over 60% for children with age ranges between 6 months to 5 years (National Collaborating Centre for Women's and Children's Health, 2013). Fever is a leading cause of concern for healthcare professionals, who often misinterpret fever as being dreadful and harmful for children, resulting in unnecessary treatments with its attendant effects and unexpected financial burden (Baker, Monroe, King, Sorrentino, & Glaeser, 2009; Dawood, Ibrahim, & Palaian, 2010).

Fever is not a primary illness in itself. It may, in fact, be a beneficial physiologic response to infections (Barbi et al., 2017; Karwowska, Nijssen-jordan, Johnson, & Dele Davies, 2002; Wallenstein et al., 2012). Despite the reported beneficial effects of fever, studies have established some inherent beliefs and fear of fever, with nurses viewing fever as being something harmful that can cause brain damage or even death to children (Dong, Jin, Lu, Jiang, & Shan, 2015; Karwowska et al., 2002). This concern or fear of fever is termed fever phobia, first coined by Schmitt (1980).

Several studies have revealed that numerous misconceptions about fever and its management among health professionals, with racial/ethnic, belief and practice variations regarding childhood fever (Crocetti, Sabath, Cranmer, Gubser & Dooley, 2009; Mohamed & Ali, 2012; Tran, 2014). Health professionals in the West, such as nurses and doctors all share in the myths and fears related to childhood fever (Dixon et al., 2006). Nurses and other health professionals have also been noted to possess inconsistent information about fever as well (Karwowska et al., 2002).

Managing fever on a daily bases is a normal routine for nurses at the hospital. Varying nursing practices with regards to fever management by nurses in hospitals have been reported (A. M. Walsh, Edwards, Courtney, Wilson, & Monaghan, 2005). Karwowska et al. (2002) reported that nurses' knowledge of fever may be lacking and nurses may be inconsistent in their fever management practices. This observation has been confirmed in subsequent reports and studies conducted in the West (Greensmith, 2012; Kelly et al., 2015; Raffaeli et al., 2016; A. M. Walsh et al., 2005).

The management protocol for febrile illnesses in children for several decades in Ghana has been to presumptively treat for malaria in moderate to high transmission areas (Webster et al., 2014). Additionally, the Ghanaian Ministry of Health (2015) recommends reducing body temperature to normal, by keeping the patient well hydrated with fluids, tepid sponge the child and the use of paracetamol as management tools for fever. Despite these fever management recommendations, very little empirical evidence exist on fever management in general in Ghana. However, fever remains the commonest problem presented at the outpatient departments in Ghana (Ansah, Gyapong, Bana, Bart-Plange & Whitty, 2016).

Problem Statement

Data from Cape Coast Teaching Hospital (CCTH), University of Cape Coast Hospital (UCCH) and Ewim polyclinic in the Cape Coast Metropolis shows that, 7 out of every 10 children (0 – 5 years) brought to these health care institutions had fever producing conditions over the past 3 years (Cape Coast Teaching Hospital, 2019; Ewim Polyclinic, 2018; University of Cape Coast Hospital, 2019).

This throws in to sharp focus the issue of fever management as an aspect of the overall management of children in the hospital. And, as established in the background, the concept of fever and fever management in children in Ghana has not been thoroughly investigated. The limited studies seen concentrated on the use of antimalarial and antibiotics as fever management tools.

Therefore, little is known about the knowledge level on fever, beliefs around fever and childhood fever management practices among nurses at the

Cape Coast Teaching Hospital, University of Cape Coast Hospital and the Ewim Polyclinic in the Cape Coast metropolis. Also, the concept of fever phobia, which leads to unrealistic and panic reaction to fever by nurses, with its attendant consequences, have not been thoroughly examined. It is this gap in knowledge and literature about childhood fever knowledge level and management practices among nurses in Ghana that this current study sought to fill.

Objective of the Study

The main aim of this study was to assess the knowledge level on fever, beliefs around fever and childhood fever management practices among nurses at the Cape Coast Teaching Hospital, University of Cape Coast Hospital and the Ewim Polyclinic in the Cape Coast metropolis.

Specific Objectives

Specifically, the study sought:

1. To determine the knowledge level of nurses about fever in children.
2. To assess the beliefs of nurses about fever in children.
3. To determine the presence of fever phobia among nurses.
4. To examine the childhood fever management practices used by nurses at these hospitals.

Research Questions

1. What is the knowledge level of nurses at these 3 hospitals about childhood fever?
2. What beliefs do nurses at these 3 hospitals hold about childhood fever?
3. Does fever phobia exist among nurses at these 3 hospitals?

4. What childhood fever management practices are used by nurses at these 3 hospitals for the care of febrile children?

Justification

Goal 3 of the Sustainable Development Goals (SDGs) seeks to ensure healthy lives and promote well-being for all at all ages by the year 2030 (UNDP, 2015). Ghana buys in to this vision, and the government has been investing in the health sector of the country.

However, under-5 mortality rates in Ghana still remains unacceptably high at 52 deaths per 1,000 live births in 2017 (Ghana Statistical Service, Ghana Health Service & ICF, 2018). Specifically, 5 out of the top 10 causes of mortality in children under 5 years was due to fever conditions CCTH in 2017 and 2018 (Cape Coast Teaching Hospital, 2019). In UCC hospital, fever producing conditions such as malaria and bronchopneumonia has been the most common cause of mortality among children under the age of 5 years in the past 3 years (University of Cape Coast Hospital, 2019). Similar data on under 5 mortalities exist at Ewim Polyclinic.

Though a number of studies have shown the presence of varying knowledge about fever, fever phobia, and non-evidence-based beliefs, as well as, varied practices among nurses which impacts on child morbidity and mortality, very little of this evidence exist in Ghana.

With nurses being at the forefront of childhood fever management, it is imperative for this study to be conducted into the childhood fever management practices of nurses to help improve upon child survival and contribute the achievement of SDG 3. It will also help fill the knowledge and

literature gap that exist in the country on childhood fever management practices among nurses.

Significance of the Study

Results from this study will help to the nursing staff and management of the 3 hospitals. Empirical evidence of the knowledge level and fever management practices among nurses will help apprise them of the strengths and weakness of the nursing staff with regards to fever management. This is expected to lead to the development of continuous professional development (CPD) trainings to improve the fever management practices in these hospitals.

Additionally, results from this study is expected to afford the hospital management an opportunity to standardize their fever management practices having apprised themselves of the current trend of fever management in the hospitals.

The findings are also expected to help the Ghana Health Service and the Ministry of Health in their quest to reduce further the unacceptable child mortality rate in the country by informing policy measures aimed at addressing child morbidity and mortality through the proper management of childhood fever in children with febrile conditions.

Delimitation of the Study

The scope of the research was confined to permanently employed nurses working at children related units and wards at the Cape Coast Teaching Hospital, University of Cape Coast Hospital and the Ewim Polyclinic in the Cape Coast metropolis.

Limitations of the Study

The study was carried out at the Cape Coast Teaching Hospital, University of Cape Coast Hospital and the Ewim Polyclinic in the Cape Coast metropolis. Hence, the findings could be peculiar to only these 3 hospitals. As such, it is possible that the findings will not apply to other facilities. Furthermore, because the study used a cross-sectional survey design, participants were unable to provide in-depth experiences, meanings, or additional clarification of answers.

Operational Definition of Terms

Nurse: Nurse: A person who has completed a two- to four-year nursing or midwifery program at a Nursing Training College/University and has been licensed to practice in Ghana by the Nursing and Midwifery Council of Ghana.

Fever Knowledge: Refer to the theoretical knowledge level of nurses on fever. This was determined by the number of correct responses to items on the fever knowledge measurement. Nurses who were highly knowledgeable about fever were those who got more than 50% - 100% of the knowledge measurement items correct, while poorly knowledgeable were those who got less than 50%.

Organisation of the Study

There are five chapters in this research. The study's background, problem statement, purpose, research aims and questions, significance, delimitations, limitations, and definition of terminology are all covered in Chapter One. The review of important up-to-date theoretical and empirical literature on the topic, as well as the theoretical/conceptual framework that drove the investigation, is presented in Chapter Two. The research

methodology is presented in Chapter Three, which covers research design, study population and setting, data collection instrument, sampling and data collection procedures, data management and analysis, It also addresses concerns of clearance and ethical considerations. Chapter Four presents the study's findings as well as a discussion of the most important ones. The study's summary, results, and recommendations, as well as proposals for further research, are presented in Chapter Five.

CHAPTER TWO

LITERATURE REVIEW

This chapter reviews the literature as well as the findings of additional studies on fever and fever management in children around the world, in Africa, and in Ghana. The goal of the study was to determine the degree of knowledge, beliefs, and childhood fever management practices of nurses at the Cape Coast Teaching Hospital, University of Cape Coast Hospital, and Ewim Polyclinic in the Cape Coast metropolis. The research would thus give empirical information on what existing in terms of nurse knowledge, beliefs, and childhood fever management practices at the Cape Coast Teaching Hospital, University of Cape Coast Hospital, and Ewim Polyclinic in the Cape Coast metropolis.

A search of libraries, research databases, and journal sites such as PubMed, ResearchGate, Hinda, HINARI, ScienceDirect, Pelagia Research Library, and Google Scholar yielded the material for the literature review. Keywords and phrases such as fever, fever management, childhood fever, fever management practices, and children fever management in Ghana were used in the search.

The search was limited to papers/articles and reports published in English that contained these keywords/phrases. After reviewing the abstracts, the researcher chose only recent literature/articles as well as classic works that matched the criteria for this review. Additionally, several university websites and libraries were explored for both published and unpublished theses, as well as books on nursing, research and statistics. The literature review was organised around the research objectives.

Temperature Range in Children under 5 Years

The human body temperature is not an absolute figure but a range, varying with age and weather condition in healthy individuals. Because to their underdeveloped immune system, infants in the first 30 days have a typical rectal temperature maximum limit of roughly 38.0°C; but these new born babies may not develop a high fever with a serious illness. (Herzog & Phillips, 2011). The maximum limit of normal temperature rises slightly to 38.1°C in new-borns aged one to two months, and to around 38.2°C in infants aged three months, but falls to 37.8°C in babies older than three months, before settling in the range of 37.6°C to 37.8°C throughout childhood. (Herzog & Phillips, 2011; Mackowiak, 2006).

Fever

Fever has traditionally been understood as a symptom rather than an illness. The usual human body temperature is 37°C, however it can fluctuate by up to 1°C in healthy people. (Walter, Hanna-Jumma, Carraretto, & Forni, 2016). Fever in children under the age of five years is one of the most prevalent clinical markers of disease and a clinical cause for paediatric consultations, accounting for around one-third of all presenting disorders in children. (Crocetti et al., 2009; Scales & Sullivan, 2013; Tran, 2014).

Fever is defined as a core temperature of 38.3 °C or greater, by the American College of Critical Care Medicine, the International Statistical Classification of Diseases, and the Infectious Diseases Society of America. That is, just above the upper limit of a normal human temperature, irrespective of the cause (O'Grady et al, 2008). Ghana's Ministry of Health defines fever as

an axillary temperature above 37.5°C (read after keeping the thermometer in place for 3 minutes) (MoH, 2015).

Different grades and ranges of fever exist, defined by higher temperature ranges (American Academy of Pediatrics, 2012; Chiappini, Bortone, Galli, & Martino, 2017; Chiappini et al., 2018; Edwards et al., 2007; Ministry of Health Ghana [MOH], 2015; National Collaborating Centre for Women's and Children's Health, 2013; Tran, 2014; Walter et al., 2016) as captured in Table 1.

Table 1: Interpretation of Temperature Ranges

Temperature Range	Interpretation
35.9°C – 38.0°C	Normal body temperature
≥ 38.1 – 39.0 °C	Fever
≥ 39.1°C – 40.0°C	High fever Very
> 41.0°C – 42.0°C	Hyperthermia

Causes and Mechanism of Fever

Under normal circumstances, human beings are capable of maintaining a normal range of internal body temperature that is called the "set point". It is a range of temperatures (approximately 36.2°C to 37.5°C) above or below which compensatory warming or cooling mechanisms of the body are activated (Luk, Ha & Hui, 2008). When body temperatures rise over the upper limit of the set point, heat-loss mechanisms include vasodilation and sweating are activated. While vasoconstriction and shivering are the warming mechanisms when the lower limit of the set point is reached (Luk, Ha, & Hui, 2008; Walter et al., 2016).

Fever is a physiologic mechanism with beneficial effects in fighting infection and it is not associated with long-term neurologic complications (Walter et al., 2016).

One of the prevailing explanations of fever is that the thermostatic centre of the hypothalamus is hypothesized to reset the "set point" at a greater level than normal when pyrogens are present. The existing body temperatures are then sensed to be too cool with an elevated “set point”. The warming mechanisms, shivering and vasoconstriction, are activated to prevent heat loss (Luk et al., 2008; Walter et al., 2016; Whitburn et al., 2011).

Fever is a common component of inflammation in animals, and it boosts the host's reaction. Inflammation is typically seen in severely sick individuals to help healing following traumatic or infectious assaults. Around 2000 years ago, Celsius first characterized the four cardinal qualities of pain, heat, redness, and swelling. Hippocrates, at the same period, recognized that fever was beneficial. A large number of both the cell-derived and plasma-derived inflammatory mediators are pyrogenic; fever associated with inflammation is probably mediated in a similar way to sepsis (Walter et al., 2016).

Infectious organisms, toxic drugs, chemical compounds, blood products, neoplastic cells, and foreign bodies have all been implicated in the cause of fever. Malignancy, tissue ischaemia, and medication responses account for the majority of fevers in hospitalized patients, with sepsis accounting for up to 74 percent. (Walter et al., 2016). The standard treatment guidelines of Ghana also implicates viral, bacterial, fungal, parasitic infections,

as well as, malignancies such as lymphoma and leukaemia in the cause of fever (MoH, 2015).

Data from CCTH, UCCH and Ewim polyclinic in the Cape Coast Metropolis confirms the Ministry of Health's information, where 7 out of every 10 children, aged 0 – 5 years brought to these health care institutions, had fever producing conditions (infections) over the past 3 years (Cape Coast Teaching Hospital, 2019; Ewim Polyclinic, 2018; University of Cape Coast Hospital, 2019).

Pharmacological agents may cause fever by a number of pathophysiological mechanisms. These include interference with the physiological mechanisms of heat loss from the peripheries, interference with central temperature regulation, direct damage to tissues, stimulation of an immune response, or pyrogenic properties of the drug (Walter et al., 2016).

Fever is prevalent following acute brain injury caused by trauma or a vascular event, and it is related with a worse outcome in patients. Fever is most likely caused by hypothalamic abnormalities in head injuries, suggesting thermal dysregulation in some cases. Brain damage causes an increase in the production of a significant number of inflammatory and pyrogenic cytokines in the brain; interleukin-6 in particular is associated with fever production after a stroke, and with a worse outcome (Chomova & Zitnanova, 2016; Helmy, Carpenter, Menon, Pickard, & Hutchinson, 2011; Mrozek, Vardon, & Geeraerts, 2012).

Beneficial Effect of Fever

The febrile response is well preserved across the animal kingdom, with some experimental evidence suggesting it may be a beneficial response to

infection. Fever whether mild or moderate plays an important role in the body's defence mechanisms against infections. Fever contains anti-infective properties as well as the ability to reduce the risk of developing allergies.

A study by Williams, Peterson, Ownby and Johnson (2004) showed that Children who experienced a febrile episode during their first year of life were less likely than those who did not to develop allergies later in life. Further, a retrospective analysis of data by Walter et al. (2016) showed that a higher temperature in patients with infection in the first 24 hours after admission to an intensive care unit (ICU) was associated to a better result than normothermia or hyperthermia over 40°C, and a temperature between 37.5°C and 39.4°C was associated to a better outcome than normothermia.

When comparing patients with community-acquired pneumonia who did not develop a febrile reaction to those who did, those who did not develop a fever had a considerably higher death rate (29%) than those who had fever (4 %) respectively. In the ICU, a temperature of more than 38.2°C has also been demonstrated to protect against invasive fungal infections (Leroy et al., 2009). Therefore, it is safe to conclude that elevated temperature may provide protection by several infectious mechanisms.

Adverse Effects of Fever

Despite the reported beneficial effects of fever, Fever has been associated to a number of negative outcomes. After a period of hyperthermia, the majority of patients recover completely, but patients exposed to greater temperatures for longer periods of time, on the other hand, are more likely to develop complications, which can lead to multi-organ failure and death in the worst-case scenario (Walter et al., 2016).

Hyperthermia has been associated to increased metabolic rates, greater fluid loss, and increased oxygen use and carbon dioxide production. Fever is a high-energy process that increases oxygen consumption by 13% for every 1°C increase in temperature rise in the body's temperature (Dinarello, 1996). As the body responds, the respiratory rate rises, which is followed by the commencement of sweating, increasing the risk of dehydration owing to increased fluid loss. Patients with cardiovascular, pulmonary, metabolic, or shock-related conditions, especially children, may have difficulties tolerating the increase rate of oxygen use produced by fever.

Fever is a common physiologic reaction that may not always necessitate treatment unless there is a specific detrimental underlying cause (example, an infection), or it causes substantial pain as well as metabolic disorders. When the temperature rises over 41.7°C, hyperthermia occurs, causing damage to the central nervous system and direct cytotoxicity (Mackowiak, 2006). Common febrile reactions associated with infection, on the other hand, are unlikely to reach this degree.

Nurses Fever Knowledge Level

A number of studies have found that nurses' knowledge of fever, its physiology, and the notion that fever can be helpful is lacking (Greensmith, 2012, Tran, 2014; Walsh et al., 2005). A Vietnamese study by Tran (2014) reported a generally poor fever knowledge level among nurses, with only 37.5% (n=240) exhibiting good fever knowledge. A similar study in Australia found that nurses fever knowledge was not as high as expected (Walsh et al., 2005). Slightly less knowledge was also reported about the physiology of fever and nurses' knowledge of antipyretics and their use in fever management was

even poorer. Greensmith (2012), in an Irish study, found that 50.9% (n=119) of nurses were knowledgeable about fever. However, in the analysis, it was found to be lower than expected.

Beliefs about Fever and Fever Phobia

The term "fever phobia" (the fear of fever) was first coined by Dr Barton Schmitt in the 1980s to represent the fear that fever is dreadful and totally harmful to their children (Schmitt, 1980; Wallenstein et al., 2012). Schmitt (1980) found that most health workers believe that fever can cause physical harm to their children, despite the reality that fever is a physiologic process and not a primary illness in itself.

The fear of fever may sometimes results in unnecessary frequent visits to the emergency department or clinic, thus leading to unscheduled physician visits, inappropriate treatments and unexpected financial budget (Dong et al., 2015). Fever phobia likely explains why the vast majority of fevers are treated with antipyretics (Dong et al., 2015; Wallenstein et al., 2012)., whether indicated or not by health workers and parents, drug overdose and toxicity in children (Mcglynn, 2012).

Despite the existence of evidence to beneficial effects of fever (Dixon et al., 2006; Evans, Repasky & Fisher, 2015; Patricia, 2014; Polat et al., 2014; Walter, Hanna-Jumma, Carraretto & Forni, 2016), significant fever phobia and negative beliefs about fever have been found in a number of studies (Kelly et al., 2016; Kwak et al., 2013; Tran, 2014; Walsh, Edwards, Courtney, Wilson & Monaghan, 2005). These beliefs and fear were found to have an influence on the fever management practices of nurses. Edwards, Courtney, Wilson,

Monaghan and Walsh (2001) found that fear about high temperature levels are more common in nurses with no or little experience of febrile conditions.

Similar fever phobia signs have been exhibited in nurses and other health care workers in several researches (Barbi et al., 2017; Chiappini et al., 2018; El-Radhi, 2012; Martins & Abecasis, 2016; Tran, 2014). Edwards, Courtney, Wilson, Monaghan and Walsh (2001) also found that "fear of fever" are more common in nurses, especially, those with no or little experience of febrile conditions. In a Portuguese study, Martins and Abecasis (2016) found that the most feared effect of untreated fever, for 92% of nurses in the study, was seizures.

Children Fever Management Practices

Childhood fever management is a complicated behaviour, with numerous studies throughout the world revealing similar beliefs and misconceptions among parents and nurses. The purpose for treating fever in children must be to relieve the child's discomfort and not to lower the body temperature (Walter et al., 2016).

Influencers of nurses' management decisions

A number of studies have shown that the decision by nurses to initiate fever management is usually due to fear of febrile seizures and brain damage (Betz & Grunfeld, 2006; Mwas & Abureesh, 2016). In Walsh et al. (2005) study, nurses' believed that the strongest pressure to administer paracetamol came from parents and peers. However, they were more likely to adhere to the wishes of medical staff than parents or peers. The fear of febrile seizures, discomfort and body temperature have also been implicated as influencers of nurses decision to manage fever (Martins & Abecasis, 2016).

Fever measurement tools and sites

The instrument used for temperature measurement is the thermometer. There are various types of thermometers available, including mercury in glass, electronic, and infrared thermometers. The most widely used these days are the electronic type (Cooke, 2019). An Italian study by Chiappini et al. (2018) confirmed this when it was found that the most widely used thermometer by nurses (68.5%) for temperature measurement was the digital one. These tools of measurement of temperature in children is recommended by authorities such as the Ministry of Health of Ghana (MoH, 2015).

The most preferred site for temperature measurement in Chiappini et al. (2018) Italian study was the axillary site. This is also in line with recommendations by the American Academy of Paediatrics (2012) and the National Collaborating Centre for Women's and Children's Health (2013), who recommends that body temperature can be measured in the axilla. Also, the rectum, mouth, skin, and ear can be used, though rarely. Rectal temperature is considered to be the most accurate for estimating core body temperature and is recommended by the American Academy of Paediatrics for children less than 4 years of age. However, its use is discouraged by other clinical guidelines because of safety and practical issues, as well as for the physical and psychological discomfort it may cause (Barbi et al., 2017).

Fever management practices

In a Portuguese study, where nurses considered that a history of febrile seizures and the fear of febrile seizures was the most decisive factor in initiating fever treatment (Martins & Abecasis, 2016). Luk, Ha and Hui (2008) in a Hong Kong study found that 31.9% of nurses resort to the use of

antipyretics in fever control in children. Even more nurses (97.4% and 82.1% respectively) were found to be using Paracetamol and Ibuprofen for fever management in Children in a Canadian study (Karwowska et al., 2002). Elbushra (2004) and Patricia (2014) who also found in their studies that paracetamol was the most common antipyretic used by nurses for patient care.

Luk et al. (2008) reported that 69.9% and 5.3% of nurses used ice bags and cool bathing respectively in fever management. This practice is however recommended by authorities and standards (MoH, 2015; Walter et al., 2016; WHO, 2013), except in hyper pyrexia situation where ice pack cooling is recommended (Luk et al., 2008). A contrary finding was however made in a Canadian study where none of the nurse respondents recommended this practice (Karwowska et al., 2002).

Despite the presence of evidence showing the ineffectiveness of tepid sponging on fever outcomes (Tran, 2014), a number of studies have shown that the practice is still pervasive among nurses (Luket al., 2008; Tran, 2004). The presence of fever management protocols aids nurses in the implementation of up-to-date evidence-based fever management practices. Luk, Ha and Hui (2008) findings in a Hong Kong study showed that 83.9% of the respondents indicated the presence of fever management protocols in their hospitals and units aids in their practice of proper fever management. The presence of fever management protocols in wards has also been underscored by Thompson and Kagan (2010) in a US study where its absence was seen as a barrier identified to fever management.

Conceptual Framework

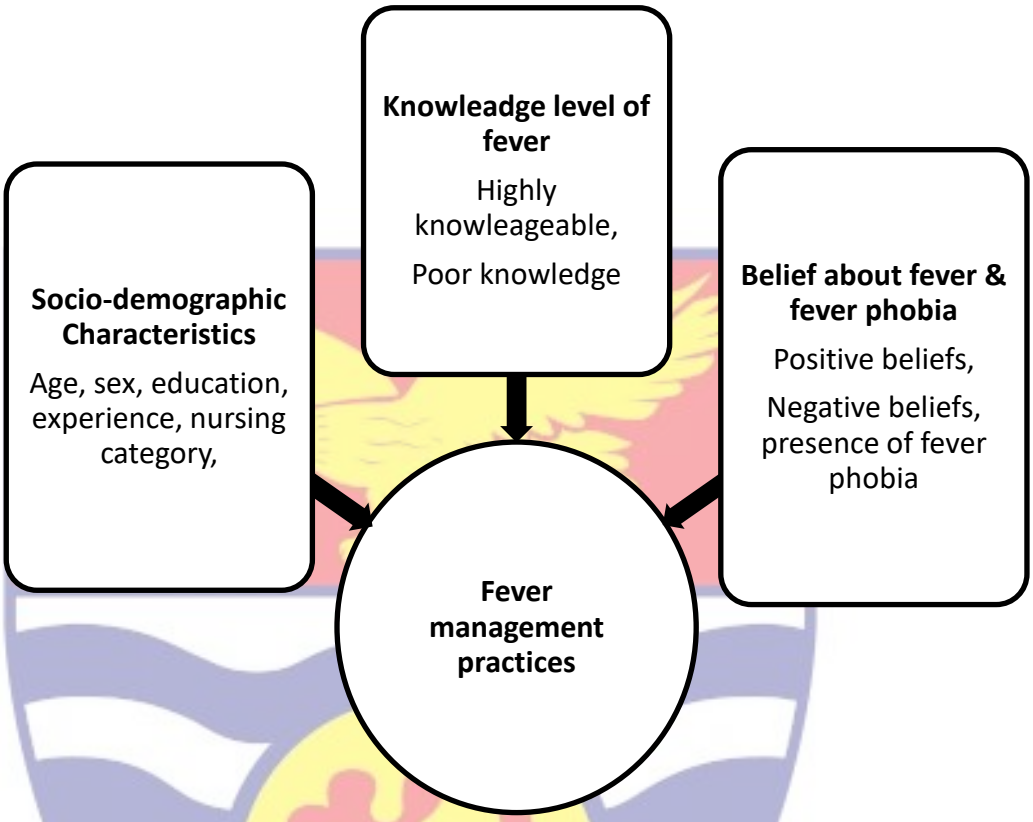


Figure 1: Conceptual Framework Developed by Researcher

A conceptual framework is an abstract collection of connected concepts and theories that can be used to organize ideas in a study. (Gerrish & Lathlean, 2015). For purposes of this study, this conceptual framework was developed along the objectives of the study and following an extensive review of literature. Knowledge about the fever, beliefs and perception about fever and socio-demographic characteristics influences fever management practices by nurses.

CHAPTER THREE

RESEARCH METHODOLOGY

Methodology describes how a study will be carried out and, among other things, specifies the methodologies to be employed (Howell, 2013). It is therefore the overall principles and approach that would guide the conduct of the study.

Study Design

A study's design is a detailed plan or blueprint for gathering data in order to answer research questions or test hypotheses. (Bhattacherjee, 2012). This study took a quantitative approach and used a cross-sectional survey design. Cross-sectional designs collect data on a population's problem at a certain point in time (Sim & Wright, 2000). The key benefits of cross-sectional surveys are that they are generally inexpensive and simple to conduct. (Polit & Beck, 2008), At the same time, the independent and dependent variables are measured (Bhattacherjee, 2012), They are frequently based on a questionnaire survey, and no follow-up is lost because participants are only interviewed once. The researcher chose a cross-sectional survey methodology with a quantitative approach because of all these advantages.

However, a cross sectional study may be prone to non- response bias if participants who consent to take part in the study differ from those who do not , resulting in a sample that is not representative of the population (Sedgwick, 2014). Also, because data on each participant are recorded only once it would be difficult to infer the temporal association between a risk factor and an outcome. Therefore, only an association and not causation can be inferred from

cross sectional study. Bhattacherjee (2012), as well as, Gerrish and Lathlean (2015) makes similar observations.

Study Setting

The study was carried out in 3 health care institutions in the Cape Coast metropolis of the Central region of Ghana. Namely, the Cape Coast Teaching Hospital (CCTH), University of Cape Coast Hospital (UCC hospital) and the Ewim Polyclinic.

The CCTH (formerly Central Regional Hospital) is currently a 400-bed capacity tertiary referral hospital situated in the Northern part of the Cape Coast Metropolis. The hospital started full operations on 12th August, 1998 as a Regional Hospital, and was converted into CCTH with the inception of School of Medical Sciences in the University of Cape Coast. The first batch of the Medical Students graduated from the Teaching Hospital in June, 2013 (CCTH, 2019).

The University of Cape Coast Hospital (UCC hospital) is located on the campus of the University of Cape Coast. It was established as a clinic in 1963, and later developed into a district level hospital with services such as maternal and child health, reproductive health, surgery and OPD services among others. The university hospital serves students, staff and their families, as well as, the communities around the University of Cape Coast (UCC hospital, 2019).

Ewim Polyclinic first started as an OPD of the then Central Hospital (now the Metro Hospital) in 1976. It was upgraded to Ewim Clinic and Urban Health Centre in 1986 and 1989 respectively. In September 2012, was again upgraded to a Polyclinic. The facility currently serves 22 communities within the Cape Coast Metropolis, with services such as OPD services, reproductive

and child health, laboratory services, adolescent friendly services, ear, nose and throat services, as well as, anti-retroviral therapy among others (Ewim Polyclinic, 2018).

These hospitals are the main government hospitals within the Cape Coast metropolis, with CCTH being the main referral tertiary hospital. Coupled with the fact that their services are on the National Health Insurance Scheme, thus, the services being available to a lot more of the citizenry, the researcher decided to use them for this study.

Study Population

The study population was nurses working at these 3 hospitals in the Cape Coast metropolis. Together, these 3 hospitals have a total of 848 nurses of all categories. Of this number, CCTH has a total of 659 nurses (with 116 directly working with children). UCC hospital has a total of 120 (with 38 working with children). Ewim Polyclinic has a total of 69 nurses (with 41 of them working with children) (CCTH, 2019; Ewim Polyclinic, 2018; UCC hospital, 2019). Hence, 195 of them work with children (Children wards, OPDs and at child welfare clinics) in these 3 institutions.

Inclusion Criteria

This study was open to nurses of all categories who are permanently employed in these 3 hospitals, and working in units and wards that admit or take care of children. A total of 195 nurses met these criteria.

Exclusion Criteria

All other nurses who worked in adult units or do not take care of children were ineligible to participate in this study. Also, student nurses and

rotation nurses (Nurse interns) were excluded from the study. This was because their work did not involve children and the nursing students, as well as, the rotation nurses were still under training.

Sample Size

Due to the relatively small number of the target population, all the 195 nurses who met the inclusion criteria from the 3 hospitals were invited to take part in the research. Following the respondents who consented to be part of the study, the study assessed 173 participants.

Sampling Technique

Due to the small number of eligible respondents, a census of the 195 nurses who satisfied the inclusion criteria was conducted in an attempt to collect data from all of them. A census is a data gathering approach that tries to collect data from all eligible units in a target population. One advantage of a census is that it eliminates sampling error (National Science Board, 2018).

Data Collection Instrument

Data was gathered via a questionnaire (See Appendix A). The questionnaire was adapted from Walsh et al. (Walsh, et al., 2005). The questionnaire had 4 sections (section A, B C and D). Section A assessed socio-demographic data, section B assessed participants' knowledge level on fever, section C assessed participants' beliefs about childhood fever and section D looked at childhood fever management practices of participants.

The questionnaire was pre-tested at the Ankaful Leprosy Hospital. The pre-test was carried out on a sample of 30 nurses at the OPD and children unit as suggested by Perneger, Courvoisier, Hudelson, and Gayet-Ageron (2015).

According to Perneger, Courvoisier, Hudelson, and Gayet-Ageron (2015), the power to detect abnormalities in a sample increases as the sample size grows. They also demonstrated that a sample size of 30 or more had a statistical power of 80% or higher. In the pre-test, 100% of the questionnaires were returned.

Items that were irrelevant or confusing were changed. After the pre-testing, several of the items were renumbered, and other changes to the questionnaire were made. The pre-test data was loaded into SPSS version 25 and statistically examined to determine the data distribution as well as the instrument's internal consistency. At an alpha level of 0.05, The test of normality showed a statistically significant deviation from Shapiro-Wilk's test of normality ($W_s = 0.391$, $p = 0.001$). This meant that the data gathered from the real study would almost certainly be skewed.

Validity and Reliability

The ability of an instrument to measure what it is designed to measure correctly and accurately is referred to as validity (Gerrish & Lathlean, 2015). Validity comes in a variety of forms. Face validity is a subjective assessment of the instrument's items' relevance, clarity, and unambiguity. Experts are asked to decide whether the items in the instrument accurately represent the idea or construct to be measured. To arrive at the Content Validity Index (CVI), a rising number of researchers advocate assessing elements in an instrument on a four-point scale (1 = not relevant, 2 = slightly relevant, 3 = relevant, and 4 = highly relevant)(Polit & Beck, 2008, 2014). A CVI score of 0.80 or higher implies that an instrument has good content validity. Bowling and Ebrahim (2005) emphasized this point by stating that conducting a literature research

and talking with experts can aid in the generation of relevant items that are face and content valid.

Three nursing lecturers and two Principal Nursing Officers assessed the questionnaire and rated it on a four-point scale as recommended by Polit and Beck (2008, 2014) to ensure its face and content validity. The ratings yielded a Content Validity Index (CVI) score of 0.76 out of 1.0. This indicated that the questionnaire's content validity was very high.

The repeatability of an instrument refers to its capacity to measure what it is designed to measure in a consistent manner (Gerrish & Lathlean, 2015) Internal consistency can be used to demonstrate reliability statistically in a variety of ways. The degree to which elements are related to one another is measured by internal consistency. When the Cronbach's alpha (α) statistic of a questionnaire exceeds 0.70, it is considered reliable (Macnee & McCabe, 2006). Cronbach's alpha statistic of 0.71 was found in a study of the pre-test data, showing strong reliability.

Recruitment and Training of Field Assistance

Two field assistants were engaged and trained to assist with the administration and retrieval of questionnaires. The assistants were nurses with some experience in data collection. The assistants were given sufficient background knowledge about the study. It was necessary to recruit field assistants who were nurses at the various facilities due to the shift system of work, while I administered and retrieved the questionnaires from staff on the day shift, the field assistants administered and retrieved the questionnaires from staff on the night shift

Ethical Issues

The University of Cape Coast's Institutional Review Board provided ethical approval. (UCC-IRB) (See Appendix G). Permission was also obtained from CCTH (See Appendix F), UCC hospital and Ewim (See Appendix E) to carry out data collection. Information about the research was attached to the questionnaire for participant's review and consent. Participants' anonymity and confidentiality were guaranteed because they were not required to submit their names or addresses. Any report or publication resulting from this study will not include the names of the participants. Sources of ideas and information for this study have been duly cited and referenced. This study posed no harm to participants.

Data Collection Procedure

The researcher and two trained field assistants collected data in each of the three hospitals. The purpose of the study, its importance, how the findings will be used, and why the participant was chosen were all addressed on the cover information sheet. It also addressed problems concerning confidentiality and anonymity, as well as providing contact information for participants. A consent form was signed by participants who agreed to take part in the study. Permission was sought from the various ward and unit in-charges. A general briefing of participants was done after which the questionnaires were self-administered.

The researcher waited to retrieve the questionnaires for those who were able to complete it the same day. Others requested to send the questionnaires home and return them at a later date; this ranged from one day to a week. For those on the night shift, the field assistant distributed and retrieved the

questionnaires. Data collection took a total of one month to complete. Clear instructions were given to participants on how to get back to the researcher or any of the field assistants for clarifications on the questionnaire

Data Management

Upon retrieval of the filled questionnaire from participants, the data was checked, cleaned, coded and placed under lock in a cabinet, where only the researcher had access to. When the retrieval of the filled questionnaire was complete, for statistical testing and analysis, the data was entered into the Statistical Package for Social Sciences (SPSS) software version 24.0 for Microsoft Windows on a computer. The soft copy of the data was protected and known to only the researcher to ensure data security.

Data Analysis

The questionnaire was used to measure both independent and dependent variables at the same time. Descriptive analysis was done through descriptive statistics presented in frequency tables. Inferential analysis allowed for testing of associations and strength of associations between variables, leading to the drawing of inferences from the results. Where the value of each cell in a frequency table was five or higher, Chi-Square Test was used to determine the presence of significant associations or differences between the independent and the dependent variables. However, where this assumption was not met in the data, Fisher's Exact Test was used.

The number of accurate replies to items on the fever knowledge measurement section was used to assess respondents' fever knowledge, which alluded to the theoretical knowledge level of nurses on fever.. Nurses who were highly knowledgeable about fever were those who got 50% - 100% of the

knowledge measurement items correct, while poorly knowledgeable were those who got less than 50%. Association between respondents' demographic characteristics and their knowledge level on fever, beliefs about fever and the presence of fever phobia was done using Chi square test or Fishers Exact test. The strength of the association was quantified using Phi or Cramer's v statistic as suggested by Akoglu (2018).

Where significant associations were found, the statistically significant demographic variables were entered into a binary logistic regression model to ascertain which associated demographic characteristics were significant predictors of the dependent variables (knowledge level on fever, beliefs about fever, presence of fever phobia). All inferential statistical tests were carried out at a significance level of $p \leq 0.05$.

CHAPTER FOUR

RESULTS AND DISCUSSION

This chapter presents and discusses the results in the light of existing evidence and provides reasons for observations and its implications. The discussion is organized under distinct subheadings, that address the research questions. The study sought to assess the knowledge level on fever, beliefs about fever and childhood fever management practices among nurses at the Cape Coast Teaching Hospital, University of Cape Coast Hospital and the Ewim Polyclinic in the Cape Coast metropolis.

Results/Findings

Descriptively, the data has been presented in contingency tables, summary statistics and described. Test of distribution of the data with Shapiro-Wilk's test presented that the data significantly deviated from normality *(W_S = 0.318, p = 0.001)*. Inferentially, test of association between respondents' demographic characteristics and their knowledge level on fever, beliefs about fever and the presence of fever phobia was done using Chi square test or Fishers Exact test. The strength of association was quantified using Phi or Cramer's v statistic as suggested by Akoglu (2018).

Further, statistically significant demographic variables were entered into a binary logistic regression model to determine which associated demographic characteristics were significant predictors of the dependent variables (knowledge level on fever, beliefs about fever, presence of fever phobia). All inferential statistical tests were carried out at a significance level of $p \leq 0.05$. The accuracy in classifications of data, Omnibus test of Model,

Cox and Snell R^2, Hosmer and Lemeshow, and Nagelkerke coefficients of the Binary logistics regression model.

Demographic Characteristics

Table 2 shows the distribution of the demographic characteristics of the respondents. Males were 31.2% and females were 68.8%. The ages of respondents ranged from 20 years and to a maximum of 55 years, with a mean age of 29.03 (SD ± 4.89). Majority of them were Christians 94.2%, with Moslems being 4.6%. In terms of marital status, 66.5% were single and 32.9% were married. Academically, most respondents had a Diploma in Nursing (57.2%), Nurse assistants were 25.4%, BSc. Nursing certificate holders were 15.0%, Masters in Nursing were 1.7%. Most were from CCTH (64.2%), followed by UCC Hospital (19.1%) and 16.8% from Ewim Polyclinic.

Most of the respondents were Registered General Nurses (67.6%), followed by Enrolled nurses (19.7%), Community Health Nurses (6.4%), Registered Community Health Nurses (3.5%), Registered Midwives (1.2%), Public Health Nurses (1.2%) and Registered Mental Nurses (0.6%). In terms of working experience, respondents had experiences ranging from a minimum age of 1 year to a maximum of 20 years, with a mean experience of 3.87 (SD ± 3.48). Most of the respondents worked in Paediatric wards (37.0%), Emergency wards (34.7%), OPDs (15.6%) and Child welfare clinics (12.7%). Of the 173 respondents, only 3.5% had paediatric specialty training, with years of work post-paediatric nursing specialty qualification ranging from a minimum age of 1 year to a maximum of 6 years, with a mean of 3.00 (SD ± 2.28).

Table 2: Demographic Characteristics of Respondents

Demographics	Frequency (n=173)	Percentage (%)
Gender		
Male	54	31.2
Female	119	68.8
Religion		
Christianity	163	94.2
Muslim	8	4.6
Believer	2	1.2
Marital status		
Single	115	66.5
Married	57	32.9
Divorced	1	0.6
Highest academic qualification		
Certificate in Nursing	44	25.4
Diploma Certificate	99	57.2
Post - Diploma Certificate	1	0.6
BSc. Nursing	26	15.0
Master's in Nursing	3	1.7
Facility		
CCTH	111	64.2
UCC Hospital	33	19.1
Ewim Polyclinic	29	16.8
Nursing category		
EN	34	19.7
CHN	11	6.4
RGN	117	67.6
RM	2	1.2
RMN	1	.6
PHN	2	1.2
RCN	6	3.5
Department of Work		
OPD	27	15.6
Emergency	60	34.7
Paediatric	64	37.0
RCH	22	12.7
Paediatric Speciality Training		
Yes	6	3.5
No	167	96.5

Source: Field Survey (2019)

Fever Knowledge Level

The researcher assessed the knowledge level of respondents on fever. As shown in Table 3, the majority (75.7%) indicated fever in children is always harmful. Similarly, most of the respondents (72.3%) indicated that fever in children cannot be beneficial.

The majority of the respondents (87.3%) were able to correctly identify that the temperatures regulatory Centre in the human body is located in the brain, Of the 173 respondents, more than half of them were aware of the guidelines for fever management by WHO (80.4%), Integrated Management of Childhood Illnesses (70.5%) and the Ghana Standard Treatment Guidelines (79.7%).

The majority of respondents (77.4%) agreed with this statement. a temperature of 41^0C impairs immune response. Of the 173 respondents, only 23.7% knew that fever less than 41^0C is not harmful to the host, the 76.3% had contrary views regarding the item. Most of the respondents (66.4%) agreed that temperature relate to the severity of the illness.

The majority of the respondents (59.6%) agreed that fever helps produce antibodies in the host. Most of the respondents (57.3%) answered correctly that the common side effect of fever is dehydration. About 90.2% of the respondents attested that fever occurs in the presence of infections and 70.0% also attested that fever can occur in the absence of infection. Majority of the respondents (70.6%) disagreed that it is unnecessary to reduce temperature less than 40^0C with antipyretics whiles 29.4% agreed to the statement. Close to three quarters of the respondents (72.9%) agreed that Antipyretic medications may be used to disguise a fever caused by a progressing infectious condition

Majority of the respondents (76.3%) agreed that febrile convulsion generally occurred within 24hours. Most of the respondents (80.3%) responded positively that risk for febrile convulsion includes a previous history. Most of the respondents (53.8%) disagreed that risk for febrile convulsion includes a family history. About 84.9% of the respondents agreed that neurological damage is common in children who had febrile convulsions.

Majority of the respondents (87.3%) agreed that febrile convulsion is preventable. Further, 67.6% out of the total respondents agreed that it is normal for a child temperature to fluctuate more than 1^{o}C during the day. Most of the respondents (75.1%) agreed that fever reduction from paracetamol generally last between 3 - 4 hours whilst 32.4% disagreed to the statement. A little over half (51.5%) disagreed that antipyretic effect of paracetamol is longer than that of ibuprofen.

Table 3: Respondents Responses to Fever Knowledge Level Items

Fever knowledge measurement items	Responses (n = 173)	
	(SA+A)	(D+SD)
Fever in children is always harmful	75.7%	24.3%
Fever in children can be beneficial	27.7%	72.3%
Temperatures control Centre is in the brain	87.3%	12.7%
Aware of WHO guidelines for fever	80.4%	19.6%
Aware of the IMCI guidelines for fever	70.5%	29.5%
Aware of the Ghana STG for fever	79.7%	20.3%
Fever of 41^{0}C impairs immune response	77.4%	22.6%
Fever < 41^{0}C is not harmful to the host	23.7%	76.3%
Temperature relate to severity of illness	66.5%	33.5%
Fever help produce antibodies in the host	59.6%	40.4%
Common fever side effect is dehydration	57.2%	42.8%
Fever occur in the presence of infection	90.1%	9.9%

Table 3 continued

Fever can occur in the absence of infection	70.0%	30.0%
It is unnecessary to reduce temperature less than 40^0C with antipyretics	29.4%	70.6%
Antipyretic medication mask infection progress	72.9%	27.1%
Febrile convulsion generally occurs within 24hrs	76.3%	23.7%
Risk for convulsion includes a previous history	80.3%	19.7%
Risk for convulsion includes a family history	46.2%	53.8%
Neurological damage is common in a convulsive child	84.9%	14.1%
Febrile convulsion is preventable	87.3%	12.7%
It is normal for temperature to fluctuate more than 1^0C in a day	67.6%	32.4%
Fever reduction from paracetamol generally lasts between 3-4hours	75.1%	24.9%
Antipyretic effect of paracetamol is longer than that of Ibuprofen	48.5%%	51.5%

Source: Field Survey (2019)
SA – Strongly Agree, A – Agree, D – Disagree, SD – Strongly Disagree

Based on a study of the percentage of respondents who correctly answered all of the knowledge measuring items, over half of the respondents (66.5%) were found to have poor fever knowledge. Those who were highly knowledgeable about fever were only 33.5%. This is captured in Table 4.

Table 4: Summary of Respondents Fever Knowledge Level

Fever knowledge level	**Responses**	
	Frequency (n = 173)	**Percentage (%)**
High knowledge	58	33.5%
Poor knowledge	115	66.5%

Source: Field Survey (2019)

A test of association between respondents' demographic characteristics and their knowledge level on fever showed that hospital of respondents (χ^2 (2, N = 173) = 20.18, *p = 0.003, Phi/Cramer's v = 0.262*), department of work (χ^2 (3, N = 173) = 20.18, *p = 0.001*, *Phi/Cramer's v = 0.342*) and the category of

nursing staff (χ^2 (6, N = 173) = 11.22, *p = 0.039*, *Phi/Cramer's v = 0.261*) had very strong statistically significant associations with respondent's fever knowledge level. These have been captured in Table 5.

Table 5: Association between Fever Knowledge Level and Demographic Characteristics of Respondents

Dependent Variable	Independent Variables	N	χ^2	df	*p* value	Phi/ Cramer's v
Fever Knowledge Level	Gender	173	2.89	1	0.089	0.129
	Age (Years)	173	24.81	21	0.255	0.379
	Religion	173	1.97	2	0.351	0.104
	Marital status	173	1.675	2	0.539	0.100
	Educational level	173	0.80	4	1.000	0.060
	Hospital	173	11.84	2	0.003*	0.262
	Department	173	20.18	3	0.001*	0.342
	Nursing category	173	11.22	6	0.039*	0.261
	Paed. Specialty	173	0.001	1	0.992	0.001
	Experiences (Yrs)	173	16.46	15	0.284	0.329

Source: Field survey (2019) χ^2 - Chi Square/Fisher's Exact statistic
* - Significant at $p \leq 0.05$

When the associated demographic variables were entered into a binary logistic regression model, the results (See Table 6) showed that respondents from CCTH were 0.300 times (OR = 0.300, 95% CI (0.129 – 0.700)) less likely to be highly knowledgeable about fever as compared to their counterparts from Ewim Poly Clinic. Those who worked in Emergency units were 0.184 times less likely (OR = 0.184, 95% CI (0.064 – 0.532)) and Paediatric wards were 0.119 times less likely (OR = 0.119, 95% CI (0.040 – 0.352)) to be highly knowledgeable about fever as compared to respondents from Reproductive and Child Health Units.

Enrolled nurses were 0.130 times less likely (OR = 0.130, 95% CI (0.029 – 0.858)) to be highly knowledgeable about fever as compared to Registered Community Health Nurses. The rest did not significantly predict respondents fever knowledge level.

Table 6: Predictive Effect of Respondents' Hospital, Department of Work and Nursing Category on Fever Knowledge Level

Independent Variable	S.E.	Wald Statistic	df	*p* value	Adjusted OR	95% CI	
						Lower	Upper
Hospital							
CCTH	0.432	7.750	1	0.005*	0.300	0.129	0.700
UCC Hosp	0.509	0.065	1	0.799	0.878	0.324	2.384
Ewim PC		11.412	2	0.003		**Reference**	
Department of work							
OPD	0.598	1.954	1	0.162	0.433	0.134	1.400
Emergency	0.540	9.796	1	0.002*	0.184	0.064	0.532
Paediatric	0.553	14.810	1	<0.001*	0.119	0.040	0.352
RCH		18.017	3	<0.001		**Reference**	
Nursing Category							
EN	0.964	4.489	1	0.034*	0.130	0.020	0.858
CHN	1.069	0.016	1	0.901	0.875	0.108	7.112
RGN	0.888	2.437	1	0.118	0.250	0.044	1.425
PHN	1.658	0.175	1	0.676	0.500	0.019	12.898
RCN		9.112	6	0.167		**Reference**	

Source: Field Survey (2019), Test – Binary Logistic Regression, * - Significant at $p \leq 0.05$, Dependent variable – Fever knowledge level, Predicted for – High knowledge on fever, OR – Odds ratio, SE – Standard error, CI – Confidence interval,

Beliefs about Fever

Table 7 presents the beliefs of the respondents regarding fever. As shown in the table, almost all the respondents (96.5%) were of the belief that fever is non-beneficial and for that matter should be managed anytime it

occurs. Only 3.5% viewed it fever as being beneficial and should be left unmanaged. Similarly, only 1.2% and 1.1% held the belief that fever should be attributed to a curse from the gods or witchcraft respectively, while the overwhelming majority of the respondents (98.8% and 98.9%) believed that fever should not be attributed to a curse from the gods or witchcraft respectively.

Close to a third of respondents (31.2%) felt that fever was harmful to children, with 68.8% feeling that fever was not harmful to children. Similarly, 28.9% held the belief that fever can damage the child's brain, while 71.1% thought otherwise. Further, 86.1% of the respondents felt that fever can cause convulsion, while 13.9% felt it cannot. Also, 19.1% felt that fever should be managed with herbs, while 80.9% held the belief that fever should not be managed with herbs.

Table 7: Respondents Beliefs about Fever

Fever beliefs statements	Responses (n = 173)	
	(SA+A)	(D+SD)
Fever is beneficial, don't always managed	3.5%	96.5%
Fever is a curse from the gods	1.2%	98.8%
Fever is as a result of witches' activities	1.1%	98.9%
I feel fever is harmful to child	31.2%	68.8%
I feel fever can damage the child's brain	28.9%	71.1%
I feel fever can cause convulsions	86.1%	13.9%
Fever should be managed using herbs	19.1%	80.9%

Source: Field Survey (2019)

SA – Strongly Agree, A – Agree, D – Disagree, SD – Strongly Disagree

Based on the analysis of the percentage of positive/true or negative/false responses by respondents to the fever beliefs measurement

items, 84.4% of respondents had positive beliefs about fever, while 15.6% had negative/untrue beliefs about fever. This is shown in Table 8.

Table 8: Summary of Respondents Beliefs about Fever

Beliefs about Fever	Responses	
	Frequency (n = 173)	Percentage (%)
Positive beliefs	146	84.4%
Negative beliefs	27	15.6%

Source: Field Survey (2019)

A test of association between respondents' beliefs about fever and selected demographic characteristics showed that educational level of respondents (χ^2 (4, N = 173) = 12.27, *p = 0.009*, *Phi/Cramer's v = 0.269*) very strong statistically significant association with respondents' beliefs about fever. Respondents' department of work (χ^2 (3, N = 173) = 8.22, *p = 0.036*, *Phi/Cramer's v = 0.209*) had a strong statistically significant associations with respondents' beliefs about fever. These have been captured in Table 9.

Table 9: Association between Beliefs about Fever and Demographic Characteristics Respondents

Dependent Variable	Independent Variables	N	χ^2	Df	*p* value	Phi/ Cramer's v
Fever Beliefs	Gender	173	0.50	1	0.477	-0.054
	Age (Years)	173	19.71	21	0.458	0.344
	Religion	173	0.24	2	1.000	0.051
	Marital status	173	0.816	2	0.713	0.048
	Educational level	173	12.27	4	0.009*	0.269
	Hospital	173	0.09	2	1.000	0.025
	Department	173	8.22	3	0.036*	0.209
	Nursing category	173	7.46	6	0.222	0.229
	Paed. Specialty	173	0.005	1	1.000	-0.006
	Experiences (Yrs)	173	10.00	15	0.848	0.203

Source: Field survey (2019) χ^2 - Chi Square/Fisher's Exact statistic
* - Significant at $p \leq 0.05$

When the associated demographic variables were put into a binary logistic regression model, the results, as shown in Table 10, showed that respondents with diploma qualification were 3.792 times (OR = 3.792, 95% CI (1.403 – 10.245) more likely to have positive beliefs about fever as compared to those with a certificate in nursing (Nurse Assistants). The rest of the significant demographic variables did not significantly predict positive beliefs about fever in respondents.

Table 10: Predictive Effect of Educational Level and Department of Work of Respondents on their Fever Beliefs

Independent Variable	S.E.	Wald Statistic	df	*p* value	Adjusted OR	95% CI	
						Lower	Upper
Educational level							
Certificate		10.335	4	0.035		**Reference**	
Dip. Cert	0.507	6.907	1	0.009*	3.792	1.403	10.245
Post-Dip.	40192.969	<0.001	1	1.000	5.384	<0.001	14.284
BSc.	0.549	0.274	1	0.600	0.750	0.256	2.201
Master's	23205.422	<0.001	1	0.999	5.384	<0.001	14.284
Department of work							
OPD		2.542	3	0.468		**Reference**	
Emergency	0.613	1.583	1	0.208	2.163	0.650	7.196
Paediatric	0.553	0.001	1	0.971	1.020	0.345	3.016
RCH	8569.170	<0.001	1	0.998	4.615	<0.001	40.815

Source: Field Survey (2019), Test – Binary Logistic Regression, * - Significant at $p \leq 0.05$, Dependent variable – Fever Beliefs, Predicted for – Positive Fever Beliefs, OR – Odds ratio, SE – Standard error, CI – Confidence interval

Presence of Fever Phobia

The presence of fever phobia in respondents was also measured as shown in Table 11. As depicted, most of the respondents (87.3%) disagreed with the statement that they get confused when a child has fever, while 12.7%

of the respondents agreed. Majority of the respondents (81.0%) disagreed with the statement that they get anxious and panic when a child has fever, while 19.0% express having anxiety and panick when a child has fever. Similarly, 83.2% disagreed with the statement that they can't eat or sleep when a child get fever, while 16.8% answered in the affirmative. Further, an overwhelming majority of the respondents (91.3%) disagreed with the statement that they cry when a child has fever, while 8.7% confirmed crying when a child has fever. Close to a third of the respondents (30.6%) confirmed that they have fears that a child may die with, while over 69.4% did not have that fear.

Table 11: Respondents Response Fever Phobia Statements

Fever Phobia Statements	Responses (n = 173)	
	Yes (SA+A)	No (D+SD)
I am confused when a child has fever	12.7%	87.3%
I get anxious & panic when child has fever	19.0%	81.0%
I can't eat/sleep when child gets fever	16.8%	83.2%
I cry when a child has fever	8.7%	91.3%
I fear a child may die with the fever	30.6%	69.4%

Source: Field Survey (2019), SA – Strongly Agree, A – Agree, D – Disagree, SD – Strongly Disagree

Based on the analysis of the percentage of positive or negative responses by respondents to the fever phobia measurement items, fever phobia was present in 14.5% of respondents, but absent in 85.5% of the respondents. This is illustrated in Table 12.

Table 12: Summary about Presence of Fever Phobia

Fever Phobia Presence	Responses	
	Frequency (n = 173)	Percentage (%)
Present	25	14.5%
Absent	148	85.5%

Source: Field Survey (2019)

The association between fever phobia and demographic characteristics of respondents was tested. The results showed that the hospital of respondents (χ^2 (2, N = 173) = 5.69, *p = 0.047, Phi/Cramer's v = 0.181*) had a strong statistically significant association with respondents' fever phobia. The rest of the demographic characteristics were not significantly associated with fever phobia. These have been captured in Table 13.

Table 13: Association between Fever Phobia and Demographic Characteristics of Respondents

Dependent Variable	Independent Variables	N	χ^2	Df	*p* value	Phi/ Cramer's v
Fever Phobia	Gender	173	1.712	1	0.191	-0.099
	Age (Years)	173	19.19	21	0.501	0.362
	Religion	173	3.54	2	0.167	0.150
	Marital status	173	0.60	2	1.000	0.033
	Educational level	173	7.09	4	0.114	0.218
	Hospital	173	5.69	2	0.047*	0.181
	Department	173	5.26	3	0.151	0.189
	Nursing category	173	8.69	6	0.148	0.218
	Paed. Specialty	173	1.05	1	0.595	-0.078
	Experiences (Yrs)	173	12.26	15	0.659	0.281

Source: Field survey (2019) χ^2 - Chi Square/Fisher's Exact statistic
* - Significant at $p \leq 0.05$

When the associated hospital of respondents was put into a binary logistic regression model, the results, as captured in Table 14, showed that the hospital of work was not a statistically significant predictor of the presence of fever phobia in respondents.

Table 14: Predictive Effect of Respondents' Hospital on the Presence of Fever Phobia in Respondents

Independent Variable	S.E.	Wald Statistic	df	*p* value	Adjusted OR	95% CI	
						Lower	Upper
Hospital							
CCTH	0.656	1.152	1	0.283	2.022	0.559	7.317
UCC	1.185	1.216	1	0.270	0.271	0.027	2.760
Ewim PC		4.539	2	0.103	**Reference**		

Source: Field Survey (2019), Test – Binary Logistic Regression, * - Significant at $p \leq 0.05$, Dependent variable – Fever Phobia, Predicted for – Presence of Fever Phobia, OR – Odds ratio, SE – Standard error, CI – Confidence interval

Childhood Fever Management Practices

Influencers of fever management decisions

As presented in Table 15, the decision to manage and how to manage fever in children by respondents in the hospital were mostly influenced by colleague nurses (50.3%), Doctors (44.5%), Pharmacist (27.2%) and the child's parents (23.7%). On the contrary, a good number of respondents reported no influence at all from Pastor/Imam (61.8%), Family friends (53.2%), Child grandparents (48.6%) and child's parents (29.5%).

Table 15: Influencers of Respondents Fever Management Decisions

Influencers of Fever Management Decisions	Responses (n = 173)			
	Not at all	A little	Much	Very much
Child's parents	29.5%	23.7%	23.1%	23.7%
Child grandparents	48.6%	30.6%	16.8%	4.0%
Family friends	53.2%	34.1%	11.0%	1.7%
Pastor/Imam	61.8%	27.7%	8.7%	1.7%
Doctors	7.5%	13.9%	34.1%	44.5%
Colleague Nurses	8.7%	10.4%	30.6%	50.3%
Pharmacist	17.3%	23.7%	31.8%	27.2%

Source: Field Survey (2019)

Table 16 presents responses about the site and tools used in monitoring fever in children. As shown, the overwhelming majority of respondents (87.3%) used digital thermometer. The rest used a non-digital thermometer (6.4%), infra-red thermometer (5.2%). Surprisingly, 1.2% of respondents indicated that they used their hands to measure temperature. With the site for measuring temperature, majority of the respondents 90.8% used the axilla, followed by forehead (5.8%), rectal (1.7%) and stomach (1.7%).

Table 16: Tools and Sites for Temperature Measurement by Respondents

Tools & Sites for Temperature Measurement	Responses	
	Frequency (n = 173)	Percentage (%)
Tool for measuring temperature		
Using Digital Thermometer	151	87.3%
Using Infra-red Thermometer	9	5.2%
Using non-digital Thermometer	11	6.4%
Hand	2	1.2%
Site for measuring temperature		
Axilla	157	90.8%
Forehead	10	5.8%
Rectal	3	1.7%
Stomach	3	1.7%

Source: Field Survey (2019)

Fever management practices

Table 17 shows the responses of respondents to items designed to assess their fever management practices. As captured in the table, most respondents (85.5%) indicated that they manage fever in children based on the temperature. Only 23.1% respondents agreed that fever management should start only after laboratory test, while 78.0% agreed that fever management should be based on physical examinations findings. Further, over half of the respondents (67.1%) agreed that fever management is based on the child's medical history.

Most of the respondents (89.0%) indicated that a febrile child should be kept well hydrated with fluids and breastfeeding encouraged. About 56.7% preferred to manage the child's fever with other methods first than medications. Majority of the respondents (87.9%) made use of paracetamol as the main choice of antipyretics to manage children fever as compared to Ibuprofen's 30.1%. Further, 39.9% of the respondents' resort to medications immediately the child's has fever.

On other forms of reducing fever in children, majority of the respondents (78.6%) said removing excess cloths from the child helps reduce fever, 93.1% indicated sponging with normal tap water, while 8.6% said the water they use water from the fridge (cold water) to sponge febrile children. The overwhelming majority (91.4%) however disagreed that a febrile child should be sponged with water from fridge.

Out of the 173 respondents, 85.6% agreed that a febrile child should be sponged starting from the feet, while 17.3% said it should start from the head. Also, most of the respondents (80.9%) agreed to combining sponging and

antipyretics in managing fever in children. On the presence of fever management protocols, most of the respondents (78.6%) agreed that they have fever management protocol in their hospitals, while 70.6% indicated that their ward/unit have child fever management protocols.

Table 17: Fever Management Practices by Respondents

	Responses (n=173)	
Fever management practices items	**(SA+A)**	**(D+SD)**
Fever in a child is managed based on temperature	85.5%	14.5%
Fever managements starts only after lab test results	23.1%	76.9%
Fever managed based on of physical exam findings	78.0%	22.0%
Fever in a child managed based on medical history	67.1%	32.9%
Child kept well hydrated/breastfed	89.0%	11.0%
Prefer to manage child's fever with medicines	43.4%	56.6%
Commonly use paracetamol as an antipyretic	87.9%	12.1%
Commonly use Ibuprofen as an antipyretic	30.1%	69.9%
Antipyretic quickly given following start of fever	39.9%	60.1%
Excess cloths removed from child	78.6%	21.4%
Febrile child sponged with water from fridge	8.7%	91.3%
Febrile child sponged with normal tap water	93.1%	6.9%
Febrile child sponged from feet first	85.6%	14.4%
Febrile child sponged from head first	17.3%	82.7%
Febrile child sponged + antipyretic	80.9%	19.1%
Hospital has child fever management protocol	78.6%	21.4%
Ward/Unit has child fever management protocol	70.6%	29.4%

Source: Field Survey (2019)

Discussion of Findings

Demographic Characteristics

Findings from the study showed that over half of the respondents were females. Similar socio-demographic findings have also been reported by (Edwards et al., 2007; Greensmith, 2012; Mohamed & Ali, 2012). These similarities may be attributed to the fact that nursing is still a female dominated profession.

They had a mean age of 29 years (SD ± 4.89), pointing to the fact that most of the nurses were relatively young. Academically, a little over half of them had a Diploma in Nursing, with a quarter being Nurse assistants. In Ghana, the diploma qualification is the basic qualification for professional nursing practice. However, Ghana still trains nurse assistants in both the preventive (certificate Community Health Nurses) and curative areas (Enrolled Nurses) of practice. (Edwards et al., 2007; Greensmith, 2012; Mohamed & Ali, 2012). Respondents had varied working experience ranging from 1 - 20 years, the key departments are emergency unit, paediatric unit, OPD and child welfare. The insignificant number of respondents with paediatric specialty limited further analysis in this present study.

Fever Knowledge Level

More than half of the respondents (66.5%) were found to have poor knowledge on fever. The findings are consistent with a similar study conducted in Vietnam which reported that, more than half of the respondents (62.5%) had poor knowledge (Tran, 2014). These findings may be attributed to the fact that, as lower-middle income countries, Ghana and Vietnam share

relatively similar characteristics in terms of their working environment and curricular training.

The poor knowledge on fever management could also be credited for excessive workload and fatigue of staff on the various paediatric wards. According to Montgomery (2007), fatigue and extreme workload on paediatric nurses account for medical errors and poor outcomes.

Findings from a study conducted on supportive health environment reported that, active involvement in ward activities yields greater knowledge and satisfaction. However, poor engagement and participation in the work place could also account for poor knowledge on the job (Ulit et al, 2020).

The findings are however contrary to findings by Greensmith (2012) and Walsh et al. (2005), who found that nurses fever knowledge level was as high as 51% in an Irish hospital and 62% in Australia respectively. Slightly less knowledge was however reported by Edwards et al. (2007) with regards to the physiology of fever and nurses' knowledge of antipyretics and their use in fever management was even poorer. The differences in the study could be attributed to the difference in the study setting. More so, the calibre of paediatric nurses may differ due to the discrepancy in training and working environment. Ullman et al, (2020) posit that paediatric nurses have higher research degrees and work in different interdisciplinary teams. As a result of efforts to implement evidence-based practise, there is a struggle to utilize research findings in the field of paediatric nursing as reported in a study done in Ireland on barriers to, and facilitators of, research utilization among nurses in Northern Ireland (Parahoo, 2000). This could account for the high knowledge recorded.

The finding does not augur well for the management of fever in children in the 3 hospitals. Nurses' knowledge deficits raise concern about the quality of care received by febrile children. This implies that nurses are likely to commit errors in the care they render to children with fever under their care because their poor knowledge level on fever. Consequently, this is likely to hinder efforts towards the full attainment of goal 3 of the SDGs (UNDP,2015).

Statistically significant association was established between respondents' demographic characteristics (department of work hospital of respondents, and category of nursing staff) and their knowledge level on fever. The department of work had the highest influence on the fever knowledge level of nurses. Raffaeli et al. (2016) made similar findings in an Italian study where there was a significant relationship between fever knowledge and place of working. However, a Vietnamese study found that nurses' knowledge on fever was influenced by their educational level, paediatric nursing experience and having undertaken paediatric courses instead (Tran, 2014). The findings could be attributed to the differences in settings, different training and practice environments of the nurses between the other study settings and that of Ghana (Cape Coast Metropolis).

The implication of this is that nurses would have to be routinely rotated through the various child health units in the 3 hospitals to ensure that each nurse gets an opportunity to upgrade her knowledge on childhood fever. Hospital of work, the results, showed that respondents from CCTH were 0.300 times less likely to be highly knowledgeable about fever as compared to their counterparts from Ewim poly Clinic. Those who worked in Emergency units were 0.184 times less likely and Paediatric wards were 0.119 times less likely

to be highly knowledgeable about fever as compared to respondents from Reproductive and Child Health Units (RCH). The differences in these findings could be as a result of the fact that emergency units are more focused on life-saving activities, which are usually prioritized, with fever knowledge being pushed down the perking order, while RCHs engage in more health promotion and education activities for children and their mothers, including fever management.

Furthermore, Enrolled nurses were 0.130 times less likely to be highly knowledgeable about fever as compared to Registered Community Health Nurses. The differences in curricular designs and training could account for this difference. Further, enrolled nurses are Nurse-Assistants while Registered Community Health Nurses are professional nurses

Beliefs about Fever

Beliefs of the respondents regarding fever showed almost all the respondents were of the belief that fever is non-beneficial and for that matter should be managed anytime it occurs contrary to evidence that suggest that fever comes with beneficial effects. For example, it has been suggested by reviews and studies that fever slows the replication of bacteria and viruses in the body (Barbi et al., 2017; Mackowiak, 2006; Martins & Abecasis, 2016; Ogoina, 2011; Walter et al., 2016). Furthermore, through enhancing phagocytosis and T-lymphocyte activity, the febrile response is believed to improve the body's ability to fight infection (Patricia, 2014; Polat et al., 2014).

Less than 2% of the respondents held the belief that fever should be attributed to a curse from the gods or witchcraft, this may be ascribed to the overall low fever knowledge level among respondents. It could also be

attributed to cultural and ethnic influences by parents and grandparents. According to Patricia (2014), culture is known to influence the knowledge level.

Close to a third of respondents believed that fever was harmful to children,

The beneficial effects of fever have been reported by several studies (Betz & Grunfeld, 2006; Kiekkas et al., 2014; Patricia, 2014; Polat et al., 2014; Tran, 2014; Walsh & Edwards, 2006). Despite the reported beneficial effects of fever, more than one quarter of respondents in this current study held the belief that fever can damage the child's brain. Further, majority of the respondents felt that fever can cause convulsion. These beliefs and concerns have been reported by previous studies where nurses perceived fever as harmful, causing febrile convulsions and brain damage (Crocetti et al., 2009; Edwards & Walsh, 2007; Tran, 2014; Wallenstein et al., 2012; Walsh et al., 2005).

The findings showed that the respondents generally have positive beliefs about fever. Respondents' educational level and department of work had a very strong statistically significant association with respondents' beliefs about fever. Respondents with diploma qualification were 3.792 times more likely to have positive beliefs about fever as compared to those with a certificate in nursing (Enrolled nurses). This finding could be attributed to the advanced education received by the diploma level nurses as compared to the enrolled nurses. Similar findings have been made by other studies (Tran, 2014; Walsh, Edwards, Courtney, Wilson, & Monaghan, 2005).

Presence of Fever Phobia

The findings reveal that majority of respondents did not experience fever phobia. This may be due to the fact that the majority of the respondents were diploma holders. holders and above, suggesting that they generally better appreciate the physiology of fever, hence, the less presence of fear of fever in children. Contrary to these findings, a number of studies continue to report fever phobia among nurses toward fever (Kelly et al., 2016; Kwak et al., 2013; Tran, 2014; Walsh, Edwards, Courtney, Wilson & Monaghan, 2005), despite evidence existing to the fact that fever is a physiologic response in the body and is actually beneficial to the host (Dixon et al., 2006; Evans, Repasky & Fisher, 2015; Patricia, 2014; Walter, Hanna-Jumma, Carraretto & Forni, 2016).

However, close to a third of the respondents confirmed having fears that a child may die when the child has fever, indicating a considerable level of fear. This may be from those with poor fever knowledge, since they do not have an insight into the physiologic benefit and the pathophysiology of fever. Similar fever phobia have been exhibited by nurses and other health care workers in numerous studies (Barbi et al., 2017; Chiappini et al., 2018; Edwards, Courtney, Wilson, Monaghan & Walsh, 2001; El-Radhi, 2012; Martins & Abecasis, 2016; Tran, 2014).

Childhood Fever Management Practices

Influencers of fever management decisions

The decision to manage and how to manage fever in children by respondents in the hospital were mostly influenced by colleague nurses, doctors, pharmacists and to a lesser extent, the child's parents. Most nurses undertake activities as ordered by doctors and senior nurses. Similar findings

were made by Walsh et al. (2005) in an Australian study. Nurses in that study reported that the strongest pressure to administer paracetamol for fever management came from parents and peers. However, they were more likely to adhere to the wishes of medical staff than parents or peers. On the contrary, a good number of respondents reported no influence at all from pastor/imam, family friends, child grandparents and child's parents.

Fever measurement tools and sites

In measuring temperature in children, the overwhelming majority of respondents made use of digital thermometers. This finding is because most hospitals within the country have moved away from analog temperature measurement tools to digital tools. Similar findings were made by Chiappini et al. (2018) in an Italian study where the digital thermometer was the most widely used .

A little over 1% of the population indicated using the back of their hand/palm to measure temperature. This method of measurement of temperature in children, though reported by a small number of respondents, is wrong as it is neither metric nor recommended by authorities like the American Academy of Pediatrics (2012), WHO and UNICEF (2005), and the Ministry of Health of Ghana (MOH, 2015).

The most preferred site used by respondents for measuring temperature in children is the axilla. Chiappini et al. (2018) made similar findings in an Italian study where the axillary site was the most preferred and used site for temperature measurement. The finding is also in line with recommendations by the American Academy of Paediatrics (2012) and the National Collaborating Centre for Women's and Children's Health (2013) recommends that body

temperature can be measured in the axilla, rectum, mouth, skin, and ear. Rectal temperature is considered to be the most accurate for estimating core body temperature and is recommended by the American Academy of Paediatrics (2012) for children less than 4 years of age. However, its use is discouraged by other clinical guidelines because of safety and practical issues, as well as for the physical and psychological discomfort it may cause (Barbi et al., 2017).

Fever management practices

Half of the respondents manage fever based on the child's past fever and medical history. Similar findings were made in a Portuguese study, where nurses considered that a history of febrile seizures and the fear of febrile seizures was the most decisive factor in initiating fever treatment (Martins & Abecasis, 2016).

Majority of the respondents made use of paracetamol as the main choice of antipyretics to manage children fever The findings, however, is in line with that of Elbushra (2004) and Patricia (2014) who also found in their studies that paracetamol was the most common antipyretic used by nurses for patient care. A similar finding was made by Luk, Ha and Hui (2008) in a Hong Kong study which showed 31.9% of nurses resort to the use of antipyretics in fever control in children. Even more nurses (97.4% and 82.1% respectively) were found to be using Paracetamol and Ibuprofen for fever management in Children in a Canadian study (Karwowska et al., 2002).

Although paracetamol and Ibuprofen are recommended in the standard protocol, nurses in this study prefer paracetamol to Ibuprofen. This could be contributed to the availability of the drug and the route of administration. Some children vomits when oral medications are given when they have fever,

preferably suppository are given and paracetamol comes in suppository form than ibuprofen.

The overwhelming majority of respondents also reportedly used normal tap water to sponge febrile children, whiles starting the sponging from the feet of children, despite the presence of evidence showing the ineffectiveness of tepid sponging on fever outcomes (Tran, 2014).

Also, most of the participants combine sponging and antipyretics in managing fever in children. Close to a 10th of respondents sponged febrile children using water from the fridge (cold water). Similar findings have been made in a Hong Kong study where the use of ice bags (69.9%) and cool bathing (5.3%) was employed for fever management (Luk et al., 2008). This practice has however been frowned upon by authorities and standards (MOH, 2015; Walter et al., 2016; WHO, 2013), except in hyper pyrexia situation where ice pack cooling is recommended (Luk et al., 2008). A contrary finding was however made in a Canadian study where none of the nurse respondents recommended this practice (Karwowska et al., 2002).

On the presence of fever management protocols, most of the respondents agreed that they have a fever management protocol in their hospitals and ward/unit. Luk, Ha and Hui (2008) made similar findings in a Hong Kong study, where 83.9% of the respondents indicated the presence of fever management protocols in their hospitals and units. The presence of fever management protocols has been underscored by Thompson and Kagan (2010) in a US study where its absence was seen as a barrier identified to fever management.

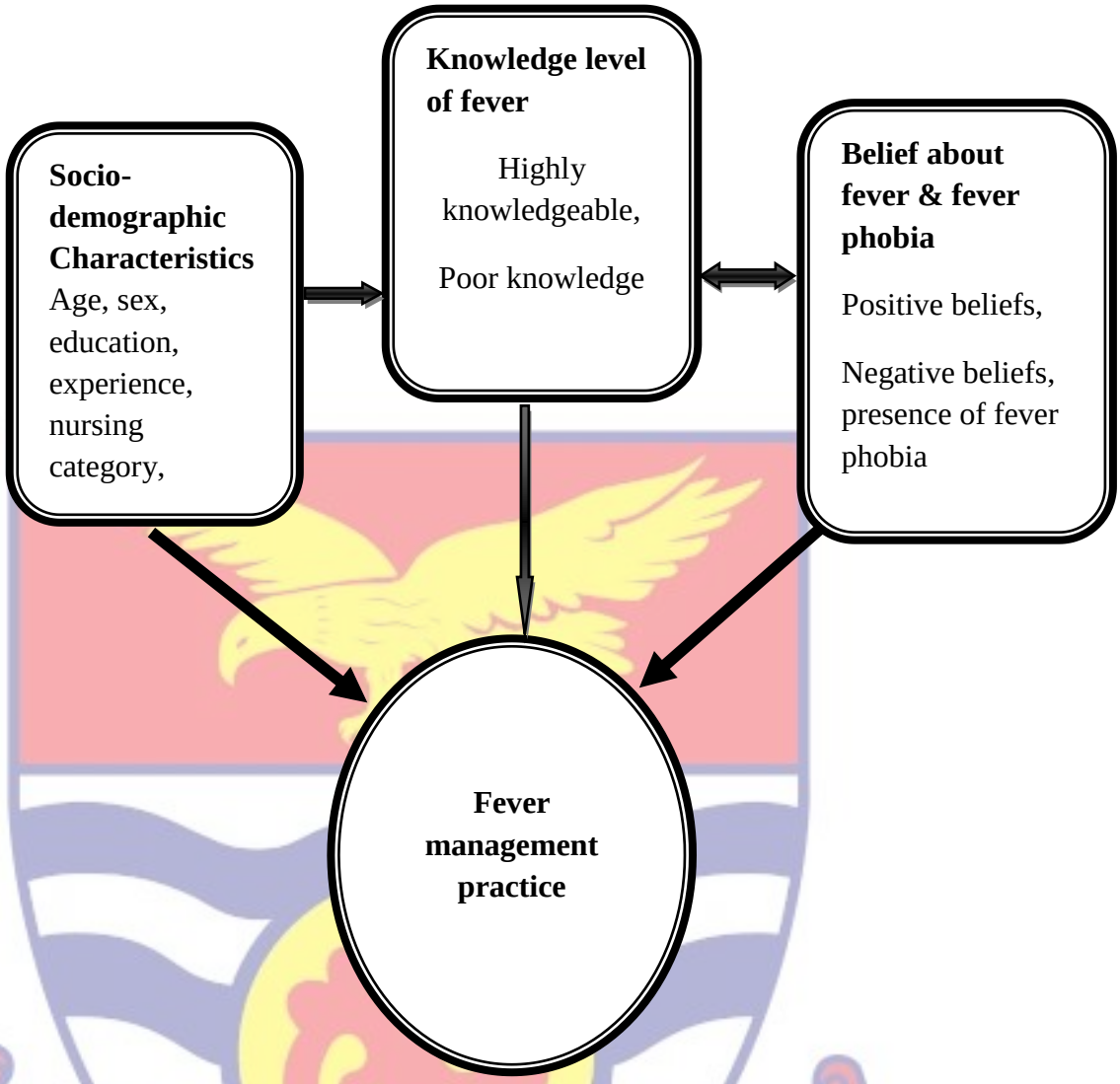


Figure 2: Conceptual framework of factors that influences fever management

The conceptual framework developed for this study noted among others the direct relations between socio-demographic characteristics (education experience, nursing category), Knowledge level of fever and belief about fever and fever phobia. However, the analysis shows that there is a reverse relation between knowledge level of fever and belief about fever and fever phobia in influencing fever management practices. Socio-demographic characteristics influences knowledge and thus fever management practices.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

The study sought to assess the knowledge level on fever, beliefs about fever and childhood fever management practices among nurses at the Cape Coast Teaching Hospital, University of Cape Coast Hospital and the Ewim Polyclinic in the Cape Coast metropolis. A cross sectional survey design with a quantitative approach was used to successfully sample 173 participants out of a target population of 195. Therefore, 173 questionnaires were retrieved, cleaned, coded and the data entered into SPSS version 24 in a computer for analysis. The major findings are summarised in the ensuing paragraphs.

Summary

Most respondents were females, with a mean age of 29.03 (SD ± 4.89). Most were Christians and single. Academically, a little over half of them had Diploma in Nursing, with Nurse assistants being up to a quarter of the respondents. Most of the respondents were from CCTH, followed by UCC Hospital and Ewim Polyclinic. In terms of nursing category, most were Registered General Nurses. But significant numbers of Enrolled nurses and Community Health Nurses were present.

In terms of working experience, the mean years of experience was 3.87 (SD ± 3.48). Most worked in Paediatric wards, Emergency wards, OPDs and Child welfare clinics. Only 3.5% had paediatric specialty training, with a mean post-paediatric nursing specialty experience of 3.00 (SD ± 2.28).

Those who were highly knowledgeable about fever were only 33.5%, with over half of the respondents (66.5%) found to have poor fever knowledge. Further analysis showed that the hospital, department of work and the category

of nursing staff had very strong statistically significant associations with respondents' fever knowledge level. Respondents from CCTH were 0.3 times less likely to be highly knowledgeable about fever as compared to their counterparts from Ewim Poly Clinic. This is an interesting finding, considering the fact that CCTH is a tertiary hospital, whose nurses comparatively should be highly knowledgeable in fever than the other hospitals.

In terms of beliefs about fever and the presence of fever phobia, almost all respondents (96.5%) were of the erroneous belief that fever is non-beneficial. Though on a small scale, 1.2% and 1.1% of respondents held the belief that fever should be attributed to a curse from the gods or witchcraft respectively. This is a worrying finding for nurses who are expected to know better to ensure adequate management of childhood fevers. About 8.7% of respondents confirmed crying when a child has fever, 30.6% confirmed having fears that a child may die as a result of fever. Overall, only 14.5% of all respondents exhibited signs of fever phobia. The overwhelming majority of respondents did not have fever phobia.

In terms of fever management practices, nurses fever management are mostly influenced by colleague nurses, doctors, pharmacists and the parents of febrile children. In temperature measurement, the overwhelming majority of made used of digital thermometers. Surprisingly, 1.2% indicated using the back of their hand/palm to measure temperature. This method is not recommended as it is not an accurate or a metric form of measuring body temperature. The site used by most respondents for measuring temperature in children was the axilla (90.8%).

Most nurses managed fever based on high temperature readings. A little over half (56.7%) preferred to manage a child's fever with other methods first than medications, such as removing excess clothes (78.6%), sponging with normal tap water (93.1%), hydration with fluids and breastfeeding (89.0%). On sponging, majority used normal tap water reduce children fever, while some nurses (8.6%) confessed using water from the fridge (cold water) to sponge febrile children. This practice is frowned upon by standards and authorities, except in situations of hyper pyrexia.

Most (85.6%) undertake the sponging starting from the feet. Most (80.9%) also combine sponging with the administration of antipyretics in managing fever in children. The antipyretic mostly employed include paracetamol (87.9%) and Ibuprofen (30.1%). Most had fever management protocols in their hospitals (78.6%) and ward/unit (70.6%).

Conclusion

Based on the findings in this study, it is safe to conclude that:

1. Most nurses in the study area have a poor overall knowledge on fever. Respondents from Ewim Poly Clinic were more likely to be highly knowledgeable about fever as compared to their counterparts from CCTH.
2. Most nurses in the study area generally hold positive beliefs about fever. However, a few nurses hold the belief that fever should be attributed to a curse from the gods or witchcraft respectively.
3. Overall, the overwhelming majority of respondents did not exhibit fever phobia tendencies. This means they have the confidence to manage fever among children

4. Most nurses used digital thermometers in temperature measurement. A few nurses, however, use the back of their hand/palm to measure temperature.
5. Most nurses preferred to manage a child's fever with methods other than medications first. Some nurses use water from the fridge (cold water) to sponge febrile children.
6. Others preferred a combination of sponging and the administration of antipyretics in managing fever in children. The antipyretic mostly employed include paracetamol and Ibuprofen.

Recommendation

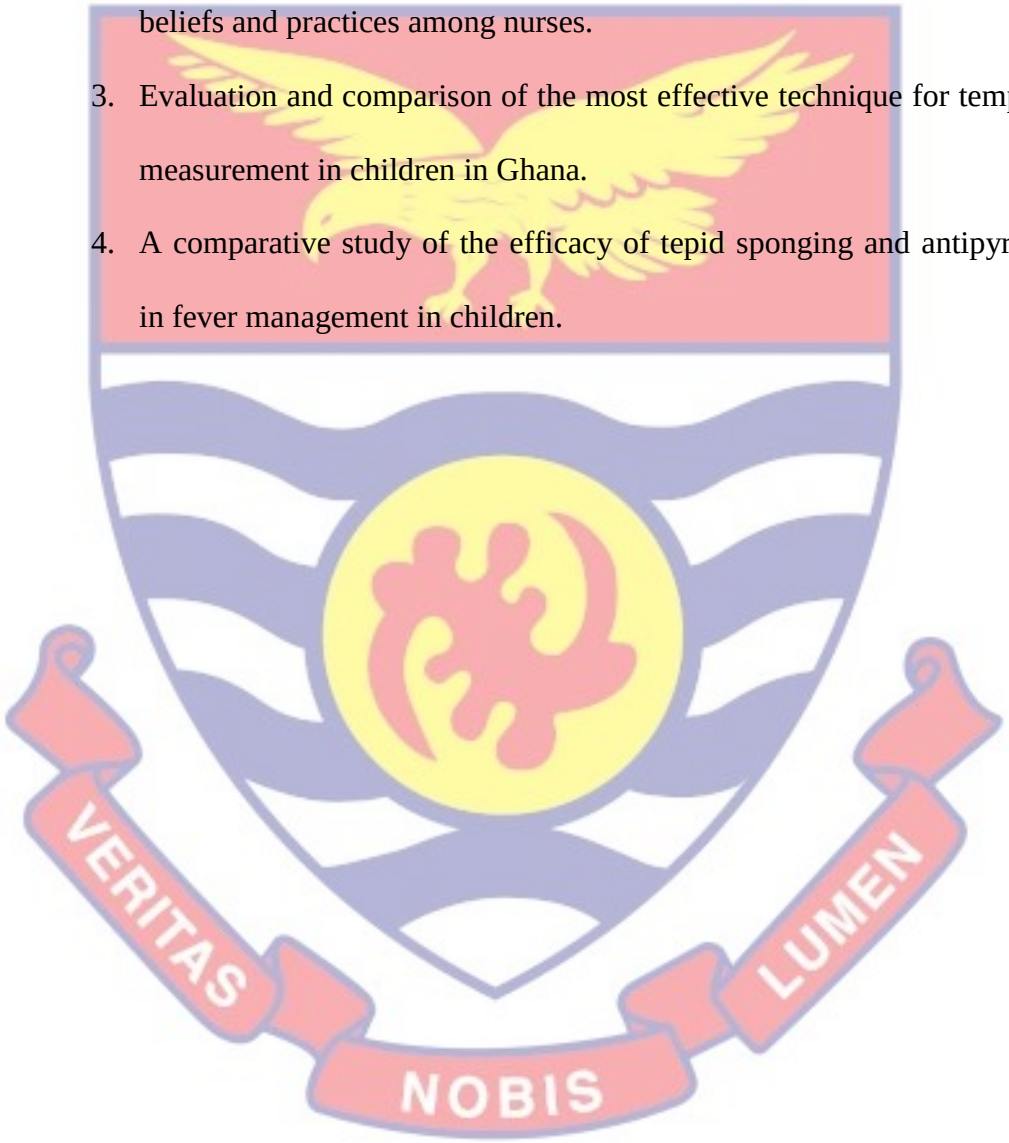
Based on the findings, the researcher makes the following recommendations:

1. The Ghana Health Service, the University of Cape Coast Hospital and the Teaching Hospital in Cape Coast should design and conduct continuous professional development (CPD) trainings on childhood fever and fever management practices for nurses in the Cape Coast metropolis.
2. The Ghana Health Service should organise workshops to re-orient nurses on negative beliefs on childhood fever.
3. The ministry of Health, the Ghana Health Service and other health institutions in the country should ensure that all health institutions should adhere to the laid down protocol on fever management in children. In addition, they should update, unify and simplify the fever management protocols in the country for health facilities and professionals.

Suggestions for Further Research

The researcher recommends further studies on the following in future:

1. An observational study to learn the practice of fever management among nurses
2. An interventional study to understand the effect of training on knowledge, beliefs and practices among nurses.
3. Evaluation and comparison of the most effective technique for temperature measurement in children in Ghana.
4. A comparative study of the efficacy of tepid sponging and antipyretic use in fever management in children.



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APPENDICES

Appendix A*:* Research Information to Participants/ Data Collection Instrument

Research Title: Fever Management in Children of 0-5 years: A Survey of the Knowledge, Beliefs and Practices among Nurses in the Cape Coast Metropolis, Central Region, Ghana.

Principal Investigator: Lawrencia Antoinette Aidoo

Address: School of Nursing and Midwifery, College of Health and Allied Sciences, University of Cape Coast, Cape Coast. Ghana.

General information about the Research: This research is generally aimed at assessing the knowledge level on fever, beliefs about fever and childhood fever management practices of Nurses at the Cape Coast Metropolis, Ghana. The principal investigator is a final year Master of Nursing student of the School of Nursing and Midwifery, University of Cape Coast. The motivation for this research is that, childhood fever management practices mostly rests with nurses, who are expected to greatly contribute to child survival and the achievement of the Sustainable Development Goal 3 (SDG 3).

Procedure: You are being invited to take part in this research because of your important role in the care of febrile children who are brought to the hospital. If you agree to take part, you will be required to sign a consent form and complete a questionnaire. About 20 minutes or less of your time will be required to complete the questionnaire.

Possible Risks and Discomforts: I do not anticipate any risk or discomfort from participating in this research.

Possible Benefits: This will help nurses improve upon child survival and contribute the achievement of the SDG 3. It will also help fill the knowledge and literature gap that exist in Ghana on childhood fever management practices among nurses.

Confidentiality: Information you will provide will be treated with the utmost confidentiality. Therefore, your name and address or telephone number is not required. The information will be used for academic and professional purposes

only. Additionally, you will not be named in any report emanating from this research.

Compensation: You will not be provided any payment for participation. Participation is voluntary.

Voluntary Participation and Right to Leave the Research: Participation is voluntary. You can change your mind if you do not wish to continue even after accepting to take part.

Funding for Research: The research is been funded by the principal investigator.

Your rights as a Participant: This research has been reviewed and approved by the Institutional Review Board of University of Cape Coast (UCC-IRB). If you have questions about your rights as a participant, contact the administrator through the phones lines: 0332133172 and 0244207814 or email address: irb@ucc.edu.gh

For further information/enquiries, contact: **Lawrencia Antoinette Aidoo, Ankaful Leprosy and general hospital, P.O. Box AD 99, Cape Coast. Telephone: 0243009813/ 0504142598, Email:** kwansemaaidoo@gmail.com

INFORMED CONSENT FORM

VOLUNTEER/PARTICIPANT AGREEMENT

The above document describing the benefits, risks and procedures for the research title ***(Fever Management in Children of 0-5 years: A Survey of the Knowledge, Beliefs and Practices among Nurses in the Cape Coast Metropolis, Ghana)*** has been read and explained to me. I have been given an opportunity to have any questions about the research answered to my satisfaction. I agree to participate as a volunteer.

Name and signature or mark of volunteer/participant_____

Date _____

INVESTIGATOR STATEMENT AND SIGNATURE

I certify that the participant has been given ample time to read. All question and clarifications raised by the participant have been addressed.

Researcher's name ……

Signature……..

Date……

Data Collection Instrument

UNIVERSITY OF CAPE COAST

RESEARCH INFORMATION TO PARTICIPANTS

Research Title: Fever Management in Children of 0-5 years: A Survey of the Knowledge, Beliefs and Practices among Nurses in the Cape Coast Metropolis, Ghana.

This research is generally aimed at assessing the knowledge level on fever, beliefs about fever and childhood fever management practices among nurses at the Cape Coast Metropolis, Ghana. The principal investigator is a final year Master of Nursing student of the School of Nursing and Midwifery, University of Cape Coast. The motivation for this research is that, childhood fever management in the hospital mostly rests with nurses, who are expected to greatly contribute to child survival and the achievement of the Sustainable Development Goal 3 (SDG 3).

QUESTIONNAIRE FOR NURSES

For each question, kindly tick in the box that best correspond to your opinion. Tick in only one box per question. There are **no right or wrong answers**. Your honest opinion is what is valued here. Thank you.

SECTION A: SOCIO-DEMOGRAPHIC DATA

1. Gender
   - Male [ ]
   - Female [ ]
2. Age (years) ……..
3. Religion
   - Christian [ ]
   - Muslim [ ]
   - Traditionalist [ ]
   - Others (specify) …….
4. Marital status
   - Single [ ]
   - Married [ ]
   - Divorced [ ]
   - Others (specify) …….

5. What is your highest academic qualification
   - Certificate in Nursing [ ]
   - Diploma [ ]

Post-diploma Cert. [ ]
BSc. Nursing [ ]
Master's in Nursing [ ]

6. Which nursing category do you belong?
   EN [ ]
   CHN [ ]
   RCHN [ ]
   RGN [ ]
   RM [ ]
   RMN [ ]
   PHN [ ]
7. Department of work
   OPD [ ]
   Emergency [ ]
   Paediatric [ ]
   RCH [ ]
   Others (specify) .....
8. Years of work experience .....
9. Do you have any Paediatric speciality training?
   Yes [ ]
   No [ ]
   Unsure [ ]
10. If yes in Q.9, how many of years of paediatric specialty training have you had? .....

SECTION B: KNOWLEDGE LEVEL OF NURSES ABOUT FEVER

The statements below are meant to measure what you know about fever in children. Kindly tick the box that corresponds to your opinion or fill in the spaces provided. **Remember, there are no right or wrong answers. It is your opinion that is needed.**

State your level of agreement with the following statements	Strongly Disagree	Disagree	Agree	Strongly Agree
11. Fever in children is always harmful				
12. Fever in children can be beneficial				
13. The body's temperature regulatory centre is located in the brain				
14. I am aware of the WHO guidelines for managing fever				
15. I am aware of the IMCI guidelines for managing				

fever				
16. I am aware of the Ghana standard treatment guidelines for managing fever				
17. Fever above 41^0C impairs the immune response				
18. Fever below 41^0C is not harmful to the host.				
19. Temperature always relate to the severity of the illness				
20. One of the benefits of fever is the production of antibodies in the host				
21. The most common side effect of fever is dehydration				
22. Fever occur in the presence of infection				
23. Fever can occur in the absence of infection				
24. It is unnecessary to reduce temperature less than 40^0C with antipyretics unless a child is at risk of additional physiological strain of fever				
25. Regular administration of antipyretic medication may mask a fever of a progressive infectious process				
26. Febrile convulsion usually generally occurs within the first 24hours of a febrile associated illness				
27. Risk for febrile convulsion includes a previous history of febrile convulsion				
28. Risk for febrile convulsion includes a family history of febrile convulsion				
29. Neurological damage is common in a child who				

has had a febrile convulsion				
30. The first febrile convulsion is preventable				
31. It is normal for a child's temperature to fluctuate more than 1^0C during any 24-hour period				
32. Fever reduction from paracetamol generally lasts between 3 – 4hours				
33. The antipyretic effect of paracetamol is longer than that of Ibuprofen				

SECTION C: BELIEFS OF NURSES ABOUT FEVER IN CHILDREN

Kindly indicate your level of agreement or disagreement with the statements below meant to measure how you view fever in children. **Remember, it is your opinion that is needed, as such, there are no right or wrong answers.**

How much do you agree with the following statements?	**Strongly disagree**	**Disagree**	**Agree**	**Strongly Agree**
34. Fever is beneficial so should be left unmanaged				
35. Fever is a curse from the gods				
36. Fever is as a result of witches' activities				
37. I am always confused when a child has fever				
38. I get anxious and panic when a child has fever				
39. When a child gets fever, I am unable to eat or sleep				
40. I cry when a child has fever				
41. I feel a child may die with the fever				
42. I feel the fever is harmful for the child				
43. I feel the fever may lead to brain damage for a child				
44. I feel the fever may lead to convulsions and epilepsy in a child				
45. Apart from hospital				

management, I believe fever in children should be also managed using herbal preparations				

SECTION D: CHILDHOOD FEVER MANAGEMENT PRACTICES USED BY NURSES AT THE HOSPITAL

Kindly indicate your level of agreement or disagreement with the statements below based on how you commonly treat children with fever in your ward. **Remember, it is your opinion that is needed, as such, there are no right or wrong answers.**

46. How do you carry out the measurement of children's temperature at the hospital?
    ……

47. Which site do you usually use when measuring children temperature at the hospital?
    ……

How much are your fever management actions influenced by the following when a child has fever	**Not at all**	**A little**	**Much**	**Very Much**
48. Child's father/mother				
49. Child grandparents				
50. Family friends				
51. Pastor/Imam				
52. Doctors				
53. Nurses				
54. Pharmacist				
55. Others (Specify)……				

Statements about fever management practices in children	**Strongly disagree**	**Disagree**	**Agree**	**Strongly Agree**
56. I treat a febrile child on the basis of temperature readings				
57. I wait till laboratory investigation are done before treating febrile child				
58. I treat a febrile child on the basis of physical examinations/Assessment				
59. I treat a febrile child on the				

basis of child health history				
60. I keep a febrile child well hydrated with fluids and encourage breastfeeding if the child is breastfeeding				
61. I prefer to manage a child's fever with medicines other than other methods				
62. I commonly use paracetamol as an antipyretic in children fever management				
63. I commonly use Ibuprofen as an antipyretic in children fever management				
64. I quickly administer medications immediately the child has fever				
65. I remove excess clothing of a febrile child to reduce his/her temperature				
66. I sponge the febrile child with cold water from the fridge				
67. I sponge the febrile child with normal water from the tap				
68. I sponge the child by starting from the legs and arms, and gradually work my way upwards to the head				
69. I sponge the child by starting from the head, and gradually work my way downwards towards the legs				
70. I still sponge febrile children with water even when they are on antipyretic medication				
71. The hospital has fever management protocols for children				
72. My ward has fever management protocols for children				

Appendix B: Student's Application Letter to UCC IRB for Ethical Clearance

University of Cape Coast
College of Health and Allied Sciences
School of Nursing and Midwifery
Cape Coast
18th March, 2019.

The Chairman
Institutional Review Board
University of Cape Coast.
Cape Coast

Dear Sir,

APPLICATION FOR ETHICAL CLEARANCE TO CONDUCT RESEARCH

LAWRENCIA ANTOINETTE AIDOO (SN/MNS/16/0001)

I wish to apply for ethical clearance to enable me conduct a research on the topic **"Fever Management in Children of 0-5 years; A Survey of the Knowledge, Beliefs and Practice among Nurses in the Cape Coast Metropolis, Central Region, Ghana."**

The research is to help me write a thesis as part of the requirement for the Master of Nursing Program. Please kindly find attached all relevant documents required for this purpose.

Yours Faithfully,

Lawrencia Antoinette Aidoo

Appendix C: Principal Supervisor's Supporting Letter for Student

UNIVERSITY OF CAPE COAST
CAPE COAST, GHANA, WEST AFRICA
SCHOOL OF MEDICAL SCIENCES
DEPARTMENT OF COMMUNITY MEDICINE

Our Ref:

Your Ref:

University of Cape Coast
College of Health and Allied Sciences
School of Medical Sciences
Department of Community Medicine
Cape Coast
18th March, 2019

The Chair
Institutional Review Board (IRB)
University of Cape Coast
Cape Coast

Dear Sir,

APPLICATION FOR ETHICAL CLEARANCE

Miss Lawrencia Antoinette Aidoo is a Master of Nursing student at the School of Nursing and Midwifery, University of Cape Coast. She has successfully defended her thesis proposal at the Department and has considered the suggestions made in consultation with the supervisors.

The supervisors approve of Miss Aidoo's application for University of Cape Coast IRB clearance. We would be grateful if you could review her thesis proposal entitled **'Fever Management in Children of 0-5 years; A Survey of the Knowledge, Beliefs and Practice among Nurses in the Cape Coast Metropolis, Ghana.'**

Yours truly,

Dr. Kingsley Kwadwo Asare Preko

(Principal Supervisor)

1

Direct: 03321-38192, 03321-38198, 03321-38199 Fax: 03321-38191, Accounts: 03321-38195

Appendix D: School of Nursing and Midwifery Introductory Letter for Student

UNIVERSITY OF CAPE COAST
COLLEGE OF HEALTH AND ALLIED SCIENCES
SCHOOL OF NURSING AND MIDWIFERY
DEAN'S OFFICE

Telephone: 233-3321-33342/33372
Telegrams & Cables: University, Cape Coast
Email: nursing@ucc.edu.gh

UNIVERSITY POST OFFICE
CAPE COAST, GHANA.

Our Ref: SNM/I/4/Vol.1/71

Your Ref:

13th March, 2019

The Chairman
Institutional Review Board
UCC

Dear Sir,

APPLICATION FOR ETHICAL CLEARANCE TO CONDUCT RESEARCH: MS. LAWRENCIA ANTOINETTE AIDOO

We forward herewith the attached application for ethical clearance from the above named level 850 Master of Nursing students with registration number **SN/MNS/16/0001** of the School of Nursing and Midwifery for your consideration, please.

Thank you.

Yours faithfully,

Dr. Dorcas Obiri-Yeboah
DEAN

Appendix E: Ewim Polyclinic Data Collection Permission

UNIVERSITY OF CAPE COAST
COLLEGE OF HEALTH AND ALLIED SCIENCES
SCHOOL OF NURSING AND MIDWIFERY
DEAN'S OFFICE

Telephone: 233-3321-33342/33372
Telegrams & Cables: University, Cape Coast
Email: nursing@ucc.edu.gh

UNIVERSITY POST OFFICE
CAPE COAST, GHANA.

Our Ref: SNM/R/2/Vol.4/
Your Ref:

13th February, 2019

EWIM POLYCLINIC
CAPE COAST
RECEIVED
Date 14/2/2019

THE CHIEF MEDICAL OFFICER
EWIM POLYCLINIC
CAPE COAST

Dear Sir/Madam,

INTRODUCTORY LETTER: LAWRENCIA ANTOINETTE AIDOO

The above named is a Level 850 Post Graduate Student at the School of Nursing and Midwifery, University of Cape Coast.

As Part of the school's requirement for graduation, she has to do a research and present a report on it. She intends to collect data from the Ewim Polyclinic as her research topic: **"Fever Management in Children of 0-5 years: A Survey of the knowledge, beliefs and practices among Nurses in the Cape Coast Metropolis".**

We would be grateful if you could accord her any assistance she may require from you to enable her collect her data successfully.

Counting on your usual cooperation.

Thank you

Yours faithfully,

Dr. Dorcas Obiri-Yeboah
DEAN

② Ag. Nurse Mgr.
Kindly assist student by way of granting her access to the paediatric ward and nursing staff at the unit most especially to enable her collect the needed data to facilitate this important academic exercise
Thank you.
15/2/2019
Health Service Administrator
EWIM POLYCLINIC
P. O. BOX 453, CAPE COAST

Appendix F: Cape Coast Teaching Hospital (CCTH) Ethical Clearance

In case of reply the reference number and the date of this Letter should be quoted

Our Ref.: CCTH

Your Ref.:

P. O. Box CT.1363
Cape Coast
CC-071-9967
Tel: 03321-34010-14
Fax: 03321-34016
Website: www.ccthghana.org
email: info@ccthghana.com

13th September 2019

Lawrencia Antoinette Aidoo
School of Nursing and Midwifery
University of Cape Coast
Cape Coast

Dear Sir/Madam,

ETHICAL CLEARANCE – REF: CCTHERC/EC/2019/046

The Cape Coast Teaching Hospital Ethical Review Committee (CCTHERC) have reviewed your research protocol titled, "***Fever Management in Children of 0-5 years: A survey of the Knowledge, Beliefs and Practices Among Nurses in the Cape Coast Metropolis, Central Region, Ghana***" which was submitted for Ethical Clearance. The ERC is glad to inform you that you have been granted provisional approval for implementation of your research protocol.

The CCTHERC requires that you submit periodic review of the protocol and a final full review to the ERC on completion of the research. The CCTHERC may observe or cause to be observed procedures and records of the research during and after implementation.

Please note that any modification of the project must be submitted to the CCTHERC for review and approval before its implementation.

You are required to report all serious adverse events related to this study to the CCTHERC within ten (10) days in writing. Also note that you are to submit a copy of your final report to the CCTHERC Office.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours sincerely

Prof. Ganiyu Rahman
Chairman, ERC

Appendix G: UCC - IRB Ethical Clearance

UNIVERSITY OF CAPE COAST

INSTITUTIONAL REVIEW BOARD SECRETARIAT

TEL: 0558093143 / 0508878309/ 0244207814
E-MAIL: irb@ucc.edu.gh
C/O Directorate of Research, Innovation and Consultancy

OUR REF: UCC/IRB/A/2016/516
YOUR REF:
OMB NO: 0990-0279
IORG #: IORG0009096

3ND JULY, 2019

Ms. Lawrencia Antoinette Aidoo
School of Nursing and Midwifery
University of Cape Coast

Dear Ms. Antoinette Aidoo,

ETHICAL CLEARANCE – ID: (UCCIRB/CHAS/2019/97)

The University of Cape Coast Institutional Review Board (UCCIRB) has granted **Provisional Approval** for the implementation of your research protocol titled *Fever Management in Children of 0-5years: A Survey of the Knowledge, Beliefs and Practice among Nurses in the Cape Coast Metropolis, Ghana.* **This approval** requires that you submit periodic review of the protocol to the Board and a final full review to the UCCIRB on completion of the research. The UCCIRB may observe or cause to be observed procedures and records of the research during and after implementation.

Please note that any modification of the project must be submitted to the UCCIRB for review and approval before its implementation.

You are also required to report all serious adverse events related to this study to the UCCIRB within seven days verbally and fourteen days in writing.

Always quote the protocol identification number in all future correspondence with us in relation to this protocol.

Yours faithfully,

Samuel Asiedu Owusu, PhD
UCCIRB Administrator

ADMINISTRATOR
INSTITUTIONAL REVIEW BOARD
UNIVERSITY OF CAPE COAST