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NURSES' ROLE IN PREVENTION OF INFANT AND UNDER-FIVE CHILD MORTALITY IN AFRICA:

A literature review

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Abstract

The under-five mortality rate remains unacceptably high with 6.3 million children dying before their fifth birthday in 2013. Research has, however, revealed that nurses are the means to reducing these untimely deaths. The aim of this research is to examine and identify the role nurses play in preventing and reducing infant and under-five mortality. The purpose of the study was to provide research based information of the position of nurses in consideration to childhood deaths.

Data for the research were obtained from PubMed and ScienceDirect search engines as well as manual data search. The accepted studies were published between the years 2000 and 2015. In total nine studies were analyzed. Inductive content analysis was the chosen method of data analysis.

The results of the study indicate there are challenge nurses face while trying to reduce and or prevent these early deaths. Nurses are challenged with inadequate medical care facilities, high maternal mortality rate as well as lack of training. Other challenges were also noted. The results also shows the role nurses are currently taking as well as some other roles nurses are suggested to play in order to lessen under-five mortality.

The findings of this study can be used by health care professionals especially nurses in developing countries. Research on the solutions needed to overcome the challenges faced as well as a study that focuses entirely on the nurses' position is needed.

Keywords/tags (subjects)

Infant mortality, child mortality, child death, nurses' role

Miscellaneous

CONTENTS

1 Introduction

In urban areas of Africa, Americas and Asia, statistics show that the poorest 20% population is twice as likely to die before their first birthday (Infant mortality, WHO, 2013). In 2013, an estimated 6.3 million children under the age of five died (Children: Reducing Mortality, 2014). Child mortality is important as it is a pointer of the usage, accessibility, and availability of the health system by the inhabitants especially children. It is also a sign of the extent in which a society exercises the most basic human right: the right to life and health (GOAL 4: Reduce the under-five child mortality rate, 2010).

Although the rate of under-five deaths has decreased by 28 per cent between 1990 and 2008, it still remains high (Goal 4 Reduce Child Mortality, 2010). Research and experience has revealed that out of the almost 11 million children deaths per year, more than half could be saved by measures such as vaccines, antibiotics, micronutrient supplementation, insecticide-treated bed nets and improved family care and breastfeeding practices (Goal: Reduce Child mortality, Unicef). Therefore, the intensification of the health system to provide such interventions could save many lives (Children: reducing mortality, 2014). A report published by the United Nations (UN) claims that "nurses are key to achieving the United Nations Development Program's Millennium Development Goals" which includes reducing child and maternal mortality (Amieva and Ferguson, 2011). According to an article titled "The vital role of health care workers" published by *the guardian* (2012), a child is more likely to live till their fifth birthday if there are enough midwives, nurses and doctors. If the rate of under-five mortality is to reduce, nurses need to be knowledgeable and empowered in caring for children. Therefore, this study aims to examine and identify the role of nurses in reducing and or preventing infant and child mortality with a purpose of providing research based information that could be used by nurses.

2 Infant and Child Mortality

2.1 Causes of infant and child mortality

Child mortality rate also known as under-five mortality rate is defined as the possibility that in every 1000 live births one baby will die before reaching age five: Whereas, the death of a child before his/her first birth day is termed infant death or infant mortality. Therefore, infant mortality rate is the number of children dying under a year of age by 1000 live births. Infant mortality rate is an important marker to measure the health and wellbeing of a population (Centre for disease control and prevention, 2014). This is because it is often linked to several factors such as maternal health, quality and access to medical care, socioeconomic conditions, and public health practices (Definition of Mortality, Infant, 2012).

In 2013, an estimated 6.3 million children under five years of age depart this life. An estimated 44% of these deaths occurred during the neonatal period. Neonatal period, which is the first 28 days of life, is considered to be the time where in a child is at the highest risk of dying. In addition, about 45% of all the under-five death has a connection with malnutrition. Although a child born in an already developed or a developing country can die before five years of age, he/she is, however, more likely to die if living in sub-Saharan Africa and Southern Asia compared to his/her counterparts in a developed country. About 50% of all under- five deaths occur in only five developing countries namely China, Democratic Republic of the Congo, India, Nigeria and Pakistan. (Children: Reducing Mortality, WHO, 2014). A large proportion of these deaths are caused by infectious yet preventable diseases (Niño-Zarazúa, 2013)

The main reasons of death in these regions are pneumonia (13%), diarrhea (9%), malaria (7%), measles, (2%), HIV/AIDS (3%), neonatal conditions like pre-term birth, birth asphyxia, and infections (46%).

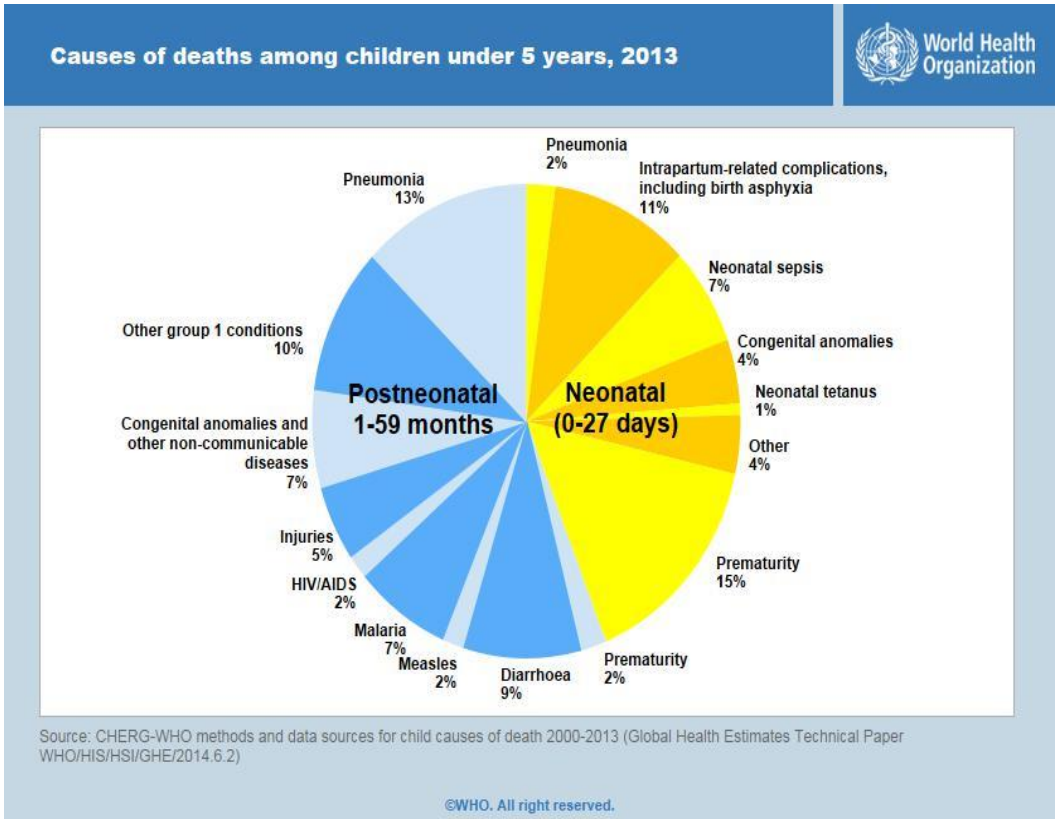

Figure 1. Causes of deaths among children under -5 years, 2013.
Source: Global health observatory (GHO) data, World Health Organization

Sierra Leone is one of those developing countries that was ranked as the 12th country in the world with the highest mortality rate of 76.64 deaths per 1000 live birth in 2012 (Index Mundi). One of the reasons for this high mortality rate is that diseases have come to be a main reason for death in children (Kandeh, 1986; Oloo, 2005; Uddin Hossain and Ullah 2009). Children under five years of age are most vulnerable to disease and one child in every four children is dying from preventable disease. Vulnerable diseases, such as diarrhea, pneumonia, measles and acute respiratory diseases (ARI) which children easily contract in their living environments although curable result in death in Sierra Leone (Davids, Susuman and Abduraghiem, 2012, 349-350). According to the Sierra Leone Demographic Health Survey conducted in 2008 (*Reproductive, Newborn, and Child Health Strategy 2011-2015*, 2011), it was estimated that the under-five mortality rate and the infant mortality rate are 140 deaths and 89 deaths per 1000 live births respectively. The neonatal mortality rate was estimated to be 36 per 1000 live births which accounts to 40% of all

infant deaths and 25% of all under-five. After the neonatal period, preventable diseases cause death in Sierra Leone (Davids, Susuman and Abduraghiem, 2013, 350). However, malnutrition is the principal factor in 57% of all childhood death (*Reproductive, Newborn, and Child Health Strategy 2011-2015*, 2011). (See Figure 1) Unfortunately, these figures place a challenge in the country's population as child mortality is used as an indicator of the health status of a country (Nannan and Hall, 2010). This is of much importance given that Sierra Leone's population is mainly comprised of children. If the child mortality rate continues to rise, there will not be enough people to repopulate the country in the future.

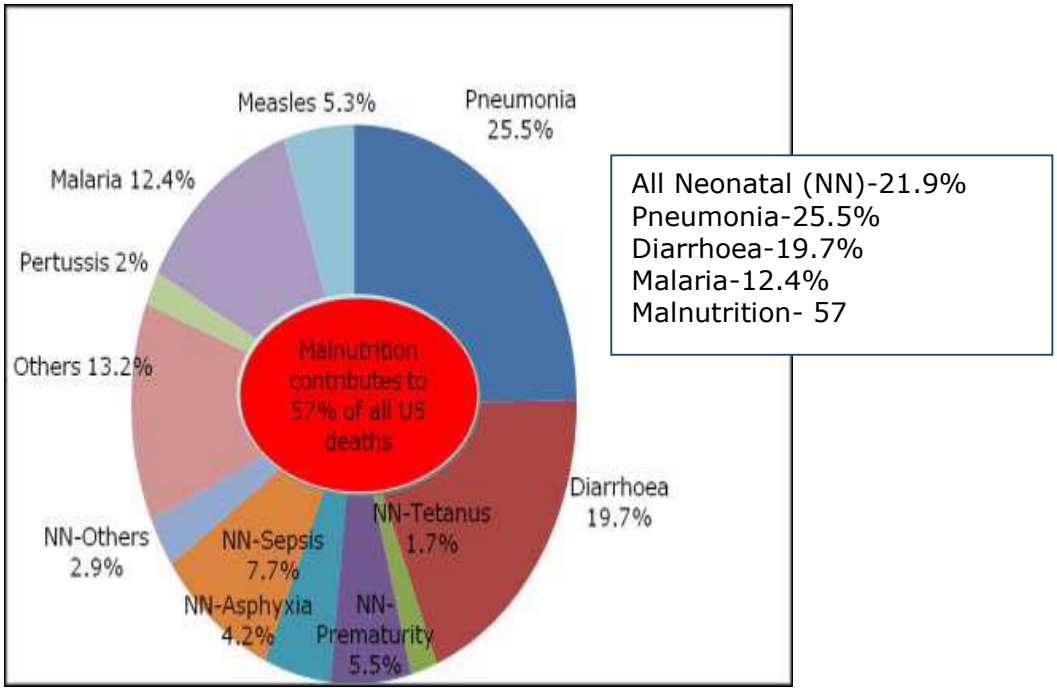

Figure 2. Causes of death in infant and children (under-five) in Sierra Leone, 2008 (*Reproductive, Newborn, and Child Health Strategy*, 2011).

2.2 Prevention of childhood mortality

A study carried out in Gambia with comparison to other studies in similar countries produced results of current child mortality preventive measures. These include: vaccination, breastfeeding, vitamin A supplementation, and

training birth attendants. After exposing the communities to the preventive measures, positive results were obtained. Under- five mortality rates was reduced significantly in Ghana and Gambia. The need to access the preventive measures was suggested both in Gambia and other settings (Rutherford, Dockerty, Jasseh, Howie, Herbison, Jeffries, Mulholland, Adegbola and Hill, 2009)

Training of birth attendants and Vitamin A supplementation

In Tanzania, trained traditional birthing attendants were found to send referrals of complicated cases to health centers as opposed to the untrained. This was observed to reduce child mortality. A study carried out in Zaire showed 73% reduction in child death and 64% reduction in risk of child death after vaccination. Vitamin A is a preventive measure against illnesses as diarrhea, measles, acute respiratory infection and malaria which are fatal among infants. Trials carried out in India, Ghana, Indonesia and Nepal showed a decrease in child mortality by 30%-54% after using vitamin A supplementation. However, further studies in India suggested that vitamin A supplementation effect on the reduction of child mortality varied in different region's baseline of vitamin A deficiency (Rutherford et al, 2009).

Breastfeeding and vaccination

Promotion of breastfeeding as an early intervention is very effective to prevent death in children related to diarrhea particularly in the first six months after birth. Extra attention needs to be directed to the underweight infants and those born of poorly educated mothers. Prolonged breastfeeding duration is also recommended according to the controlled case studies carried out in Mexico and Tanzania as it had been recommended by the World Health Organization. In addition, exclusive breastfeeding is highly suggested to prevent common diseases among infants. The risk for infant mortality due to lack of sufficient breastfeeding is higher among under-weight infants. The practice of weaning needs to be improved since poor weaning practices reduce the benefits of breastfeeding. This is due to the fact that maternal antibody protection obtained from breastfeeding reduces upon the start of weaning. Therefore, ma-

ternal education on breastfeeding and weaning is essential to improve child survival (Yoon, Black, Moulton, and Becker,1996; Rutherford et al. 2009). Diseases for instance measles, tetanus, diphtheria, polio, pertussis, some types of pneumonia and diarrhoea caused by *rotavirus* although common in children can be prevented by vaccines (Children: Reduce mortality, 2014) An estimated 15.6 million deaths in children has been prevented through measles vaccination since 2000. (Immunization, 2015).

Other preventive measures

Family planning is also noted as a preventive measure against infant and under-five mortality. In Sub Saharan Africa, infant mortality is more common since child spacing is not as widely used as in other regions of the world. Less infant mortality is observed in countries where women use modern contraceptives like implants, Intrauterine device, condoms and sterilization. Women in Haiti, Nepal, Rwanda, Uganda, Pakistan and Yemen for example have not adopted the use of family planning and thus there are high rates of unwanted pregnancies. Birth timing through family planning is highly suggested to lower the chances of infant mortality in these regions. This is because large families decrease the chances of poor families adequately investing in their children's health and wellbeing. In some developing countries, traditional child spacing has been successful through lengthy breastfeeding and postpartum abstinence from sexual intercourse but this has declined with time (Alan Guttmacher Institute, 2002.)

In developed countries, there has been a significant decrease in death and complications related to HIV/ AIDS. This is not the case in developing countries. Perinatal HIV prevention is essential in these countries. New biomedical advances to improve child survival levels are needed. In addition, this issue needs to be addressed as a family and community intervention. Mother to child HIV/AIDS transmission can be prevented by providing women reproductive health care. Orphaned children due to HIV/ AIDS need to be taken care of too. Developed countries have managed to eliminate the impacts of HIV/AIDS on child survival by addressing problems as community and family issue, moreover the new advanced biomedical interventions are highly used in the

countries (Cock, Fawler, Mercier, Vencenzi, Saba, Hoff, Alnwick, Rogers, Shafer, 2000). According to The Alan Guttmacher Institute (2002), some women in HIV/ AIDS stricken countries, HIV positive women avoid breast feeding to reduce the chances of transmitting the virus to the infants. In addition, women in the urban areas find it more convenient to use formulas instead of breastfeeding. Heikens, Bunn, Amadi, Manary, Chhagan, Berkley, Rollins, Kelly, Adamczick, Maitland, and Tomkins (2008) put it that, in Sub Saharan Africa, severely malnourished infants are either prenatally infected with HIV or inadequately fed. The infants are usually affected by diarrhea, pneumonia, skin infections and oral trash. To lessen this, therapeutic diets, rehydration foods and ready to use therapeutic foods are recommended among malnourished infants. By and large, to reduce infant mortality among malnourished HIV positive infants, a decent understanding of evidence based guidelines for severely malnourished children is required and child survival initiatives must be supported through partnership of clinical scientists, establishing well equipped institutions and financial support of child survival initiatives.

2.3 The challenges in preventing child hood mortality

According to Macinko, Souza, Guanais, Simo (2005) developing countries face challenges in fighting child mortality. This is due to the low GDP per capita where the population cannot afford health care services. High fertility rate also contributes to the increase in the child mortality rates. Family planning options have not been fully addressed by these countries hence, a great challenge. In addition, Claeson, Bos, Mawji, and Pathmanathan (2000) state that, in India, poor child birth care, preventive and curative care in postnatal period, sanitation, water supply, housing and maternal factors like age, child spacing and parity is a great challenge towards the effort to reduce child mortality.

There is a weak service delivery for interventions in the health sector in Africa. This is related to poverty and food insecurity. The less focus on house hold and community level interventions by the health systems is also a challenge. This leads to low coverage and performance that contributes to the rise of

preventable diseases that lead to death among infants. Community based interventions can be used to fight diseases like malaria, HIV/AIDS, pneumonia, measles, diarrhea, injuries and many others. In addition, there is high rate of child mortality related to maternal health and mortality at an average rate of 1,000 per 100,000 live births. In some countries like Malawi, the legal system disempowers the medical practice. Old colonial rules and policies which are still in use restrict many medical practices thus increasing the risk of child death. These old policies prevent nurses, doctors and other medical practitioners from providing lifesaving services (Reducing Child Mortality: The Challenges in Africa, United Nations, 2007.)

Furthermore, nurses are not adequately trained which makes them incapable of conveying information to patients. A study done in Kilimanjaro in 2000, shows that the women are not well informed on safe infant feeding guidelines due to lack of information, time, follow up support and directive counseling. This is related to mixed roles among nurses, a large work burden and lack of confidence among nurses due to inadequate counseling training and skills, (Sebalda, Leshabari, Astrid, Paoli and Moland, 2007).

3 Aims, Purpose, and Research Questions of the study

This study aims to find out the nurses' role in infant and under-five mortality prevention. The purpose is to provide researched information to increase nurses' knowledge of child mortality prevention by the findings of this research.

In order to reach the aims and purpose of the study, the following questions should be addressed**:**

- What are nurses' doing to prevent infant and under-five mortality in Africa based on previous studies?
- What challenges do nurses face in dealing with child mortality according to earlier studies?

4 Research Methodology

4.1 Literature review

A literature review is a sensibly argued case based on a broad understanding of a state of knowledge about a study topic. It is a well thought-out way to research a topic (Machi and Mc Evoy 2012, 4). It is an opportunity to analyze already researched materials, to know if there are any gaps in knowledge and to inspect different theoretical positions used in interpreting research results (Dahlberg and McCaig, 2010). Literature reviews are important because new insights can be developed by reviewing all previous research which will, otherwise, not be available. In addition, it is vital to identify research question and examine answers by carefully studying related literature: a process known as systematic method of literature review (Aveyard, 2010 6-8).

A systematic literature review is carried out through certain phases in a manner that seeks to identify, select, assess, and produce research evidence related to the research question. The phases proceed logically first, by creating a research plan with the aims, then identifying the research questions, after that searching for all relevant articles and selecting the ones that answer the research questions, finally, evaluating the quality and summarizing the findings using scientific methodology. By deciding on the objectives of the research and the research questions to be answered, it will have an impact on the inclusion and exclusion criteria. Systematic literature review is of much importance to the health and social care professionals as there is an increasing amount of literature available in their field and they have a professional obligation to be up to date with recent research and development about their practice. It provides a means of access to predigested evidence (Aveyard, 2010 6-8: Bettany-Saltikov, 2012 5-11: Webb & Roe 2008, 4).

This study was executed by using a literature review method. It adhered to the guidelines of a literature review. This research formed a research plan which included the research questions, the inclusion and exclusion criteria for choos-

ing articles and the method for data collection. The appropriate articles were already identified beforehand so that their results could not have an influence on decisions to be included in this study (Webb & Roe 2008, 4).

4.2 Literature search

The data that was used in conducting this review was searched electronically through electronic databases and digital libraries of academic journals. The chosen databases were PubMed, and Elvesier Science Direct. In addition, manual search was also implemented. Firstly, a preliminary test search was carried out to ensure there is no ambiguity, appropriate data to answer the research questions were available and to obtain the keywords. After testing different key words in the different search databases, the final keywords were made. The key words that were used to search for materials are child/infant mortality, nurses' role, prevention, challenges in child/infant mortality, neonatal/child death, nurses' role, and nurses and child/infant mortality. These words were chosen as they were very broad and simple and they provided a wider range of results. This was done to ensure that all the relevant data were found.

The next step was to set the limit to the search. The search literature had to be free full texts. The search was limited to literature between the years 2000 to 2015. Furthermore, literature that was based on developing countries was also considered. In addition, only articles in English were considered. Once the relevant articles based on their titles were found, their abstracts were read to select the most suitable to this study. Only the full text of related abstracts was read. All selected articles were given the benefit of equal and consistent scrutiny to judge its worth while focusing on the research question. Finally, all relevant results were evaluated and analyzed. Articles were excluded because they were not written in English and their title and abstracts were not relevant to this study. Moreover, articles with only abstracts or articles that were not free were also dismissed.

The literature search produced numerous results but only nine was included in this study.

The inclusion criteria for this literature review are below:

Inclusion Criteria:

- Articles from trusted academic journals
- Articles and report, written in comprehensible English.
- Publications related to under-five mortality
- Academic publications from 2000 to 2015.
- Publications on nurse's role related to children.
- Articles that are free full text
- Articles about developing countries

Exclusion Criteria:

- Articles with only abstracts published
- Paid articles
- Articles in other languages

TABLE 1. Results of literature search

Database	Keyterms	Results	Chosen on basis of title and abstract	Relevant studies
1. PubMed	Child mortality	588	14	1
2. PubMed	Nurses and infant mortality	75	1	0
3. PubMed	Nurses and child mortality	79	5	0
4. Science direct	Challenges in child mortality	73	10	0

5.Science direct	Neonatal deaths	129,872	10	3
6. Science direct	Child deaths	424,827	25	2
7. Manual Search	Nurses role, challenges,	-	-	3

4.3 Data Analysis

The nine literature gathered were analyzed using the inductive content analysis method. Inductive content analysis is a means of analyzing written, verbal or visual communication messages. It includes open coding, concept and category creations (Elo and Kyngas, 2007, 107). Inductive content analysis focuses on developing categories and interpretations that are very similar to the recorded data (Waltz, Strickland, and Lenz, 2010, 279).

According to Elo and Kyngas (2007, 109), an inductive content analysis approach moves from specific to general. This means that particular examples are noted from the data and then merged to form a broad statement. Inductive content analysis consists of three phases: preparatory, organizing and reporting. The first step is the open coding. During this step the articles are read through a couple of times and notes are taken down in order to understand the main ideas. The next step is category creation. The categories created are used in comparing and summarizing the articles as they describe the main ideas. The finally step, which is the reporting phase, categories with similar contents are grouped together to form a main category. This presents a entire picture of the results (Elo and kyngas, 2007 109-110).

Using this approach, abstracts of the selected articles, according to the inclusion criteria, were read a number of times to ensure whether or not they are relevant to this study. After which the ones applicable to the challenges of child mortality or the role of nurses in preventing child/infant mortality were selected. The chosen articles were first studied and then analyzed. Analyzing

of the articles involves underlining texts that answer the research questions and then color coding texts that have similar meaning or ideas. Texts with the same color are then put into subcategories. This yielded 12 subcategories. Finally, the subcategories are combined to four form main categories. Figure 3 shows the process of data analysis.

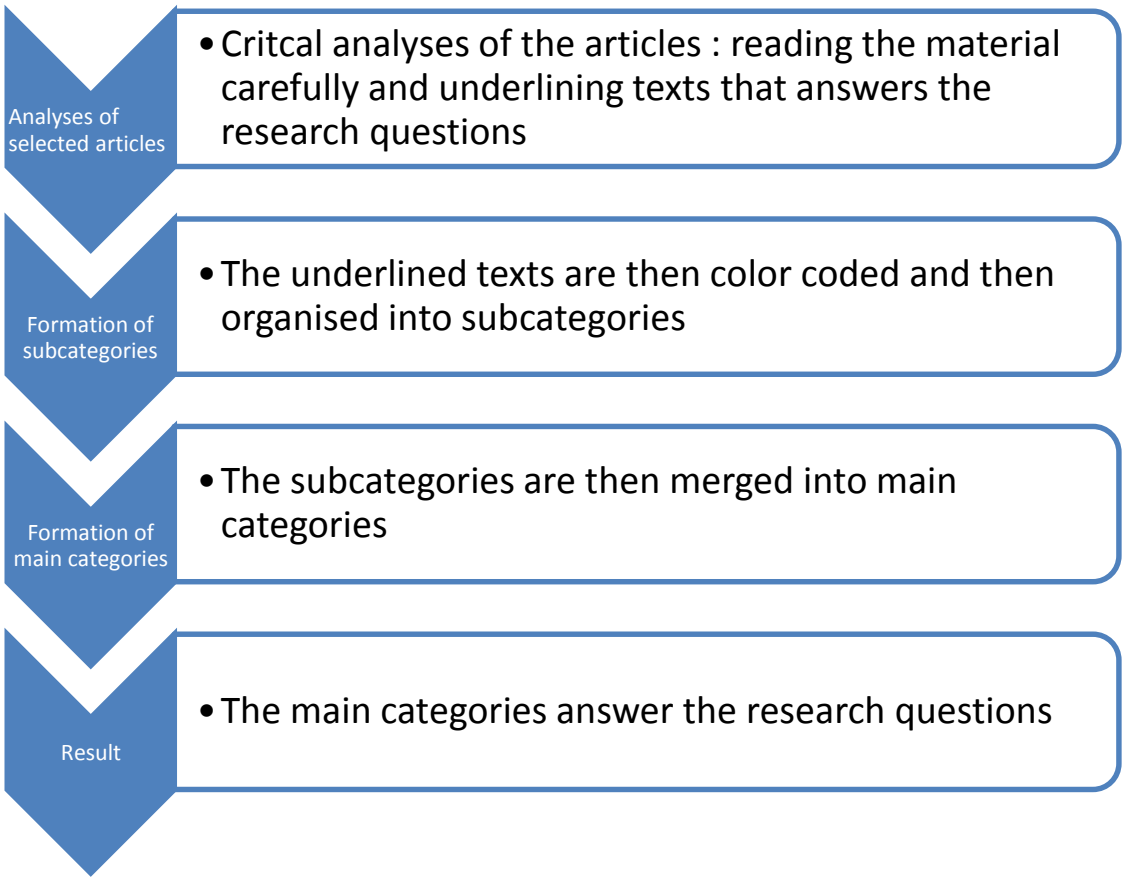

FIGURE 3. The process of analyzing the researched data

5 Results

The outcomes of this literature review are shown below according to the research questions they answer. There are four main categories: three describing the challenges in preventing infant and under-five child mortality and one discussing the role of nurses in its' prevention.

TABLE 2. The results of the literature search were grouped according to the research questions.

Sub-Category	Main Category	Research Question
❖ Low budget for health ❖ Lack of basic supplies and facility organization ❖ Not enough healthcare providers ❖ Staff not well trained	Inadequate medical care facilities	Challenges
❖ Inequity in distribution of healthcare and interventions ❖ high maternal mortality rate ❖ low access to cost-effective intervention	Accessibility to healthcare	Challenges
❖ Poor health ❖ high fertility rate ❖ healthcare at home	Effects of poverty	Challenges
❖ Suggested role of nurses		

❖ Outreach activities ❖ Vaccinating ❖ Educating mothers	Role of nurses	Nurses' role

5.1 Inadequate medical care facilities

Low budget for health

The study of Martines, Paul, Bhutta, Koblinsky, Soucat, Walker, Bahl, Fogstad, Costello (2005,1193) was the only one that mentioned the budget for health. The study claimed that a lot of developing countries have yet to achieve degrees anywhere near the targeted 15% expenditure for public health from the national budget. It further states that some countries spend a lot in other areas despite the poor health status of the country.

Lack of basic supplies and facility organization

The study done by Victora, Wagstaff, Schellenberg, Gwatkin, Claeson, Habicht (2003,233-236) maintain that there are inequities in child health across dozens of countries. Health care facilities serving poor communities, which are more likely to have high child mortality, are less likely to be stocked with drugs. The study also mentioned that facilities serving poor communities are less organized than the facilities serving wealthier communities. In addition, there are inconvenient opening hours and the health care providers are insensitive to the needs of the people. The healthcare facilities are of low quality as drugs and other inputs are in short supply.

Not enough healthcare providers

Lack of professional healthcare providers was brought up in two studies: Victora et al. (2003) and Das, Lassi, Salam, Bhutta (2013). Both studies believe that there are insufficient health care workers. The study by Victora et al

(2003, 234-236) mentioned that health care workers were hesitant to serve in areas with poor people. And the study of Das et al (2013,1) claimed that there is a scarcity of trained human resources in primary health setups.

Staff not well trained

The number of health workers providing child care that had been trained were less than 10% according to Bryce, Arifeen, Pariyo, Lanata, Gwatkin, Habicht (2003,160). It further states that the rate of training was insufficient in achieving higher coverage in the near future. Victora et al (2003, 234) as well says that facilities in poor communities are unlikely to have well trained staff.

5.2 Accessibility to healthcare

Inequity in distribution of healthcare and interventions

Inequity in distribution of healthcare and interventions was highlighted in numerous studies (Jones, Steketee, Black, Bhutta, Morris, 2003,65; Bryce, Arifeen, Pariyo, Lanata, Gwatkin, Habicht , 2003,159: Zere, Kirigia, Duale and Akazili, 2012,5-6; Martines, Paul, Bhutta, Koblinsky, Soucat, Walker, Bahl, Fogstad, Costello, 2005,1189; Victora et al (2003, 233-236). Jones et al(2003) put it that the worldwide coverage of most interventions is below 50% and the needed interventions to reduce child mortality by two thirds in 2015 although available are not getting to the children and mothers that need them most. According to Bryce et al (2003) there has been a stagnant or even reduction in immunization and skilled attended delivery as well as other interventions in several poor countries. Furthermore, it was reported that breastfeeding of infants between 6-11 months was the lone intervention getting to almost all children with measles only reaching two thirds of children under-five and the other interventions less than 60 %. Even though some of the interventions are inexpensive, the rate of coverage is extremely low in the settings with the highest mortality (Martines et al, 2005, 1189).

The study done in Ghana by Zere et al (2012) reported that there were certain interventions that were in favor of the poor women and others against them. The presence of a skilled birth attendant during delivery was at the disadvantage of poor women. Other interventions such as delivery in a health care facility, cesarean section, the use of birth control and the preventive treatment of Malaria are all in favor to wealthy women.

The poorest children are more unlikely to get vaccinations, to receive Vitamin A, or even sleep under an insecticide treated net (Victora et al 2003, 233-236).

High maternal mortality rate

High maternal mortality rate was reported as another cause of under-five death in two studies. Lawn, Cousens, and Zupan (2005, 895) state that a mother's death increase the newborn's risk of dying. And Amieva and Ferguson (2011,55) says that a motherless newborn is 3-10 times more likely to die. They further explained that failing to reduce maternal mortality rate has terrible implications on reducing child mortality.

Low access to cost-effective intervention

Bryce et al. (2003,159) declare that under five year old children in some of the poorest countries had less than one health care services contact per year on average. Another study reported a poor access to health care facilities (Das et al, 2013,1).

5.3 Effects of poverty

Poor health

Lawn, Cousens, and Zupan (2005, 895-896) believe that poverty is the primary cause of many neonatal deaths either through the higher incidence of risk factors like maternal infection or through the decreased access to effective

care. Other studies also mention that poor children are more disposed to poor health and are least likely to seek care from a health worker when sick. Another study also says that poverty limits the use of care and that in the poorest quantile only 1% of women deliver with skilled attendant. Within the poorest countries the poor women have two to three times less antennal coverage.

High fertility rate

Only the study by Zere et al (2012) mentioned the use of contraceptives. It states that the use of modern day contraceptives is higher among wealth women. Poor women did not use contraceptives and thus there had a higher fertility rate.

Healthcare at home

Globally about half the number of births takes place in the absence of a skilled care. The family or a traditional birth attendant is usually the first line providers of care during delivery (Martines, Paul, Bhutta, Koblinsky, Soucat, Walker, Bahl, Fogstad, Costello, 2005, 1190-1191).

5.4 Role of nurses

Suggested role of nurses

The article published by Amieva and Ferguson (2011) highlighted four significant roles for nurse: partnering with midwives and local community health workers, ensuring equity in achieving the united nations millennium development goals, helping in closing research gap and lastly being active in policy advocacy.

In one of the studies done in Ghana to try to find out the impact of nurses on child mortality prevention and reduction, it was mentioned that nurses were doing outreach activities like visiting houses, immunizing children and educat-

ing mothers. That same study also showed how volunteers can assist nurses but it noted that volunteers had a negative impact. However, another article showed a positive impact of volunteer or community workers on care seeking behavior. (Pence, Nyarko, Phillips, Debpuur, 2005 : Das, Lassi, Salam, Bhutta, 2013)

6 Discussion

The main aim of this research was to study and discover what nurses are doing to prevent/ reduce infant and child mortality. In order to achieve this, the researchers had to answer two primary questions: what nurses' are doing to prevent infant and under-five mortality in Africa and what challenges they face in dealing with child mortality according to previous studies. The aim was well achieved as the analyzed articles presented what nurses were doing and also offered suggestions on what other roles nurses should take. It also brings to light the challenges faced in trying to end childhood deaths. The purpose of this study was also reached as the findings of this research can be used by nurses to further deepen their knowledge.

The reviewed studies were either researches carried out in country(ies) in Africa or they were scientific publications that addressed the issue of child mortality. It was surprising to find out that there was limited amount of studies that focused on the role of nurses. Most of the studies found dealt with child mortality and the millennium development goals of reducing child mortality and maternal mortality. However, only two of the reviewed studies tackled the position of nurses with respect to under-five mortality. One of the assessed articles maintained that nurses are actually the means in achieving the millennium development goal (MDGs) 4 and 5. MDGs 4 and 5 are reducing child and maternal mortality respectively (Amieva and Ferguson, 2011). This has indeed made it obvious that nurses face an enormous task in accomplishing MDGs 4 and 5. Furthermore, the challenges found were not directly addressed to nurses but rather the challenges that are faced by public health when trying to lessen child mortality.

The findings of the research provided evidence that there is a low GDP for health as the governments of developing countries do not spend the required minimum for healthcare. This is of vital importance as it impacts the lives of mothers and children. Other challenges include inequity in accessing healthcare. Poor children and mothers do not have all the needed interventions despite the fact that they are already at the disadvantage of having higher mortality rates as they are more prone to diseases. This is due to the healthcare providers not willing to serve in poor areas. As Bryce, Arifeen, Pariyo, Lanata, Gwatkin, and Habicht (2003) clearly put it that there is a huge gap in what can be done and what is being done and that gap keeps widening .This is because although the effective interventions are already known, they are, however, not delivered to those that need them most. Jones, Steketee, Black, Bhutta, Morris (2003, 65) describe intervention as "a biological agent or action intended to reduce morbidity or mortality" The reviewed studies show that breastfeeding was the only intervention that reached nearly all children: regardless of the reality that there are several other interventions such as vaccinations, vitamin A supplements, family planning and training traditional birth attendants: which were already brought up in the background of this study.

The research pointed out that a lot of the challenges that is faced while trying to end under-five death has poverty as an underlying factor. The high poverty rates dissuade women and children from seeking help from a healthcare professional. And, as a result, young children under five have on average less than one contact with a healthcare professional in a year. In addition, poor women within the poorest countries have about three times less antennal visit compared to their wealthy counterpart. Poor care seeking behavior coupled with high fertility rate has detrimental effects of tackling child mortality.

In regard to the role of nurses, the study by Amieva and Ferguson(2011) suggested certain other roles nurses should take up if reducing child mortality can be a reality. Of the four mentioned roles, only one was something nurses were already doing: partnering with local community members. Although, the study conducted by Pence, Nyarko, Phillips, and Debpuur (2005) used the term vol-

unteers, it is still considered the same as local community members. This is because the volunteers were already part of the community. The results of the study of Pence et al. (2005) showed that volunteers had negative impact of care seeking behavior. Even though, another study's result contradicted it. The difference in research findings could be because the nurses involved in one of the studies were not well trained enough and so did not provide sufficient information to the people. Or it could mean that both nurses and volunteers' roles were not well laid out and the mothers and children were confused as whom to turn to for help.

In trying to reduce and prevent child mortality, nurses need to be equipped and empowered with knowledge. This can help them in delivering research based care and provide sufficient information to the mothers to enable them to best care for their children. This will, as a result, be moving towards achieving the goals of child mortality reduction.

6.1 Ethical Consideration

This study has been written while taking into account the following ethical principles as stated by Resnik, (2011) the search for data and the presentation of data should be carried out in utmost honesty and sincerity, without any misrepresentation or wrong presentation of facts, due credits should be given where necessary for all works used in the study, all information should be presented without any form of bias or prejudice.

The research did not make any claim of others work as its own; hence, all derived words, ideologies, and creations were duly given credit to its owners. The findings were reported with complete honesty, there were no misinformation, misleading, and intentionally misrepresentation of facts or figures. The researchers ensured that appropriate credits were given to authors on whose works were reviewed. Plagiarism was avoided by fully acknowledging all content belonging to others and full references made. Fabrication, which is presenting forged observations or results as one’s own was avoided. Falsifica-

tion, which is the intentional alteration or presentation of original findings in a way that alters the results as well as leaving out of results that would be essential to the conclusion, was also avoided. (Ethical principles of JAMK University of applied Sciences 2013, 6).

Furthermore, abiding to the JAMK University of Applied Sciences ethical principles (2013, 7) due account was given to the experts and researchers for their work and achievements by respecting their work, naming their publications correctly and providing due credit and weight to the achievements in this research.

6.2 Reliability and Validity

According to Meadows and Bellington (2005, 7), the reliability of a research depends on the author's research methods applied and the way of presentation or explanation of these methods. When a literature review is the method used, there should be rational criteria that explain why an article is included or excluded. A systematic literature review uses a thorough research methodology in an attempt in limiting research bias. It is therefore, close to a primary research study with the exemption that the participants are the papers instead of people (Khan, Kunz, Kleijnen & Antes 2003).

Another feature in checking the results is the validity of the study (Meadows and Bellington, 2005, 7). Validity is the extent to which the results of a study are likely to be authentic, free from bias and believable (Buckingham, Fisher & Saunders, 2008). However, some biases that are credible threats to validity are selection, availability, publication, cost, and selection bias. Selection bias can be overcome when inclusion and exclusion criteria is documented before the first search for literature. Accordingly, a literature review that is systematic is somehow guarded from bias. (Rothstein, Sutton & Borenstein, 2005, 2-3; Torgerson, 2006, 90-99).

With this regard, the process of data collection and evaluation was documented and described accurately during the concluding of this study. In order to limit research bias, the research questions were already defined and the crite-

ria for including articles were already specified. The keywords used were broad so that it will yield more results.

6.3 Limitations of the study

The selected reviewed articles were only studies published in English. The inclusive published studies were only in an electronic format, since other forms of publications were not included. This might limits the quantity and quality of searched literature. It is also worth to note that only nine articles were analyzed out the possibly thousands which may perhaps be considered for analysis. It is therefore, not far-fetched to infer that these nine articles are not totally representative of all available studies and they perhaps may not symbolize the reality of the issues. Secondly, some articles were not found during the initial literature search but were discovered during another search using same key words. Additionally, some studies which could have provided more data could not be accessed as they were paid articles.

6.4 Conclusion and recommendation for further studies

This literature review concluded the fact that was collected from nine different articles. All the included articles talked about under-five child mortality and some about the challenges and the nurses' role. There is certainly an extensive research on infant and child death. The causes of major death, the location of the highest number of occurring death as well as all the effective interventions have been reported. 90% of these early death occur in only 42 countries by a short list of known but preventable causes (Jones, Steketee, Black, Bhutta, Morris, 2003, 65). Yet still, an unacceptably huge amount of death still occurs. This makes one wonder why the numbers are still high. This could be because areas plagued with high mortality have the least amount of access to cost-effective intervention and also the least amount of information about the deaths (Lawn, Cousens, and Zupan, 2005, 365). Achieving the task of decreasing infant and child mortality is a task that requires healthcare profes-

sionals like nurses to be well informed of their position as well as have enough knowledge to relay to mothers and children.

The study attempted to explore the position of nurses in reducing or preventing child mortality, and the challenges that are faced while doing so. Although, this study has put forth the challenges, the solution to overcome those challenges has not been presented as it is outside the range of this research. An invaluable future research recommendation will therefore be, for example, the solution in overcoming the barriers in childhood mortality. In addition, in spite of the fact that under-five mortality is a major problem in the world and nurses are needed more than ever to aid in reducing child mortality, there is limited number of studies that focuses entirely on the role of nurses. A study centering wholly of the nurses position can be a useful element in tackling this issue.

7 References

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APPENDIX

No.	Authors and time	Title	Aim	Participants, sample	Data collection and analysis	Key results
1	Jennifer Bryce, Shams el Arifeen, George Pariyo, Claudio F Lanata, Davidson Gwatkin, Jean-Pierre Habicht, and the Multi-Country Evaluation of IMCI Study Group 2003	Reducing child mortality: can public health deliver?	Examining previous experiences in the delivery of child survival interventions and to contribute to the search of improving it.	12 countries	Literature search. The authors searched published work.	The results of the search showed that fewer children are receiving the needed effective intervention.
2	Cesar G Victora, Adam Wagstaff,	Applying an equity lens to child	To show the ineq-uities in child	Not relevant	Review of documents, reports and programme	There is a consistent inequity in child health

	Joanna Armstrong Schellenberg, Davidson Gwatkin, Mariam Claeson, Jean-Pierre Habicht 2003	health and mortality: more of the same is not enough	health care.		work.	care. Poor children are more exposed to risks for disease and have lower resistance to infectious diseases
3	Amieva S. and Ferguson S. 2011	Moving forward: nurses are key to achieving the United Nations Development Program's Millennium Development Goals	Highlights the role of nurses in achieving the Millennium Development Goals (MDGs) 4 and 5 (reducing child and maternal mortality) and proposes actions for nurses that	Not relevant	Publications in research field	The article gives some recommendations to nurses.

			stream into the strategic frame-works of the World Health Organiza-tion and the United Nations.			
4	Gareth Jones, Richard W Steketee, Robert E Black, Zulfiqar A Bhutta, Saul S Morris, and the Bellagio Child Sur-vival Study Group 2003	How many child deaths can we prevent this year?	To assess the poten-tial effect of translat-ing cur-rent knowledg e about child sur-vival interven-tions into effective action	Not rele-vant	Publications in research field	The results show the in-terventions needed to achieve the millenni-um develop-ment goal of reducing child mortality by two-thirds by 2015 are available, but that they are not being deliv-ered to the mothers and children who need them most.

5	Jai K Das, Zohra S Lassi, Rehana A Salam, Zulfiqar A Bhutta 2013	Effect of community based interventions on childhood diarrhea and pneumonia: uptake of treatment modalities and impact on mortality	To find out whether community health workers on treatment and child mortality and how effect community bsed interventions are.	Not relevant	a systematic review of the randomized controlled trials, quasi-experimentaland observational studies.	Community based interventions led to significant rise in care seeking behaviors
6	Eyob Zere, Joses M Kirigia, Sambe Duale and James Akazili 2012	Inequities in maternal and child health outcomes and interventions in Ghana	To examine the equity dimension of child and maternal health outcomes and interventions using Ghana as a case study	Not relevant	Data from Ghana Demographic and Health Survey 2008 report is analyzed for inequities in selected maternal and child health outcomes and interventions using population-weighted, regression-	Inequities wre found that sometimes favours the poor women and sometimes rich women. However, No statistically significant inequities are observed in infant and under-five mortality, perinatal mortality,

					based measures: slope index of inequality and relative index of inequality	wasting and acute respiratory infection in children
7	Jose Martines, Vinod K Paul, Zulfiqar A Bhutta, Marjorie Koblinsky, Agnes Soucat, Neff Walker, Rajiv Bahl, Helga Fogstad, Anthony Costello 2005	Neonatal survival: a call for action	To address issues related to improving neonatal survival	Not relevant	Not relevant	The article suggest some actions in order to improve neonatal survival.
8	Joy E Lawn, Simon Cousens, Jelka Zupan	4 million neonatal deaths: When? Where? Why?	To provide information that will guide efforts to reduce	Not relevant	Not relevant	It provides information on the strengthening of health systems even at community

	2005		deaths of newborn children in countries with the highest deaths..			level to offer care for newborn children the highest mortality locations, and the costs of doing so.
9	Brian Wells Pence, Philomena Nyarko, James F. Phillips, Cornelius Debpuur 2005	The Effect of Community Nurses and Health Volunteers on Child Mortality: The Navrongo Community Health and Family Planning Project	To develop and test feasible strategies for achieving the goals of “Health for All" in Ghana.	Children under-five in four different rural areas in Ghana.	Quantitaive research	Areas with only nurses doing outreach activities, vaccinating children and educating parents reduced child mortality. However, when both nurses and volunteers were together child mortality increased.