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Examining the Needs and Stress Levels of Fathers with Infants Receiving Neonatal Intensive Care

Botchway, Augusta Korkor

UNIVERSITY OF CALGARY

Examining the Needs and Stress Levels of Fathers with Infants Receiving Neonatal Intensive Care

by

Augusta Korkor Botchway

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Abstract

Background: Ghanaian fathers are the primary decision-makers in all aspects of the family, including health care. However, the needs and stress levels of fathers whose infants are receiving neonatal intensive care remains largely unknown resulting in limited paternal involvement in the neonatal intensive care unit (NICU).

Objectives: The study examined the stress levels and needs of fathers during the hospitalization of their infants in the NICU and whether infant and father characteristics predicts the needs or stress levels of fathers.

Method: A cross-sectional study in which eighty fathers completed the Fathers' Support Scale: NICU and the Parental Stressor Scale: NICU questionnaire together with infant and father demographic information. Data were analyzed using descriptive statistics, hierarchal multiple regression, and correlation.

Results: The most important need for fathers in the NICU is support from neonatal nurses to learn more about their baby. Secondly, Ghanaian fathers were stressed by their inability to have a relationship with their baby and assume their parental role during the NICU admission. Lastly, this study indicated that the higher the needs of fathers in the NICU, the higher their stress levels.

Conclusion: Ghanaian fathers whose infants are in the NICU experience stress as their needs are not met. Thus, the findings of this study have implications for nursing practice and policy changes such as open visiting and paternity leave that integrate fathers in the care of their infants in the NICU. Further research is warranted on fathers' needs and stressors in the NICU more specifically on fathers in low-middle-income countries.

Preface

This thesis is original, unpublished, independent work by the author, A. Botchway. The thesis project "Examining the Needs and Stress Levels of Fathers with Infants Receiving Neonatal Intensive Care" was approved by the University of Calgary Conjoint Health Research Ethics Board Certificate number REB17-0904 issued on August 12, 2017, the Scientific and Technical Committee (STC) and the Institutional Review Board of the Korle Bu Teaching Hospital certificate number KBTH-EB 00068/2017 issued on October 27, 2017.

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I am grateful to the management of the Korle Bu Teaching Hospital (KBTH) for agreeing that the study be conducted in their hospital and to the staff of the neonatal intensive care unit (NICU) for their receptiveness, especially Ms. Maud Essabah Fandoh. My sincere thanks and appreciation is extended unto Miss Genevieve Gorni, public health nurse at the Department of Child Health for first contacting fathers in the NICU to inform them about the study.

Finally, I wish to thank parents especially fathers whose infants were on admission at the NICU for agreeing to be part of this study and for taking the time to fill out the questionnaire during their visitation times in the NICU. Although this study may not benefit them directly, their responses will help neonatal nurses best support fathers in low-middle-income countries during the admission of their infants in the NICU.

Dedication

I dedicate this work to Mr. Julius Ahiabor, my husband, for his spiritual and financial support to enable me to complete this master's program and for accepting the full-time role to care for our son, Elike Kwame Ahiabor during this period.

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List of Abbreviations

Abbreviation	Definition
FSS: NICU	Father Support Scale: Neonatal Intensive Care Unit
HIC	High-Income Countries
KBTH	Korle Bu Teaching Hospital
LMIC	Low-Middle-Income Countries
NHIS	National Health Insurance Scheme
NICU	Neonatal Intensive Care Unit
PSS: NICU	Parental Stressor Scale: Neonatal Intensive Care Unit
UNICEF	United Nations Children's Fund
WHO	World Health Organization

Chapter 1: Introduction

Background

Due to the implementation of the Millennium Development Goal 4, under-five child mortality declined to 53% worldwide, resulting in the survival of about six million additional children per year (United Nation Children's Fund [UNICEF], 2015b). Despite this success, approximately 16,000 children died per day in 2015, of which 45% were infants who died during the first 28 days of life (neonatal period) (UNICEF, 2015b). Neonatal death accounts for 37% of under-five mortalities in Africa, the highest contributor worldwide. In 2015, the infant mortality rate was 43 per 1000 live births, with 28 per 1000 live births accounting for neonatal mortality in Ghana. Prematurity is the leading cause of neonatal deaths in Ghana, followed by birth asphyxia, sepsis, and congenital malformations (UNICEF, 2015a).

Ghana is a middle-income country located on the south coast of the Gulf of Guinea in West Africa and shares borders with Burkina Faso to the north, Republic of Togo to the east and Cote d'Ivoire to the west (Central Intelligence Agency, 2018). The country can be divided into three parts: the coastal plain that is crossed by many streams and rivers, the middle belt which is heavily forested, and the northern savannah which is dry because of it being drained by the White and Black Volta rivers (Nyarko, 2014). The socioeconomic development of the country is higher in the coastal regions and declines toward the northern part. There are diverse ethnic groups such as Akan, Ewe, Hausa and Ga, and they are found in the 10 regions of Ghana with the capital being Greater Accra.

Whole communities in Ghana rejoice in and look forward to a healthy baby because the child is perceived as a gift to the community, and nurturing is a collective responsibility. Infants who are born preterm or critically ill full-term newborns are admitted to the Neonatal Intensive

Care Unit (NICU) for weeks and sometimes several months. The admission can be an extremely stressful experience for parents (Lee, Wang, Lin, & Kao, 2013; Mahon, Albersheim, & Holsti, 2015), which can alter their transition to parenthood and may have a long-term effect on the parent-infant relationship (Gooding et al., 2011; Shahkolahi, Abdeyazdan, Mehrabi, & Hajiheidari, 2014). Additionally, infants who are discharged from the NICU are at risk for a host of adverse physical and mental health challenges, such as attention deficit disorder and delays in cognitive development later in life (Klassen, Lee, Raina, Chan, Matthew, & Brabyn, 2004). As a result, parents need to be informed and involved during and after their infant's discharge from the NICU.

Fathers in the Ghanaian culture are the primary decision-makers in all aspects of the family, including health care (Abotchie, 2008). Ghanaian fathers, however, are insufficiently involved in their infants' care, mainly due to culturally defined gender responsibilities. For example, fathers have to work to provide financial support for the family while women perform all the care activities of the child (Dumbaugh et al., 2014). As such, fathers are not given adequate and daily information about the state of the health of their infants and the treatment they are receiving. Sometimes when fathers seek information they face challenges such as the use of medical terms when NICU staff are speaking about their infant's condition. Inadequate information sometimes results in Ghanaian fathers making decisions (for instance, discharging infants to seek alternative medicine), which may have an adverse impact on their infant's health and even lead to death (Bazzano, Kirkwood, Tawiah-Agyemang, Owusu-Agyei, & Adongo, 2008). Paternal involvement in childcare promotes the social, behavioral, mental, and cognitive development of children from infancy to adulthood (Sarkadi, Kristiansson, Oberklaid, & Bremberg, 2008). Factors such as the gender of a child (Pleck & Masciadrelli, 2004), as well as

whether the father is living with the child (Goldberg, 2013), impact paternal involvement. A study in Taiwan showed that fathers with previous NICU experience are less involved in childcare after discharge when compared with fathers of nonhospitalized infants (Lee, Lin, Huang, Hsu, & Barlett, 2009). This may occur because noninvolvement of fathers in the NICU results in fathers not feeling confident and competent in the care of NICU graduates (Helth & Jarden, 2013). Therefore, the need exists to increase fathers' involvement during the infants' admission to the NICU, so that they can make informed decisions about their infants and be more likely to remain involved after discharge.

The number of studies on fathers whose infants are in the NICU in high-income countries has increased (Arockiasamy, Holsti, & Albersheim, 2008; Gooding et al., 2011; Mahon et al., 2015), and these reports have demonstrated the growing involvement of fathers in the NICU (Feeley, Waitzer, Sherrard, Boistvert, & Zelkowitz, 2013; Garten, Nazary, Metze, & Buhrer, 2013; Hollywood & Hollywood, 2011; Lee et al., 2009). However, little is known about how low-middle-income countries (LMIC), especially in sub-Saharan Africa, are handling issues surrounding family needs and stress in the NICU in a health care system that is very different from high-income countries. In particular, limited studies exist in Ghana on paternal participation, their needs, and their level of stress; thus it is important for more studies to address the gap in the literature on the needs and stress levels of fathers whose infants are admitted to NICU from a LMIC's perspective, specifically Ghana.

Health Care Systems in Ghana

There are four departments of health in Ghana; geriatric care, health promotion, nutrition and reproductive and child health (Ghana Health Service, 2018). The aim of child health programs is to promote and maintain optimum growth and development of children from age 0

to 18 years. The components of child health in Ghana are newborn care services, child welfare services (well-child visits), school health services and adolescent health and development. Neonatal health is one of the priorities of child health care that focuses on newborn care, management of neonatal illness, breastfeeding promotion and child welfare services (Ghana Health Service, 2018). The target is to decrease neonatal mortality to 12 per 1000 live births (The World Bank, 2018).

The majority of health care services in Ghana are provided by the central government with support from private non-profit agencies (Mission hospitals), private profit agencies and traditional medicine (Aseweh Abor, Abekah-Nkrumah, & Abor, 2008). There are four teaching hospitals in Ghana: Korle-Bu Teaching Hospital (KBTH), Komfo Anokye Teaching Hospital (KATH), Tamale Teaching Hospital (TTH) and the Cape Coast Teaching Hospital which all provide specialized care and plays an important role in research and teaching. Each region has a Regional Hospital that provides secondary health care while district hospitals, polyclinics and health centers provide primary health care services. To bring basic health care activities and public health close to people living in deprived communities, Community-based Health Planning and Services (CHPS) compounds are established in remote parts of Ghana (Ministry of Health, 2017). The medical system in Ghana is heavily centered in the two populous cities, Accra and Kumasi. Although there are several hospitals in Ghana, most of them do not have the required staff, infrastructure and modern technology to provide specialized services to people; therefore, patients who need specialized care such as neonatal intensive care are referred to the KBTH (Drislane, Akpalu, & Wegdam, 2014).

In 2004, the government of Ghana implemented the National Health Insurance Scheme (NHIS) with the objective to abolish out-of-pocket payments at the point of health service

delivery and to ensure that residents gain financial access to health care (National Health Insurance Scheme [NHIS], 2018). Residents are required to pay premiums of which about 69% of registered NHIS subscribers are exempted such as pregnant women, children under 18 years and those aged above 70 years. As soon as a woman is confirmed pregnant by a midwife or doctor the expectant mother is required to register with the scheme. The pregnant woman gains financial access to antenatal, delivery and 6 weeks postnatal care, in addition to newborn care including neonatal intensive care for a period of 3 months (NHIS, 2018). However, not all services are covered under the NHIS, so pregnant women and parents of the newborns have to make out-of-pocket payments for certain drugs and procedures.

According to the Labor Act-2003 (ACT 651) of Ghana Section 57, a woman who is working is entitled to 12 weeks maternity leave with full pay in addition to any unused annual leave (Ghana Legal, 2018). The maternity leave period can be extended for 2 weeks in situations such as multiple births (Ghana Legal, 2018). To date there is no government policy on paternity leave. Understanding the needs and stress levels of fathers becomes more important given socio-cultural, economic and political circumstances impacting them when their infants are admitted to the NICU.

Culture

Culture is a way of life of a group of people in which the norms and values of the people are transferred from one generation to another in the way they nurture their children (Keshavarz & Baharundin, 2009). The culture of the father has an impact on his paternal involvement in childcare, since the role of men and fatherhood is culturally defined (Miller & Maiter, 2008). Therefore, understanding the cultural context of people helps predict the way they do things. Although parenting exists across all cultures it varies from one culture to another. For example,

parenting in the western world is individualistic while in traditional Ghanaian society it is collectivistic, in which the extended family and members of the community are involved in parenting (Nyarko, 2014; Schwartz, 2006). Parents from a collectivist culture teach their children to put the needs of the family and community first before attending to their own needs and instill values such as dependence, conformity and helpfulness (Rudy & Grusec, 2006). To instill these normative values parents from a collectivist culture, tend to use an authoritarian style by demanding obedience, being controlling and being very strict (Ispa et al., 2004). As part of the collectivist tradition, men in certain parts of Africa such as Somalia, Sudan and Ethiopia spend more time with other men, which is regarded as an important role and an expectation of men in the community (Renzaho, Green, Mellor, & Swinburn, 2011). While fathers are socializing with other men, they deprive themselves of a relationship with their children, which affects father-child relationships and communication. However, the infiltration of Western cultures and urbanization have led to rapid emergence of individualistic parenting where parents are solely responsible for the child without the direct support of extended family members (Nyarko, 2014).

Another example is the style of parenting in Ghana. Mothers largely adopt a permissive style in which they are protective and liberal in the nurturing of the child, while fathers typically use the authoritarian style where strict standard of upbringing are set based on their culture (Nyarko, 2014). Some Ghanaian mothers, however, may adopt an authoritative style while some fathers adopt the permissive style (Nyarko, 2014). There are diverse ethnic groups in Ghana with similar underlying principles that guide each ethnic group (Ampofo et al., 2009; Boakye-Boaten, 2010; Nyarko, 2014). For instance, irrespective of the ethnic group, the father is the authority of the family and is responsible for the economic and financial provision of the home. As such,

fathers are the main decision-makers in the home and determine the care seeking behavior for the family.

Problem Statement

In my 8 years of experience working as a registered nurse in Ghana, West Africa I have seen more women (mothers, grandmothers' aunties and sisters) than men (fathers, grandfathers', uncles and brothers) in the pediatric unit of the hospital. I have observed that the few fathers who are with their children in the NICU are often not supported by the staff in the unit. It is common for staff to ask fathers where the mother of the child is than for mothers to be asked the whereabouts of the child's father during general care activities of the child. These cultural gender roles of Ghanaians idealize the primary role of mothers as caregiver of the child and fathers as the financial provider. This is shown clearly in the relationships and dealings between health professionals and parents (mothers and fathers) of children receiving health care in hospitals (Dumbaugh et al., 2014). The few fathers involved in the care of their children have expressed their frustration when staff make them feel like visitors and incapable of performing certain basic tasks for their baby on admission. Research suggests that fathers feel unnoticed (Helth & Jarden, 2012; Lindberg, Axelsson, & Ohrling, 2007) and unable to participate in the care of their children (Pohlam, 2005) as hospital staff give them the impression that the hospital space is for women (Msuya, 2008). There is a growing need for fathers to be involved in the care (Feeley, Sherrard, Waitzer, & Boisvert, 2013) and decision-making (Dumbaugh et al., 2014; Lindberg et al., 2007) as paternal involvement in care impacts many aspects of the child's development (e.g., physical, social, emotional) (Sarkadi et al., 2008). Furthermore, when their needs are not met they feel more stressed as a result of the admission of their child (Ahn & Kim, 2007). This increased need for fathers to be involved in decisions about their child's care and the importance

of paternal involvement in families, especially with their children, underscores the significance for a study on the needs and stress levels of father's while considering the sociocultural, economic and political dynamics that impacts father when their infant is in the NICU.

My interest in this thesis project stems from Ghana's urgent goal to reduce neonatal mortality, in a bid to achieve Sustainable Development Goal 3 that aims to end preventable childhood death, especially under 5, with the goal to reduce neonatal mortality to 12 per 1000 live births (The World Bank, 2018). A study of this nature is timely, considering the degree of neonatal mortality and morbidity that occurs in Ghana and the role fathers can play in reducing these rates. Importantly, a study that investigates fathers' needs and stress levels when their infants are in the NICU will offer rich insights that can help guide interventions (practice and policy) to support fathers in an LMIC context (Melnyk et al., 2006; Nearing, Salas, Granado-Villar, Chandler, & Soliz, 2012). Additionally, my desire is to see neonatal nurses support fathers in the neonatal unit by developing protocols tailored around the father's needs, so they feel welcomed and involved in their infant's care.

Research Questions

The aim of this study was to examine the stress levels and needs of Ghanaian fathers during the hospitalization of their infants, so that neonatal nurses can provide appropriate support, and to determine whether certain infant and father characteristics predict fathers' needs and stress levels in the NICU. The research questions for this study are:

a) What are the needs of Ghanaian fathers during the hospitalization of their infant in the NICU?

b) What are the stress levels of Ghanaian fathers during the hospitalization of their infant in the NICU?

c) Is there a relationship between infant and father characteristics (such as infants' gender and fathers' educational level) and the needs or stress levels of fathers in the NICU?

d) Is there a relationship between self-reported needs and stress among Ghanaian fathers in the NICU?

Chapter 2: Theoretical Framework and Literature Review

Every parent hopes for a healthy full-term child. However, a healthy full-term child is not always a guarantee, as some infants are born premature or sick at full-term and hence require more intensive support after birth. The admission of these babies to the NICU is a source of stress to parents (Skene, Franck, Curtis, & Gerrish, 2012) as it disrupts the normal attachment process between the parent and the child (Fegran, Helseth, & Fagermoen, 2008) and alters their parental roles (Russell et al., 2014). In LMIC such as Ghana, fathers' needs, and stress levels may vary from those of fathers with infants in the NICU in high-income countries given the unique socio-cultural, economic and political context of Ghana. This highlights the importance of conducting a study to examine the specific needs and stress levels of fathers in a Ghanaian NICU. Theoretical frameworks that guide this study on the needs and stress levels of fathers in the NICU were identified with this understanding, and a literature search was conducted to identify studies examining father's needs and stress level when their infants are in the NICU. This chapter presents the theoretical framework and also includes the search strategy, search terms, study selection, a brief description of the studies included in the literature review and a summary of the evidence of the chosen studies.

Theoretical Framework

The theoretical framework that supports this current study are self-determination theory (SDT) and the parental NICU stress model.

Self-determination theory. Self-determination theory (SDT) is a framework that assists in understanding and identifying the needs of fathers whose infants are in the NICU. Self-determination theory is a meta-theory of human motivation that is concerned with supporting people to behave in healthy ways (Deci & Ryan, 2000). The theory proposes that two forces

motivate people: intrinsic and extrinsic motivation. First, intrinsic motivation refers to natural energy arising from within, whether from curiosity, empathy, innate care, or personally acquired norms and values that motivate the individual to perform a task. Such motivation encourages people to engage in activities that are of interest to them and bring personal fulfillment and satisfaction (Deci & Ryan, 2013; Grolnick, Deci, & Ryan, 1997). By contrast, extrinsic motivation arises from external factors such as the obligation to obey rules and regulations or to perform tasks that bring reward or evaluation. Therefore, self-determination theory is the interaction between extrinsically and intrinsically motivating factors and the natural needs of the individual (Deci & Ryan, 2000). Self-determination theory proposes that social and cultural factors contribute to people's decision to perform a task and influence the quality of the performance.

Research has shown that both intrinsic and extrinsic motivation require support from the social environment to ensure that the activity is performed adequately (Deci & Ryan, 2000; Deci & Vansteenkiste, 2004). According to self-determination theorists, such support involves three innate psychological needs: relatedness, competence and autonomy; these foster quality engagement and motivation, including enhanced persistence, creativity and performance (Deci & Ryan, 2000). Self-determination theory further suggests that when the three psychological needs are not supported, adverse consequences impact the effectiveness of the performed activity and the setting. Even though support for the need of relatedness and competence are important, studies show that the fulfilment of the need for autonomy has central significance (Deci & Ryan, 2000; Ryan, Deci, Grolnick, & La Guardia, 2006). Therefore, satisfying people's need for autonomy impacts greatly on motivation and development.

Autonomy relates to an individual's choice and authorization for the performance of an activity (Deci & Ryan, 2000; Joussemet, Landry, & Koestner, 2008). Thus, being autonomous denotes that a person is exhibiting free will while taking into consideration the external environment in which the action is taking place and the person's sense of self (Deci & Vansteenkiste, 2004). The need for autonomy is providing fathers with the choice to identify their needs, considering both intrinsic and extrinsic motivation, while their infants are in the NICU. In this study, the needs of fathers in the NICU were assessed and whether a relationship exists between infant and father characteristics and father's needs in the NICU. The parental NICU stress model supports paternal stress in the present study.

The parental NICU stress model. The parental NICU stress model (Appendix A), developed by Wereszckak, Miles, and Holditch-Davis (1997), guides our understanding of the stress that occurs among fathers whose infants are in the NICU. The parental NICU stress model, adapted from the Parental Intensive Care Unit Stress Model (Miles & Carter, 1983), was specifically designed for parents with infants in the NICU. In this model, factors that contribute to parental stress response in the NICU are termed stressors (Wereszckak et al., 1997). Some researchers outlined NICU environmental stressors as direct contributors to parental response to stress. Miles, Funk, and Carlson (1993) described in detail four environmental stressors in the NICU. First, sights and sounds are the physical NICU environment which includes monitors, noise, infants, lighting equipment and staff. Second, infant appearance and behavior describes the looks and behavior of the infant, which is often different from a healthy full term baby because of medical intervention and infant illness. Thirdly, parent-infant relationship describes the alteration in parental role and early parent-infant attachment due to nurses being the primary

caregivers of infants in the NICU and fourthly, staff, which describe staff behavior towards and communication with parents about their infant's condition.

Wereszczak et al.'s (1997) model describes sources of stressors that influence parents in the NICU: a) the parents' personal characteristics, such as parents' past experiences and concurrent life events; (b) situational factors, which include the severity of the infant's illness and unknown outcome of the infant's illness; (c) personal resources of the parent, such as family support, cognitive resources and financial resources; and (d) environmental support, such as support from staff or other parents in the NICU. Parents manage perceived stressors in the NICU by using coping skills developed in the past, as well as developing new coping skills (Wereszczak et al., 1997). Therefore, for parents with infants in the NICU to be better able to manage stress, it is essential for a change to occur in the individual, in the environment, in the staff, or the available resources (Miles et al., 1993).

Parents can cope with stressful experiences during the admission of their infant in an environment where NICU staff, especially neonatal nurses, identify the stressors and provide support to parents immediately when it is determined that the infant will need admission and after the infant's admission. With the understanding of the theoretical framework that supports the present study on the needs and stress levels of fathers in the NICU, a literature search was done to address the question "What are the needs and stress levels of Ghanaian fathers whose infants are receiving neonatal intensive care?"

Search Strategy

Articles for this review were searched through three electronic databases, Medical Literature Analysis and Retrieval System Online (MEDLINE), Cumulative Index to Nursing and Allied Health Literature (CINAHL) and Psychology Information (PsycINFO).

Search terms. The search words were identified relating to the stress and needs of fathers during the admission of their infants in the NICU. Terms referring to fatherhood, stress, needs, involvement include "fatherhood," "father," "paternal" were combined with "neonatal intensive care unit," "NICU," and "stress," "needs," "involvement," "participation," or "engagement". Additional search combination included LMIC, Africa or Ghana. Limits were not set on origin of study and date of publication because of the insufficient number of studies on fathers with infants in the NICU.

Study selection. Studies on parents in the NICU have gathered limited data on fathers; sometimes results for fathers are combined with results for mothers (Skene et al., 2012), or the number of fathers who participated in the study is lower compared to the number of mothers (Russell et al., 2014). In other cases, the term "parents" was used when the results of fathers were not stated in the study (Carmona & Lopes, 2006; Penticuff & Arheart, 2005). Therefore, only studies with data and results of fathers clearly stated were included in this literature review. Both quantitative and qualitative studies were included to provide an in-depth account of paternal experiences. Finally, studies were included if they were published in English. Editorials and studies that targets NICU staff were excluded; however, their list of references were screened for articles on fathers with infant in the NICU.

The preliminary electronic search identified 105 potentially relevant peer-reviewed articles and 18 duplicates were removed. The title or abstract of 87 peer-reviewed articles were screened for relevance and 40 articles did not meet the above inclusion criteria leaving 47 articles for full review. Of the 47 articles, 7 were excluded because they examined parents' needs or stress after discharge; therefore, 40 were retained. An additional 15 articles were handpicked from the reference list and personal library; thus, a total 55 articles were available for inclusion.

One study, however, produced two articles (Feeley, Sherrard et al., 2013; Feeley, Waitzer et al., 2013) hence 54 studies were integrated in the literature review.

Description of Included Studies

Of the 54 studies, 8 (Ampofo, Okyererfo, & Pervarah, 2009; Boakye-Boaten, 2010; Dumbaugh et al., 2014; Heidari, Hasanpour, & Fooladi, 2012; Iliyasu, Abubakar, Galadanci, & Aliyu, 2010; Kakaire, Kaye, & Osinde, 2011; Musabirema, Brysiewicz, & Chipps, 2015; Nyarko, 2014) were from LMIC and published within the last 8 years. The majority of the studies (n = 46) were conducted in high-income countries such as Canada, the United States of America and Sweden, where the economic circumstances of families (higher standard of living and income), as well as government or institutional policies (paternity leave and open visitation) differ from those in Ghana. Nonetheless, observations and conclusions gleaned from these studies were integrated to provide insight and guide the methodology of the current study, particularly given the limited literature from LMIC. The following themes emerged when reviewing the included studies: fatherhood, paternal involvement, benefits of paternal involvement, paternal response to the NICU admission, patterns of fathers' involvement in the NICU, barriers and facilitators to paternal involvement in the NICU and paternal involvement in NICU—LMIC and Ghanaian perspectives.

Fatherhood

Fatherhood is "the state of being a father" (Collins English Dictionary, 2017). Jones and Mosher (2013) define father or paternity as a male parent of a child acquired biologically or through adoption. A man can also acquire the position of father (i.e. stepfather) through marriage or when cohabitating with a woman who has children from a previous relationship. The relationship between a father and his child (i.e., biological, adopted or stepfather) does not affect

the father's care for the child (Jones & Mosher, 2013). There is conflicting data on the effect of gender of the child and paternal involvement. Researchers report that fathers are more likely to be involved with their male child than with their female child (McMunn, Martin, Kelly, & Sacker, 2017; Norman, 2010; Pleck & Masciadrelli, 2004). Other studies state that irrespective of the gender of the child, fathers have equal paternal involvement (Bogenschneider, 1997; Hofferth, 2003; Phares, Fields, & Kamboukos, 2009). Two studies (McMunn et al., 2017; Norman, 2010) recruiting British fathers in the United Kingdom found that depending on the economic class or educational level of fathers the gender of the child influences paternal involvement. Other studies (Bogenschneider, 1997; Hofferth, 2003; Phares et al., 2009; Pleck & Masciadrelli, 2004) recruiting fathers of diverse ethnic groups such as Caucasian, African American and Hispanic in the United States also suggest that based on the father's culture paternal involvement is determined by the child's gender. These studies demonstrate that paternal involvement is based on the gender of the child but influenced by culture, fathers' education level and economic class.

In the diverse culture of the United States, fathers who live with their children can be defined as resident fathers, and fathers who live apart from their children as non-resident fathers (Jones & Mosher, 2013). Men's understanding of fatherhood and their level of involvement in the lives of their children varies for resident and non-resident fathers. According to Goldberg (2013), resident fathers are often more involved in the lives and care of their children than non-resident fathers. Since resident fathers live in the same house with their child they have more access to the child while non-resident fathers have to overcome hurdles such as proximity to the child or custody arrangements, which affects a father's interaction with the child (Arditti & Keith, 1993; McBride, Brown et al., 2005). Additionally, resident fathers usually have a close

relationship with the mother of their child since mothers can limit a father's access to the child when they do not have good relationship with the father (maternal gatekeeing) (Fagan & Cherson, 2017; Puhlman & Pasley, 2013). However, the resident status of fathers and his level of involvement may vary depending on the type of paternal participation (finaiancial provider, caregiver, etc.) under consideration. For example, a non-resident father who values fatherhood may be less likely to read to his child when compared to a resident father, but resident and non-resident fathers may equally provide financially for the child (Goldberg, 2013). Divorced fathers who are non-resident fathers tend to be highily involved with their child than non-resident fathers who did not marry the mother of the child (Cheadle, Amato, & King, 2010). The former's level of involvement is atrributed to paternal bonding with the child when parents were together and the father's greater legal rights concerning access to the child.

Finally, a man's relationship and experence with his own father shapes his perception about fatherhood, therefore, making men's involvement and transition into fatherhood different among fathers (Pleck, 2010). A father may find a role model in his own father who provided financially for the family rather than performing caregiving activities or being present at home, but the roles of fatherhood have changed over the years (Johnson, 2008). These early role experiences have a lasting impact on a new father's willingness to be actively involved in caretaking practices with his child (Johnson, 2008; Pleck, 2010). Paternal involvement is defined by the following characteristics that contribute to the outcomes of care delivered by the father of the child.

Paternal Involvement

Pleck (2010) reports universal concepts of paternal involvement with some unique features, including (a) positive engagement, (b) warmth and responsiveness, (c) control, (d)

indirect care and (e) process responsibility. Positive engagement refers to the frequency and quantity of time spent by fathers participating in interactive activities with the child, for example, teaching, playing and reading (Pleck, 2010). Warmth and responsiveness entails fathers' expression of emotion, love and praise for the child, and a timely response to the child's emotional needs (Colman, Hardy, Albert, Raffaelli, & Crockett, 2006; Kochanska, Aksan, Prisco, & Adams, 2008; Pleck, 2010). The characteristic of control refers to the fathers' monitoring to ensure the safety of the child (Pleck, 2010). Control involves the process of decision-making regarding issues related to the child, to facilitate positive outcomes and the progress of the child (Carlson, 2006; Pleck, 2010; Xu, Farver, & Zhang, 2009). The indirect care component includes providing material care such as babysitter arrangements and provision of some basic needs such as food and shelter, and encouraging the child to join social groups, with the goal of building peer relationships for the child (Pleck, 2010; Pleck, 2012). Process responsibility refers to fathers' involvement in monitoring and ensuring whether the components of positive engagement, warmth and responsiveness, control and indirect care are met, and if not, putting appropriate measures in place (Pleck, 2010; Pleck, 2012). Studies have outlined outcomes of paternal involvement for the family and the nation at large.

Benefits of Paternal Involvement

Paternal involvement in the care of the child affects aspects of children's cognitive, behavioral, social and mental development, as well as physical health (Sarkadi et al., 2008). For example, children of involved fathers are better academic achievers (McBride, Schoppe-Sullivan, & Ho, 2005; Nord & West, 2001), form positive peer relations (Verissimo et al., 2011) and exhibit fewer behavioral problems like aggression and psychological distress (Ducharme, Doyle, & Markiewicz, 2002; Nepomnyaschy & Donnelly, 2015). Consequently, paternal

involvement affects the physical health and well-being of children by promoting healthy lifestyles choices, like exercise, (Figueroa-Colon, Arani, Goran, & Weinsier, 2000; Laxman et al., 2015; Wolfberg et al., 2004) and improves the quality of life of children with chronic diseases as well as reduces the period of hospitalisation of children (Alio, Kornosky, Mbah, Marty, & Salihu, 2010; Laxman et al., 2015; Martinez & Hernandez, 2014). On the contrary, evidence suggests that fathers are more likely to engage children in risk taking activities while playing, which increases children's risk of childhood injuries (Brussoni & Olsen, 2011; Lamb, 2002; Lewis, Dilillo, & Peterson, 2004). Paternal involvement benefits not only the child, but the father himself, and the mother.

Paternal involvement decreases parental conflicts, which fosters positive emotional and behavioral development for children and adolescents (Barnett & Hyde, 2001; Davies & Cummings, 2006). The level of a father's confidence in parenting skills and his competence in decision-making are increased when he is involved in his child's care. Paternal involvement also promotes the well-being of the father and offers the father the chance to obtain personal fulfilment by increasing the father-child attachment (Brown, Mangelsdorf, & Neff, 2012; Kadivor & Mozzafarinia, 2013; Pleck 2012, Sarkadi et al., 2008). When fathers are involved in their child's care it relieves mothers of the burden of being the primary carer of the child and the home. Additionally, paternal involvement gives mothers the chance to have time for themselves, reduces maternal depression (Laxman et al., 2015) and enables mothers to fulfil their ambition such as going back to school (Pleck & Masciadrelli, 2004). Given the benefits of paternal involvement to the family, it has become necessary to understand the needs of fathers' involvement in childcare, particularly when the infant is hospitalized in the NICU.

Paternal Response to NICU Admission

Fathers play a significant role in the care of their infants, but little is known about their response to NICU admission. What is known is that fathers report overwhelming stress, anxiety and distress as a result of the admission of their infant (Musabirema et al., 2015). Studies conducted in high-income countries reported that in certain instances, fathers view themselves as the sole protector and overseer of the entire family: the mother, the ill infant and other children at home (Ionio et al., 2016; Lee et al., 2013; Mahon et al., 2015; Matricardi, Agostino, Fedeli, & Montirosso, 2013; Sloan et al., 2008). In addition, fathers often view themselves as the main communicator with friends and extended family, which they find stressful, and are further stressed by having to return to work immediately or within a few days of the infant's birth (Mackley, Locke, Spear, & Joseph, 2010). There are cases of fathers reporting such high levels of stress that may adversely affect them physiologically, emotionally and physically (Alkozei, McMahon, & Lahav, 2014; Heidari et al., 2012; Mackley et al., 2010). In turn, this can affect the behavioral and psychological development of the baby as a result of the altered father-infant attachment that was not established during the infant's admission (Dudek-Shriber, 2004; Howe, Sheu, Wang, & Hsu, 2014). The analysis of these studies showed that negative emotions and stress were higher during the acute phase of the infant's illness or near the beginning of the admission than when the infant's condition was stable or at discharge.

Patterns of Fathers' Involvement in the NICU

Fathers play several different roles in the NICU, characterized by two types of paternal involvement: direct and indirect care. Direct care refers to the father having physical contact with the child, like carrying, feeding and diapering (Feeley, Waitzer, et al., 2013). For indirect care, the father may or may not be physically present in the NICU but is involved in making decisions

for the infant, praying and supporting the mother in the NICU (Feeley, Waitzer, et al., 2013; Russel et al., 2014). Research in high-income countries suggest that while some fathers believe they play the same roles as mothers in the NICU, except in breastfeeding (Feeley, Waitzer, et al., 2013; Russell et al., 2014), other fathers consider the mothers as the primary caregiver and believe that the father's role is to meet the needs of mothers by ensuring mothers are comfortable, so that they can effectively care for their infants in the NICU (Feeley, Waitzer, et al., 2013; Helth & Jarden, 2013).

Some researchers suggest that fathers are motivated to be involved when asked by the mothers or health professionals (Feeley, Sherrard, et al., 2013; Feeley, Waitzer, et al., 2013; Sisson, Jones, Williams, & Lachanudis, 2015; Skene et al., 2012). Recent studies point out that fathers want to be involved in the care of their infants in the NICU (Feeley, Sherrard, et al., 2013; Feeley, Waitzer, et al., 2013; Ignell Mode, Mard, Nyqvist, & Blomqvist, 2012; Russell et al., 2014; Sloan et al., 2008). Involving fathers in direct and indirect care in the NICU has a positive influence on the home environment after discharge (Feeley, Sherrard, et al., 2013; Tessier et al., 2009). It also makes fathers feel secure, confident and competent in their paternal roles (Blomqvist, Rubertsson, Kylberg, Joreskog, & Nyqvist, 2012). A study conducted in Ghana revealed that fathers were minimally involved in direct care during infant care at home but provided money for the financial and material support of the infant (Dumbaugh et al., 2014). This study also reported Ghanaian fathers with infants were the decision-makers on where to seek help for the sick infant (Dumbaugh et al., 2014). In the NICU environment, both barriers to and facilitators of paternal involvement are present.

Barriers and Facilitators to Paternal Involvement in the NICU

Fathers are often the first to visit their infants in the NICU (Ozdemir & Alemdar, 2016), in cases where mothers are recovering from delivery or being critically ill due to complications during or after delivery. However, fathers do not frequently visit the unit throughout the period of hospitalization of the infant. Researchers report fewer and shorter paternal visits to the NICU when compared to mothers (Arockiasamy et al., 2008; Feeley, Waitzer, et al., 2013; Franck & Spencer, 2003; Garten et al., 2013; Garten, Maass, Schmalisch, & Buhrer, 2011; Latva, Lehtonen, Salmelin, & Tamminen, 2007; Matricardi et al., 2013). Fathers visit the NICU less, for reasons associated with proximity to the unit, working hours, financial problems, cultural factors that consider mothers as the caregivers of children and hospital visitation restrictions (Feeley, Sherrard, et al., 2013; Feeley, Waitzer, et al., 2013; Martinez & Hernandez, 2014; McAllister, Burgess, Kato, & Barker, 2012). Until these challenges are addressed with understanding and supportive interventions, the issue of less paternal visitation may persist.

Garten et al. (2011) reported that parental history of treatment for infertility was related to increased paternal visits and that the gender of the child influenced paternal visits to the NICU. Increased paternal visitation also reduces the level of father's stress and promotes father-infant attachment (Ozdemir & Alemdar, 2016). However, Garten et al.'s (2011) study on the visitation and frequency patterns of fathers in the NICU was a retrospective chart review, hence the possibility of missing data and bias during data collection. Additionally, nursing staff collected data for two studies (Garten et al., 2011; Matricardi et al., 2013), and therefore, over-reporting or under-reporting of parents' visits can be possible, considering the busy schedules of nurses in the NICU. In this study fathers will be asked directly the number of times they visit the NICU in a week.

Aspects of fathers' work, the size of the infant (Arockiasamy et al., 2008; Feeley, Sherrard, et al., 2013; Feeley, Waitzer, et al., 2013; Garten et al., 2013; Heidari et al., 2012), the presence of sophisticated equipment in the NICU environment (Bozzette, 2011) and hospital policies regarding such things as visitation times (Feeley, Sherrard, et al., 2013; Sloan et al., 2008) affect paternal involvement in the NICU. Paternal involvement increases in the NICU when fathers have unlimited entry into the unit (Feeley, Sherrard, et al., 2013; Feeley, Waitzer, et al., 2013), compared to units where restrictions are applied regarding frequency and timing of visits by fathers (Ionio et al., 2016; Pallas-Alonso et al., 2012). In Ghana, parental access to the NICU is based on policies of the hospital. Fathers' involvement is also affected by work place policies. Fathers on paid paternity leave are more involved in the care of their infants in the NICU than fathers who were working (Feeley, Waitzer, et al., 2013). Other fathers use work to escape from stress in the NICU, as work helped them regain their sense of control (Arockiasamy et al., 2008; Helth & Jarden, 2013). The economic circumstances of families, as well as government or institutional policies, may prevent fathers from going on paternity leave (Heidari et al., 2012; Helth & Jarden, 2013) and therefore, influence paternal involvement in the NICU.

Fathers narrate the importance of communication and clarity of information and the effect on their inclusion in the NICU (Feeley, Sherrard, et al., 2013; Ignell Mode et al., 2014). Fathers with varied beliefs of paternal invovlement (direct or indirect care) have expressed how conflicting, inconsistent information and the use of unexplained medical terms by neonatal staff make them feel a lack of control and affected their level of involvement in the NICU (Arockiasamy et al., 2008; Blomqvist et al., 2012; Feeley, Sherrard, et al., 2013; Garten et al., 2013; Heidari et al., 2012; Helth & Jarden, 2013; Ignell Mode et al., 2014; Lee et al., 2013; Sloan et al., 2008). Fathers have felt NICU staff ignored them during conversations and the

needs of mothers ranked higher than the needs of fathers (Helth & Jarden, 2013). The fathers explained that accurate, consistent information about the condition and well-being of their infant when delivered at the right time and in a language that they can understand, gives them a sense of control, reduces stress and makes them feel involved in the care of their infants (Feeley, Sherrard, et al., 2013; Hollywood & Hollywood, 2011; Kadivari & Mozafarinia, 2013; Maguire, Bruil, Wit, & Walther, 2007; Sisson et al., 2015). Some researchers advocate for father-specific information that suits the fathers' lifestyles and social context (Arockiasamy et al., 2008; Garten et al., 2013; Ichijima, Kirk, & Hornblow, 2011; Lee et al., 2013). For example, fathers may not pay attention to the education of the neonatal nurse when in a hurry to go to work or when fathers believe that caregiving activities is the role of the mother. Studies have emphasized fathers' need for more informational support from neonatal staff to increase paternal involvement in the NICU (Arockiasamy et al., 2008; Feeley, Sherrard, et al., 2013). In addition, supportive nursing interventions such as providing fathers with simple, realistic information about their premature infant and encouraging fathers to touch and feed their infants promote and increase paternal involvement in the NICU (Ignell Mode et al., 2014; Lee et al., 2013).

When nurses assess the needs of fathers it will enable them to explore alternate forms of involvement that fathers desire, provide fathers with options and encourage them to be involved in other ways with their infant's care. As much as family and friends are forms of support, they sometimes negatively influence parents to make decisions that may not be beneficial to the infant (McCaw-Binns, La Grenade, & Ashley, 1995). Therefore, NICU staff need to encourage fathers to share their fears and worries about their infant and the NICU care. Having identified the benefits of paternal involvement and its challenges, some researchers emphasize the need for health professionals to support and provide resources to encourage paternal involvement in child

care in the paediatric unit, including the NICU (Broger & Zeni, 2011; Sarkadi et al., 2008). Paternal involvement in the NICU was further examined from LMIC and the Ghanaian perspective.

Paternal Involvement in NICU—LMIC and Ghanaian Perspectives

A study in Ghana reports that fathers perceive their involvement with infants in general as giving verbal instruction, supervision and support to mothers and grandmothers whose responsibilty it is to care for the infant (Dumbaugh et al., 2014). However, fathers in this study reported assuming supervisory roles due to their lack of knowledge on infant care and having little or no physical contact with their infants. Some fathers also expressed their desire to be involved in their infant's care (Dumbaugh et al., 2014). Even though specific care practices were not discussed in the study, fathers wanted to help care for their infants so mothers could rest. Additionally, involving fathers will empower them to be informed about their infant's health so that they can make informed decisions about their infant's care.

People from varied cultural environments react to the admission of an infant in the NICU differently (Provenzi & Santoro, 2015). Studies conducted in Nigeria (Iliyasu et al., 2010), Uganda (Kakaire et al., 2011) and Ghana (Dumbaugh et al., 2014) have stated that African men are increasingly becoming interested in being involved in their families' health care practices such as childcare, but gender norms that construct a patriarchal society often limit how men engage in these practices. In these societies' men who are more engaged in caretaking practices are perceived as weak and are often stigmatized (Montgomery, Hosegood, Busza, & Timaeus, 2006). Another study in Iran reveals the social stigma of shame and guilt attached to parents with hospitalized infants. This stigma results from the socio-cultural structure in Iran glorifying healthy infants, and parents having to explain to concerned family and friends why their infants

are in the hospital. These fathers also risk job and income loss due to the prolonged hospital stay of their infants (Heidari et al., 2012).

While some studies have reported a relationship between the gender of the infant and paternal involvement and visitation in the NICU (Pleck & Masciadrelli, 2004), other studies have found no relationship (Garten et al., 2013; Lee et al., 2013). This result may be different in cultures like Africa (Milazzo, 2014) and Asia (Bharati, Shome, Pal, Chaudhury, & Bharati, 2011; Roopnarine, Krishnakumar, & Vadgama, 2013), where families desire male over female children due to religious, economic and cultural reasons, which may determine whether fathers visit and are involved in the NICU. Consequently, establishing the needs and stress levels of fathers is critical to enabling NICU staff to have cultural insight when dealing with fathers of diverse cultures and expectations in being engaged in childcare in the NICU. This study will enrich research on fathers in a Ghanaian NICU and enlighten NICU staff as to where and how support can be strengthened to encourage fathers to be more engaged in the care and decision-making regarding their infant during and after NICU admission.

Chapter 3: Methods

This chapter describes the research design, setting, study participants, sample size and the recruitment process. The chapter also includes data collection, analysis and ethical considerations.

Research Design

The current study is a quantitative study using a cross-sectional design to investigate what fathers regard as important in the care of and decision-making for their infants in the NICU. Cross-sectional design was appropriate for collecting data on this current research problem being studied since data was collected at a single period and in a specified environment (Polit & Beck, 2012). Additionally, cross-sectional design was used to clarify how the variables under study (needs and stress) influence each other, as it helped illuminate the effects of infant and father characteristics on the needs and stress levels of fathers in the NICU.

Setting

The study was conducted in the NICU of the Korle Bu Teaching Hospital (KBTH) Accra, Ghana. The KBTH provides care to people within a wide geographical area and serves as a referral hospital for most regions in Ghana. The NICU of the hospital admits over 2000 newborns yearly with various health problems of preterm and term infants. The unit has a bed capacity of 50 which consists of 20 incubators, 25 cots and 5 beds for mothers of preterm infants awaiting discharge. KBTH was chosen because it is one of the largest research and teaching hospital in Ghana, which trains most health professionals, including nurses and physicians.

Study Participants

A convenience sample of fathers of infants admitted in the NICU who met the eligibility criteria participated in the study. According to Polit and Beck (2012), convenience sampling

involves using the most available people in a population under study in a specified area and time frame.

Inclusion and exclusion criteria. Fathers were included in the study if they: (a) had an infant hospitalized in the NICU for at least 48 hours (b) spoke English or Twi (c) visited the NICU at least once and d) were 18 years or older. Fathers with critically ill infants were excluded from the study as data collection may be extremely stressful to such fathers. A critically ill child was identified based on the definition or indications of physicians in the NICU for example an infant in severe respiratory distress. Additionally, fathers with a previous history of an infant hospitalized in the NICU were excluded, since their past experience may impact their response with regards to their current stress level and needs (Feeley, Sherrard, et al., 2013; Feeley, Waitzer, et al., 2013).

Sample Size

To determine whether there is a relationship between infant and father characteristics (such as infants' gender and fathers' educational level) and the needs or stress levels of fathers in the NICU, G POWER version 3 was used to calculate the sample size for the study (Faul, Erdfelder, Buchner, & Boisvert, 2009). The level of significance was set at .01 to control for Type I error due to multiple hypotheses that were tested to identify the relationship between infant and father characteristics, and fathers' needs or stress levels (Dudek-Shriber, 2004). To attain a power of .80 with an effect size of .33, the required sample size was 80.

Recruitment

A public health nurse, formerly a NICU nurse, but currently employed in the outpatient department (OPD) of the Department of Child Health worked closely with nurses in the NICU to identify fathers who were eligible for the study. The public health nurse first approached fathers

and provided a brief overview of the study and inquired about fathers' interest in the study. Interested fathers filled out a recruitment form (Appendix B) giving the researcher permission to contact fathers in person or on the telephone to elaborate on the study. Five fathers declined to participate, giving time constraints or not being interested in participating in research. In total 85 fathers where approached and 80 fathers accepted to participate in the study. Data was collected within a period of two months—from November to December 2017 following approval by the Conjoint Health Research Ethics Board at the University of Calgary and the Scientific and Technical Committee and the Institutional Research Board of the KBTH.

Data Collection

The researcher used questionnaire (paper based) to collect data for this study because they are commonly used with a cross-sectional design for quantitative studies due to their flexibility and ability to collect data from a large sample of a given population (Polit & Beck, 2012). Additionally, information obtained from questionnaires can be used for many purposes, applied to many populations, and focus on a range of topics. The questionnaire used for this study was translated into Twi, a language spoken among most Ghanaians, and then translated back by an expert into English to ensure language equivalency. The questionnaire was piloted among 4 Ghanaian fathers in the NICU for its readability, understandability, and father's preference on how to fill out the questionnaire. Two fathers completed the pilot questionnaire in English, and the Twi version was read out to 2 fathers, and their responses were ticked. No changes were made after the pilot study based on feedback from fathers. Forty-three fathers used approximately 20 minutes to independently complete the English version of the questionnaire and the researcher read the questions to 37 fathers and ticked the responses for fathers who could

not read Twi or English. No father filled the questionnaire in Twi. All data were collected during visiting hours as agreed by fathers.

Tools for Data Collection

The questionnaire (Appendix C) for this study consisted of demographic information of the father and the infant and the two scales to answer the research questions. The researcher developed the demographic data, which included such information as father's age, level of education and current employment status. Additionally, fathers were asked information concerning the number of visits they made to the NICU and the number of times fathers were present and participated in NICU rounds. The demographic data collectively described fathers who agreed to participate in study. The researcher gathered data on characteristics of infants from infants' medical records, with permission from their fathers, which include gestational age, birth weight, gender, length of stay and infants' medical condition.

With permission from the authors (Appendix D) fathers filled out the Fathers' Support Scale: Neonatal Intensive Care Unit (FSS: NICU) (Appendix C) developed by Mahon et al. (2015), which measured fathers' needs during the hospitalization of their infant in the NICU. The instrument contains 34 questions with three sections: a) Learning about Your Baby (10), b) Taking Care of Yourself and Your Family (13) and c) Taking Care of Your Baby (10). Fathers' responses to questions on the FSS: NICU were rated with a Likert scale ranging from 0 – not important to 4 – extremely important and a non-applicable option. The last question on the FSS: NICU gave fathers the opportunity to share their opinion or that of their partners on what would be helpful in supporting them during their infant's admission in the NICU. The FSS: NICU was developed in Canada and tested among 116 fathers with infants in a level III NICU in Vancouver, Canada. The internal consistency (Cronbach's alpha) on 116 fathers was .82 with

test reliability on 72 fathers for the full scale of .81 (Mahon et al., 2015). In the process of the literature search no tool was found that was developed in LMIC, Africa or Ghana that assesses the needs of fathers in the NICU. The FSS: NICU was chosen among other tools because it is the only tool that currently assesses the needs of fathers in the NICU. Other scales like the Family Needs Inventory (Ward, 2001) and Paternal Satisfaction Scale (Latour, Duivenvoorden, Hazelzet, & van Goudoever, 2012) involved parents (fathers and mothers); however, fathers were underrepresented during the development of the instrument (Mahon et al., 2015).

Secondly, the Parental Stressor Scale: Neonatal Intensive Care Unit (PSS: NICU) (Appendix C) by Miles, Holditch-Davis, Schwartz and Sher (2007) was used with permission from the authors (Appendix D) to measure fathers' perception of stress in the NICU. The PSS: NICU contains 26 questions and three subscales: a) Sights and Sounds (5 items), b) Baby looks and Behaves (14 items) and c) Relationship and Parental Role (7 items). The level of stress was rated on a 5-point Likert scale ranging from 1 – not at all stressful to 5 – extremely stressful, with a non-applicable option for participants who have not experienced the item. At the end of the PSS: NICU fathers were given the opportunity to share any situation that they found stressful during their infant's admission in the NICU. The psychometrics of the PSS: NICU has been tested on 190 parents (115 mothers and 75 fathers) whose premature infants were admitted to three NICU, one of which was in Canada, with the other two located in the Midwest and Southeast of the United States. The reported internal consistency was .92 (Miles et al., 1993). An updated version of the PSS: NICU also reported Cronbach's alpha of .92 (Miles et al., 2007). A study on Taiwan fathers evaluating the effectiveness of an intervention to reduce paternal stress using the PSS: NICU reported Cronbach's alpha of .95 and .97 in the pre-test and post-test study, respectively (Lee et al., 2013). The PSS: NICU was chosen because it is a tool that has been

widely used to assess stress for both mothers and fathers in many countries such as Taiwan (Lee et al., 2013), Rwanda (Musabirema et al., 2015) and Australia (Turner et al., 2015). The PSS: NICU assesses contributors to stress such as the physical environment, infant's appearance and looks in the NICU. The face and content validity of the FSS: NICU and PSS: NICU were established by their authors and reviewed by nurse researchers, neonatologists and parents.

Ethical Considerations

When participants were first contacted by the researcher, the entire study was explained after which the consent form (Appendix F) was given to fathers to sign or thumb print having understood the aims and their level of involvement in the study. The consent form was written in English or Twi and read out to fathers who could read neither Twi nor English. The form explained the purpose of the study and the level of participation required from fathers. Additionally, the consent form included how the researcher will use fathers' responses and the risks of participation in the study to the infant and father. Fathers who agreed to be part of the study signed or thumb printed the consent form. Participation in the study was voluntary and fathers were given the free will to withdraw from the study at any time by not completing the questionnaire or by informing the researcher about their decision not to participate in the study. Fathers were assured that their decision (to participate, not participate, or withdraw) would not affect their care, that of their infant or the care of the mother in the NICU. The researcher did not pay participants, nor did fathers have to pay to participate in this study.

Fathers' names were not asked for on the questionnaire to anonymize the data during the data entry and analysis process. The completed questionnaires were stored in an office away from the unit, and data was stored on the researcher's password protected laptop. Completed questionnaires and databases will be destroyed seven years after completion of the study.

Participants' anonymity and confidentiality are guaranteed in all presentations and publications of the results of this study.

Data Analysis

All the generated data was analyzed using the Statistical Package for Social Sciences (SPSS) (2015) Version 22. Data describing infant and father characteristics was summarized using mean and standard deviation for continuous variables when data was normally distributed and median and range when data was skewed, and percentages and frequency for categorical data. The rating scale for the FSS: NICU and PSS: NICU were Likert scales and were analyzed as continuous variables. The following are data analysis methods for each research question:

a) What are the needs of Ghanaian fathers during the hospitalization of their infant in the NICU?

   Mean and standard deviation were calculated for each of the subscales.

b) What are the stress levels of Ghanaian fathers during the hospitalization of their infant in the NICU?

   Mean and standard deviation were calculated for each of the subscales.

c) Is there a relationship between infant and father characteristics (such as infants' gender and fathers' educational level) and the needs or stress levels of fathers in the NICU?

   The researcher identified the relationship between infant and father characteristics (independent variables) and fathers' needs or their stress levels (dependent variable) in the NICU using a hierarchical multiple regression in which three blocks were used on the subscales and the total scores. Results of previous studies had shown that infant characteristics have a stronger impact on paternal needs and stress level than fathers' characteristics (Dudek-Shriber, 2004; Feeley, Waitzer, et al., 2013). Therefore, the author

of this study entered infant variables first into the block. The first block included infants' gestational age, birth weight, and diagnosis. Length of infant stay in the NICU and infant gender were entered into the second block, followed by fathers' variables: age, educational level and employment status as the last block. Only results with the level of significance of less than .01 were reported to control for Type I error due to multiple hypotheses for this question.

d) Is there a relationship between self-reported needs and stress among Ghanaian fathers in the NICU?

   The author used correlation to indicate whether there is a relationship between fathers' needs and their stress levels in the NICU. The level of significance for question d) was .05.

Knowledge Translation

The goal of this study is to raise awareness in LMIC, particularly in Ghana, among NICU staff, especially neonatal nurses, about the needs and stressors of fathers whose infants are in the NICU. This study will be submitted as a thesis to the University of Calgary. A request will be made to present the findings of study during a monthly seminar organized by the Department of Child Health of the KBTH, where all health professionals including trainees, directors and managers of the units attend. KBTH trains most health professionals in Ghana such as nurses and doctors; presenting my findings during the monthly meetings will serve as an opportunity to help create awareness among trainees about the needs and stressors of Ghanaian fathers in the NICU. These graduates will be encouraged to reflect on their own practice to promote change, as well as be encouraged to help implement paternal involvement interventions in the NICU. Additionally, results from this study will be submitted for publication in the Journal of Perinatology and

presented at both national and international peer-reviewed seminars and/or conferences aimed at health care professionals, especially those working in the NICU.

Chapter 4: Results

This chapter presents the results of the study to examine the needs and stress levels of fathers with infants receiving neonatal intensive care at the KBTH. This section includes demographic characteristics of infants and then fathers, fathers' visiting patterns and answers each of the research questions

Demographic Characteristics of Infants

The gestational age (M = 35.84; SD = 3.97) and birth weight (M = 2.30; SD = 0.89) of infants born to participating fathers were gathered from infants' medical records. The average gestational age and birth weight of infants in this study suggest that majority of the infants had low birth weight due to prematurity (World Health Organization [WHO], 2017). More than half of the infants were born at the KBTH (67.5%), 32.5% were born in other hospitals and transferred to the NICU of the KBTH. Most infants were males (61.3%), and over half were born through caesarean section (53.8%). The majority of the infants on admission were singletons (91.3%) and the remaining from multiple gestations (8.8%). For fathers with multiple births, data was collected for the first child (first twin or triplet). Approximately half of the infants were admitted on the account of prematurity (56.3%) with a median length of stay in the NICU of 3.5 days (range 2–10 days). Given the Ghana government's policy on free healthcare for pregnant women and subsequent free healthcare for infants within the first 3 months of life, the majority of neonates (90.0%) were insured by the National Health Insurance Scheme (NHIS). Two infants did not have any form of insurance possibility because their mothers failed to register with the NHIS when pregnant or they were non-resident foreigners in Ghana. Infant characteristics are shown in Table 1.

Table 1: Characteristics of Infants Born to Participating Fathers (N = 80)

Characteristics		
	M	***SD***
Gestational Age (weeks)	35.84	3.97
Birth weight (kg)	2.30	0.89
	Median	**Range**
Infant's length of stay in the NICU (days)	3.50	2 – 10
	n	**%**
Infant's birth hospital		
Korle Bu Teaching Hospital	54	67.5
Amasaman Government Hospital	14	17.5
Other hospital	11	11.0
Home delivery	1	1.3
Mode of Delivery		
Spontaneous Vaginal Delivery	35	43.8
Caesarean Section	43	53.8
Vacuum Extraction	2	2.5
Birth Type		
Singleton	73	91.3
Multiple gestation	7	8.8
Gender		
Male	49	61.3
Female	31	38.8

Characteristics	*n*	%
Infant Diagnosis		
Prematurity	45	56.3
Infection	35	43.8
Type of Insurance		
NHIS	72	90.0
Private Insurance	5	6.3
NHIS and Private Insurance	1	1.3
No Insurance	2	2.5

Note. kg = kilograms; NICU = neonatal intensive care unit; NHIS = national health insurance scheme.

Demographic Characteristics of Fathers

The sample consisted of 80 fathers whose infants were receiving care in the neonatal intensive care at the KBTH with a median age of 35 years (range 18–75 years). The majority of respondents were from the Akan tribe representing 38.8% of the sample, Ewe 25%, Ga 21.3%, Hausa 2.5% and 12.3% representing other tribes such as the Guan. Approximately three-fourths of respondents were married (78.8%), while the remaining (21.3%) cohabited with the mother of the infant on admission. All fathers had some level of formal education. The majority had completed senior high school or less (61.3%), and the least educational level completed was post-secondary education (38.8%). Nearly all participants were employed (91.3%) with most being self-employed (48.8%). Participants were engaged in various professions with businessmen being the most common occupation (11.3%) followed by drivers (8.8%). Almost all fathers were not on paternity leave (93.8%). Most fathers were first-time fathers (35.0%), 32.5%

had one child, and 32.5% had 2 or more children at home. Table 2 outlines the demographic characteristics of fathers.

Table 2: Demographic Characteristics of Fathers (*N* = 80)

Characteristics		
	Median	**Range**
Age of fathers (years)	35	18 – 75
	n	**%**
Ethnicity		
Akan	31	38.8
Ewe	20	25.0
Ga	17	21.3
Hausa	2	2.5
Other	10	12.5
Marital status		
Married	63	78.8
Cohabit	17	21.3
Highest level of education		
Completed senior high school or less	49	61.3
Post-secondary education	31	38.8
Employment status		
Employed	73	91.3
Not employed	7	8.7

Characteristics	***n***	**%**
Employers		
Self employed	39	48.8
Private	29	36.3
Government	12	15.0
Occupation		
Businessman	9	11.3
Driver	7	8.8
Other	64	79.9
Other children		
First time father	28	35.0
One child	26	32.5
2 or more	26	32.5
Paternity leave		
Yes	5	6.3
No	75	93.5

Note. NICU = neonatal intensive care unit

Fathers Visitation Patterns in the NICU

A greater number of the fathers (70.0%) visited their infants daily and identified their median duration of stay as 2 hours (range = 0.15–12:40 hours) in the NICU. The majority of the fathers preferred to visit the NICU anytime (48.8%) and nearly all participants wished they were present during ward rounds (93.8%); however, only half of the fathers had been present during

ward rounds (50%). Table 3 displays the characteristics of fathers' visitation patterns in the NICU.

Table 3: Fathers Visitation Patterns in the NICU

Characteristics	***n***	**%**
Number of visit per week		
2 times or less	12	15.0
3-5 times	12	15.0
Daily	56	70.0
Preferred time to visit the NICU		
Early morning (before 9:00am)	16	20.0
Morning (between 9:00 and 12:00pm)	4	5.0
Afternoon (between 12:00pm and 5:00pm)	6	7.5
Evening (between 4:00pm and 9:00pm)	13	16.3
Late night (after 9:00pm)	2	2.5
Anytime	39	48.8
Ever present during ward rounds		
Yes	40	50.0
No	40	50.0
Would you like to be present during ward rounds		
Yes	75	93.8
No	5	6.3

Note. NICU = neonatal intensive care unit

Research Question a) what are the needs of Ghanaian fathers during the hospitalization of their infant in the NICU?

The needs of Ghanaian fathers during the hospitalization of their infant in the NICU were analyzed using the mean and standard deviation for each subscale of the FSS: NICU. The needs of fathers were measured using three subsections of the FSS: NICU, "learning about your baby", "taking care of yourself and family" and "taking care of your baby". Fathers identifying which of the subscales within the FSS: NICU they perceive important underscores this as a need of which fathers require support from NICU staff.

Participants rated the "learning about your baby" subscale the highest (M = 3.58, SD = 0.48) among the FSS: NICU subscales. Fathers identified getting up-to-date information about their infant's health as the most important need (M = 3.83, SD = 0.55), followed by receiving adequate information from doctors (M = 3.71, SD = 0.46) and receiving information in plain non-medical language (M = 3.69, SD = 0.52). Fathers also rated moderate importance to the ability for them to understand what is being said during ward rounds (M = 3.61, SD = 0.77). Fathers rated the "taking care of your baby" subscale the second highest (M = 3.15, SD = 0.51) among the FSS: NICU subscales. Within this particular subscale, the most important need was fathers being able to touch and hold their baby (M = 3.68, SD = 0.57), followed by fathers' ability to comfort their infant when in pain or looked upset (M = 3.63, SD = 0.60) and then understanding possible long-term complications about their infant (M = 3.61, SD = 0.81). Fathers rated moderate importance to being able to talk to other parents with previous NICU experience (M = 2.53, SD = 1.46) and being able to perform routine care for their infant such as feeding (M = 2.13, SD = 0.60). "Taking care of yourself and family" subscale was rated least important (M = 2.51, SD = 0.57). Within this subscale, however, respondents rated taking care of their finances

as extremely important (*M* = 3.77, *SD* = 0.70), followed by being able to talk to their partners often (*M* = 3.60, *SD* = 0.54) and then being able to pray or perform spiritual practices (*M* = 3.34, *SD* = 1.24). Fathers rated little importance to being able to talk to other NICU parents (*M* = 1.89, *SD* = 1.48), getting away to have some time alone (*M* = 1.63, *SD* = 1.61) and being able to talk to extended family about sick infant (*M* = 1.26, *SD* = 1.46). The least important item was talking to friends about their sick infant (*M* = 0.89, *SD* = 1.15). On the FSS: NICU scale, majority of fathers answered their need for adequate information about their infant's health in the NICU as more important than talking to friends about their infant. None of the fathers responded to the last open-ended question on the FSS: NICU which gave them the opportunity to identify other things that they or their partners would consider helpful in supporting them while their baby is in the NICU. When prompted to answer the question they believed the questionnaire addressed all their needs. The data is presented in Table 4.

Table 4 Mean and Standard Deviation of the Subscales of FSS: NICU

FSS: NICU subscales	***M***	***SD***
Learning about your baby		
Getting regular information about your baby's health	3.83	0.55
Getting information about your baby in plain, non-medical language	3.69	0.52
Being able to get the information you need about your baby from the NICU doctors	3.71	0.46
Being able to understand what you hear about your baby on rounds	3.61	0.77
Getting recommendations for your baby's care from one doctor after medical meetings about your baby.	3.59	0.76

FSS: NICU subscales	*M*	*SD*
Learning about your baby (continued)		
Getting the information, you need about your baby from the NICU nurses	3.51	0.86
Knowing the roles of staff who care for your baby	3.40	1.06
Getting a general idea (rather than a detailed report) about your baby's health daily	3.59	0.73
Feeling you are kept as well informed as the baby's mother	3.52	0.81
Being able to get information about your baby by phone	3.28	1.10
Mean score	3.58	0.48
Taking care of yourself and your family		
Being able to talk with your partner often	3.60	0.54
Being able to talk with friends about your baby often	0.89	1.15
Being able to go to work	3.23	1.18
Being able to take time off work to be with your baby	3.28	0.87
Being able to take care of your finances	3.77	0.70
Being able to help with the care of your other children	3.03	1.28
Being able to talk with other NICU parents	1.89	1.48
Being able to talk with your extended family about your baby	1.26	1.46
Being able to get away to have some time on your own	1.63	1.61
Being able to exercise	2.09	1.50
Being able to pray or do other spiritual practices	3.34	1.24
Getting away to have some time with your partner	2.41	1.56

FSS: NICU subscales	*M*	*SD*
Taking care of yourself and your family (continued)		
Being able to talk to an expert about your emotions or feelings	2.44	1.46
Mean score	2.51	0.57
Taking care of your baby		
Being able to touch and hold your baby	3.68	0.57
Being able to comfort your baby if he/she is in pain or looks upset	3.63	0.60
Being able to do routine care for your baby such as feeding and diaper changing	2.13	1.61
Being a part of important decisions about your baby's care	3.43	1.12
Having different doctors' opinions about the best way to treat your baby	3.18	1.28
Getting a medical opinion about your baby's care from one doctor after a group discussion	3.34	1.02
Being able to talk to parents who had a baby in the NICU in the past	2.53	1.46
Understanding possible long-term problems your baby might have	3.61	0.81
Being able to stay and sleep overnight in the NICU when your baby is sick (even if you live close to the hospital)	3.19	1.20
Being able to have your baby take part in research studies	2.86	1.42
Mean score	3.15	0.51

Note. FSS: NICU = father support scale: neonatal intensive care unit

Research question b) what are the stress levels of Ghanaian fathers during the hospitalization of their infant in the NICU?

The stress levels of Ghanaian fathers were analyzed by calculating the mean and standard deviation for each of the subscales of the PSS: NICU. The PSS: NICU was used to measure the stress levels of fathers during the admission of their infants in the NICU. Participants rated the "relationship and parental role" subscale the highest (M = 3.51, SD = 1.22). Fathers identified the most stressful items as their separation from their infants (M = 4.09, SD = 1.49), followed by not spending time alone with their infant (M = 3.83, SD = 1.66), feeling helpless about their inability to protect their baby from pain and painful procedures (M = 3.81, SD = 1.51) and feeling helpless about how to help their newborn during the period of hospitalization (M = 3.76, SD = 1.59). Fathers rated a little stressful to their inability to feed (M = 2.91, SD = 1.99) and care for their baby themselves (M = 2.91, SD = 2.03). Regarding the level of importance, the "baby looks and behaves" subscale was rated the second highest (M = 2.89, SD = 1.16). The most stressful responses occurred when infants appeared to be in pain (M = 3.95, SD = 1.81) and looked sad (M = 3.84, SD = 1.94). The next extremely stressful item was fathers seeing tubes and needles put in their infant (M = 3.67, SD = 1.75). Fathers rated the "sights and sounds" subscale the least stressful (M = 2.86, SD = 1.18), with the most stressful item being the sight of other sick neonates in the NICU (M = 3.64, SD = 1.53).

Fathers identified that among the PSS: NICU, the "sights and sounds" and "baby looks and behaves" subscales were less stressful when compared with the "relationship and parental role" subscale. This suggests that during the hospitalization of infants in the NICU, Ghanaian fathers are more stressed about their inability to form a relationship and assume parental role with their infant than sensory information in the NICU and the visual appearance and behaviors

of their infant. None of the fathers responded to the last open-ended question on the PSS: NICU which gave them the opportunity to identify other stressful situation as they felt the tool adequately addressed all their stressors. The data is presented in Table 5.

Table 5: Mean and Standard Deviation of the Subscale of PSS: NICU

PSS: NICU subscales	***M***	***SD***
Baby looks and behaves		
Tubes and equipment on or near my baby	3.10	1.95
Bruises, cuts or incisions on my baby	2.95	2.01
The unusual color of my baby (for example, looking pale or yellow jaundiced)	2.99	2.26
My baby's unusual or abnormal breathing patterns	2.99	2.26
The small size of my baby	1.89	2.13
The wrinkled appearance of my baby	0.94	1.66
Having a machine (respirator) breathe for my baby	1.86	2.31
Seeing needles and tubes put in my baby	3.69	1.75
My baby being fed by an intravenous line or tube	3.73	1.67
When my baby seemed to be in pain	3.95	1.81
When my baby looked sad	3.84	1.90
The limp and weak appearance of my baby	3.51	1.93
Jerky or restless movements of my baby	2.15	2.26
My baby not being able to cry like other babies	2.78	2.38
Mean score	2.89	1.16

PSS: NICU subscales	*M*	*SD*
Sights and sounds		
The presence of monitors and equipment	3.03	1.99
The constant noises of monitors and equipment	2.53	1.76
The sudden noises of monitor alarms	2.98	1.72
The other sick babies in the room	3.64	1.53
The large number of people working in the unit	2.15	1.53
Mean score	2.86	1.18
Relationship and parental role		
Being separated from my baby	4.09	1.49
Not feeding my baby myself	2.91	1.99
Not being able to care for my baby myself (for example, diapering, bathing)	2.91	2.03
Not being able to hold my baby when I want	3.28	1.96
Feeling helpless and unable to protect my baby from pain and painful procedures	3.81	1.51
Feeling helpless about how to help my baby during this time	3.76	1.59
Not having time alone with my baby	3.83	1.66
Mean score	3.51	1.22

Note. PSS: NICU = parental stressor scale: neonatal intensive care unit

Research question c) is there a relationship between infant and father characteristics (such as infants' gender and fathers' educational level) and the needs or stress levels of fathers in the NICU?

To determine which infant and father characteristics (independent variables) predict the needs or stress levels (dependent variable) of fathers, hierarchical multiple regression was used with three models on the subscales, and the total score of the FSS: NICU and PSS: NICU. The three models were identified based on previous studies that showed that infant characteristics had a stronger influence on the needs and stress levels than father characteristics (Dudek-Shriber, 2004; Feeley, Waitzer, et al., 2013). The predicators were entered into three models: model 1 contained infants' gestational age, birth weight, and diagnosis; model 2 consisted of length of stay of infant in the NICU and gender, and lastly model 3 contained age of father, employment status and level of education. There was no indication of multicollinearity as each of the independent variables (infant and father characteristics) had a Variance Inflation Factor (VIF) score below 10 and Tolerance score above 0.20. The residuals were independent and approximately normally distributed by the normal probability plot. From the scatter plots I found the residual variances to be homoscedastic and Cooks distance scores were below 1, indicating no individual cases having an effect on the model. Therefore, the assumptions of the multiple regression model were satisfied.

Total score FSS: NICU. Hierarchical multiple regression analysis was used to test whether infant and father characteristics significantly predicted the FSS: NICU. Model 1 was not statistically significant, F (3, 48) = 2.367, $p > 0.01$ and accounted for 12.9% of the variance in the FSS: NICU (R^2 = 0.129, Adjusted R^2 = 0.74). Models 2 and 3 were also not statistically significant and accounted for an additional 3.9% and 8.4%, respectively, of the variance in the

FSS: NICU (Table 6). Therefore, infant and father characteristics were not statistically significant F (8, 43) = 1.809, p > 0.01 and explained 25% of the variance in the FSS: NICU (R^2 = 0.252, Adjusted R^2 = 0.113).

Table 6: Summary of Hierarchical Regression Analysis for Variables Predicting FSS: NICU

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
Model 1	Gestational age	-0.052	0.022	-.534	0.023	0.129	2.367
	Birth weight	0.176	0.102	.391	0.092		
	Diagnosis	0.146	0.106	.186	0.174		
Model 2	Gestational age	-0.050	0.023	-.508	0.032	0.168	1.088
	Birth weight	0.168	0.105	.373	0.117		
	Diagnosis	0.153	0.106	.195	0.156		
	Length of stay	-0.020	0.033	-.087	0.557		
	Gender	0.124	0.116	.153	0.291		
Model 3	Gestational age	-0.050	0.023	-.517	0.037	0.252	1.602
	Birth weight	0.161	0.105	.358	0.134		
	Diagnosis	0.152	0.107	.194	0.161		
	Length of stay	-0.014	0.034	-.059	0.693		
	Gender	0.094	0.116	.116	0.424		
	Father's age	-0.003	0.007	-.059	0.678		
	Employment status	0.464	0.239	.278	0.059		

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
	Level of Education	-0.120	0.112	-.154	0.288		

Note. FSS: NICU = father support scale: neonatal intensive care unit

Learning about your baby. Hierarchical multiple regression analysis was used to test whether infant and father characteristics significantly predicted the "learning about your baby" subscale. Model 1 was not statistically significant, $F(3, 73) = 1.107$, $p > 0.01$ and accounted for 4.4% of the variance in the "learning about your baby" subscale ($R^2 = 0.044$, Adjusted $R^2 = 0.004$). Models 2 and 3 were also not statistically significant and accounted for an additional 4.2% and 10.6%, respectively, of the variance in the "learning about your baby" subscale (Table 7). Therefore, infant characteristics and father characteristics were not statistically significant $F(8, 68) = 2.007$, $p > 0.01$ and explained 19.1% of the variance in the "learning about your baby" subscale ($R^2 = 0.191$, Adjusted $R^2 = 0.096$). The educational level of fathers was negatively associated with "learning about your baby" subscale, however this association approached significance ($\beta = -0.305$, $p = 0.01$).

Table 7: Summary of Hierarchical Regression Analysis for Variables Predicting Learning about your Baby Subscale

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
Model 1	Gestational age	-0.024	0.022	-.196	0.282	0.044	1.107
	Birth weight	0.058	0.097	.109	0.549		
	Diagnosis	0.149	0.109	.157	0.175		

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	ΔF
Model 2	Gestational age	-0.024	0.022	-.196	0.286	0.085	1.616
	Birth weight	0.033	0.098	.061	0.739		
	Diagnosis	0.172	0.109	.181	0.118		
	Length of stay	-0.059	0.033	-.215	0.077		
	Gender	-0.053	0.115	-.054	0.647		
Model 3	Gestational age	-0.019	0.021	-.156	0.387	0.191	2.966
	Birth weight	0.044	0.096	.083	0.645		
	Diagnosis	0.187	0.105	.197	0.078		
	Length of stay	-0.042	0.033	-.153	0.205		
	Gender	0.006	0.113	.006	0.956		
	Father's age	-0.001	0.007	-.023	0.837		
	Employment status	0.330	0.195	.187	0.096		
	Level of Education	-0.296	0.112	-.305	0.010		

Taking care of yourself and family. In this present study hierarchical multiple regression analysis was used to test whether infant and father characteristics significantly predicted the "taking care of yourself and family" subscale. Model 1 was not statistically significant, $F(3, 52) = 1.016$, $p > 0.01$ and accounted for 5.5% of the variance in the "taking care of yourself and family" subscale ($R^2 = 0.055$, Adjusted $R^2 = 0.001$). Models 2 and 3 were also

not statistically significant and accounted for additional 1.6% and 1.9%, respectively, of the variance in the "taking care of yourself and family" subscale (Table 8). Therefore, infant and father characteristics were not statistically significant $F(8, 47) = 0.585$, $p > 0.01$ and explained 9.1% of the variance in the "taking care of yourself and family" subscale ($R^2 = 0.091$, Adjusted $R^2 = -0.091$).

Table 8: Summary of Hierarchical Regression Analysis for Variables Predicting Taking Care of yourself and Family

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
Model 1	Gestational age	-0.033	0.032	-.239	0.315	0.055	1.016
	Birth weight	0.092	0.152	.142	0.549		
	Diagnosis	0.209	0.154	.184	0.181		
Model 2	Gestational age	-0.033	0.033	-.242	0.318	0.072	0.436
	Birth weight	0.099	0.156	.153	0.530		
	Diagnosis	0.217	0.156	.190	0.172		
	Length of stay	0.003	0.046	.010	0.947		
	Gender	0.150	0.165	.130	0.366		
Model 3	Gestational age	-0.027	0.036	-.197	0.452	0.091	0.327
	Birth weight	0.080	0.161	.124	0.624		
	Diagnosis	0.225	0.163	.198	0.174		
	Length of stay	0.002	0.048	.007	0.964		
	Gender	0.141	0.170	.122	0.412		
	Father's age	-0.007	0.010	-.094	0.517		

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
	Employment status	0.189	0.371	.076	0.613		
	Level of Education	-0.084	0.171	-.075	0.625		

Taking care of your baby. To determine whether infant and father characteristics significantly predicted the "taking care of your baby" subscale hierarchical multiple regression analysis was used with three models. Model 1 was not statistically significant, F (3, 73) = 1.635, p > 0.01 and accounted for 6.3% of the variance in the "taking care of your baby" subscale (R^2 = 0.063, Adjusted R^2 = 0.024). Models 2 and 3 were also not statistically significant and accounted for additional 4.2% and 4.5%, respectively, of the variance in the "taking care of your baby" subscale (Table 9). Therefore, infant and father characteristics were not statistically significant F (8, 68) = 1.509, p > 0.01 and explained 15.1% of the variance in the "taking care of your baby" subscale (R^2 = 0.151, Adjusted R^2 = 0.051).

Table 9: Summary of Hierarchical Regression Analysis for Variables Predicting Taking Care of your Baby Subscale

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
Model 1	Gestational age	-0.051	0.023	-.388	0.033	0.063	1.635
	Birth weight	0.166	0.103	.288	0.110		
	Diagnosis	0.036	0.115	.035	0.756		

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
Model 2	Gestational age	-0.049	0.023	-.374	0.039	0.105	1.683
	Birth weight	0.134	0.104	.233	0.199		
	Diagnosis	0.059	0.115	.058	0.608		
	Length of stay	-0.066	0.036	-.219	0.072		
	Gender	-0.042	0.763	-.355	0.734		
Model 3	Gestational age	-0.046	0.024	.217	0.054	0.151	0.051
	Birth weight	0.125	0.105	.059	0.240		
	Diagnosis	0.060	0.115	-.245	0.601		
	Length of stay	-0.074	0.037	-.245	0.053		
	Gender	-0.50	0.126	-.048	0.693		
	Father's age	-0.010	0.007	-.159	0.173		
	Employment status	0.277	0.215	.147	0.201		
	Level of Education	-0.032	0.123	-.031	0.795		

Total score PSS: NICU. Hierarchical multiple regression analysis was used to test whether infant and father characteristics significantly predicted the PSS: NICU. Model 1 was not statistically significant, $F(3, 76) = 1.530$, $p > 0.01$ and accounted for 5.7% of the variance in the PSS: NICU ($R^2 = 0.057$, Adjusted $R^2 = 0.020$). Models 2 and 3 were also not statistically significant and accounted for additional 2.1% and 6.4%, respectively, of the variance in the PSS:

NICU (Table 10). Therefore, infant and father characteristics were not statistically significant F (8, 71) = 1.464, p > 0.01 and explained 14.2% of the variance in the PSS: NICU (R^2 = 0.142, Adjusted R^2 = 0.045).

Table 10: Summary of Hierarchical Regression Analysis for Variables Predicting PSS: NICU

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
Model 1	Gestational age	-0.082	0.041	-.356	0.050	0.057	1.530
	Birth weight	0.311	0.184	.302	0.094		
	Diagnosis	-0.175	0.204	-.096	0.393		
Model 2	Gestational age	-0.076	0.041	-.033	0.070	0.078	0.836
	Birth weight	0.320	0.187	.311	0.090		
	Diagnosis	-0.188	0.205	-.103	0.363		
	Length of stay	0.058	0.062	.109	0.357		
	Gender	0.233	0.215	.125	0.283		
Model 3	Gestational age	-0.069	0.042	-.300	0.104	0.142	0.045
	Birth weight	0.334	0.187	.324	0.079		
	Diagnosis	-0.154	0.203	-.085	0.449		
	Length of stay	0.093	0.064	.175	0.147		
	Gender	0.349	0.218	.188	0.114		
	Father's age	0.013	0.013	.113	0.318		
	Employment status	-0.038	0.359	-.012	0.916		

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
	Level of Education	-0.449	0.218	-.241	0.043		

Note. PSS: NICU = parental stressor scale: neonatal intensive care unit

Baby looks and behaves. The current study used hierarchical multiple regression analysis to test whether infant and father characteristics significantly predicted the "baby looks and behaves" subscale. Model 1 was not statistically significant, F (3, 76) = 0.425, p > 0.01 and accounted for 1.7% of the variance in the "baby looks and behaves" subscale (R^2 = 0.017, Adjusted R^2 = -0.022). Models 2 and 3 were also not statistically significant and accounted for an additional 6% and 1.1%, respectively, of the variance in the "baby looks and behaves" (Table 11). The infant and father characteristics were not statistically significant F (8, 71) = 0.844, p > 0.01 and explained 8.7% of the variance in the "baby looks and behaves" subscale (R^2 = 0.087, Adjusted R^2 = -0.016).

Table 11: Summary of Hierarchical Regression Analysis for Variables Predicting Baby Looks and Behaves

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
Model 1	Gestational age	-0.048	0.053	-.166	0.366	0.017	0.425
	Birth weight	0.088	0.238	.067	0.714		
	Diagnosis	0.087	0.265	.038	0.743		
Model 2	Gestational age	-0.035	0.053	-.120	0.510		
	Birth weight	0.092	0.238	.070	0.701		

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
	Diagnosis	0.070	0.261	.030	0.789	0.076	2.394
	Length of stay	0.100	0.080	.149	0.211		
	Gender	0.553	0.274	.234	0.047		
Model 3	Gestational age	-0.029	0.055	.100	0.598	0.087	0.273
	Birth weight	0.090	0.246	.068	0.717		
	Diagnosis	0.086	0.266	.037	0.748		
	Length of stay	0.108	0.083	.160	0.199		
	Gender	0.591	0.286	.250	0.042		
	Father's age	-0.005	0.017	-.035	0.763		
	Employment status	0.244	0.472	.060	0.606		
	Level of Education	-0.211	0.286	-.089	0.463		

Sights and sounds. Hierarchical multiple regression analysis was used to test whether infant and father characteristics significantly predicted the "sights and sounds" subscale. Model 1 was not statistically significant, F (3, 76) = 0.999, p > 0.01 and accounted for 3.8% of the variance in the "sights and sounds" subscale (R^2 = 0.038, Adjusted R^2 = 0.00). Models 2 and 3 were also not statistically significant and accounted for additional 1.1% and 5.7%, respectively, of the variance in the "sights and sounds" subscale (Table 12). Infant and father characteristics

were not statistically significant F (8, 71) = 1.052, p > 0.01 and explained 10.6% of the variance in the "sights and sounds" subscale (R^2 = 0.106, Adjusted R^2 = 0.005).

Table 12: Summary of Hierarchical Regression Analysis for Variables Predicting Sights and Sounds Subscale

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
Model 1	Gestational age	-0.083	0.053	-.279	0.126	0.038	0.999
	Birth weight	0.310	0.240	.233	0.200		
	Diagnosis	-0.226	0.266	-.096	0.398		
Model 2	Gestational age	-0.079	0.054	-.265	0.153	0.048	0.410
	Birth weight	0.324	0.245	.243	0.190		
	Diagnosis	-0.241	0.269	-.102	0.374		
	Length of stay	0.060	0.082	.088	0.464		
	Gender	0.191	0.282	.079	0.501		
Model 3	Gestational age	-0.076	0.055	-.258	0.171	0.106	1.520
	Birth weight	0.365	0.247	.274	0.144		
	Diagnosis	-0.206	0.268	-.087	0.445		
	Length of stay	0.105	0.084	.153	0.214		
	Gender	0.321	0.287	.134	0.268		
	Father's age	0.025	0.017	.164	0.159		
	Employment status	0.012	0.474	.003	0.980		

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
	Level of Education	-0.469	0.287	-.195	0.107		

Relationship and parental role. Hierarchical multiple regression analysis was used to test whether infant and father characteristics significantly predicted the relationship and parental role subscale. Model 1 was not statistically significant, F (3, 76) = 2.335, p > 0.01 and accounted for 8.4% of the variance in the "relationship and parental role" subscale (R^2 = 0.084, Adjusted R^2 = 0.48). Model 2 was not statistically significant and had no additional variance in the "relationship and parental role" subscale. Model 3 also was not statistically significant but accounted for additional 9.1% of the variance in the "relationship and parental role" subscale (Table 13). Therefore, infant and father characteristics were not statistically significant F (8, 71) = 1.903, p > 0.01 and explained 17.7% of the variance in the FSS: NICU (R^2 = 0.177, Adjusted R^2 = 0.084).

Table 13: Summary of Hierarchical Regression Analysis for Variables Predicting Relationship and Parental Role Subscale

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
Model 1	Gestational age	-0.114	0.054	-.369	0.039	0.084	2.335
	Birth weight	0.535	0.243	.387	0.031		
	Diagnosis	-0.387	0.269	-.158	0.155		
	Gestational age	-0.115	0.055	-.375	0.041		

	Independent variable	***B***	***SE B***	***β***	***p* value**	R^2	**Δ*F***
Model 2	Birth weight	0.545	0.250	.394	0.032	0.085	0.031
	Diagnosis	-0.393	0.275	-.160	0.156		
	Length of stay	0.013	0.084	.018	0.878		
	Gender	-0.046	0.288	-.018	0.875		
Model 3	Gestational age	-0.101	0.055	-.329	0.070	0.177	2.627
	Birth weight	0.547	0.246	.395	0.030		
	Diagnosis	-0.344	0.267	-.140	0.202		
	Length of stay	0.066	0.084	.093	0.431		
	Gender	0.134	0.287	.054	0.642		
	Father's age	0.020	0.017	.129	0.247		
	Employment status	-0.371	0.473	-.086	0.435		
	Level of Education	-0.666	0.286	-.267	0.023		

Research question d) is there a relationship between self-reported needs and stress among Ghanaian fathers in the NICU?

Eighty fathers whose infants were receiving neonatal intensive care were surveyed about their needs (M = 3.02, SD = 0.39) and stress levels (M = 3.09, SD = 0.91). Reporting level of significance at 0.05, Pearson's r correlation data analysis was used to determine the relationship between the needs and stress levels of fathers in the NICU. The results showed a significant

moderate positive relationship exist between FSS: NICU and PSS: NICU, r (78) = 0.37, p = 0.007. This means that in the sample of fathers there is enough evidence to suggest that a relationship exists between the needs and stress levels of fathers in the NICU. Hence, the higher the needs of fathers the more stressful fathers are during the period of admission of their infant in the NICU.

Chapter 5: Discussion

This research provides valuable insight into the needs and stress levels of Ghanaian fathers during hospitalization of their infants in the NICU at KBTH. According to Case-Smith (2001), the process of intervention starts by identifying the concerns of the family. Therefore, it is important for neonatal nurses to determine specifically what the needs and stressors of fathers in the NICU are and to tailor interventions that address those needs, reduce the stress, and improve fathers' ability to understand and adapt to the situation of their infants being in the NICU. Based on data analysis, the current study reveals that the most important need for Ghanaian fathers in the NICU is support to learn more about their baby. Secondly, Ghanaian fathers were stressed by their inability to have a relationship with their baby and assume their parental role during the NICU admission. Lastly, this study indicated that the higher the needs of fathers in the NICU, the higher their stress levels. Separating studies of fathers from those involving mothers is necessary to identify the unique responses of fathers and move away from the notion that studies on mothers are the gold standard for research on parents in the NICU (Arockiasamy et al., 2008). However, revisiting studies on mothers within the perspective of findings of this study will enable a better understanding of the unique needs of Ghanaian fathers with infants in the NICU at KBTH.

Ghanaian fathers have needs when their infants are in the NICU, and as their needs increase so do their stress levels. These findings are consistent with other studies that also indicate that when fathers' or parents' needs increase so do their stress levels (Ahn & Kim, 2007; Mok & Leung, 2006). Similar studies conducted on mothers indicated that meeting the needs of mothers minimized their stress levels in the NICU (Preyde & Ardal, 2003; Punthmatharith, Buddharat, & Kamlangdee, 2007). These findings support the call for neonatal nurses to address

the needs of fathers, which will in turn reduce their stress levels in the NICU. The current study further examined the specific needs and stress levels of Ghanaian fathers whose infants are in the NICU.

Needs of Fathers whose Infants are in the NICU

Learning about your baby. The most important need for fathers of newborns admitted to the NICU was to learn about their infants on admission. This finding is supported by other studies (Arockiasamy et al., 2008; De Rouck & Leys, 2009) that suggest that information about the sick infant is important to fathers whose infants are in the NICU. In this present study, fathers' needs were assessed when their infant's median length of stay was 3.5 days (2 – 10 days), which is the period where some researchers' state fathers demonstrate the most needs and highest stress levels (Lindberg et al., 2007; Mahon et al., 2015). Studies conducted on mothers indicate that providing supportive intervention to meet the needs of mothers minimizes their stress levels in the NICU (Preyde & Ardal, 2003; Punthmatharith et al., 2007). Consequently, NICU staff, especially neonatal nurses, should provide fathers with early information about the infant's care and complications of the condition (Mok & Leung, 2006; Ignell Mode et al., 2014). Providing fathers with early, adequate and understandable information increases their knowledge, which creates a sense of control for fathers in the NICU (Arockiasamy et al., 2008; De Rouck & Leys, 2009; Ignell Mode et al., 2014).

Fathers in the current study identified that information about their infants' health should be provided regularly and in clear and non-medical terms by the NICU staff, especially physicians. These findings are supported by other studies that advocate for NICU staff to provide information in plain terms that fathers can easily understand and to give fathers the opportunity to ask questions (Feeley, Waitzer, et al., 2013; Ignell Mode et al., 2014). NICU staff must

provide consistent and accurate information in a language that fathers can comprehend (Heidari et al., 2012; Helth & Jarden, 2013; Ignell Mode et al., 2014). Studies focusing on mothers have reported that when mothers are given simple, consistent and honest information about their child's condition they become knowledgeable and are more likely to participate in, cope with and adapt to their infant's admission (Mok & Leung, 2006).

Over 50% of fathers in this study were of minority ethnic groups (e.g., Ewe, Ga, Hausa, etc.). The present study did not investigate the relationship between fathers' ethnic background and their needs in the NICU. However, studies have suggested the importance of considering ethnicity when addressing all needs of parents in the NICU (Douglas et al., 2011; Hall et al., 2015; Weibe & Young, 2011). NICUs can strengthen the use of NICU staff as interpreters who will convey information to fathers in their native language (Hall et al., 2015). NICU staff should improve their communication skills with minority populations by being culturally sensitive, flexible and learning to appreciate the different values and cultural practices when providing information to parents (Douglas et al., 2011; Weibe & Young, 2011). A study conducted in the NICU of a Canadian hospital emphasizes the need for cultural interpreters in the NICU (Bracht, Kandankery, Nodwell, & Stade, 2002). These cultural interpreters not only help translate information from staff to parents, but also the cultural beliefs, norms and values of parents to staff during multidisciplinary team meetings with families or parent support meetings (Bracht et al., 2002; Levetown, 2008). Hall et al. (2015) emphasize the essence of NICU staff to provide parents (fathers) with information within a cultural framework. For example, in certain cultures parents need to be asked who they would like to involve in decision-making for their sick child, as family members other than parents are responsible for all healthcare decisions (e.g., most educated person or a health professional in the family) (Hall et al., 2015). In this study, fathers

preferred to receive information from physicians rather than nurses, similar to Ignell Mode et al.'s (2014) findings. Fathers in Ignell Mode et al.'s (2014) study reported that physicians were their source of information, and fathers valued several physicians involved in the care of their infants so that all health problems of the child are addressed. Fathers also valued regular meetings with physicians to discuss the progress and way forward in the care of their infant (Ignell et al., 2014). Fathers, however, complained that the use of medical terms by physicians made it difficult for them to understand the information, so they turned to nurses for clarification. In another study, nurses were parents' source of information since nurses were always on the unit and updated them regularly on their child's care (Kowalski, Leef, Mackley, Spear, & Paul, 2006). NICU nurses in Ghana can play an important role by clarifying and communicating information about the infant's health in ways that fathers can understand.

Almost 30% of fathers were not able to visit the NICU daily with 15% visiting 2 times or less. Most fathers in this study were working and not on paternity leave as in the case of Ghana and other LMIC such as Iran (Heidari et al., 2012). Paternity leave and unlimited access of fathers to the NICU have shown to have greater influence on the participation and presence of fathers in the NICU (Feeley, Sherrard, et al., 2013, Feeley, Waitzer, et al., 2013; Lindberg, Axelsson, & Ohrling, 2008) which promote father-infant bonding (Hutti, 2005). Given the importance fathers placed on learning about their baby, it is recommended for Ghanaian nurses to think innovatively about ways of sharing information with fathers who do not visit the NICU frequently. Most Ghanaian fathers in this study rated receiving information about their infant's care on the telephone as moderately important. Neonatal nurses can discuss with fathers their preferred time and form of contact to provide routine updates so that a call from the NICU does not heighten anxiety (Smith, Steelfisher, Salhi, & Shen, 2012). Aside from telephone (Smith et

al., 2012), NICU staff in high-income countries use Skype or FaceTime (Epstein, Sherman, Blackman & Sinkin, 2015; Gooding et al., 2011) and web camera (Thibeau, Ricouard, & Gilcrease, 2012) to provide parents with updates about infant care and to include parents in bedside rounds. These modern means of communication may help enhance relationships among infants, fathers and NICU staff (Epstein et al., 2015), increase parent-infant bonding and reduce stress (Thibeau et al., 2012). For example, on days when fathers cannot be present in the NICU, staff can use Skype, FaceTime, WhatsApp or call parents on the telephone to give them updates about their infants' progress. Another means of providing fathers with information is by short written materials (Arockiasamy et al., 2008) in the form of leaflets or pamphlets with photos (Maguire et al., 2007), which fathers can carry with them and refer to in their spare time. A study conducted in Taiwan provided fathers with a booklet designed for fathers with premature infants in the NICU (Lee et al., 2013). Fathers in the intervention group rated the booklet very helpful in providing them with information (Lee et al., 2013). These communication mediums (i.e., Skype, Face Time, WhatsApp, leaflets or pamphlets) are worth investigating so NICU staff can identify the best tool for information delivery to Ghanaian fathers with infants in the NICU.

Another way to provide fathers with information in the NICU is by including them in bedside rounds. The majority of fathers in this study preferred to be involved in bedside rounds and half had been present during bedside rounds. Despite half of fathers being present during rounds, most of them rated high importance to their ability to understand what they hear during the rounds, meaning their information need was not being met. A study in Pakistan indicated how these rounds should be conducted so they meet the parent's needs (Ladak et al., 2013). The study recommends family centered-rounds where parents are informed about the time the rounds will start, the process, and the roles team members will play. Team members are introduced to

parents before the commencement of rounds, and the physician in charge discusses plans for care based on infants' physiological parameters such as current health status and laboratory tests (Ladak et al., 2013). At the end of the family-centered rounds, the physician briefs parents about discussions and gives parents the opportunity to ask questions (Ladak et al., 2013). Parents were satisfied with their involvement in decision-making when family-centered rounds were implemented (Latta, Dick, Parry, & Tamura, 2008; Rotman-Pikielny et al., 2007), it reduced the length of stay of infant and provided parents with information about their child (Ladak et al., 2013). Nurses in Ladak et al.'s (2013) study did not have a strong likeness for family-centered rounds due to parental interference during the rounds. However, the attitude of health professionals towards family-centered rounds has been attributed to their level of education (Marco et al., 2006). NICU staff have raised issues of privacy and confidentiality in open bay NICUs as a barrier to involving parents in rounds (Bramwell & Weindling, 2005). A way to ensure privacy during family-centered rounds is to request the presence of only parents whose infants are being seen by the health team while other parents wait in the waiting room (Baptist Health Systems, 2010).

Fathers' feedback to learn about their babies was significantly related to their level of education. The majority of fathers in this study had less than post-secondary education. From the analysis, fathers with less than post-secondary education want to have more information about their sick infant compared to fathers with post-secondary education. Mundy's (2010) study found a significant relationship between the information needs of parents with 12th-grade education and those who had college education. Fathers with less educational levels may not readily have access to information about their infant from print media or internet and so need more information from the NICU staff. Hence, it is vital for neonatal nurses to provide fathers with

support based on the fathers' educational levels. Studies suggest that neglecting the information needs of fathers makes them feel stressed, have difficulty getting involved in their child's care (Pohlman, 2005) and affects the establishment of father-infant bonding during admission (Martel, Milette, Bell, Tribble, & Payot, 2016; Provenzi & Santoro, 2015) and after discharge (Lee et al., 2009).

Taking care of your baby. The ability to take care of your baby was rated as the second highest need on the FSS: NICU by Ghanaian fathers. Giving routine care such as feeding and changing diapers, however, was less of a priority in terms of the needs of Ghanaian fathers in this study. In Franck and Spencer's (2003) study 75% of mothers engaged in bathing or feeding their infants compared to only 20% of fathers. Similar to a Ghanaian study, fathers' lack of emphasis on the importance of feeding or changing their infant's diapers may be due to cultural norms that socialize men to think that their role is to provide financially for the family while mothers have the sole responsibility of taking care of the child (Dumbaugh et al., 2014). Ghanaian fathers preferred to touch, hold and comfort their infant when the child looked upset or in pain. There are studies that have similar findings (Lee et al., 2009; Lindberg et al., 2008). Physical contact such as touching and holding the infant is relevant for paternal identity. Fathers' report not feeling like fathers until they have had the opportunity to hold or touch their infants (Lee et al., 2009; Lindberg et al., 2007); this makes them feel involved and live the experience of fatherhood (Fegran et al., 2008). All fathers in a study in Canada had some form of physical contact (touch or hold) with their infant (Feeley, Waitzer, et al., 2013); however, many fathers were hesitant to do so until the infant gained weight. Not all fathers were open to physical contact; a study on French fathers showed that fathers did not want to have physical contact with their infant but preferred to stand back and watch mothers and NICU staff care for their infant

(Guillaume et al., 2013). Previous studies suggest that fathers fear harming (Noergaard et al., 2017) or infecting their infant (Lee et al., 2009), and this prevents them from having physical contact with their infant. Moreover, negative feedback (a look of sadness or pain) from infants affected paternal involvement, and when babies exhibit positive responses, fathers perceive this to be an indication for them to be more involved (Feeley, Waitzer, et al., 2013).

Neonatal nurses can promote positive interaction between fathers and their infants including comforting for pain by educating fathers to observe and interpret infant cues and engage appropriately. The Newborn Behavioral Observations tool (Nugent, Keefer, Minear, Johnson, & Blanchard, 2007) is a useful tool that nurses can use to educate fathers on how to identify and interpret infant cues. Neonatal nurses should empower fathers to identify changes in their infant's breathing, oxygen saturation, heart rate, feeding, movement and skin color in addition to when to respond to infant cues (Khee Loo, Espinosa, Tyler, & Howard, 2003). It is essential for fathers to know that the monitors attached to their infant will help track changes in the physiologic characteristics of the baby and the sound of an alarm may be due to the fact that the leads are detached from the body of the baby or they are loose (Khee Loo et al., 2003). This supports the call for neonatal nurses to identify which form of physical contact fathers prefer so they can provide support and encouragement for such levels of engagement. Nurses act as role models when seen by fathers performing caregiving activities on their child. Fathers cautiously observe nurses as they provide care for their infants and learn from them (Feeley, Waitzer, et al., 2013). When neonatal nurses coach fathers while providing care, fathers' self-efficacy is increased (Thomas, Feeley, & Grier, 2009). Modelling and verbal encouragement also fosters paternal involvement (Feeley, Waitzer, et al., 2013) and nurse-parent relationships (Reis, Rempel, Scott, Brady-Fryer, & Van Aerde, 2010).

Researchers have reported the benefits of skin-to-skin contact to fathers (Blomqvist et al., 2012; Helth & Jarden, 2013). Fathers felt close, responsible and in control of the situation when given the opportunity to have skin-to-skin contact with their child. Skin-to-skin contact also helps reduce fathers' fears of harming their fragile infant (Bauer, Sontheimer, Fischer, & Linderkamp, 1996). It is recommended for neonatal nurses to educate and encourage skin-to-skin contact for fathers in the NICU. Studies have shown that language development in children is associated with adult-child conversations, adult word counts (Zimmerman et al., 2009), and language input (Mayberry, Lock, & Kazmi, 2002). A study by Caskey, Stephens, Tucker, and Vohr (2014) indicates that exposing premature infants to adults' words is related to the infant's language outcomes and cognitive development after discharge. Another study also suggests that fathers' use of many varied vocabularies during interactions with their infants improved children's communication skills and language development (Pancsofar, Vernon-Feagans, & Family Life Project Investigators, 2010). These studies emphasize the importance for NICU staff to encourage fathers not only to hold or perform skin-to-skin contact but also to talk to their infants. Ghanaian fathers attached high importance to the need to understand the long-term complications of their infant's condition as also reported in Ignell Mode et al. (2014). Consequently, skin-to-skin contact provides an ideal opportunity to educate fathers about long-term outcomes and ways that they can improve those outcomes for their infants. Paternal awareness of the long-term complications of their infants' condition and its management helps fathers care for the infant at home and reduce the rate of re-admission, thereby reducing the national cost on the healthcare system (Alio et al., 2010). In a study on Danish fathers, fathers preferred a balanced role as the breadwinner (cultural norm) and co-parent (social norm) to the infant on admission (Noergaard et al., 2017). Therefore, it is beneficial for nurses to know that

cultural and social norms play a role in fathering roles, which affect their needs when providing support for them in the NICU. The third most important need for fathers in this study was their ability to take care of themselves and family on the FSS: NICU.

Taking care of yourself and family. To fathers in the current study, taking care of their finances during the admission of their infant was very important. Most of the infants in this study had health insurance. Similar to a study by Morris (2008), insurance (either government or commercial) pays for most of the cost of neonatal intensive care. Parents in Ghana have to make out-of-pocket payments for certain investigations and procedures that are not covered by their health insurance, as well as the additional cost of transportation for the NICU visits. Financial challenges sometimes cause delays in infants receiving medication or undergoing a procedure. In Ghana, fathers have to bear the financial burden since they are the financial provider of the family (Dumbaugh et al., 2014). Hence, it is of essence for collaborative government policies, hospital policies, and fundraising efforts to provide financial support to parents who have financial hardships (Bockli, Andrews, Pellerite, & Meadow, 2014). Fathers attached high importance to their ability to talk to their partner often during this period. The findings of this study, in accordance with previous studies show that fathers are concerned about the wellbeing of their partners; so, they ensure regular communication to help their partners cope (Arockiasamy et al., 2008) and provide support to help their partners feel relief about their infant on admission (Noergaard et al., 2017).

Fathers gave little importance to talking to other NICU parents and extended family about their sick infant, which is not consistent with previous studies conducted in high-income countries (Arockiasamy et al., 2008; Gooding et al., 2011; Hugill, Letherby, Reid, & Lavender, 2013; Ireland, Khashu, Cescutti-Butler, Van Teijlingen, & Hewitt-Taylor, 2016; Smith et al.,

2012) where fathers wish for a network of parent support in the NICU. Researchers report that fathers interacting with parents whose infants have similar medical conditions can be a source of support and information (Gooding et al., 2011; Smith et al., 2012). The fathers in Noergaard et al.'s (2017) study desired to obtain social support from a network of fathers during this period. Involving family and friends, especially those who have medical knowledge, acts as a coping strategy and provides a network of support for parents in the NICU (Noergaard et al., 2017). Parents' having supportive networks (family members, friends and NICU parents) in the NICU has been shown to increase parental competence (Davis, Mohay, & Edwards, 2003) and decrease stress (Shaw et al., 2006). Smith et al. (2012), however, admit that support from family and friends can be disturbing when they do not have understanding about the condition of the child. Ghanaian fathers may not want to talk to their extended family about their infant for fear of being stigmatized as in the case of an Iran study (Heidari et al., 2012) where parents with a neonate on admission were stigmatized because the Iranian society fails to accept sick infants, and parents have to explain to family and friends why their infant was still in the hospital after delivery. NICU staff should address stigmatization of neonates and parents in the NICU by continuous public education and empowering parents about their infant's condition, so they become comfortable talking about their sick infant. Moreover, future studies should explicate reasons why Ghanaian fathers in this study did not want to form social networks with other parents on the unit particularly since in other part of Africa such as Somalia, Sudan and Ethiopia men like to form social networks with other men (Renzaho et al., 2011).

Fathers in the present study gave little importance to getting away and taking time for themselves. Other studies suggest that fathers need time away from the NICU; this serves as an emotional coping mechanism (Smith et al., 2012) and a way to maintain their sense of control

(Arockiasamy et al., 2008; Noergaard et al., 2017) so that they get time and space for physical recovery and connect with loved ones. This study further examined what stressed fathers in the NICU at the KBTH.

Stressors of Fathers with Infants in NICU

Relationship and parental role. The most stressful aspect of the NICU for Ghanaian fathers was their inability to have a relationship with and assume a parental role to their infant. Similar results were reported in other studies (Agrawal & Gaur, 2016; Baia et al., 2016; Bouet, Claudio, Ramirez, & Garcia-Fragoso, 2012; Busse, Stromgren, Thorngate, & Thomas, 2013; Dudek-Shriber, 2004; Matricardi et al., 2013; Miles, Funk, & Kasper, 1992; Turner et al., 2015). The current study did not find a relationship between fathers' age (i.e., father's characteristics) and stress level or needs. Fathers' age has however, been identified as a predictor of stress in other studies (Baia et al., 2016; Dudek-Shriber, 2004). Young fathers were most stressed (Baia et al., 2016; Dudek-Shriber, 2004) possibly due to not knowing what to expect or how to cope, which made them more anxious (Premberg, Carlsson, Hellstrom, & Berg, 2011). Young fathers are also most likely to be first time fathers. Approximately, a third of the fathers in this study were first-time fathers. It is recommended for neonatal nurses to provide young fathers and first-time fathers' anticipatory guidance, so they are less anxious and know what to expect.

Previous studies explain that fathers are most stressed by their altered parental role and relationship because they find it difficult to perform parenting activities (Busse et al., 2013) and lack the confidence to care for their infant as a result of barriers in the NICU (Sikorova & Kucova, 2012). Additionally, fathers are stressed by their role alteration due to their feelings of inability to protect their infant from harm (Feeley, Waitzer, et al., 2013). In this study the most stressful events about fathers' relationship and parental role were the separation of fathers from

infant, their inability to protect their infant from pain and painful procedures, not having time alone with their infant and feeling helpless about how to help their infant during their infant's admission. Often in the neonatal care environment, the main priority of neonatal staff is to use appropriate intervention and treatment to stabilize and ensure infants survive; and they sometimes place less importance on parental needs in the NICU (Agrawal & Gaur, 2016; Jones, Woodhouse, & Rowe, 2007). In other instances, neonatal nurses focus more on the needs of mothers than fathers because of nurses' beliefs about mothers as the primary caregiver of the child (Franck & Spencer, 2003). Fathers also may believe that the hospital environment is a space solely for women (Msuya, 2008) and that their infants are best cared for by mothers and nurses (Lee et al., 2009). Mothers may be readily reachable in the NICU as compared to fathers, due to fewer and shorter visits by fathers in the NICU (Franck & Spencer, 2003; Garten et al., 2011; Latva et al., 2007; Polman, 2005). However, most fathers in this study visited the NICU daily and spent an average of 2 hours in the NICU.

The most stressful event about their relationship and parental role was separation from their infant. Parental separation from their infants disturbs family life, alters parental roles and affects parent bonding (Hutti, 2005). Based on the level of caregiving activities that fathers want to be involved in, the NICU nurses can promote father-infant bonding by encouraging fathers to engage in parenting activities such as skin-to-skin contact (Helth & Jarden, 2013) and father-child conversations (Zimmerman et al., 2009). Another source of stress for fathers in this study was their inability to spend time alone with their child. This finding is supported by other studies from high-income countries (Arockiasamy et al., 2008; Gooding et al., 2011; Smith et al., 2012) that report that fathers cherish time alone with their infant. Single-family rooms allow parents to spend time alone with their infant by enabling an improved ability to deliver private and

individualized environments for the family and infant and also improves infants' outcomes when compared to an open bay NICU (McGrath, 2005). Single-room NICU is the current recommendation worldwide when constructing a NICU (Gooding et al., 2011, White, Smith, & Shepley, 2013); however, this recommendation may not be practical in a low-resource setting such as Ghana. Consequently, neonatal nurses should encourage fathers to have time alone with their infant as it promotes father-infant bonding (Helth & Jarden, 2013) and help create these opportunities. For example, they can encourage fathers to come when mothers are expressing and storing breast milk, which reassures the mothers that their child is with the father and provides the father some alone time with their baby.

Ignoring the needs of fathers postpartum can lead to paternal depression (Cameron, Sedov, & Tomfohr-Madsen, 2016), which negatively affects fathers' parenting practices (Wilson & Durbin, 2010), father-infant attachment (Don & Mickelson, 2012) and the behavioral and emotional development of the child (Ramchandani et al., 2008). Paternal-infant bonding is crucial for the mental and physiological development of the infant (Browne, 2017), which can be initiated in the NICU by encouraging fathers to have playful contact with infants. This causes a rise in the levels of oxytocin, the key hormone linked with parenting and human attachment (Swain et al., 2014). A study by Berg and Wynne-Edwards (2001) reveals that involved fathers experience hormonal changes that facilitate paternal care and fatherhood. The hormonal changes occur when men are allowed to actively participate in their infant's delivery and admission and when they are given the opportunity to share the joy of fatherhood and permitted to take paternity leave to care for their infant (Berg & Wynne-Edwards, 2001).

Another aspect of the relationship and parental role that fathers were stressed in this study was their feeling of helplessness and their inability to protect their infant from pain and painful

procedures. This finding is supported in other studies that report that parents are emotionally stressed due to their infant's pain, which can have long-lasting consequences on parent-infant relationships (Hohmeister, Demirakca, Zohsel, Flor, & Hermann, 2009; Wereszckak et al., 1997). Studies have reported that fathers feel less confident and competent in their parental roles due to the barriers in the NICU which render them incapable of protecting their child from harm and prevent them from relating to their hospitalized child (Arockiasamy et al., 2008; Ignell Mode et al., 2014; Sloan et al., 2008). Parents were also worried about the medium and long-term effects of pain on their child (Franck, Oulton, & Bruce, 2012). In addition to pharmacological management of pain, studies advocate for parental involvement in giving non-pharmacological interventions for infants' pain (Franck, Cox, Allen, & Winter, 2004; Franck, Scurr, & Couture, 2001). Franck et al. (2012) report that when neonatal staff provide fathers with information about their infants' pain and support and encourage fathers to offer comfort to their infant, it relieved parents of the stress expressed as a result of their infants' pain. The information fathers require about their infants' pain includes how infants feel about pain, causes of pain in neonates, how to identify pain and treatments available and how physicians make decisions about discontinuing analgesics (Franck et al., 2012). In Finland, mothers were taught to provide facilitated tucking during stress or painful procedures (Axelin, Lehtonen, Pelander, & Salantera, 2010; Axelin, Salantera, & Lehtonen, 2006). Mothers reported that tucking calmed their infant; infants were in less pain and were secure. Some mothers reported that taking part in tucking helped them deal with their own stress (Axelin et al., 2010; Axelin et al., 2006). However, other mothers were uncomfortable with their involvement in the tucking but helped because they felt it was a way to comfort their infant. Hence, facilitated tucking may be a non-pharmacological strategy that fathers can use to reduce their infant's pain. Other non-pharmacological pain management

strategies that fathers can be involved in is skin-to-skin contact and non-nutritive sucking (Franck et al., 2012), touching or massaging (Im, Kim, Park, Sung, & Oh, 2007), holding or rocking (Carbajal, Veerapen, Couderc, Jugie, & Ville, 2003) and giving infants milk drops before and during painful procedures (Shah, Aliwalas, & Shah, 2006).

Baby looks and behaves. The looks and behavior of infants were the second most stressful area for fathers in this and several other research studies as well (Baia et al., 2016; Busse et al., 2013; Dudek-Shriber, 2004; Miles et al., 1992). There are, however, studies that found this to be the most stressful area for fathers (Ozdemir & Alemdar, 2016; Musabirema et al., 2015). Based on the PSS: NICU used in this study, fathers' stress was related to the sight of needles and tubes on their babies and the look of pain and sadness on their infants. Most infants in this study were in the NICU on account of prematurity. Premature infants may appear and behave differently, may need to be connected to medical equipment, and may remain longer in the NICU to give them time to develop (Agrawal & Gaur, 2016). Therefore, neonatal nurses should educate fathers on the medical interventions being performed on their infant, support fathers to comfort and use non-pharmacological methods to manage infant pain. The least stressful subscale for Ghanaian fathers was the sights and sounds in the NICU.

Sights and sounds. The sights and sounds of the NICU was the least stressful for fathers in this and other studies (Baia et al., 2016; Busse et al., 2013; Dudek-Shriber, 2004; Miles et al., 1992). In these studies fathers understood that the NICU environment was a specialized unit that cares for sick babies and that NICU staff were competent and have the interest of the infant at heart. The sight of another sick infant and the presence of monitors and equipment were stressful for fathers; this result is similar to a study on mothers (Valizadeh, Akbarbeglo, & Asadollahi, 2009). For parents whose infants are at high risk of NICU admission, neonatal nurses can

arrange for prenatal visits to the NICU to enable parents to familiarize themselves with the NICU staff and environment (Fowlie & McHaffie, 2004; Halamek, 2001). When NICU admission is unanticipated, neonatal nurses can brief the fathers on what to expect prior to entering the NICU. Familiarizing parents (fathers) to the NICU environment gives fathers the awareness that the NICU is a highly specialized unit that cares for seriously ill infants and may help reduce their stress levels. Studies on mothers support this assertion as orienting high-risk pregnant mothers or mothers of preterm infant to the NICU helped reduced maternal stress and anxiety (Reid, 1998; Mettling & Rubarth, 2012; Valizadeh et al., 2016). The use of booklets with pictures or films (online visual tour) has been found to be effective in familiarizing parents to the NICU (Valizadeh et al., 2016). Fathers valued an individualized (De Rouck & Leys, 2009) prenatal tour to the NICU as it helped reduce anxiety and enable fathers have an idea of what to expect if their infant is admitted to the NICU (Ignell Mode et al., 2014). Therefore, neonatal nurses can implement a routine prenatal tour to the NICU to psychologically prepare fathers on the NICU environment and educate NICU fathers to understand that the unit is a specialized unit, and, hence, they may see other infants who are seriously ill besides their infant. Additionally, hospital management should consider single-room care for infants, which is the current recommendation for NICU construction (Gooding et al., 2011). Single-room care will help reduce fathers' regular exposure to other sick infants in the NICU.

Strengths

To date, this is the only study conducted in the NICU of a Ghanaian hospital that examines the needs and stress levels of fathers. Therefore, this study is a valuable addition to the limited nursing research literature on fathers in LMIC and in Ghana specifically. Most fathers who were approached about the study accepted to participate, and participants had varied ethnic

and educational backgrounds. This study identified specific support needs that neonatal nurses can provide to fathers to help minimize stress levels, give fathers competence and confidence in their parenting skills and enable them to make informed decisions by being more engaged in the care and well-being of their infant. The support needs identified in the present study include providing fathers with adequate and understandable information about their infants' condition and general well-being, encouraging fathers to have skin-skin contact, education on infant cues and non-pharmacological management of pain. The study outlined priority actions that will enable nurses to actively and efficiently communicate information to fathers and serve as a guide to strengthen and advocate for father support intervention in the NICU. Lastly, this study provides preliminary data to propose and study interventions for further research.

Limitations

Considering the limitations shared below, the reader is cautioned on the inferences they make based on the findings of this study. The study was conducted in a single hospital using convenience sampling; hence, the generalizability of the results is limited. Due to ethical regulations, only fathers of stable infants were recruited for the study; therefore, an important group of fathers' needs, and stress levels may be excluded from this study. Fathers who have never been to the NICU during the hospitalization of their infants were excluded from this study, so their needs were not assessed for the NICU staff to provide support. The researcher did not assess the medical stability of the infant by available risk indices because such tools are invasive, prolonged and require data collected over a period beginning immediately after birth (Nicholas, 2006). Therefore, assessing the stability of the infant was at the discretion of the NICU staff, which may be subjective. The internal consistency and reliability of both tools were not tested on Ghanaian fathers before being used in this study because of time constraints, but face and content

validity were assessed by Dr. Naab (committee member from Ghana) who is an expert in the field. Fathers responded to this study using self-reported questionnaires, which are valuable measures for research. However, the sole dependence on questionnaires is a limitation due to potential social desirability and subjective report bias (Polit & Beck, 2012), so observation of fathers can be included in future studies. The non-statistically significant results between infant and father characteristics and the needs and stress levels of fathers may be because the sample size was estimated based on literature that was not conducted in Ghana and thus may be underpowered.

Another limitation is that an overwhelming number of participants were married, from the Akan tribe, had some formal education and had jobs; these may have influenced the results of the study. The father's personality factors and level of resiliency may have also contributed to the results. Lastly, the KBTH is located in Accra, the capital of Ghana, and most infants were born in the urban areas of Accra; hence, it is possible certain father characteristics such as educational level and employment status may differ if participants were recruited from rural areas, since fathers in urban and rural areas may view or think differently about their baby in NICU.

Implications for Practice

In light of the findings of this study the transcultural nursing theory (Leininger, 1995) is relevant to my practice and other nurses. Considering the values, beliefs and practices of Ghanaian fathers with infants in the NICU it is important for neonatal nurses to recognize and meet the needs of fathers by understanding the sociocultural context of fathers, develop and implement culturally specific interventions and resources in the NICU. To provide culturally appropriate intervention(s), NICU nurses first have to be aware and maintain Ghanaian fathers'

role as decision-maker by making the NICU welcoming to fathers, encouraging fathers to be present during bedside rounds and involving them in decision-making. This will provide fathers with information about their sick infant and help reduce their stress levels in the NICU. Fathers in this study did not want to discuss their infant's admission with their extended family, friends and other NICU parents. Hence, it is important for neonatal nurses to respect this need and identify interventions that will support fathers individually. Lastly, it is essential for nurses to reshape or modify any cultural practices that cause harm than good while respecting fathers cultural values and beliefs. For example, the main role of mothers in the Ghanaian culture is that of caregiver, thus giving routine care such as changing diapers and feeding which promotes father infant attachment was less of a priority to some fathers in this study. Neonatal nurses can encourage, coach and support fathers who wish to be involved in routine care; however, respect fathers who do not want to be involved in routine care. Consequently, nurses should identify and support which form of involvement fathers prefer such as touching or holding infant which was the choice for most fathers in this study.

The study findings will be used to raise awareness among NICU staff, especially neonatal nurses about what needs fathers regard as important and to identify fathers' stress levels during their infants' hospitalization. Enlightening neonatal nurses on the benefits of addressing the needs of fathers to help reduce their stress levels during this period will help them identify and plan interventions that will support fathers of infants receiving neonatal intensive care at the KBTH of Ghana. When differences of opinion exist, there will be an opportunity for health professionals to debate about the importance of implementing father support interventions in the NICU. As more health professionals become involved in supporting fathers in the NICU they will advocate for policymakers to implement policies that will promote paternal involvement in

the NICU such as paternity leave and open visitation. At the educational level, nurse educators will be encouraged to include in the nursing curriculum conversations about the needs of fathers whose infants are in the NICU so that graduate nurses are fully aware about the importance of paternal involvement and support intervention for fathers.

Suggestions for Future Study

It will be beneficial for more studies on fathers in LMIC including Ghana to explore the level of paternal involvement, their needs and stress levels in the NICU. To ascertain the consistency of the responses and if differences exist based on the location of the hospital and ethnicity of fathers, future studies can look at including a randomly selected larger sample size collected from different hospitals and regions of Ghana. Future studies should consider collecting data at different times of the infants' admission as previous studies found that the needs and stress level of parents are influenced by the length of stay of the infant in the NICU (Lindberg et al., 2007; Mahon et al., 2015). Additionally, it is important for further studies to be conducted in hospitals in Ghana that give unlimited access to parents in the NICU. This will help determine whether open visiting policies have an impact on the needs and stress levels of Ghanaian fathers in the NICU. It is important for future studies to examine the effect of out-of-pocket payments and proximity to the hospital on the needs and stress levels of fathers because fathers in this study were concerned about their finances. Lastly, it is necessary for a qualitative study to be conducted on the experiences of Ghanaian fathers whose infants are in the NICU to provide context for the quantitative findings and enable an in-depth understanding of fathers' needs and stress levels when their babies are in the NICU.

Recommendations

It is recommended for NICU staff, especially neonatal nurses, to play a key role in addressing the needs and stress levels of fathers by providing support and ensuring that fathers feel like partners in the care of their infants just as mothers to help fathers cope in the NICU. NICU staff can achieve this by educating fathers on the treatment, tests and general health of their infants and ensuring a welcoming environment for fathers in the NICU. It is important for NICU staff to involve fathers in decision-making concerning their infants and address the various needs of fathers by providing support, which will cause a significant reduction in fathers' stress levels. Lastly, hospitals and governments need to look at reviewing existing policies to reduce paternal separation and implement policies such as open visiting access for fathers in the NICU and give fathers the opportunity to have paid paternity leave. The interventions recommended in this study can be linked to the principles of family-centered care such as sharing unbiased and honest information about the infant to the parents and empowering parents (Gooding et al., 2010). My findings, however, show that it is of essence to go beyond family-centered care and look at how context influences attitudes about fatherhood and engagement in the NICU and shapes social networks that are important for coping with stress from having an infant in the NICU.

Conclusion

This study explored the needs and stress levels of Ghanaian fathers whose infants are receiving neonatal intensive care. The study's findings suggest that the most important need for Ghanaian fathers in the NICU is support from neonatal nurses to learn more about their infants. Secondly, Ghanaian fathers were stressed by their inability to have a relationship with their infants and assume their parental role during the NICU admission and lastly, the study indicated

that the higher the needs of fathers in the NICU, the higher their stress levels. Supporting fathers in the NICU by meeting their needs will make fathers feel part of their infants' care in the NICU and reduce their level of stress. Although the findings of this study are similar to studies in high-income countries, there are key differences such as fathers taking time for themselves and getting support from family and friends. These differences may be due to the culture and the way people of the opposite sex are socialized. Generally, further research is warranted on fathers' needs and stressors when their infants are in the NICU and more specifically on those fathers with infants in the NICU in LMIC. This study does not seek to minimize the importance of the needs and contributions of mothers in the NICU; however, the topic was chosen as a result of my observations as a nurse practicing in the NICU, and the influence of culture on paternal involvement in the Ghanaian NICU.

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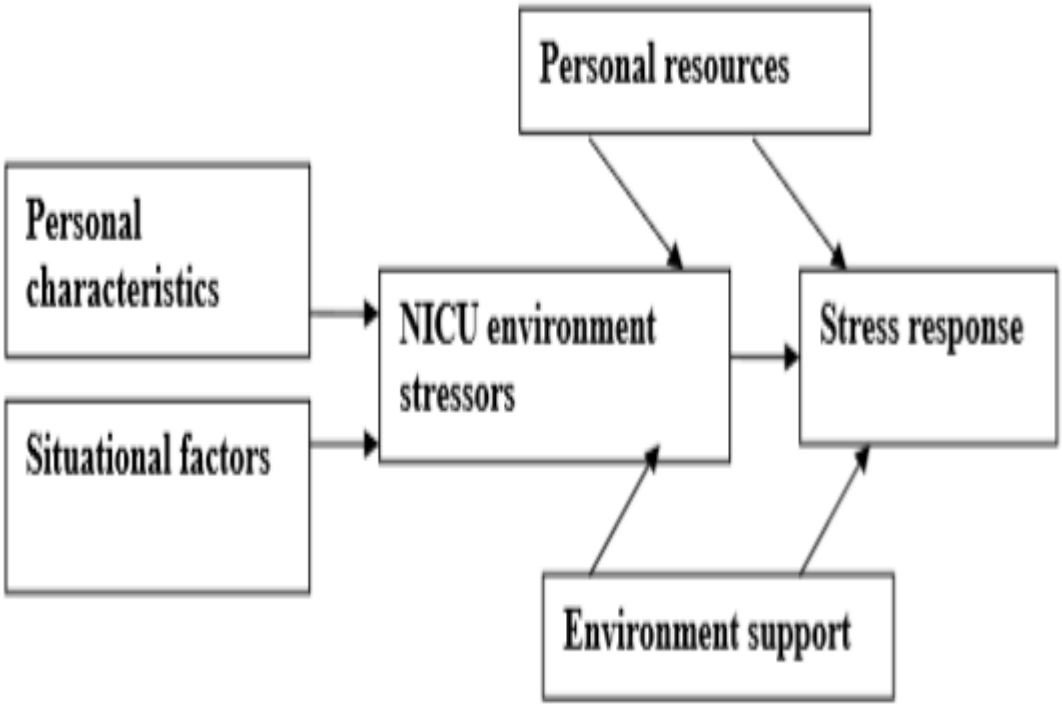
Appendix A: The Parental Stress Model



Appendix B: Recruitment Script

Hello Fathers,

A Master of Nursing student is conducting a study about the needs and stress levels of fathers during the admission of their babies in the Neonatal Intensive Care Unit (NICU) of the Korle Bu Teaching Hospital. By participating in this study, you will help identify the needs and stress levels of fathers with infants in the NICU, so that neonatal staff can provide support during this period. All you need to do in this study is to fill out a questionnaire.

Will you like to be part of this study or will you want further information about the study?

☐ No

☐ Yes

If No, we would appreciate you sharing the reason for not participating.

Reason:

_____

_____

Thank you for considering the request.

If YES, please provide the information below, the researcher will contact you for further details about the study.

Father's Name: _____

Telephone number: _____

What is the best time to call you?

☐ Early morning (before 9:00 a.m.)
☐ Morning (between 9:00 a.m. and 12:00 p.m.)
☐ Afternoon (between 12:00 p.m. and 5:00 p.m.)
☐ Evening (between 4:00 p.m. and 9:00 p.m.)
☐ Late night (after 9:00 p. m.)
☐ Anytime

Contact Person

Name of Contact Person: _____

Your Relationship with the Contact Person: _____

Telephone number of the Contact Person: _____

Thank you for agreeing for the researcher to contact you.

Recruitment Script (Twi Version)

Agyanom mekyia mo,
Osuani bi a ɔɔyɛ master's wɔ nɛɛse adwuma no mu no ɛreyɛ nhwehwɛmu afa adiadeɛ ne ɔhaw a agyanom a wɔmma da Neonatal Intensive Care Unit (NICU) wɔ Korle-Bu ayaresabea no fa mu. Wode woho hyɛ mu a, wobɛboa ama y'ate agyanom a wɔmma da NICU no adiadeɛ ne wɔn haw ase na ama adwumayɛfoɔ a wɔhwɛ mmadoma no ɛtumi aboa agyanom wɔ saa berɛ yi mu. Nea ɛwɔ sɛ yoyɛaa ne sɛ wobɛyi nsɛmmisa bi ano. Wobɛpɛ sɛ wode woho bɛhyɛ nhwehwɛmu yi mu, anaasɛ wobɛhia nimdeɛ foforɔ bi afa ho?

☐ Aane

☐ Daabi

Sɛ wompɛ sɛ wode woho hyɛ mu a, yɛn ani bɛsɔ sɛ wobɛkyerɛ yɛn deɛ nti.

_____
_____
_____

Yɛda wo ase sɛ woagye yɛn adesrɛde yi ato mu.

Sɛ woayɛ krado sɛ wode woho bɛhyɛ mu a, ma yɛn woho nsɛm kakra bi. Nyansapɛfoɔ no bɛferɛ wo ne wo ɛdi ntitaho.

Wo din: _____
Phone nɔma: _____

Berɛ bɛn na ɛyɛ mawo sɛ yɛbɛferɛ wo?

- ☐ Anɔpa tutuutu (ansa nɔnkron abɔ)
- ☐ Anɔpa (firi nɔnkron kɔsi nɔndu-mmienu)
- ☐ Awia (firi nɔndu-mmienu kɔsi nɔnnum)
- ☐ Anwummerɛ (firi nɔnnan kɔsi nnɔnkron)
- ☐ Anadwo (firi nɔnkron ɛɛkɔ)
- ☐ Berɛ biara

Nipa a yɛne no nni nkitaho
Ne din: _____
Ɔyɛ wo deɛn: _____
Ne phone nɔma: _____

Yɛda wo ase sɛ woagye ato mu sɛ nyansapɛfoɔ no ɛnferɛ wo

Appendix C: Questionnaire

Fathers' Demographic Data

1. How old are you? …… years.

2. What is your Ethnicity?
   - ☐ Akan
   - ☐ Ewe
   - ☐ Ga
   - ☐ Hausa
   - ☐ Other (please specify): _____

3. Marital Status: (Tick one box)
   - ☐ Single
   - ☐ Married
   - ☐ Living together
   - ☐ Separated,
   - ☐ Divorced
   - ☐ Widowed

4. Highest Level of Education Attained: (Tick one box)
   - ☐ Less than Junior High School
   - ☐ Junior High School
   - ☐ Senior High school
   - ☐ Diploma or Higher National Diploma (PND)
   - ☐ Bachelor's degree
   - ☐ Masters
   - ☐ Other (please specify): ……

5. What is your Occupation? …..

6. Are you currently employed?

   Yes ☐ No ☐

7. Who are your employers?

☐ Government sector

☐ Private sector

☐ Self employed

☐ Other (please specify): _____

8. Are you on paternity leave?

Yes ☐ No ☐

9. How many times per week do you visit your baby in the hospital? (Tick one box)
   - ☐ 2 times or less in a week
   - ☐ 3-5 times in a week
   - ☐ Daily

10. How long do you visit? …… hours …...minutes

11. Number of children at home (Tick one box).
   - ☐ None
   - ☐ One
   - ☐ 2-4
   - ☐ 5 or more

12. What type of health insurance does your child have? (Tick one box)
   - ☐ National Health Insurance
   - ☐ Private Health insurance
   - ☐ Both
   - ☐ None

13. When would you prefer to visit your baby? (Tick one box)
   - ☐ Early morning (before 9:00 a.m.)
   - ☐ Morning (between 9:00 a.m. and 12:00 p.m.)
   - ☐ Afternoon (between 12:00 p.m. and 5:00 p.m.)
   - ☐ Evening (between 4:00 p.m. and 9:00 p.m.)
   - ☐ Late night (after 9:00 p. m.)
   - ☐ Anytime

14. Have you ever been present at your baby's bedside during ward rounds? (Tick one box)
    Yes ☐ No ☐

15. Would you like to be present at your baby's bedside and involved during ward rounds? (Tick one box)
    Yes ☐ No ☐

Infant's Health Information

1. Gestational age ……. Weeks

2. Mode of Delivery
   - ☐ Spontaneous Vaginal Delivery (SVD)
   - ☐ Cesarean Section (CS)
   - ☐ Vacuum extraction

3. Birth weight…….kg

4. Birth type (Tick one): Single ☐ Twin ☐ Triplet ☐

5. Infant's diagnosis……

6. Gender (Tick one)

   ☐ Male

   ☐ Female

7. Length of stay in the NICU of the Korle Bu Teaching Hospital …….. days

8. Infant's birth Hospital (Tick one box)
   - ☐ Korle-Bu Teaching Hospital
   - ☐ Other Hospital (specify) ……

Fathers Support Scale (FSS: NICU)

The purpose of this scale is to help us know what fathers need while their baby is in the Neonatal Intensive Care Unit (NICU) so that we can provide more support. Please read each question and circle the number that describes best how you feel.

Section I: Learning about Your Baby

As a father of a baby in NICU, how important are the following things to you? (Tick one box)

		Not important	A little important	Moderately important	Very important	Extremely important	Does not apply to me (N/A)
1.	Getting regular information about your baby's health						
2.	Getting information about your baby in plain, non-medical language						
3.	Being able to get the information you need about your baby from the NICU doctors						
4.	Being able to understand what you hear about your baby on rounds						
5.	Getting recommendations for your baby's care from one doctor after medical meetings about your baby.						
6.	Getting the information you need about your baby from the NICU nurses						
7.	Knowing the roles of staff who care for your baby						
8.	Getting a general idea (rather than a detailed report) about your baby's health daily						

		Not important	A little important	Moderately important	Very important	Extremely important	Does not apply to me (N/A)
9.	Feeling you are kept as well informed as the baby's mother						
10.	Being able to get information about your baby by phone						

Section II-Taking Care of Yourself and Your Family.

As a father of a baby in the NICU, how important are the following things to you?

		Not important	A little important	Moderately important	Very important	Extremely important	Does not apply to me (N/A)
11.	Being able to talk with your partner often						
12.	Being able to talk with friends about your baby often						
13.	Being able to go to work						
14.	Being able to take time off work to be with your baby						
15.	Being able to take care of your finances						
16.	Being able to help with the care of your other children						
17.	Being able to talk with other NICU parents						
18.	Being able to talk with your extended family about your baby						
19.	Being able to get away to have some time on your own						
20.	Being able to exercise						

		Not important	A little important	Moderately important	Very important	Extremely important	Does not apply to me (N/A)
21.	Being able to pray or do other spiritual practices						
22.	Getting away to have some time with your partner						
23.	Being able to talk to an expert about your emotions or feelings						

Section III: Taking Care of Your Baby

As a father of a baby in the NICU, how important are the following things to you? (Tick one box)

		Not important	A little important	Moderately important	Very important	Extremely important	Does not apply to me (N/A)
24.	Being able to touch and hold your baby						
25.	Being able to comfort your baby if he/she is in pain or looks upset						
26.	Being able to do routine care for your baby such as feeding and diaper changing						
27.	Being a part of important decisions about your baby's care						
28.	Having different doctors' opinions about the best way to treat your baby						
29.	Getting a medical opinion about your baby's care from one doctor after a group discussion						

		Not important	A little important	Moderately important	Very important	Extremely important	Does not apply to me (N/A)
30.	Being able to talk to parents who had a baby in the NICU in the past						
31.	Understanding possible long-term problems your baby might have						
32.	Being able to stay and sleep overnight in the NICU when your baby is sick (even if you live close to the hospital)						
33.	Being able to have your baby take part in research studies						

35. Please tell us if there are other things that you or your partner would find helpful in supporting you while your baby is in the NICU.

…….

Parental Stressor Scale: NICU (PSS: NICU)

Below is a list of items that might describe the way your BABY LOOKS AND BEHAVES while you are/were visiting in the NICU as well as some of the TREATMENTS that you have seen done to your baby. Not all babies have these experiences or look this way, so choose the "not applicable" if you have not experienced or seen the listed item. If the item reflects something that you have experienced, then indicate how much the experience was stressful or upsetting to you. (Tick one box)

		Not at all stressful	A little stressful	Moderately stressful	Very stressful	Extremely stressful	Not Applicable (N/A)
36.	Tubes and equipment on or near my baby						
37.	Bruises, cuts or incisions on my baby						
38.	The unusual color of my baby (for example, looking pale or yellow jaundiced)						
39.	My baby's unusual or abnormal breathing patterns						
40.	The small size of my baby						
41.	The wrinkled appearance of my baby						
42.	Having a machine (respirator) breathe for my						
43.	Seeing needles and tubes put in my baby						
44.	My baby being fed by an intravenous line or tube						
45.	When my baby seemed to be in pain						
46.	When my baby looked sad						
47.	The limp and weak appearance of my baby						

		Not important	A little important	Moderately important	Very important	Extremely important	Does not apply to me (N/A)
48.	Jerky or restless movements of my baby						
49.	My baby not being able to cry like other babies						

Below is a list of the various SIGHTS AND SOUNDS commonly experienced in an NICU. We are interested in knowing about your view of how stressful these SIGHTS AND SOUNDS are/ were for you. Choose the option that best represents your level of stress while in the NICU. (Tick one box)

		Not at all stressful	A little stressful	Moderately stressful	Very stressful	Extremely stressful	Not Applicable (N/A)
50.	The presence of monitors and equipment						
51.	The constant noises of monitors and equipment						
52.	The sudden noises of monitor alarms						
53.	The other sick babies in the room						
54.	The large number of people working in the unit						

How do you feel about your own RELATIONSHIP with the baby and your PARENTAL ROLE? If you have experienced the following situations or feelings, indicate how stressed you have been by them by clicking the circle. Again, choose Not Applicable if you did not experience the item.

		Not at all stressful	A little stressful	Moderately stressful	Very stressful	Extremely stressful	Not Applicable (N/A)
55.	Being separated from my baby						
56.	Not feeding my baby myself						
57.	Not being able to care for my baby myself (for example, diapering, bathing)						
58.	Not being able to hold my baby when I want						
59.	Feeling helpless and unable to protect my baby from pain and painful procedures						
60.	Feeling helpless about how to help my baby during this time						
61.	Not having time alone with my baby						

Thank you for your help.

Feel free to write about other situations that you found stressful during the time that your baby was in the neonatal intensive care unit?

Questionnaire (Twi Version)

Agya ho nsɛm

1. Woedi mfie ahe? Mfie …….

2. Wo yɛ deɛn ni?
   - ☐ Akan ni
   - ☐ Anwona ni
   - ☐ Ɛnkran ni
   - ☐ Pepe ni
   - ☐ Foforɔ (Mesrɛ kyerɛ): _____

3. ☐ Me yɛ osigyani
   - ☐ Me yɛ ɔwarefoɔ
   - ☐ Me ne obi te nanso yɛnwaree
   - ☐ Nsɛm bi nti me ne mehokafoɔ ɛnte
   - ☐ M'ɛgyae awareɛ
   - ☐ Me yɛ okunani

4. Woakɔ sukuu aduru he?: (Yi mmuaeɛ no mu baako)
   - ☐ M'ɛnduru JSS
   - ☐ Me wiee JSS
   - ☐ Me wiee SSS
   - ☐ Me wɔ diploma anaa HND
   - ☐ M'akɔ suapɔn sukuu
   - ☐ Me wɔ master's
   - ☐ Foforɔ (Mesrɛ wo kyerɛ): ……

5. Adwuma bɛn na woyɛ? ……

6. Wowɔ adwuma bi mu seesei?

   Aane ☐ Dabi ☐

7. Whan na afa wo adwuma mu?

☐ Aban no

☐ Adwuma a ɛnnyɛ aban dea

☐ Me yɛ m'ankasa m'adwuma

☐ Foforɔ (Mesrɛ wo kyerɛ): _____

8. Wo kɔ adwumayɛ mu ahomegyeɛ anaa?

   Aane ☐ Dabi☐

9. Nnawɔtwe mu no, mpɛen bɛyɛ ahe na wokɔsra woba no wɔ ayaresabea? (Yi mmuaeɛ no mu baako)
   - ☐ Mpɛen baako anaa mmienu
   - ☐ Mpɛen mmiɛnsa kɔsi nnum
   - ☐ Dabiaara

10. Wosra no a, wotena nenkyɛn mmerɛ tenten bɛyɛ sɛn? Dɔnhwere …… Simma …...

11. Ɛmma sɛn na ɛwɔ fie? (Yi mmuaeɛ no mu baako).
   - ☐ Menni ba wɔ fie
   - ☐ Baako
   - ☐ Mmienu kɔsi nnan
   - ☐ Nnum anaa nnum ne ɛkyire

12. Health insurance bɛn na woba no wɔ? (Yi mmuaeɛ no mu baako)
   - ☐ Deɛ ɛyɛ aban dea
   - ☐ Deɛ ɛnnyɛ aban dea
   - ☐ Ne mmienu nyinaa
   - ☐ Ɔnni bi

13. Ɛmmerɛ bɛn na wotae pɛ wobano sra? (Yi mmuaeɛ no mu baako)
   - ☐ Anɔpa tutuutu (ansa nɔnkron abɔ)
   - ☐ Anɔpa (firi nɔnkron kɔsi nɔndu-mmienu)
   - ☐ Awia (firi nɔndu-mmienu kɔsi nɔnnum)
   - ☐ Anwummerɛ (firi nɔnnan kɔsi nnɔnkron)
   - ☐ Anadwo (firi nɔnkron ɛɛkɔ)
   - ☐ Berɛ biara

14. Woawɔ woba nenkyɛn wɔ berɛ a nɛɛsenii anaa dɔkotanii aba nsrahwɛ da? (Yi mmuaeɛ no mu baako)
   Aane ☐ Daabi ☐

15. Wobɛpɛ sɛ wobɛwɔ hɔ wɔ berɛ a dɔkotanii anaa nɛɛsenii aba nsrahwɛ? (Yi mmuaeɛ no mu baako)
   Aane ☐ Daabi ☐

Ɔbadoma apɔmuden ho nsɛm

1. Wɔwoo Ɔbadoma no nnawɔtwe …..……. akyi

2. Ɔkwan a wɔfaaso dewoo Ɔbadoma no
   ☐ Wɔwoo no faa awotwaano mu
   ☐ Opiresan
   ☐ Wɔde afidie tweeno defirii awotwaano mu

3. Nemu duro ……. kg

4. Na wɔnam dodoɔ ahe? (yi mu baako) Bakorɔ ☐ nta ☐ ahenasa ☐

5. Ɔbadoma nhwehwɛmu akyiri asɛm……

6. Ɔbaa anaa barima (yi baako)

   ☐ Ɔbaa

   ☐ Barima

7. Ɛnna dodoɔ a woatena NICU hɔ wɔ Korle Bu ayaresabea hɔ. Nna …….

8. Bɛɛbia wɔwoo ɔbadoma no (yi baako)
   ☐ Korle-Bu ayaresabea
   ☐ Ayaresabea foforɔ (mesrɛ kyerɛ) ……

Fathers Support Scale (FSS: NICU)

Nsɛmfua a edidisoɔ yi botaeɛ ne sɛ ɛbɛboa ama y'ɛhu nea agyanom ɛhia wɔ berɛ a wɔn mmɔfra da Neonatal Intensive Care Unit (NICU), sɛdeɛ ɛbɛyɛ a yɛbɛtumi ahyɛ yɛn adwuma mu kena. Mesrɛ sɛ nɔma a ɛkyerɛ nea wodwen no, twa ho hyia.

Section I: Woba ne ho adesua

Woba da NICU yi, sɛn na nnsɛmfua a edidisoɔ yi ho hia wo? (Yi mmuaeɛ no mu baako)

		Ɛhonhia me koraa	Ɛhohia me ketuaa bi	Ɛhohia me kakraa	Ɛhohia me paa	Ɛhohia me bebree	Ɛnfa meho
1.	Sɛ wobɛnya woba n'apɔmuden ho nsɛm daadaa.						
2.	Sɛ wobɛnya woba n'apɔmuden ho nsɛm wɔ kasa a ɛbɛyɛmmerɛ sɛ wobɛte aseɛ mu.						
3.	Sɛ wobɛtumi ɛnya wobaneho nsɛm efiri NICU adɔkotafoɔ hɔ.						
4.	Sɛ adɔkotafoɔ ba nsrawhɛ a, wobɛtumi ate nsɛm a wɔka fa wobaneho no ase.						
5.	Sɛ wobɛnya adwenkyerɛ efiri dɔkota baako hɔ afa wobanewhɛ ho wɔ berɛ a adɔkotafoɔ no ɛwie nhyiamu afa wobaneho						
6.	Sɛ wobɛnya nsɛm a wohia fa wobaneho no ɛfiri NICU nɛɛsefoɔno hɔ.						

		Ɛhonhia me koraa	Ɛhohia me ketuaa bi	Ɛhohia me kakraa	Ɛhohia me paa	Ɛhohia me bebree	Ɛnfa meho
7.	Sɛ wobɛhu adwuma a woba n'awhɛfoɔno nyinaa yɛ wɔ wobaneho.						
8.	Sɛ wobɛhu biribi afa woba n'apɔmuden ho nyinaa dabiaa, na wonhia nkyerɛmu fann.						
9.	Sɛ yɛbɛma wo wobaneho nsɛm sɛdeɛ yɛdema wobano maame no						
10.	Sɛ wobɛtumi ɛnya wobaneho nsɛm afa ahomatorofoɔ so.						

Section II- W'abusua ne woankasa wohoso whɛ.

Wowɔ ba ɛda NICU yi, sɛn na nnsɛmfua a edidisoɔ yi ho hia wo?

		Ɛhonhia me koraa	Ɛhohia me ketuaa bi	Ɛhohia me kakraa	Ɛhohia me paa	Ɛhohia me bebree	Ɛnfa meho
11.	Sɛ wobɛtumi ne wohokafoɔ ɛdi nkɔmɔ daadaa						
12.	Sɛ wobɛtumi ne wonnanfonom ɛdi wobaneho nkɔmɔ daadaa						
13.	Sɛ wobɛtumi akɔ adwuma						

		Ɛhonhia me koraa	Ɛhohia me ketuaa bi	Ɛhohia me kakraa	Ɛhohia me paa	Ɛhohia me bebree	Ɛnfa meho
14.	Sɛ wobɛtumi agye mmerɛ ɛfiri adwumamu na woatena wobano nkyɛn						
15.	Sɛ wobɛtumi ahwɛ wo sikasɛm so yie						
16.	Sɛ wobɛtumi aboa wɔ womma a aka no whɛ mu						
17.	Sɛ wobɛtumi ne awofoɔ a wɔnso wɔmma da NICU hɔ ɛdi nkɔmɔ						
18.	Sɛ wobɛtumi ne woabusua ɛdi wobaneho nkɔmɔ						
19.	Sɛ wobɛtumi anya mmerɛ kakra ama woho						
20.	Sɛ wobɛtumi atenetene wonpɔn mu						
21.	Sɛ wobɛtumi abɔ mpaeɛ anaa woayɛ ɛnneɛma bi a wogyidie hyɛwo sɛ yɛ						
22.	Sɛ wobɛtumi anya mmerɛ kakra ama wo ne wohokafoɔ						
23.	Sɛ wobɛtumi ne obi a ɔnim de adi nkɔmɔ afa w'atenka a wofa mu neho						

Section III: Woba ne whɛ

Wowɔ ba ɛda NICU yi, sɛn na nnsɛmfua a edidisoɔ yi ho hia wo? (Yi mmuaeɛ no mu baako)

		Ɛhonhia me koraa	Ɛhohia me ketuaa bi	Ɛhohia me kakraa	Ɛhohia me paa	Ɛhohia me bebree	Ɛnfa meho
24.	Sɛ wobɛtumi akuta wobano mu						
25.	Sɛ wobɛtumi akyekye wobano werɛ wɔ berɛ a newerɛ aho anaa ɔɔfa ɔyaw mu						
26.	Sɛ wobɛtumi ahwɛ woba no (tesɛ wobɛma no aduane, anaa wobɛdware no)						
27.	Sɛ wobɛkaho ama yafa adwen afa wobano ho						
28.	Sɛ wobɛnya adɔkotafoɔ ahodoɔ adwenkyerɛ afa wobanowhɛ ho						
29.	Sɛ wobɛnya ɔdɔkotanii baako adwenkyerɛ afa wobanowhɛ ho wo berɛ a adɔkotafoɔ no ɛdi nkɔmɔ ɛwie						

		Ɛhonhia me koraa	Ɛhohia me ketuaa bi	Ɛhohia me kakraa	Ɛhohia me paa	Ɛhohia me bebree	Ɛnfa meho
30.	Sɛ wobɛtumi ne awofoɔ a wɔmma ada NICU hɔ da atwetwe nkɔmɔ						
31.	Sɛ wobɛtumi ate ɔhaw a ɛbɛtumi aba wobano so daakye no ase						
32.	Sɛ wobɛtumi ada wobano nkyɛn wɔ NICU hɔ sɛ ɔyare a (mpo sɛ wote bɛn NICU hɔ a)						
33.	Sɛ wobɛtumi ama wobano aka nhwehwɛmu bi ho						

35. Sɛ biribi foforɔ wɔhɔ a ɛbɛboa wo anaa wohokafoɔ wɔ saa berɛ yi a woba da NICU hɔ a, twerɛ wɔ ha.

…….

Parental Stressor Scale: NICU (PSS: NICU)

Nsɛmfua a edidisoɔ yi ka nsem fa sɛnea woba no tebea ne neneyɛe teɛ wɔ berɛ a wosraa no wɔ NICU hɔ. Ɛsan nso kyerɛ ɛneɛma a woehu sɛ wɔreyɛ de asa woba no yadeɛ. Ɛnnyɛ nkwadaa nyinaa na ɛfa saa tebea yi nyinaa mu, nti sɛ woenhu saa ɛneɛma yi bi wɔ woba ne ho a, yi mmuaeɛ wei: "ɛnfa meho". Sɛ asemfua no kyerɛ biribi a woehu wɔ woba neho a, kyerɛ sɛnea ɛhaa wo fae (Yi mmuaeɛ no mu baako)

		Ɛnhame koraa	Ɛhame ketuaa bi	Ɛhame kakra	Ɛhame paa	Ɛhame bebree	Ɛnfa meho
36.	Nnorobɛn ne mfidie sɛ ɛwɔ mebano ho anaa ɛbɛn no						
37.	Sɛ mebano honam ani etwitwie anaa ɛwɔ nkuro-nkuro						
38.	Sɛ mebano honam ahosuo asesa (neho ayɛ hoyaa anaa ayɛ sɛ akokɔsradeɛ)						
39.	Sɛ mebano ahome asesa anaa sɛ ɛnsisiso papa						
40.	Sɛ mebano ayɛ ketekete						
41.	Sɛ mebano honam aponpon						
42.	Sɛ efidie bi ɛɛboa mebano ama n'ahome						
43.	Sɛ nnorobɛn ne mpaneɛ wɔ mebano ɛho						
44.	Sɛ wɔde aduane afa dorobɛn mu ama mebano						

		Ɛhonhia me koraa	Ɛhohia me ketuaa bi	Ɛhohia me kakraa	Ɛhohia me paa	Ɛhohia me bebree	Ɛnfa meho
45.	Na mehu mebano sɛ ɔɔfa ɔyaw mu						
46.	Na mehu mebano sɛ newerɛ aho						
47.	Na mehu mebano sɛ w'ayɛ mmerɛ paa						
48.	Na mebano ɛɛwosowoso						
49.	Na mebano ɛntumi ɛnsu tesɛ nkwadaa a aka no						

Nsɛmfua a edidisoɔ yi kyerɛ ɛneɛma a wotae hu ne ɛneɛma a wotae te ɛwɔ NICU mu. Yɛpɛ sɛ yɛhu woadwenkyerɛ fa sɛnea ɛneɛma yi ha wo fa. Yi mmuaeɛ nemu deɛ ɛkyerɛ dodoɔ a wofa saa haw ne mu wɔ NICU hɔ (Yi mmuaeɛ no mu baako)

		Ɛnhame koraa	Ɛhame ketuaa bi	Ɛhame kakaraa	Ɛhame paa	Ɛhame bebree	Ɛnfa meho
50.	Mehu mfidie a ɛwɔ NICU hɔ no a						
51.	Mfidie no dede a ɛyɛ						
52.	Dede a mfidie no wɔ hɔ a ɛyɛ mpofirimu						
53.	Ɛnkwadaa a aka no a wɔyare da ɛdan no mu no						
54.	Nnipa bebree no a wɔyɛ edwuma wɔ hɔ no						

Atenka bɛn na wowɔ fa wo ne ɔdadoma no ntam nkitahodie ne wo dibea sɛ ɔwofoɔ ho? Sɛ woafa saa tebea yi bi mu a, yi mmuaeɛ a ɛkyerɛ sɛnea ɛhaawo fae. Sɛ wonfaa saa tebea yi bi mu da a, yi mmuaeɛ wei: "ɛnfa meho"

		Anhame koraa	Ɛhaame ketuaa bi	Ɛhaame kakaraa	Ɛhaame paa	Ɛhaame bebree	Ɛnfa meho
55.	Sɛ menni mebano nkyɛn						
56.	Sɛ menkasa memma meba no aduane						
57.	Sɛ menkasa mentumi nhwɛ meba no (tesɛ n'adwareɛ mu)						
58.	Sɛ mentumi ɛnkuta mebano mu wɔ berɛ a mepɛ biaa						
59.	Sɛ mentumi ɛnnyɛ biribiara ɛnfa mmɔ mebaneho ban efiri neyaw mu						
60.	Sɛ mennim nea mennyɛ ɛnfa mmoa mebano saa berɛ yi mu						
61.	Sɛ mennya berɛ ɛmma me ne mebano nkoaa						

Medaase ne wommoa.

Wowɔ ho kwan sɛ wobɛtwerɛ ɛneɛma foforɔ a ɛhaa wo wɔ berɛ a na woba no da NICU hɔ.

Appendix D: Permission Letters

|Request for Permission to Use PSS: NICU

To: [redacted]

From: Investigator's Name: Augusta Botchway MN (student)

[redacted]

I request permission to use the Parental Stressor Scale: NICU (IH) for the following study:

Title and Purpose of Study: Examining the Needs and Stress Levels of Fathers with Infants Receiving Neonatal Intensive Care?

The purpose of this study is to identify the needs and stress levels of fathers during the hospitalization of their infants in the NICU. This study also seeks to investigate whether certain infants' (gestational age and gender) and fathers' (age and educational level) characteristics impact on the needs and stress levels of fathers in the NICU.

Signature (or typed name indicating signature): Augusta Botchway

Date: 05/19/2017

By completing and returning this form you have permission:

____x__I hereby give my permission for you to copy (re retype) my instrument for use in your research. This permission is valid only for the study named in your letter.

____x__I request that you send me an abstract or complete copy of the results of your study when completed.

____x__I request that you use the appropriate reference when submitting proposals or papers for publication using the tool.

[redacted]

Please sign or type name and address and return via mail or email.
This letter once returned to me signifies permission to use the tool. I do not write individual letters of approval.

Permission Letter FSS: NICU

Re: NICU

HL [redacted]

Fri 5/26, 7:53 AM

[redacted]

Reply all

You replied on 5/26/2017 2:17 PM.

Dear Augusta,
You have my permission to translate the scale to Twi for your study. I wish you all the best in your research.

[redacted]

[redacted]

UNIVERSITY OF CALGARY

Appendix E: Consent Form

TITLE: Examining the Needs and Stress Levels of Fathers with Infants Receiving Neonatal Intensive Care

INVESTIGATORS: Augusta Botchway MSc (Student), Dr. Shahirose Premji (Supervisor), Dr. Florence Naab (Committee member), Dr. Aniela Dela-Cruz (Committee member)

Augusta Botchway

Tel: [redacted]

[redacted]

This consent form is only part of the process of informed consent. It should give you the basic idea of what the research is about and what your participation will involve. If you would like more detail about something mentioned here, or information not included here, please ask. Take the time to read this carefully or review with the investigator to understand the information shared below. You will receive a copy of this form.

BACKGROUND

Fathers in the African culture, for example in Ghana, are the primary decision-makers in all aspects of the family, including health care. However, the needs and stress levels of father during the hospitalization of their baby in the neonatal intensive care unit (NICU) remain largely unknown. Factors such as culture, finances, and attitude of NICU staff can affect fathers' involvement in the NICU. We want to understand the father's needs so that NICU staff can

provide support to fathers during this period. This study involves fathers whose babies have been admitted for more than 48 hours in the NICU of the Korle Bu teaching Hospital. Fathers are required to fill out a questionnaire once for this study.

WHAT IS THE PURPOSE OF THE STUDY?

The purpose of this study is to identify the needs and stress levels of fathers during the hospitalization of their infants in the NICU. This study also seeks to investigate whether certain infants' (gestational age and gender) and fathers' (age and educational level) characteristics impact on the needs and stress levels of fathers in the NICU.

WHAT WOULD I HAVE TO DO?

If you agree to participate in this study, you will be asked to complete a questionnaire asking about your needs and stress levels in the NICU. The questionnaire also includes questions about your age, educational level, and the number of times you have visited the NICU during the hospitalization of your infant. We will review your infant's medical records to obtain information about your infant such as gestational age, diagnosis, gender, delivery type, and length of stay, etc. It will take approximately 20-30 minutes to fill the questionnaire however; you can take as long as you need to answer the question.

WHAT ARE THE RISKS?

There is no known risk or danger associated with this study. However, fathers in the NICU may experience higher levels of stress that can affect their health and general well-being, therefore, the counseling department of the KBTH is available at any point in time by contacting Rev. Patterson on telephone 0233 243 677 807

WILL I BENEFIT IF I TAKE PART?

There are no benefits of this study to you but many potential societal and scholarly benefits which makes this research worth studying. The findings of this research will enable us to understand what fathers need, and their stress level in the NICU. The findings obtained from this study will assist neonatal nurses to provide support to meet fathers' needs and help reduce their stress.

DO I HAVE TO PARTICIPATE?

Participation in this study is voluntary. You may withdraw from the study at any time by not completing, or while completing the questionnaire by contacting the investigator. If you are not comfortable answering a question you may leave it blank, although we encourage you to respond so we have complete data. You may seek clarification from the investigator to help you understand the question and so that you are comfortable responding. If you decide to withdraw from the study it will not affect the care you, your baby, and partner will receive in the NICU. Please note that once data analysis is done your data cannot be withdrawn from the study.

WHAT ELSE DOES MY PARTICIPATION INVOLVE?

There is no other involvement required in the study

WILL I BE PAID FOR PARTICIPATING, OR DO I HAVE TO PAY FOR ANYTHING?

You will not be paid and do not have to pay for anything to participate in this study.

WILL MY RECORDS BE KEPT PRIVATE?

Once you agree to participate in this study, your name is not needed on the questionnaire, so no one can trace the response back to you. However, each questionnaire is coded to help us

with the analysis of the data. The completed questionnaire will be stored in a locked office of a member of the research team away from the unit and data stored on a laptop belonging to the researchers will be password-protected. Five years after completion of the study, questionnaires and data files will be destroyed. Your privacy, anonymity, and confidentiality are assured at all times during presentation and publication of the findings of this study.

IF I SUFFER A RESEARCH-RELATED INJURY, WILL I BE COMPENSATED?

No injuries are expected to occur from your participation in this study.

SIGNATURES

Your signature on this form indicates that you have understood to your satisfaction the information regarding your participation in the research project and agree to participate. Furthermore, you give us permission to check your infant's medical records to collect information about the characteristics of your infant. In no way does this waive your legal rights nor release the investigators or involved institutions from their legal and professional responsibilities. You are free to withdraw from the study at any time without jeopardizing your health care. If you have further questions concerning matters related to this research, please contact:

Dr. Shahirose Premji [redacted]

Or

Dr. Florence Naab [redacted]

If you have any questions concerning your rights as a possible participant in this research, please contact the Chair, Conjoint Health Research Ethics Board, University of Calgary at [redacted]

Participant's Name	Signature and Date
Investigator/Delegate's Name	Signature and Date
Witness' Name	Signature and Date

The University of Calgary Conjoint Health Research Ethics Board has approved this research study.

A signed copy of this consent form has been given to you to keep for your records and reference.

Consent Form (Twi Version)

Mpenesoɔ krataa

Ti asem: Nhwehwɛmu fa ahiadeɛ ne ɔhaw a egyanom a wɔmma da Neonatal Intensive Care Unit no ɛfa mu.

Nyansapɛfoɔ: Augusta Botchway, MSc (osuani), Dr. Shahirose Premji (ɔkyerɛkyerɛni), Dr. Florence Naab (agyinatukuoni), Dr. Aniela Dela-Cruz (agyinatukuoni)

Augusta Botchway

Tel: [redacted]

[redacted]

Mpenesoɔ krataa yi ka akwan a nyansapɛfoɔ fa so de nya wohɔ ankwannya wɔ nhwehwɛmu bi ho. Saa krataa yi bɛkyerɛ wo nhwehwɛmu yi fapem, ne dea ɛbɛhia sɛ wobɛyɛ. Sɛ wopɛ nkyerɛkyerɛmu foforɔ bi fa nsɛm a ɛwɔ krataa yi mu anaa wopɛ sɛ wohunu biribi a ɛnni krataa yi mu a, mesrɛ bisa. Kan krataa yi yie; afei nso wobɛtumi ɛbisa nyansapɛni no ama no akyerɛkyerɛ wo nsɛm no mu yie. Wo nsa bɛka krataa yi baako.

NNYINASOƆ

Wɔ ebibiman tesɛ Ghana mu no, agyanom na ɛsi gyinaeɛ wɔ biribi biara ho, mpo ɛwɔ apɔmuden nsɛm ho. Nanso ahiadeɛ ne ɔhaw a agyanom a wɔmma da Neonatal Intensive Care Unit no fa mu no, ɛnnyɛ adeɛ a bebree nim. Nsɛm bi tesɛ sikasem, amamerɛ, ne suban a edwumayɛfoɔ a wɔwɔ NICU no, nya nsunsuansoɔ bi wɔ sɛnea agyanom de wɔnho hyɛ NICU nsɛm mu. Yɛpɛ sɛ yɛte agyanom ahiadeɛ ase sɛnea ɛbɛyɛ a NICU edwumayɛfoɔ bɛtumi aboa agyanom wɔ saa berɛ yi mu. Nhwehwɛmu yi no, agyanom a wɔmma ɛdi mmerɛ bɛboro nnɔnhwere ɛduanan-nwɔtwe wɔ NICU wɔ Korle-Bu ayaresabea hɔ na yɛde wɔn ɛɛyɛ. Ɛbɛhia sɛ agyanom bɛ yi nnɛmmisa bi ano ɛpeɛn koro.

NHWEHWƐMU YI BOATAEƐ NE SƐN?

Nhwehwɛmu yi botaeɛ ne sɛ yɛbɛhunu ahiadeɛ ne ɔhaw a agyanom a wɔmma da Neonatal Intensive Care Unit no ɛfa mu. Bio, Yɛresan nso ahwehwɛ sɛ, ɔbadoma (mmosome dodoɔ a ɔdiiyi ansa wɔɔwo no ne sɛ ɔyɛ ɔbaa anaa barima) ne agya (mfeɛ dodoɔ a w'edi ne baabi a w'akɔ sukuu eduru) su binom nya nsunsuansoɔ wɔ ahiadeɛ ne ɔhaw a agyanom a wɔmma da Neonatal Intensive Care Unit so anaa.

DEƐBƐN NA MƐYƐ?

Sɛ wogye tomu sɛ wobɛka nhwehwɛmu yi ho a, yɛbɛhia sɛ wobɛyi nnsɛmmisa bi ano ɛfa woahiadeɛ ne wohaw wɔ NICU hɔ. Nnsɛmmisa no fa womfeɛ a woɛdi ho, baabi a woakɔ sukuu ɛduru, ne mpɛen dodoɔ woakɔ NICU hɔ berɛ a na woba da hɔ no. Yɛbɛhwɛ woba no ayaresabea nkrataa mu ɛhunu abosome dodoɔ akyi a wɔde woo no, mmerɛ tenten a ɔdii wɔ NICU hɔ, ne deɛ ɛkekaho. Wobɛdi dɔnhwere bɛyɛ du-mmienu kɔsi du-mmiensa wɔ nnsɛmmisa no nyianoɔ ho. Wobɛtumi ɛdi mmerɛ tenten biara a wobehia.

NKWANHYIA BI BƐTUMI ATO ME WƆ NHWEHWEMU YI MU?

Nkwanhyia anaa ɔhaw biara ɛmmata nhwehwɛmu yi ho. Nanso ɛbɛtumi aba no sɛ agyanom a wɔmma da NICU hɔ no bɛteetee, na wei bɛtumi anya nsunsuansoɔ bɔne bi wɔ wɔn apɔmuden ne wɔn asetenapa so. Sɛ biribi saa to wo a, wobɛtumi akɔ counselling department wɔ KBTH.

MEDE MEHO HYƐ NHWEHWƐMU YI MU A, MANYA MFASOƆ BI?

Wookasa afa woahiadeɛ ne wohaw ho no bɛboa ama woakoma atɔ woyam. Nhwehwɛmu yi nsunsuansoɔ bɛma y'ate agyanom a wɔmma da NICU no adiadeɛ ne wɔn haw ase. Afei nso ɛbɛboa anɛɛsefoɔ a wɔhwɛ mmadoma no ama wɔn ɛtumi aboa agyanom ma wɔnhaw so ate.

ƐTWA SƐ KYENKYENAA MEDE MEHO HYƐMU?

Firi wopɛ mu fa woho hyɛ nhwehwɛmu yi mu. Sɛ wopɛ sɛ woyi woho firimu a, ma nyansapɛfoɔ no aso nte. Mpo sɛ woahyɛ aseɛ eeyi nnsɛmmisa no ano a, wobɛtumi ɛyi woho ɛfiri mu. Sɛ wotiri mu ɛntene wo wɔ asɛmbisa bi ho na wontumi ɛnyi ano a, kwan da hɔ sɛ wobɛgya. Nanso yɛrehyɛ wo nkuran sɛ yi nnsɛmmisa no nyinaa ano na ama yɛn amanebɔ no ɛdi mu. Sɛ wohia nkyerɛmu wɔ asembisa bi ho a, wotumi bisa nyansapɛfoɔ no. Sɛ woyi woho firi nhwehwɛmu yi mo a, ɔhwɛ a wo ne woba no ne wohokafoɔ nya wɔ NICU hɔ no ɛnsesa.

BIRIBI BIO WƆHƆ A EHIA SƐ MEYƐ?

Nhwehwɛmu yi ɛnhia biribibiara bio.

MƐNYA AKATUA BI, ANAA ETWA SƐ METUA BIRIBI HO KA?

Wonya akatua biara, na wontua sika biara ansa wode woho ahyɛ nhwehwɛmu yi mu.

MENKRATAA NO BƐYƐ KƆKOAMDEƐ?

Wogye tomu sɛ wode woho bɛhyɛ nhwehwɛmu yi mu a, ɛho nhia sɛ wobɛ twerɛ wodin wɔ krataa no so, ɛnti obiara ɛnhu sɛ wo na woeyiyi nsɛmmisa no ano no. Nanso nhyehyɛɛ bi da nkrataa no ho a ɛbɛboa ama y'ate nnyiano no ase na y'ehu nhwehwɛmu no awieeɛ. Yɛbɛto nkrataa no dan mu wɔ ɔfese, na nnyiano nonso yɛde bɛgu abɛɛfo afidie badwenmma(kɔmputa) a ɛyɛ nyansapɛfoɔ no ankasa dea so, na yɛde 'password' bɛbɔ ho ban. Wɔ mfeɛ nson akyi no, Yɛbɛsɛe nkrataa no ne nyiano no nyinaa. Nya awerɛhyɛmu sɛ obibiara ɛnhunu da sɛ wode woho hyɛɛ saa nhwehwɛmu yi mu.

SƐ MEHYIA NKWANHYIA BI ANAA ME PIRA ƐNAM NHWEHWƐMU YI A, MOBƐHYƐ M'ANANMU?

Nkwanhyia anaa opira biara enni nhwehwɛmu yi mu.

FA WONSA HYƐ KRATAA YI ASE

Wonsa a wode ahyɛ krataa yi ase no kyerɛ sɛ woate biribibiara fa nhwehwɛmu yi ho ase, na woagye atomu sɛ wode woho bɛhyɛmu. Bio ɛkyerɛ sɛ woama yɛn kwan sɛ yɛnhwɛ woba no ayaresabea nkrataa mu. Kwan biaa so no, ɛnkyerɛ sɛ woɛtwa mmara mu neɛ ɛsɛ wo mu, na ɛnkyerɛ sɛ nnwumakuo ne nyansapɛfoɔ a wɔdi nhwehwɛmu yi mu akotene anya akwanya sɛ wɔnnwane wɔn ɛmmara mu asɛdeɛ. Wowɔ ho kwan sɛ wobɛyi woho ɛfiri nhwehwɛmu yi mu berɛ biara, na ɛnsesa woapɔmuden ho whɛ a wonya no. Sɛ wowɔ nnsɛmmisa foforɔ bi a, wobɛtumi aferɛ:

Dr. Shahirose Premji [redacted]

Anaa

Dr. Florence Naab [redacted]

Sɛ wowɔ nnsɛmmisa bi fa nea ɛsɛ wo sɛ obi a woka nhwehwɛmu yi ho a, ferɛ otitenani a ɔda Conjoint Health Research Ethics Board no ano wɔ Calgary Suapɔn wɔ [redacted] Korle Bu Teaching Hospital Institutional Review Board wɔ nɔma yi so [redacted]

Wo din	Sign ne/ Tintim ɛna nydɛ date
Nyansapɛfoɔ anaa n'namusifoɔ din	Sign ne/ ɛna nydɛ date
Adanseni din	Sign ne/ ɛna nydɛ date

Conjoint Health Research Ethics Board a ɛwɔ Calgary Suapɔn ɛne Institutional Review Board ɛwɔ KBTH mu na ama ho kwan sɛ nhwehwɛmu yi nkɔso.

Yɛde krataa yi baako a yasign so ama wo, na ama aberɛ biara a wopɛ sɛ wohwɛ biribi wɔmu no woahwɛ.