Impact of maternal education and health awareness on child health in Kandahar Province, Afghanistan

_____

A Thesis

Presented to

The Faculty of the Graduate School

at the University of Missouri-Columbia

_____

In Partial Fulfillment

of the Requirements for the Degree

Master of Public Health

_____

by

Mohammad Azeem Zmarial Kakar

Dr. Deborah Hume, Thesis Supervisor

December 2016

The undersigned, appointed by the dean of the Graduate School, have examined the thesis entitled

IMPACT OF MATERNAL EDUCATION AND HEALTH AWARENESS ON CHILD HEALTH IN KANDAHAR PROVINCE, AFGHANISTAN

presented by MOHAMMAD AZEEM ZMARIAL KAKAR

a candidate for the degree of master of public health,

and hereby certify that, in their opinion, it is worthy of acceptance.

Professor Deborah L. Hume

Professor Suhwon Lee

Professor Lise Saffran

This work is dedicated to my kind parents, who always supported me throughout my educational life. Thanks, dear Mom and Dad.

ACKNOWLEDGEMENTS

TABLE OF CONTENTS

IMPACT OF MATERNAL EDUCATION AND HEALTH AWARENESS ON CHILD HEALTH IN KANDAHAR PROVINCE, AFGHANISTAN

Mohammad Azeem Zmarial Kakar

Dr. Deborah Hume, Dissertation Supervisor

ABSTRACT

Improving child health and decreasing child mortality still remains a challenge to the government of Afghanistan. According to UNICEF, Afghanistan ranked 16th among the countries with high child mortality (2015). Kandahar province located in the southern part of Afghanistan also suffers from poor child health. Inadequacy of maternal education, lack of health awareness, and intricate cultural and social practices in the province shapes the health-related behavior of mothers.

The result of the study indicates that maternal health awareness is a significant predictor of health-supportive behaviors regardless of geographic location. Mothers with high health awareness were more likely to use contraceptives, made frequent clinic visits during pregnancy, preferred hospital births, received immunization for their children in proper time, complied with World Health Organization's breastfeeding guidelines for their children, and avoided utilization of spiritual and herbal remedies for their ill children.

Contraceptive use in women was associated with autonomy of women. However, very limited number of women in the sample was able to make independent decision regarding their and their child's health. However, the study did not find any significant relation of health awareness on child's nutritional status of the children.

Satisfactory improvement of child health in the province requires government to address other determinants of health in addition to maternal health awareness. Even though health awareness was found significant factor of health related behaviors, but relying merely on maternal health awareness would not be accompanied with significant outcome if addressing other determinants of health are ignored.

Introduction

The determination and commitment of the international community has been accompanied by substantial outcomes to reduce child mortality. Since 2000, collaborative efforts saved almost 48 million under-5 children from premature deaths, and the world has experienced an almost 53% improvement in under-5 child survival since the 1990s when 12.7 million were dying before reaching their fifth birthday. However, under-5 child mortality remains a substantial threat to the populations of developing nations (United Nations International Children's Fund, 2015). A recently published report by the United Nations International Children's Emergency Fund (UNICEF, 2015) predicts that 5.9 million children will lose their lives in 2015 before reaching their 5th birthday, reflecting the loss of 11 children every single minute and 16,000 lives lost per day almost 45% of expected deaths will occur within 28 days of delivery, and Africa and South Asia are the prominent regions that make the largest contribution (80%) to worldwide child mortality (UNICEF, 2015). UNICEF defines under-5 child mortality rate as the "probability of dying between birth and exactly five years of age, expressed per 1,000 live births" (2015, p. 87).

Review of the Literature

In reviewing the literature, I examine research on biological factors, social-structural factors, and maternal practices that contribute to under-5 child mortality, as well as the relationships among the aforementioned three factors. I also review the specific situations in Afghanistan, particularly in Kandahar province, that affect child survival.

Regarding biological factors, I review research on the cause, magnitude and trends of infectious disease and malnutrition. In addition, I discuss the existing link between infectious disease and malnutrition among under-5 children. Regarding social-structural factors, I assess the literature on disparities and their association with under-5 child mortality. I discuss socio-economic disparities, geographic disparities, political turmoil, and the status of women (education, economic power and autonomy), and their impact on child survival. Regarding maternal behavior, I examine literature on the effect of birth intervals, breastfeeding, healthcare seeking, immunization, and hygiene/sanitation. This section will be followed by exploring links between the aforementioned factors. For clarity, I will review each factor in turn. However, it is understood that these factors influence one another and create a cumulative pattern of risk for, or protection from, child mortality.

Last, I provide an overview of the current situation on the status of women, traditional health seeking behaviors, and attitudes towards spiritual remedies among new mothers in Afghanistan, particularly in Kandahar province.

Biological Factors Contributing to Under-5 Child Mortality

A number of factors contribute to child mortality in developing countries. Foremost among them are biological causes including infections and under-nutrition.

Infectious diseases. Infectious diseases remain the leading cause of under-5 child mortality in the regions suffering from the highest burden of child mortality. Among infectious diseases, pneumonia and diarrhea are the top two diseases contributing to child mortality (UNICEF, 2015). A study by Kosek, Bern, and Guerrant (2003) reported that diarrhea caused approximately 2.5 million deaths in under-5 children annually in 2003. There has been improvement however, and current estimates report all infectious diseases to cause 2.5 million under-5 deaths annually. Nevertheless, infectious diseases persist to cause 39 per cent of under-5 child deaths in South Asia and pneumonia and diarrhea account for 15% and 10% of the total under-5 child mortality in South Asia, respectively (UNICEF, 2015). A study by Johnson, Liu, Fischer-Walker, and Black (2010) also mentioned pneumonia and diarrhea as the top causes contributing to under-5 deaths in Africa and South Asia. Their findings showed that pneumonia was responsible for 21-31% and diarrhea was responsible for 25-31% of deaths in under-5 children in South Asia. According to the *Pneumonia and Diarrhea Progress Report 2014*, pneumonia and diarrhea caused 33,000 deaths in Afghanistan that placed the country at 8th among the countries suffering from high under-5 child mortality due to these infectious diseases (International Vaccine Access Center, 2014).

Under-nutrition. Under-nutrition emerges in three forms (underweight, stunting, and wasting), and refers to lack of "energy, protein and essential fatty acids" (West, Stewart, Caballero, & Black, 2012, p. 251; WHO, 2010) contributed to cause 45% of deaths occurring in children under five years of age in 2011 (Black et al., 2013; Prendergast, 2015). The World Health Organization defines underweight as weight for age <-2 standard deviations (SD) of the WHO Child Growth Standards median," stunting as a "height for age < -2 SD of the WHO Child

growth Standards median, and wasting as "weight for height < -2SD of the WHO Child Growth Standards median" (2010, p. 1).

Poor diet and infections cause stunting in children; stunting increases the risk of diseases in children and makes them susceptible to death; in addition, stunted children suffer from "delayed mental development, poor school performance and reduced intellectual capacity" that will limit economic productivity (WHO, 2010, p. 10). Furthermore, growth-retarded mothers are more likely to experience obstetric complications and deliver a child with low birth weight that will lead to an intergenerational cycle of malnutrition (WHO, 2010).

Wasting is regarded as a "symptom of acute malnutrition, usually as a consequence of insufficient food intake or a high incidence of infectious disease, especially diarrhea" that results in poor immune system functioning and increased susceptibility to infections (WHO, 2010, p. 10). A global trend of nutrition in children under 5 indicates that in 2013, 51 million were wasted, 17 million were severely wasted, and 99 million were underweight. Of these about two thirds lived in Asia and one third in Africa (UNICEF, WHO, The World Bank, & UN, 2014, p. 2).

Though the prevalence of malnutrition is highest in Africa, Asia has the highest number of malnourished children (UN IGME, 2014). In particular, South Asia (India, Afghanistan, Pakistan, Bangladesh, Sri Lanka, Bhutan, Maldives, and Nepal) is the region engulfed with pervasive prevalence of malnourished children (UN IGME, 2014). Poverty is a fundamental cause of malnutrition (Müller & Krawinkel, 2005), and "under nutrition is the underlying cause of a substantial proportion of all child deaths" (Black, Morris, & Bryce, 2003, p. 2233). Therefore, an increase in the level of poverty affects child's nutritional status and mortality (Gaiha, Kulkarni, Pandey, & Imai, 2011). Gaiha et al. (2011) reported that children residing in

poverty were more likely to suffer from poor nutrition, and were prone to bear a huge burden of child mortality. However, the study concluded that raising living standards alone would not initiate a drop in child mortality, unless associated with increasing female literacy rates, narrowing the existing rural-urban disparities, and reducing income inequalities (Gaiha et al., 2011).

Synergistic relationship between under-nutrition and infectious disease. The existing synergistic relation between infection and poor-nutrition in children is referred to as a "vicious cycle" (West et al., 2012, p. 251). Children suffering from infectious diseases are more likely to develop under-nutrition (West et al., 2012, p. 251), and under-nourished children are more susceptible to infections due to their fragile immune system. In addition, under-nutrition exacerbates the risk of dying from infectious disease due to the increased frequency and delayed recovery from infection (United Nations Inter-agency Group for Child Mortality Estimation, 2014).

Social-Structural Factors Contributing to Under-5 Child Mortality

Looking beyond the biological factors that contribute to child mortality, the existence of disparities such as wealth, education, urban vs. rural life settings, and areas suffering from political turmoil also operate as essential factors contributing to high under-5 mortality rates among populations of various nations (UNICEF, 2015). Reports indicate that children from poorer families are at 1.9 times higher risk, children residing in rural areas are at 1.7 times higher risk, children residing in areas with conflict are at 2 times higher risk, and children born to uneducated mothers are at 2.8 times higher risk of dying before reaching their fifth birthday compared to their counterparts born to wealthier families, residing in urban areas, areas with political stability, or born to educated mothers, respectively (UNICEF, 2015).

Socioeconomic disparities in child survival. Socioeconomic disparities lead to variation in child survival rates between the poor and wealthy strata of the society (Houweling & Kunst, 2010; Wagstaff, 2000). Better income/wealth influences the availability and quality of food, quality and quantity of water, size and quality of housing, energy supply, accessibility to transportation, utilization of preventive measures, and access to health information through media; all aforementioned factors are considered as long-term contributors to child survival (Mosley & Chen, 1984). Therefore, income/wealth is considered as a strong determinant of health in developing countries (Mosley & Chen, 1984), and inequality in distribution of wealth will place a serious public health threat to child survival outcomes in low and middle income countries (Houweling & Kunst, 2010).

A study examining the impact of socioeconomic and geographical disparities in child survival in Uttar Pradesh, India also highlighted vast discrepancies in child survival. The study used wealth data from 2005 geographical (rural vs urban) data from 2007 for estimating the differences in under-5 mortality based on economic and geographic disparities, and reported that under-5 mortality rates in rural and urban areas were 110 and 82 per 1000 live births, respectively (Dettrick, Jimenez-Soto, & Hodge, 2013). In addition, in rural low-income areas, the mortality rate was 113, however in higher income rural areas the mortality rate dropped to 75 (Dettrick et al., 2013). Similarly, the study reported an under-5 child mortality rate of 103 in low-income urban areas; however, the rate in high income urban areas was 52 (Dettrick et al., 2013).

Geographical disparities in child survival. The effect of geographical disparities on child survival is also well-documented (Stock, 1983; Wang, 2003). Long distances to health facilities impede preventive care utilization in populations and leave children unimmunized in regions that have failed to address geographic inequalities (Mashal, Nakamura, Kizuki, Seino, &

Takano, 2007; Stock, 1983). Wang indicated the existence of high mortality rates in rural areas compared to urban areas and added that the child survival rates are very poor in rural communities having economically stressed inhabitants (2003). Keya, Rob, Rahman, Bajracharya, and Bellows (2014) argue that bridging the gap of geographical disparities will lead to utilization of antenatal care, delivery services, and immunization services in higher rates.

Political turmoil. Conflict and child mortality walk hand in hand (Bustreo, Genovese, Omobono, Axelsson, & Bannon, 2005) and the mechanisms that lead to higher child mortality rates in conflict-affected regions include deteriorations of living conditions, limitations on health services utilization, shortage of resources (i.e. health worker, equipment supplies, services), and destruction of health infrastructures (Bustreo et al., 2005; Ouili, 2015). Ouili (2015) reported that inhabitants of conflict-affected areas were struggling with resource reduction, substandard living, and higher school dropouts. In addition, inhabitants of conflict zones also had limited access to health facilities and minimal service utilization (i.e. prenatal visits and immunization coverage) (Mashal et al., 2007; Ouili, 2015). Ouili reported a 3.5% increase in under-5 mortality rates in families who live for at least one year in conflict-affected areas (2015).

Status of women. Women's status (indicated by educational attainment, economic independence, and autonomy) is cited as an important predictor of change in child mortality within a society (Boehmer & Williamson, 1995). Women with autonomy have the authority to control their fertility (Balk, 1994). In addition, the more autonomous women are, the more likely they are engaged in seeking preventive care (i.e. immunization) for their children (Hossain, Phillips, & Pence, 2007). Autonomy of women also contributes to child survival by permitting women to decide regarding nutritional options for their children (Hossain, et al., 2007).

7

The link between status of women and educational attainment of women is well-established (Boehmer & Williamson, 1995). Among predictors of child mortality reported by UNICEF (2015), maternal education was the strongest potential indicator of child survival, relative to geographical disparities, political tumoil, and socioeconomic status. Thus, in the following section, I examine literature on educational attainment and health awareness of mothers and its correlation with child health. In the subsequent section I will review research on how maternal educational attainment and health awareness impact child health through specific behaviors such as immunization, breastfeeding practices, birth-spacing, and sanitation.

Lack of maternal health awareness and education are associated with higher incidences of poor-nutrition and deaths in children younger than 5 years of age. Researchers found that maternal education and health awareness can shape health-related attitudes and behavior by attenuating fatalistic beliefs, improving self-efficacy by balancing disproportionate household power in making decisions, and maintaining healthy communication with family members for improving child health and navigating health related issues (Caldwell, 1979). Education encourages maternal engagement in optimal health seeking behaviors such as immunization and breastfeeding practices (Kumar et al., 2015). Maternal education is also related to maintaining optimal pregnancy intervals, timely management of childhood diseases, and improved hygiene, sanitation, and nutrition (Basu, 1994; Basu & Stephenson, 2005).

Caldwell (1979) cited a study from Ghana that reported the existence of a huge variation in child survival rates among children born to educated mothers compared to children who were born to uneducated ones. The study observed 2- 4 times higher mortality rates in mothers having no educational attainment compared to mothers with elementary or secondary educational attainments respectively. UNICEF's recently published report (2015) is consistent with

Caldwell's finding in terms of the magnitude of educational disparities and the impact on child health educational disparities, its magnitude and impact on child health. Caldwell (1979) suggested that socio-economic factors have the potential to influence child's health; however, he mentions maternal education as "the single most significant determinant" in child mortality (p. 408). Caldwell further states that maternal education is not a "proxy;" in fact, it is an "important force" operating in the apparatus of child mortality reduction (1979, p.408).

Cleland and van Ginneken (1988) also emphasized the significance of maternal education and reported that after controlling for economic factors, "1-3 years of schooling is associated with a fall of 20% in childhood risks of death and further large decreases are recorded with successive increments in educational attainment" regardless of variation in accessibility and effectiveness of health facilities in the region (p. 1365). The analysis of the Nigerian Demographic and Health Survey data also found a link between maternal education and child survival and provides further support that that mothers' formal education fosters child survival (Smith-Greenaway, 2013).

A case study conducted in Rajshahi district in Bangladesh demonstrated the positive effect of socioeconomic and demographic factors such as maternal education, immunization, ever breastfeeding, mother's age at birth, birth interval, existence of toilet facilities, and health facilities on infant and child mortality (Mondal, Hossain, & Ali, 2009). The study further demonstrated that, women obtaining primary education have 31.40 % lower risk of child mortality compared to their uneducated counterparts, and if the maternal educational attainment is extended to secondary level, the risk of child mortality will drop by 52.30% (Mondal et al., 2009). In addition, families in houses with hygienic toilet facilities experiences 32% lower child

mortality than those in houses lacking toilet facilities, when other variables such as socioeconomic status and access to health facilities were controlled (Mondal et al., 2009).

A comparative study by Ali, Chaudry, and Naqvi (2011) concluded the existence of "strong and consistent" link between maternal education and child mortality (p.103). The findings illustrated that children born to educated mothers were less likely to experience malnutrition, and education enabled mothers to identify symptoms of disease and recognize the importance of seeking early treatment for their children (Ali et al., 2011). This prevented a time lag in seeking required treatment for ill children. Basu and Stephenson (2005) argued that avoiding delays in seeking treatment are crucial for child survival.

In addition to the vital role of formal maternal education on reducing child mortality, adult literacy programs fortified with health related topics could be a beneficial and cost effective intervention for decreasing child mortality rates in developing countries; however, such adult literacy programs have been under-utilized (Blunch, 2013). Blunch speculated that provision of health related topics such as "immunization, safe motherhood and childcare, and safe-drinking water" during non-formal adult education would have a significant impact on maintaining ideal child health (2013, p.123).

Desai and Alva (1998), however, dispute Caldwell's conclusion. Desai and Alva argue that maternal education is not the direct cause of improved child health outcomes, but rather is a proxy for other causal factors achieved through health seeking behavior stimulated by education. They further stated that education plays a limited role to cause a direct decline in child mortality. Nevertheless, their findings show a close link between maternal education and high immunization coverage in children (Desai & Alva, 1998).

Maternal Practices

Desai and Alva (1998) indicated a well-established relationship between maternal education and immunization status of a child and its impact on child mortality. Educated mothers seem to be more vigilant for seeking biological defense at a proper time against preventable infectious diseases that present serious threats to their children (Desai & Alva, 1998; Onsomu, Abuya, Okech, Moore, & Collins-McNeil, 2015; Owais, Hanif, Siddiquie, Agha, & Zaidi, 2011). Childhood immunization is the most effective intervention in prevention of infectious diseases (Anderson, 1992) and access to "life-saving immunizations such as measles, Hib, rotavirus and pneumococcal vaccines" at the proper time has a huge impact on childhood mortality reduction (Andre, 2008, p. 144). Prendergast (2015) reported that undernourished children experience intense disruption of the immune system, which allows the infection to interrupt normal body functions. For malnourished children who have few biological defenses against infection, immunization is even more vital compared to their well-nourished conterparts (Prendergast, 2015). Studies reported that areas with high immunization coverage experience lesser burdens of child mortality (van der Klaauw & Wang, 2009).

Autonomy, which according to Caldwell (1979) relies upon the educational attainment of women, has also been shown to be predictive of immunization behavior. A research study conducted in Nigeria highlighted the association of women's autonomy and the immunization status of children (Singh, Haney, & Olorunsaiye, 2012). The study included 3,454 currently married women having a child between 12 and 23 months; the data for the study was obtained from the Nigerian Demographic and Health Survey (DHS). The results suggested that women having a maximum role in household decision-making processes were more likely to immunize their children than women with less decision-making power. Additionally, women who viewed

11

the beating of women by their husbands as an unacceptable act, tended to complete required immunizations for their children to a greater extent than women who viewed beating of a wife as an acceptable act.

Breastfeeding, like immunization practices, is an important player in reducing the magnitude of child mortality (Kumar et al., 2015). Exclusive breastfeeding significantly reduces the probability of diarrhea and pneumonia infections, the leading known causes of child mortality (Black et al., 2008). Researchers report a connection between maternal education and optimal breastfeeding practices, and highlights the lower rates of optimal breastfeeding practices among mothers struggling with education and health literacy (Kaufman, Skipper, Small, Terry, & McGrew, 2001). World Health Organization (WHO) and UNICEF recommend exclusive breastfeeding for children during the first six months after childbirth, with continued breastfeeding for the first 2 years of life and complementary feeding after six months of age. They reason that breastfeeding provides sufficient energy and nutrients, and will provide infants ample biological defenses against infections (UNICEF, WHO, World Bank, & UN, 2014).

Black et al. (2008) reported that "suboptimal breastfeeding" claimed 1.4 million child lives globally, and South-central Asia and sub-Saharan Africa suffer the most from child mortality (p. 254). A study from Ghana reported 16% drop in neonatal mortality when breastfeeding was initiated on the first day of the birth; in addition, the study also reported 22% drop in child mortality when breastfeeding occurred within the first hour of the birth (Karen et al., 2006). However, FHS-3 data highlights that 3/4 of the children are not breastfed and almost half of the children do not receive exclusive breastfeeding from their first day of birth (Kumar, et al., 2015). In general, merely 2 in 5 children receive breastfeeding within an hour of birth and only 2 in 5 children are exclusively breastfed in first six months of life (UNICEF, 2015).

Available data indicates that 32% of children in Latin America and the Carribean,10% of Asian and 6% of African children between the ages of 6-11 months do not continue breastfeeding (Black et al., 2008). A cross sectional study conducted in a tertiary care hospital in Southern India illustrated the role of awareness in shaping attitude of mothers regarding breastfeeding and immunization practices (Kumar, et al., 2015). The study suggested that integrating the immunization and breastfeeding topics into adult education will shape attitudes in positive pattern and will lead to adaptation of health-friendly behaviors that encourage child survival and reduce child mortality (Kumar, et al., 2015).

Research also suggests that lower fertility may be associated with maternal education (Basu & Stephenson, 2005) and with higher autonomy (Eswaran, 2002; Gudbrandsen, 2013; Hindin, 2000). Low fertility is associated with low mortality in children younger than 5, and findings show negative impact of high fertility rate on child mortality (Kozuki & Walker; 2013). Kozuki and Walker further stated "Low fertility mothers may have better nutritional status and access to care, hence short birth intervals may not deplete the mother's nutritional resources to a level that results in increased risk of mortality for the child" (p.8, 2013). Van der Klaauw and Wang (2009) concluded that short birth intervals significantly increase child mortality. A study by Rasooly et al. (2013) demonstrated that mothers exercising birth intervals of less than 18 months are more likely to lose their children due to the sepsis, and mothers maintaining longer birth intervals (59 months or more) also were at risk of losing their children before their 5th birthday. Basu and Stephenson reported the influence of rudimentary education on health related behavior of mothers, and demonstrated that changes in behavior can lead to child survival in families (2005). They highlighted that "if education changes fertility levels, this may have implications for child health and mortality as bio-demographic factors associated with fertility

(such as low birth intervals and maternal age at delivery) may impinge on child health" (Basu & Stephenson, 2005, p. 2013).

Women enjoying autonomy had lower fertility rates compared to their counterparts living in families with traditional inter-household power structures (Gudbrandsen, 2013). Gudbrandsen further stated, "If the first born (child in a family) is a girl, then the people (families) have more children" (p. 166, 2013). This may be because in developing countries, families have stronger beliefs that male children can provide better old-age security to their parents compared to female children (Eswaran, 2002). Eswaran (2002) also indicated the effect of female autonomy on birth spacing. Eswaran speculates that women having authority in decision making are less likely to contribute to high fertility rates, rather, these women will prefer to invest in quality of their children. In addition, a study in Zimbabwe reported a positive effect of women's autonomy over controlling reproductive behavior and contraceptive utilization among them (Hindin, 2000).

In addition to aforementioned factors, it is speculated that child mortality is related to housing characteristics, electricity and type of houses (van der Klaauw & Wang, 2009); and traditional health seeking behaviors within society (Azevedo, Prater, & Lantum, 1991; Caldwell, 1979). Mortality rates are also reported higher among children whose mother was a teenager at the time of birth (van der Klaauw and Wang, 2009).

A study conducted by Nigussie, Mariam, and Mitike (2004) in North West Ethiopia revealed that education of mothers influences their preference for place of child delivery. Pregnant women with secondary or high school education were 11 times more likely to visit health facilities at the time of birth than pregnant women who lacked education; in addition, the

rate of traditional harmful practices was higher in home deliveries than in hospital deliveries. (Nigussie et al., 2004).

Other factors such as mother's age at the time of birth, gender discrimination and indoor pollution also contribute to child mortality (van der Klaauw and Wang, 2009).

Specific Situation in Afghanistan

Afghanistan is a land-locked mountainous country located in South Asia. According to World Bank (2013) data, it is home for to a population of 30.55 million. Afghans have lived under the condition of war from the Russain invasions from 1970s until 2002 with the collapse of Taliban. Conflict has continued until the current date in limited parts of Afghanistan. The long-lasting war has not only claimed millions of lives, but also devastated the basic infrastructure of the country. Afghanistan still suffers from poor health infrastructure, poverty, food insecurity, economic instability, and political turmoil. These factors made millions of other Afghans vulnerable to the threat of preventable diseases. This is particularly true of women and children, the most sensitive groups due to their social status. Children lack many opportunities in Afghanistan such as education, safe play areas, comfortable and secure family environment. Due to economic constraints of the families, children are often forced into child labor. Thus, Afghanistan does not have a pleasant reputation for children to live; except for some African countries, Afghanistan has one of the highest child mortality rates.

However, the current data trends identify positive changes in children's survival since the 1990s, when the under-5 child mortality rate was 179 (Rasooly et al., 2013). The current child mortality rate is 91. the major contributors to achievements in the declining child mortality in the country include "increasing age at marriage, higher contraceptive use, lower fertility, better

immunization coverage, improvements in the percentage of women delivering in health facilities and receiving antenatal and postnatal care" (Rasooly et al., 2013). Nevertheless, high under-child mortality rates in Afghanistan remain a grave challenge to the Ministry of Public Health.

The contemporary under-5 child mortality rate of 91 places Afghanistan at16th among countries stricken by high under-5 child mortality. Afghanistan has the highest under-5 mortality rate outside 15 African nations (UNICEF, 2015). Nevertheless, underreporting of child mortality, particularly of female children and in rural areas, is a problem in the country (Viswanathan et al., 2010) and may change the current estimations of child mortality rates reported by UNICEF. In addition, Afghanistan has the highest prevalence of child malnourishment, ranking 9th with 27.4% malnutrition rate (UNICEF, 2014). Almost 20% of child mortality is attributed to vaccine-preventable diseases within Afghanistan (Ministry of Public Health [MoPH], 2015). Research findings show that lack of security and geographical inequalities further limit endeavors to provide optimal immunization coverage in the country (Mashal et al., 2007).

Available data indicates that illiteracy is a significant challenge to the progress of Afghanistan. Findings from the Afghanistan Mortality Survey 2010 (Afghan Public Health Institute et al., 2011) remain consistent with findings from previous researchers and confirm the drop in child mortality rates concurrent with an increase in women's educational attainment in Afghanistan. However, the adult female illiteracy rate still remains as high as 61% in Afghanistan (UNESCO, 2015). In addition, due to the poor and fragile governmental system, half of Afghan children do not attend schools, 87% of Afghans do not have access to safe drinking water, and 88% of Afghans do not have access to proper sanitation (AMS, 2010).

Some traditional practices further add to the magnitude of the problem in the country by various means. Atal depicts the male dominant aspect of Afghanistan and low social status of women in conservative societies within Afghanistan. Men are assumed intellectually superior to women in Afghanistan, and "silence" and "obedience" are considered as "valuable characteristics" of women (Atal, 1991, p.6). Mostly, women's role is limited to household chores and rearing children; they have a limited role in the decision-making process. For example women are required to obtain prior permission even for seeking emergency healthcare for their children in Afghanistan. Common traditional health seeking practices in the country further threaten the society; regions in the country that lack proper health facilities and experience pervasive illiteracy are suffering more from such health deteriorating and life threatening activities.

Due to scarcity of education and health literacy, women in Afghanistan frequently contact local religious healers to mitigate the symptoms of diseases. These religious healers make fraudulent claims regarding treatment of various diseases. Women generally ask for Taweez (writing prayers on piece of paper) for certain diseases, these Taweezes are then "consumed with water" or "sewn into the leather" or cloth and placed around the arm or neck of the patient (Grima, 2002). The patients do not contact health care facilities for seeking treatment and may wait for Taweez to show curative effects. Thus seeking various types of spiritual treatment even for acute and highly mortal infectious diseases from shrines or religious frauds lacks any health gain, fosters the severity of disease and delay in treatment. Such malpractices increase the chances of child mortality in the country. Herbal medicines also have wide range of consumption in the country (Grima, 2002) that cause a delay in seeking scientific treatment in appropriate time.

The southern region of Afghanistan experiences all these conditions in more severe form. The southern region consists of Kandahar, Helmand, Urozgan, and Zabul provinces. Kandahar province has 18 districts; it is also known as the center for southern region. Although Kandahar is the country's second largest city and was once Afghanistan's capital (Holland, 2010, p. 279), the province still struggles with poverty, illiteracy, security and lack of capacity (Holland, 2010). There is no research on the contributions of these four factors to child mortality in the Kandahar province. However, based on studies outside of this particular region, I speculate mentioned four factors as contributors to high mortality rate in the region.

Kandahar is more conservative with having intricate traditional hierarchy approaches for various issues including health care. A disconnect between residents and health facilities (perhaps due to lacking of both trust and awareness, limited accessibility, fatalistic beliefs) may avert required prenatal visits and postnatal visits to a clinic, and may encourage homebirths in society. In such cases, the pregnant women rely on three sources for the information they require: first, Traditional birth attendants (TBA) with limited trainings and formal education, second, Traditional Birth Attendant with having no formal education or trainings, and third, elder women in the house, in particular mother in-laws. Both types of Traditional Birth Attendants are women who maintain high social relations, strong connections in the community, and are seasoned in recommending herbal or homemade remedies. These remedies rarely comply with the modern medicine guidelines and pose threats to children's health in society. Traditional Birth Attendants are usually charlatans and influence their clients by their skills and salubrious verbal communications learned from their precedents. As TBAs receive incentives for their services, they may also operate as a barrier between pregnant women and health facilities.

Moreover, the decision of dietary selection for women during pregnancy, after delivery and for newborn babies lies in the hands of mothers in-law. Though as a culture, after delivery, maternal relatives (usually mothers of the pregnant women or their older sisters) visit their houses during childbirth, generally their role is limited to serve the new mother by cooking food, washing clothes, massaging her back and rubbing body, and assisting them to calm the child while crying. But the main decision making authority on what to feed both the newborn and the new mother is taken mainly by mothers in-law, and in some circumstances they may ignore or veto suggested diets or recommendations proposed by others. Due to this reason, in prenatal and postnatal periods new-mothers undergo restricted diets. The mother in-law may convince her that different diets may affect child health and cause constipation and diarrhea in children. The most recommended diet for new mothers is broth, although not all families can afford meat, and most families can only offer very rudimentary diet that lacks nutritional values. Dietary restrictions will lead to poor nutrition in new-mothers and make them prone to various diseases that may also affect children's health through poor breastfeeding practices. In addition, mothers in-law may not permit the new mothers to attend prenatal and postnatal visits.

Newborn children are usually held by all members in the family, regardless of considering their hygiene and sanitation. In some circumstances when children are crying while their mothers are not around for a reason, the easiest way to make them calm is to put ones thumb in their mouth to suck. Hence the chances of infection transmission cannot be neglected. After childbirth, mothers generally avoid feeding their newborn babies with the colostrum. Acceptance of authority in family make mothers to initiate child feeding with dextrose, and in some circumstances, they feed the newborns with butter or oil assuming that it may clean their intestine following the birth. Sometimes, mothers are psychologically not prepared to breastfeed

their children, and they choose to feed them with dried formula. Breastfeeding cannot be compensated with dry formula in terms of the quality, However, pervasive poverty in the region limits the ability of families to buy high quality dry formula for their newborn babies. Exercising such practices poses a serious threat of diarrhea and malnutrition in the neonatal period. Children suffering from diarrhea are immediately treated with herbal medicines available at home. In addition, families apply dietary restrictions by not feeding the child and assuming that discontinuing the feeding will cause relief from diarrhea. Because the immune system of child is frail in the neonatal period, newborns are more prone to lose their lives in first months of their life.

Other superstitions in society includes beliefs in some mental diseases particularly diseases associated with convulsion as being of a supernatural origin. Children suffering from febrile convulsions are usually taken to shrines or religious healers for spiritual remedies rather than health facilities. Shrines and religious healers are generally not accessible in urban areas without traveling for long distances, creating the barriers for feeding the child. Keeping the child away from feeding during the travel to visit shrines or religious healers fosters the deterioration of child health. Thus, time-lag in treatment and keeping child away from food leads to poor child health outcomes.

Misuses of medicine (i.e. Phenergan [promethazine] and Lomotil [diphenoxylate and atropine]) in children are also widespread. Most often, these drugs are used to make the children fall asleep during the night or while new mother is busy with house chores and visiting bazaars for a reason. In latter case, the mothers usually give extra dose of the drugs speculating that child should remain asleep until the mother returns home. The drugs are affordable and easily accessible in local drug stores, and everyone can purchase it regardless of their age. Though the

research on misuse of medication in Afghanistan is scarce, the negative effects of these drugs, particularly the overdoses, cannot be condoned.

Afghanistan is well-known for having the world's lowest educational level; illiteracy has wide and disseminated range in Kandahar province. Existing data indicates that over all literacy rate in Kandahar province is 7%, only 20% of men and 5% of women are literate (CSO,/Afghanistan Statistic Yearbook 2010-2011). Forty percent of the population in Kandahar province have limited access even to drug stores that are located in a distance of 10 kilometers, and only 27% of the population has access to electricity. The report further states that "only 3.5% of the population has a health center and 4.2% has a Dispensary within their village;" and 39% of men's Shura (forum) and 59% of women's Shura reported the absence of health workers in visited health facilities (Ministry of Rural Rehabilitation and Development, Kandahar Provincial Profile, 2013, p. 15). Data from this report about the lack of critical sick-care provision implies that public health services are also lacking. Therefore, health promotion and health education programs that promote healthy life styles, improve sanitation, hygiene, and heath care seeking behaviors, prevent communicable diseases, and promote healthy practices by mothers for child survival are lacking. Thus the province experiences dire conditions of child health, with increased chances of under-5 child mortality.

Hypotheses

In this research thesis, I explored the impact of maternal education, health awareness and autonomy on maternal health supportive behaviors, child mortality and malnutrition. I investigated various aspects of the lives and circumstances of mothers to create a fuller picture of child health in Kandahar province.The following specific hypotheses were tested.

H1. Mothers with education and health awareness will be more likely to follow WHO's breastfeeding guidline for their children.

H2. Higher education and health awareness in mothers will be correlated with higher contraceptive use.

H3. Education and health awareness of mothers will be related to higher immunization of their children regardless of the distance to health facility.

H4: Mothers with education and health awareness in mothers will be correlated with lower number of births.

H5A: Mothers with education and health awareness will be more likely to utilize and modern care facilities for themselves.

H5B: Mothers with education and health awareness will be more likely to utilize and modern care facilities for their children.

H6: Mothers having education and health awareness will be more likely to maintain proper sanitation and hygiene.

H7: Mothers having education health awareness will be less likely to seek baseless health seeking approaches such as spiritual remedies or folk medicine for the children.

H8: Children born to mothers having education and high health awareness will be less likely to suffer from malnutrition.

H9: Mothers with autonomy will be more likely to utilize contraception.

H10: Higher level of autonomy will be associated with lower fertility rates.

<center>**Method**</center>

Participants

Women of child bearing age who were seeking treatment for their ill children aged 0-59 months in Merwais Regional Hospital located in Kandahar province, Afghanistan, regardless of their ethnicity or language, were eligible to participate in this study. Due to time limitations, the participants were selected through convenience (non-probability) sampling. One hundred and fifty nine women consented to participate in the study, and gave consent for their hospitalized child to be included. Women having a child suffering from a congenital disease or abnormality, women whose ill child was older than 5 years, or children accompanied by caregivers other than their mothers were excluded from the study.

Procedure

In order to collect data at the hospital, I recruited two fifth-year female medical students who showed interest in research study to provide assistance in conducting interviews with participants. There were two reasons for recruiting female interviewers to assist with the data collection process. First, poor literacy rates among women in the southern region of Afghanistan limit the reading and writing ability of most of the women living in Kandahar province. According to UNESCO (2015), adult female illiteracy rate is estimated as high as 61% in Afghanistan. Thus, there was a need for an individual to help participants read questionnaire and note the responses in questionnaire. Second, Afghanistan is a male-dominated country; culturally, women will be reluctant to speak out when asked by a nurse or physician of opposite gender to conduct interview and fill out the questionnaire. If, however, they agreed to participate in a study, it may be due to the fear of poor treatment of their child if they refuse participation. Communicating with participants by a person of same gender not only helps ensure the freedom

of choice but also allowed participants to freely assert their views. This provided them with greater protection in accordance with ethical principles required for a scientific research. After the completion of data collection process, the female interviewers were compensated 220 dollars each for conducting interviews with the study group.

The female interviewers received a brief training on obtaining informed consent from participants, maintaining privacy of information, ensuring voluntary participation and other ethical concerns the interviewer must contemplate during collecting data for the study. The interviewers were instructed to inform participants of the general purpose of the research prior to starting the interview and make sure they knew that there would be no penalty if they wished to cease participating at any time.

Women who admitted their children to the pediatric ward for receiving treatment were approached by a female interviewer, who greeted them by saying Salaam (Hello). The interviewer then continued the conversation by asking about the health of mother and the child (as a part of Afghan greeting), and then the interviewer provided a brief overview on the purpose of the study. The interviewer also explained that the study would explore the impact of education and health awareness of mothers on child survival. The interviewer further explained that the study will contain questions regarding immunization status of the child, breastfeeding, reproductive and sanitary practices of mothers, utilization of preventive care, contacting health facility, and traditional practices for seeking healthcare for the ill child. In addition, questions regarding socioeconomic and demographic information of participants will also be part of the questionnaire. The interviewer added that it is hoped that the result of the study will contribute to the child survival through the changes in policies and interventions. Moreover, interviewer also mentioned the incentives that eligible participants will receive upon completion of the interview.

Individuals who showed interest in participating in the study received a consent form from the interviewer.

The interviewer started the interview in a separate room when the participants felt comfortable for the interview. All participants who were accompanying their ill child and met the criteria of the study were eligible for interviews. To maintain an environment of confidentiality, eligible participants were interviewed in separate rooms. Participants were interviewed one at a time. Their responses were recorded on the questionnaire form.

The study took place between January 14, 2016 and January 27, 2016. The questionnaire was pre-tested for timing and appropriateness of the questions and response options. The researcher received Institutional Review Board approval from University of Missouri-Columbia. An official letter from the director of the University of Missouri Master Public Health Program was forwarded to the Directorate of Public Health in Kandahar province, explaining the aim of this particular study in Kandahar province. The directorate of Public Health of Kandahar province then sent a letter to Directorate of Merwais Regional Hospital requesting that they provide assistance in collecting data from Pediatric ward of Merwais Regional Hospital.

At the end of each interview the interviewer thanked the participants for their time and assured participants about the privacy of their information. Responses to the questionnaire were re-translated into English.

Measurement Instruments

A structured and semi-structured questionnaire was developed in the English language, consisting of two sections containing a total of 97 questions. The full questionnaire is presented in the Appendix. Section one gathered anthropometric measures and information about the child patient; Section Two assessed the variables of interest for the mother and family that are

expected to be related to the child's health. After approval from the thesis committee, the questionnaire was translated into the Pashto language, the main language spoken in Kandahar province. All questions were read to participants by the interviewer.

Characteristics of child patient. Section one of questionnaire contained seven questions regarding the name, age, sex, weight, height, mid upper arm circumference (MUAC) and probable diagnosis of the patient. The child's mother was requested to report the child's name, age and sex. Information regarding current diagnosis of disease was obtained from the patient's medical record. Because malnutrition was considered a key variable in this study, eligible sick children who were admitted to pediatric ward of Merwais Regional Hospital for treatment were checked for malnutrition through acceptable anthropometric indicators of malnutrition. To obtain information regarding nutritional status of target children, height for weight, weight for age, height for age and mid upper arm circumference (MUAC) were calculated. The interviewers recorded the MUAC of the child at the start of the interview with measure tape, and at the end of interview the participants of the study were requested to take their child and walk to the corridor of the ward where the scale for obtaining weight and height were installed. Height for weight, weight for age and height for age were calculated using reference medians recommended by the WHO. Children having Z score of -2 for weight-for-height were referred to as children suffering from wasting, children with Z score of -2 for height-for-age were marked as stunted, and children whose Z score for weight-for-age was -2 were identified as underweight. Based on MUAC measurement, children were classified into four categories. Children with MUAC over 135 mm were considered well nourished; MUAC between 125 and 135 mm were considered at risk for malnutrition; MUAC between 110 and 125mm were considered moderately malnourished; and MUAC less than 110 mm were considered severely malnourished.

Mother's characteristics and family living condition. Section two of questionnaire assessed the variables of interest for the mother and family that are expected to be related to the child's health.

Mother's demographics. Participants of the study self-reported their name, age, occupation and address. Additionally, participating mothers were interviewed regarding their literacy and educational level, considering both formal and non-formal education. Those who reported that they are able to read and write (question 5) were further asked about their primary, secondary, high school, and university education (question 6). Participants' education was operationalized as the number of years of formal education completed. Individuals were asked if they were taught common health-related topics, for instance, importance of hand-washing, immunization, breastfeeding, hygiene and sanitation, and for raising their level of health education (question 7).

Mother's reproductive history. Interviewers gathered information on birth history of child's mother by asking questions regarding total number of births, number of her children who are still alive and their gender, age of eldest and youngest child, number of her children who had died, and the cause of their death. Birth interval was calculated by dividing the number of births by the number of years between first born and last born child.

Mother's awareness of preventive measures. Mother's health awareness is the knowledge and understanding of mothers to avoid health damaging practices, engage in activities that protect health, and deal with management of illnesses in appropriate time and using appropriate means. Health awareness was calculated as the sum of responses to a series of 19 questions reflecting the mother's knowledge of health. Scores for awareness on particular health topics (discussed individually below) were calculated separately, and then all were combined to

create the composite "maternal health awareness" measure. The composite awareness score

included scores for awareness regarding immunization, breastfeeding, birth spacing and

contraception, spiritual healing, folk remedies, feeding, handwashing, and water purification.

The total score for the health awareness variable ranges from 0 – 77. Higher score indicates

higher level of health awareness among individuals.

Immunization. Participants were asked whether they could recall names of common

vaccines (Q5). Naming each vaccine had a score of one, the total score ranged between 0-6.

Because polio vaccination is highly publicized in the country compared to other childhood

vaccinations, recalling the names of additional childhood vaccinations (e.g. BCG, diphtheria,

pertussis, tetanus, and measles) for question 5 illustrated a higher level of health awareness

regarding immunization. Next, participants were asked how much they agreed with the

statements "immunizations can protect my child from communicable diseases" (Q6) and "it is

important to immunize my child on schedule" (Q7); responses were scored 0 for strongly

disagree, 1 for disagree, 2 for neutral, 3 for agree, and 4 for strongly agree. Total scores could

range from 0 to 14.

Breastfeeding. Mothers were asked if breastfeeding increases the chances of child

survival (Q9), and if breastfeeding can protect the child from infection (Q10). Scores ranged

from 0 (strongly disagree) to 4 (strongly agree) for each question, with total breastfeeding

awareness scores ranging from 0 to 8.

Birth spacing and contraception. Participants were asked how much they agreed that

short birth intervals can deteriorate child's nutritional status (Q26), and if utilizing contraception

can increase child survival (Q27). Scores ranged from 0 (strongly disagree) to 4 (strongly agree).

Total scores could range from 0 to 8 for birth spacing/contraception.

Belief in spiritual remedies. This variable describes the tendency of individuals towards seeking spiritual remedies for their ill children rather than modern health care. It is a composite of three questions. Individuals who strongly agreed that Taweez improves child's health scored 0, and if they strongly disagreed, they scored 4 (0-4 scale, Q23). Participants who strongly agree that Taweez cures diarrhea, pneumonia, and measles scored 0; strongly disagree scored 4 (0-4 scale, Q24). Scores could range from 0 to 4 for each of the three diseases. Individuals who stated strongly agree in response to "I would consider Taweez if my child's health does not improve with medicine" scored 0, if they strongly disagreed, it scored 4 (0-4 scale, Q2). Total score for the variable ranges from 0-20. Lower score indicates higher belief in seeking spiritual remedies.

Belief in folk medicine. This variable illustrates the belief that folk medicine is acceptable as a treatment for their ill child. It is a composite of two questions. The participants who strongly believed that folk medicine could cure diarrhea, pneumonia, and measles scored 0; strongly disagree scored 4 (0-4 scale, Q25), with a range of 0-4 possible on each disease. Participants who strongly agree with the statement "Folk medicine should be used to treat my child's prior visiting the doctor" scored 0; if they strongly disagreed they scored 4 (0-4 scale, Q3). Participants who strongly agree with the statement "Folk medicine should be used to treat my child's illness in combination with scientific medicine" scored 0; if they strongly disagreed they scored 4 (0-4 scale, Q4). Total score ranged between 0 and 20. Lower score reflects higher level of belief on the curative effects of folk medicine. Along with the belief in spiritual remedies, this variable indicates reluctance of participants towards modern health care utilization and their involvement in medically unacceptable practices for their children's health.

Feeding. Participants were asked if children should be fed other types of food (besides breastfeeding) if they are less than six months of age; scores could range from 0 (strongly agree) to 4 (strongly disagree).

Handwashing awareness. Recalling names of diseases prevented by handwashing (Q32) was calculated as hand washing awareness (naming the diseases correctly scored = 2, partially correct scored 1, and incorrect answer scored 0). Acceptable answers to this question included diarrhea, influenza, germ and microbe.

Water purification. Participants were asked to name common water purification methods (Q33). Naming three methods of water purification (boiling, chlorination, and filters) scored 3, naming two methods scored 2, naming one purification method scored 1, and naming none scored 0).

Mother's autonomy. Autonomy is a composite of 5 questions. Participants who have a job scored 1, and those who do not have a job scored 0 (Q3). Participants who feel obligated to feed their child other than breastfeeding score 0; if they do not feel obligated they score 1 (Q13). If participants report seeking permission to visit a health facility for treating their child they scored 0; if they did not seek permission for visiting a health facility, they scored 1 (Q20). Participants who reported that they can decide number of children they should have scored 1; if they are not able to make this decision, they scored 0 (Q29). The total score for autonomy ranges from 0 to 5. Higher score reflects higher level of decision-making authority among women.

Mother's health-related behaviors. Mother's health-related behaviors are reflective of their actions that strongly impact the health of their children. The following variables assessed health-related behaviors of the participants.

Immunization behavior. Immunization behavior illustrates the active engagement of mothers to seek biological defense for their child in appropriate time. It was generated from the combination of 3 questions. Participants who have immunization card scored 1, and who did not have immunization card scored 0 (Q1). Participants who immunized their children "within 0-4 week" scored 3, those who immunized within 5-9 weeks scored 2, those who immunized their children within 1-5 years scored 1, and those who failed to immunize their children scored 0 (Q2). Participants who immunized their children in health facility score 2, at home score 1, and who missed immunization score 0 (Q3). The total possible score ranges between 0 and 7. Higher score indicates higher engagement of mothers in immunizing their child.

Breastfeeding behavior. This variable describes the practice of mothers for breastfeeding their child based on WHO's breastfeeding guidelines. Three questions were added to assess this behavior. Participants who breastfed their children within first hour when they were born scored 1, participants who did not start breastfeeding their child within one hour scored 0 (Q11). Participants who exclusively breastfed their child for six months scored 1, those who did not practice exclusive breastfeeding for six months scored 0 (Q12). Participants who continued breastfeeding their child for two years scored 1; those who did not continue breastfeeding their child for two years scored 0 (Q13). The total possible scores ranged between 0 and 3. Higher score indicates higher engagement of mother in breastfeeding practices.

Hygiene and sanitation behavior. This variable assessed the action and attentiveness of participants for maintaining hygiene and sanitation. It was created from two questions. Participants who always wash their hands before breastfeeding their child scored 4; those who never wash their hands before breastfeeding their child scored 0 (Q34). Participants who always wash their hands with soap scored 4, and those who never use soap for handwashing scored 0

31

(Q35). The score for Hygiene and Sanitation ranged from 0 to 8. Higher scores indicate higher involvement in hygiene and sanitation behavior.

Use of modern care for mothers. This variable assessed mothers' involvement in visiting health facility in order to maintain her own health. The variable is a composite of three questions. Participants who visited health facility for immunization during pregnancy scored 1, and those who did not visit health facility scored 0 (Q19). Participants who gave birth at health facility scored 2, and at home scored 1 (Q21). Participants who received immunization during pregnancy scored 1, and those who did not receive immunization during pregnancy scored 0. The total possible score ranged from 1-4; higher scores indicate higher utilization of modern health care by mothers.

Use of modern care for children. This variable describes the practice of mothers treating their child in health facility, and seeking assistance from doctors rather than utilizing uncertain treatment methods for their ill child. The variable is a composite of two questions. If the participants immunized their child at a health facility they scored 1, otherwise 0 (Q3). If participants were seeking assistance from a doctor or health facility for their ill child, they scored 1, otherwise 0. The score ranged between $0 - 2$. Higher scores indicate higher engagement of mothers in seeking modern health care for their children.

Behavior regarding use of spiritual and folk remedies. Behavior regarding use of spiritual and folk medicine remedies examined the engagement of participants who prefer spiritual remedies and folk medicine over visiting health facility or a doctor for treating their ill child. It is a composite of six questions. Participants were asked "have you ever used anything (Medicine, Tawees, or folk medicine to make your child sleep?" If the answer was (yes), I scored it as a 0, if it was (no), it was scored as 1 (Q43). Participants were asked "have you ever taken your child to

religious healer or shrine?" If the answer was (yes), it scored 0, if the answer was (no) it scored 1 (Q48). Participants were asked "if your child was suffering from diarrhea, what measures do you measures do you take at home to make the disease less severe, before taking him to the health facility". If they were visiting a shrine, using an herbal remedy, or using an un-prescribed medicine, it scored 0; participants who gave the child oral rehydration salts (ORS) or boiled water to treat the diarrhea scored 1 (Q49). Participants were asked how much they agreed with the statement "Folk medicine should be used to treat my child's illness prior to visiting the doctor." Participants who strongly agreed scored 0 and those who strongly disagreed scored 4 (Q4). Participants were asked "when you realize your child is not feeling well, what approaches you seek to make the child feel better?" If the first approach was to seek assistance from mullah, use folk medicine, or visit pharmacy will score 0; visiting doctor or health facility will score 1)(Q5). Finally, participants were asked how much they agreed with the statement "I give my child folk medicine if he/she is not feeling well." Participants who stated strongly agree to treat their child with folk medicine scored 0 and ones who stated strongly disagree score 4 (Q6). The score ranges between 0 and 11. Lower scores are indicators of higher levels of seeking spiritual/folk medicine remedies.

Household and living conditions. In addition to mother's level of education and health awareness I also explored general information related to spouse's literacy, education, and occupation. Participants were asked to describe their spouse's job, whether the spouse could read or write, and if the spouse had attended the school.

Family socioeconomic status (SES) was operationalized in two ways: first on the basis of household income (very low = 5,000 Afs or below per month; low= 5,001 – 10,000 Afs per month; moderate 10,001 - 20,000 Afs per month; and high = 20,001 Afs or above per month).

Second, family SES was operationalized as the sum of "yes" responses to the following items in question number 12: does your family have a radio, television, mobile phone, refrigerator, generator for electricity, car, or deep well. The total score ranged from 0 to 7.

Questions 13, 14, 15 and 16 further assessed family's living conditions that could impact health status. "Having no separate kitchen," "sharing a single toilet" by all family members, having a larger family size (more than 5), and sharing a room among three or more family members reflected poor sanitation and hygiene, more crowded conditions, and indirectly described the poor socioeconomic status of the family. Crowding within families were calculated by dividing number of individuals by number of available rooms in household.

Information was gathered on accessibility of health facilities and pharmacies to the participants. An answer of "0-30 minutes" to questions 26 and 27 showed accessibility of health facilities and pharmacies, respectively. On the other hand answers "almost one hour" or "more than one hour" to question 26 and 27 described limited or no accessibility within walking distance of participants to the health facility and pharmacy, respectively.

Questions regarding the source of drinking water for the child, and previous history of the child's health and hospitalization were included to fully develop the picture of the family's health status.

Results

Children in Sample

The study gathered information on 159 children who were admitted in Pediatric ward of Merwais Regional Hospital. Ages of children ranged between 1 month and 48 months ($M = 11.67$, $Mdn = 8$, $SD = 10.98$). Out of 159 children 103 (64.8%) were males, and 56 (35.2%) were females.

Only 10 children (6.3%) were in good nutritional status, and 148 (93.1%) were malnourished. Among the malnourished children 21.4% were severely malnourished, 50.9% were moderately malnourished, and 20.8% were at risk for malnutrition. Nutritional data for one child was missing.

Almost 97% of the admitted children were suffering from infectious diseases, and the leading cause of admission was respiratory tract infection (80.5%). Among Respiratory tract Infections, Severe Pneumonia was the most frequent cause (46.5%) followed by acute bronchitis (11.9%). Gastro-intestinal tract infections accounted for 8.2% of the cases.

Mothers in Sample

Demographics. The study included 159 female participants who accompanied their ill child for seeking treatment in Merwais Regional Hospital. Ages of the participants ranged from 17 to 45 years ($M = 28.71$, $SD = 6.52$, $Mdn = 30$). The education of the participants were quite concerning, 95.6% had no formal education. Only 4.4% of the participants attended the school (0.6% had 5 years of education, 0.6% had 6 years of

education, 1.3% had 7 years of education, 1.3% had 8 years of education); and 8.2% of participants had received other education (attended literacy course and home-study). Due to low variability in educational attainment of the participants, I was not able to test the hypothesis about relationship between maternal education and outcome variables. Almost all (99.4%) of the participants were housewives. Only 0.6% worked outside of the home.

Autonomy. Only 4.4% of the participants were autonomous in decision making regarding their health, 49.1% were partially autonomous, and 46.5% were having no autonomy in decision making regarding their health and the child's health.

Mother's reproductive history. The majority (64.2%) of participants visited the clinic while they were pregnant. In addition, 67.9% of participants visited a health facility for delivery, 54.7% reported that they received immunization during pregnancy, and 42.8% of the participants reported the use of contraceptives; 5% reported that they are using contraceptives without keeping their spouses aware. On the other hand, 10% of participants stated that contraceptive use is a sin, 13.8% of participants stated that utilizing contraceptives are harmful, and 27.7% stated that they have no permission to use contraceptives.

Participants reported 1-14 births ($M = 5.26$, $Mdn = 5$, $mode = 4$, $SD = 2.98$), 82.4% of participants were having birth interval of less than 2 years ($M = 1.436$, $Mdn = 1.437$, $SD = 0.75$). Mother in-laws assisted greater number (38.4%) of home deliveries, followed by Traditional Birth Attendants who were accounted for 18.2% of home-deliveries. On the other hand, almost 36% of the participants had lost at least one under-5 child.

Health related behaviors. The mean for immunization behavior was 4.30 (*Mdn* = 5, *SD* = 2.24). Almost 21% of the participants missed to immunize their child. The two major causes that prevented participants from immunization included no permission for immunization (10.7%), and distance from health facility (5%).

The mean for adherence to WHO's breastfeeding guideline was 0.80 (*Mdn* = 1, *SD* = 0.744). Out of 159 women, 145 (91.2%) of women feed their child with colostrum. Significant percentage (88.1%) of participants reported that they feed their newborn child with other food prior to start breastfeeding. Other feeds include (Glucose 37%, black tea 30.2%, and black tea and glucose together 18.2%). In addition, 60.4% were feeding their newborn children with butter before starting breastfeeding. Among participants, 32.7% also reported using of thumb as a sucker to make their child calm while they were crying.

The mean for hygiene and sanitation was 1.436 (*Mdn* = 4, *SD* = 1.50). Hygiene and sanitation includes the frequency of washing hands before breastfeeding the child, and the frequency of use of the soap during washing hands.

The mean for use of modern health care for mothers was 2.87 (*Mdn* = 3.00, *SD* = 1.086), and the mean for use of modern health care for children was calculated 0.99 (*Mdn* = 1.00, *SD* = 0.759). The analysis indicates higher use of modern health care for mothers and children by individuals with higher health awareness.

Majority of participants were involved in seeking spiritual remedies and utilization of folk medicine practices (*M* = 4.45, *Mdn* = 4.00, *SD* = 1.98). Seventy percent of participants reported utilization of uncertain methods which included visiting shrines and spiritual/herbal healers as their first choice of seeking medication for their ill child. Moreover, 77.4% of

participants visited shrine or religious healer for seeking treatment for their ill child prior to hospitalizing their child. Seventy three percent of the participants reported that they assist their children whenever they suffer from diarrhea; and 42.1% mentioned Herbal remedy, 17% stated used of un-prescribed medicine from pharmacy, and only 8.8% stated Oral Rehydration Salt (ORS) as a first attempt for assistance when their children suffer from diarrhea.

Almost half of the participants (41.5%) reported usage of sleeping medication in order to make their child fall asleep. Lomotil tablets were widely used (33.3%) as a sleeping medication for children. Phenergan syrup was second widely used (6.3%) sleeping medication among the participants.

Health Awareness. Health Awareness score among participants ranged from 20 to 69 ($M = 36.77$, $Mdn = 35$, $SD = 8.43$).

The mean for Hand Wash Awareness was 1.28 ($Mdn = 2$, $SD = 0.91$). More than a half (56.6%) of participants were not able to name any water purification method ($M = 0.45$, $Mdn = 0.00$, $SD = 0.53$).

Descriptive analysis showed that 93% of participants were not able to name BCG, 73% were not able to name Pertussis vaccine, 65% were not able to name measles vaccine, and 62.3% of the participants were not able to name polio vaccine. After asked by interviewers about the source of information regarding vaccine names, 23.9% reported vaccinators, 10.1% reported doctors, and 6.9% reported radio as their source of their information. Only 59% of individuals were able to correctly name diseases that could be prevented by hand washing. Additionally, 56% were not able to name any water purification method, and 41.5% of individuals named only one out of three water purification methods.

Almost 80% participants were agreed that Taweez improves child health.

Health Awareness category. To facilitate analysis with categorical or ordinal outcomes, Health Awareness Category was created based on percentage of correct information provided by participants. Individuals who had 36% or lower correct responses (score 0 – 26) were categorized into category 1 (very low Health Awareness). Individuals who responded 37.5% - 54.2% of questions correctly (score 27 – 29) were categorized into category2 (low Health Awareness), individuals who responded from 55.5% to 65.2% of questions correctly (Score 40 – 47) were categorized into category 3 (medium Health Awareness), and individuals who responded to 66.7% or higher questions correctly (Score 48 and above) were categorized into category 4 (high Health Awareness).

Family, Home, and environment.

Almost 30% of spouses of the participants were able to read and write. Among them, 11.3% received elementary school education, 2.5% had secondary school education, 5.7% had high school education, 1.9% had university degree, and 5.7% had attended religious schools. The majority of the participants (55.3%) were from the city and 44.7% were inhabitants of the country side.

Occupation of spouses were mostly low paying jobs that included Labor (27%), Driver (15.7%), Farmer (15.7%), Shopkeeper (10.1%), and 8.2% were jobless. Only one person's spouse was deceased.

The sample overall was quite impoverished; 65% of participants had very low household income (less than 6000 Afghanis), 30.2% had low household income (6,001 – 10,000), and only 5% of the families had medium household income (10,001-20,000). The mean number of

household assets reported was 2.62 (SD=1.13). Values ranged 1 to 7. Over half of the participants (53.5%) reported 2 assets or less.

The number of people sharing access to a toilet was calculated as number of people in the household divided by number of available toilets in the house. The number of people sharing a toilet ranged from 1.33 to 20 ($M = 8.29$, $Mdn = 8$, mode=8, SD=3.94), and 10% of the participants were lacking access to toilets. Moreover, 7% of participants were lacking separate kitchen space, and it is assumed they cook inside their rooms or outside in a yard. Family size of participants ranged from 3 to 45 ($M = 11.81$, Mdn=10, $mode = 8$, $SD = 6.73$). Family crowding (number of individuals in a house/number of rooms) ranged from 0.83 to 21 ($M = 3.83$, $Mdn = 3.33$, $mode = 4$, $SD = 2.52$).

Seventy percent of participants named deep well as a primary source of their drinking water, 13.2% reported pipe, 11.9% reported well, and 4.4% reported stream or river as a source of their drinking water. Over half (72%) of the participants reported that their under-5 children had at least once suffered from diarrhea last summer, and almost 53% of them required hospitalization due to diarrhea.

Almost 95% of the participants had access to local pharmacies within 30 minutes of walking distance, and 59.1% of participants had accessibility to health facility within 30 minutes of walking distance.

Great majority (95%) of participants had no access to kindergarten; 58.5% reported that their under-5 children attends Madrasas (mostly unformal local religious schools).

Slightly over one third (37%) of individuals preferred boys, and 69.2% had no preference to have a boy or girl babies.

TABLE 1- characteristics of participants and their household

Characteristic	No (%)
Children:	
Gender of children	
Female	56 (35.2%)
Male	103 (64.8%)
Nutritional Status	
Malnourished	148 (93.7%)
Nourished	10 (6.3%)
Children attending Madrasas	93 (58.5%)
Mothers:	
Demographics	
Occupation	
Housewives	158 (99.4%)
Working	1 (0.6%)
Formal educational attainment	
No education	152 (96.6%)
Have education	7 (4.4%)
Reproductive behavior	
Birth place for hospitalized child	

Home	51 (32.1%)
Health facility	108 (67.9%)
Visit to a health facility during pregnancy	
Yes	102 (64.2%)
No	57 (35.8)
Received immunization during pregnancy	
Yes	87 (54.7%)
No	72 (45.3%)
Use contraceptive	
Yes	68 (42.8%)
No	91 (57.2%)
Under-5 child lost due to disease	57 (35.8%)
Autonomy in seeking health care	
No autonomy	74 (46.5)
Partial autonomy	78 (49.1)
Full autonomy	7 (4.4)
Health related behavior	
Feed child with colostrum	
Yes	145 (91.2%)
No	14 (8.8)
Feed child with butter	

Yes	63 (39.6%)	
No	96 (60.4%)	
Used thumb as a sucker		
Yes	52 (32.7%)	
No	107 (67.3%)	
Utilized sleeping medication for the child		
Yes	66 (41.5)	
No	93 (58.5)	
Assisted diarrhea	116 (73%)	
Used home-made medicine to treat diarrhea	67 (42.1%)	
Used un-prescribed medicine from pharmacy	27 (17%)	
Used Oral Rehydration Salt	14 (8.8)	
Visited Shrine or religious healers for seeking treatment	123 (77.4)	
Hygiene and Sanitation	$M = 1.43$	$SD = 1.5$
Immunization behavior	$M = 4.30$	$SD = 2.24$
Adherence to WHO's feeding guidelines	$M = 0.80$	$SD = 0.744$
Use of modern care for mothers	$M = 2.87$	$SD = 1.086$
Use of modern care for children	$M = 0.99$	$SD = 0.759$
Health awareness:		
Health Awareness	$M = 36.77$	$SD = 8.43$
Hand wash awareness	$M = 1.28$	$SD = 0.91$

Water purification knowledge	$M = 0.45$	$SD = 0.53$

Able to name vaccines

    BCG   11 (6.9%)

    Pertussis   43 (27%)

    Measles   55 (34.6%)

    Polio   60 (37.7%)

Source of information for vaccine names

    Vaccinators   38 (23.9%)

    Doctors   16 (10.1%)

    Radio   11 (6.9%)

    No source of information   77 (48.4%)

Household and environment

Spouse

    Alive   158 (99.4%)

    Deceased   1 (0.6%)

Formal Education

    Yes   44 (27.7%)

    No   115 (72.3%)

Occupation

    Labor   43 (27.0%)

Driver	25 (15.7%)
Farmer	25 (15.7%)
Shopkeeper	16 (10.1%)
Jobless	13 (8.2%)
Other	21 (22.7%)
Income	
Very low household income	103 (64.5%)
Low household income	48 (30.2%)
Medium household income	8 (5.0%)
Location	
City	88 (55.3%)
Country side	71 (44.7%)
Toilets	
Having access	144 (90.6%)
Lacking access	15 (9.4%)
Kitchen	
Having access	148 (93.1%)
Lacking access	11 (6.9%)
Source of drinking water	
Pipe	21 (13.2%)
Well	19 (11.9%)

Stream or river	7 (4.4%)
Deep well	112 (70.4%)
Children suffered from diarrhea last summer	99 (62.3%)
Hospitalized due to diarrhea	83 (52.2%)
Access to pharmacy within 30 minutes walking distance	150 (94.3%)
Access to health facility within 30 minutes	94 (59.1%)
Access to kindergarten	8 (5%)

Testing Hypotheses

H1: As predicted, I found positive relationship between level of Health Awareness and adherence of individuals with the WHO's breastfeeding guideline for children χ^2 (1, n = 159) = 5.35, , p =0.021). Mothers with higher levels of Health Awareness were more likely to breastfeed their child according to WHO's breastfeeding guidelines compared to mothers with lower levels of Health Awareness. (Linear by linear correlation).

H2: Chi square analysis was performed to examine the relationship between Health Awareness categories and use of contraceptives (yes or no) in target group. The relation between these two variables was significant, χ^2 (3, n=159) = 18.75, $p < 0.05$, supporting hypothesis that mothers who had higher levels of Health Awareness were more likely to use contraception than mothers with low Health Awareness.

H3A: Hierarchical linear regression was performed with a distance to health facility controlled by entering first. Health Awareness significantly predicted immunization behavior (R^2 = 0.08, F= 6.77, p =0.002). Individuals with high Health Awareness were more likely to seek immunization for their children regardless of the distance to the hospital.

H4: I tested the hypothesis with correlation, but found significant correlation in direction opposite what was predicted (r = 0.174, N = 159, p =0.014). Therefore, I conducted hierarchical linear regression analysis entering age of mother in the first step. However, the direction of relationship between health awareness and number of births

was significant in the opposite direction. Mothers with higher level of health awareness are more likely to have multiple births.

H5A: Pearson correlational analysis indicated support for the hypothesis that health awareness would be positively associated with use of modern care for mothers ($r = 0.228$, $N = 159$, $p = 0.002$. Mothers with high Health Awareness were more likely to use modern health care for themselves compared to mothers with low Health Awareness.

H5B: The Pearson correlation indicated a positive relation between Health Awareness and use of modern care for the children ($r = 0.439$, $N = 159$, $p < 0.001$). Mothers with high Health Awareness were more likely to use modern health care for their children compared to mothers with low Health Awareness, supporting the hypothesis.

H6: The hypothesized relationship between health awareness and hygiene and sanitation behavior was not found; Pearson correlation was not significant, ($r = 0.128$, $N = 159$, $p = 0.54$).

H7: Pearson correlation was performed to examine the relation between level of Health Awareness and avoiding use of spiritual/herbal remedies for the ill children (lower scores indicated higher utilization of sprirtual and herbal remedies among participants). The result was significant ($r = 0.702$, $N = 159$, $p < 0.001$). Individuals with higher level of Health Awareness were more likely to avoid seeking spiritual/herbal remedies.

H8. Pearson correlation was performed to examine the relation between Health Awareness and nutritional status of the children. The hypothesis that greater Health Awareness would be correlated with better nutritional status was not supported. ($r = 0.009$, $N = 158$, $p = 0.457$).

H9: Chi square analysis was performed to test the hypothesis that higher autonomy would be associated with contraceptive use. Linear by linear association was used rather than the Pearson Chi Square. The linear by linear association shows a positive relation between autonomy and contraceptive use χ^2 (1, N=159) = 10.45, p =0.001. Mothers with high autonomy were more likely to use contraceptives than mothers with low autonomy.

H10: I tested the hypothesis with correlational analysis, but found significant correlation in direction opposite what was predicted (r = 0. 637, N = 159, $p < 0.001$). Therefore, I conducted hierarchical linear regression analysis entering age of mother in the first step. However the direction of relationship between autonomy and number of births was significant in the opposite direction, that is, higher autonomy was associated with more births.

Relationship between Health Awareness and Health Supportive Behavior

A two stage hierarchical multiple regression was conducted with the composite health supportive behavior variable as the outcome variable. In the first stage of the regression, I entered a number of control variables that could potentially predict health supportive behaviors: these were geographical location, autonomy of women, women's reading ability, and their belief in herbal remedies for their children, belief in Taweez, autonomy, and income. In the second step I entered the health awareness variable. This was done to determine whether health awareness predicted variability in health supportive behavior over and above what was predicted by the control variables entered in stage one. The control variables together significantly predicted health supportive behavior (report model R^2 = 0.309, F = 11.25, df = 6, 151, $p < 0.001$. Together the

control variables accounted for 30.9% of the variability in health supportive behavior. The full model with all control variables and health awareness was significant ($R^2 =$ 0.398, $F = 14.145$ $df = 7$, 150, $p =0.001$). The addition of health awareness produced a statistically significant increase in the proportion of variability accounted for ($\Delta R^2 = 0.89$, $p < 0.001$), beyond the variability predicted by the control variables.

Discussion

The initial goal of the study was to explore the impact of maternal education, health awareness and autonomy on shaping the health-related behaviors of women in Kandahar province regarding their children's health. Overall, I found good support for the hypothesized relationships, with some limitations.

Data was collected from pediatric ward of Merwais Regional Hospital during January 2016. Due to the crowded situation in the ward, the interviewers were allowed to collect data after 1:00 p.m. every day. The majority of the patients were suffering from very poor health. Infectious diseases accounted for almost all cases admitted for treatment in the pediatric ward of Merwais Regional Hospital. Respiratory tract infections, especially pneumonia, were the leading cause for hospitalization of the children, followed by diarrhea. The majority of the hospitalized children suffered from malnutrition.

The data from mothers indicated low utilization of preventive health services, suboptimal breastfeeding practices, a strong tendency towards utilization of spiritual and herbal remedies, and limited engagement of individuals for seeking modern care for both their children and themselves among mothers with low health awareness.

Women's educational attainment was uniformly low in the sample. My analysis demonstrated that almost 94% of the participants were unable to read and write, and few had attended formal school. As a result of the limited variability in educational attainment, I was unable to explore the association of education with outcome variables, and instead focused on health awareness and autonomy.

My analysis also demonstrated that over half (64.1%) of the participants in the sample had very low or low health awareness. Additionally, the results of the analysis indicated a lack of maternal autonomy related to health.

Support for Hypotheses

Overall I found good support for the role of health awareness and some support for the role of autonomy in predicting health supportive behavior. The result of the study showed that maternal health awareness was associated with better immunization behavior, adherence to WHO's breastfeeding guidelines, use of contraception, use of modern care for mothers and child, and the avoidance of spiritual and folk remedies. In addition, higher autonomy was associated with contraceptive use. However, I did not find the predicted associations of maternal health awareness with sanitation and hygiene behavior or with malnutrition in the child. Neither autonomy nor health awareness were associated with the number of births contrary to the hypotheses.

Although some hypotheses regarding particular health related behaviors were not supported (hygiene and sanitation, limiting number of births), health awareness was a strong predictor of health supportive behavior in general. Based on work by Fishbein and Ajzen (1974) in which they found attitudes to be poor predictors of single-act criteria but good predictors of multiple act criteria, I assumed that health awareness would be a good predictor of a composite of multiple health supportive behaviors. Though a strong relationship was observed between health awareness and the composite of health supportive behaviors, still there were some interesting contradictions.

The level of awareness regarding the advantages of breast feeding maternal health awareness on breastfeeding practices was satisfactory. The majority (93.1%) of participants agreed that breastfeeding increase chances of child survival, and 92.1% believed that breastfeeding protects children from illnesses. However, in spite of high awareness of breastfeeding advantages, adherence to WHO's guidelines overall was not strong. The general measure of health awareness was correlated with mothers' compliance with WHO's breastfeeding guidelines. Individuals with higher health awareness were more like to engage in initiating breastfeeding their child within the first hour after childbirth; they were also more likely to exclusively breastfeed their child up to six months, and continue breastfeeding their child up to two years of age. The findings of the research remain consistent with the finding of the study conducted by Johnson, Liu, Fischer-Walker and Black (2010) who mentioned pneumonia and diarrhea as the leading causes of the under-5 child mortality in South Asia. In addition un-immunized children are at greater risk of poor health due to infection (Klaauw & Wang, 2009), and infected children are more likely to suffer from malnutrition (Merson, 2012).

A study by Black et al (2008) reports that early initiation of breastfeeding in children reduces the chances of Pneumonia and Diarrhea among them and therefore reduces child mortality. Study shows that immunization and breastfeeding practices highly contribute to child health and protect them from pre-mature deaths (Kumar et al., 2015). Therefore, the indirect role of health awareness in preventing malnutrition cannot be ignored.

Even though the importance of child immunization was well-noticed among the participants, 20% of the participants failed to immunize their children due to the distance or due to having no permission from their families to immunize their child. A substantial number of mothers in the study could not name common vaccines. For instance, 93.1% could not name

53

BCG, 73% could not name pertussis, and 65.4% could not name measles. Furthermore, 62.3% could not name polio, even though Afghanistan is among the polio endemic countries that attracted a significant amount of funding for anti-polio campaigns. Moreover, 48.4% stated no source of information for their limited knowledge of vaccine names.

Similarly, although maternal health awareness and autonomy both had a positive effect on contraceptive use in mothers, and the majority of participants believed that contraceptive use and adequate birth spacing will contribute to child health, the use of contraceptive among them was not satisfactory. Though 19.5% of participants strongly agreed and 61% of them agreed that birth spacing can improve child's health, only 42.8% reported the use of contraception for keeping optimal birth intervals. Cultural practices, strong religious beliefs, and lack of adequate information on the use of contraceptives limit contraceptive use in the population. Some of the participants viewed contraceptive use as a sin, other believed that the use of contraceptives may cause adverse health effects. Furthermore, 27.7% of participants were not permitted to use contraceptives by their household members who had decision making authority for them. In this case, lack of autonomy (limited decision making authority) in women may reduce the effect of health awareness on contraceptive use. Only 5% of participants reported utilization of contraceptive without informing their spouses. I speculate that limited autonomy and high health awareness interaction could be the cause of hidden use of contraceptives among participants.

Health awareness also was related to the degree of participant's engagement in non-scientific health care-seeking behaviors such as spiritual and folk medicine. Individuals with high health awareness were more likely to avoid seeking spiritual and herbal remedies for their children. However, the use of folk medicine for treatment of any childhood disease was very common among participants. Fifteen percent of the individuals treated their children with folk

medicine before seeking other types of treatment for their ill children. In addition, 64.8% of individuals believed that folk medicine cures diarrhea, 64.2% believed folk medicine cures pneumonia, and 54.1% believed that folk medicine cures measles. Seeking spiritual remedies that include taking the child to religious healers or Shrines for Taweez was highly practiced among the participants. More than two thirds (77.4%) of participants had sought spiritual remedies for their ill children. More than half (54.1%) of participants viewed Taweez as a cure for diarrhea and pneumonia, and 53.5% believed that Taweez cures measles. Beliefs that spiritual practices could cure illnesses may prevent participant from using modern health-care as their first choice. Such practices interfere in seeking proper diagnosis and treatment in appropriate time for the children, add to the severity of the disease, and increase the chances of mortality among them.

These contradictions reflect constraints (cultural, social, and economic) behind women's ability to engage in health supportive behaviors. Cultural and social constraints give limited or no authority to mothers particularly if they are young, to make any decision regarding their child's health. Mother in-laws usually hold the controlling power of the daughter in-laws. As an accepted cultural system in the province, challenging mother in-laws authority by daughter in-laws would lead to argument between husbands and wives. Thus, if a child is suffering from an illness, it would be harder for a mother to convince her mother-in-law for taking the child to a clinic. Instead, mother in-laws would recommend folk remedies or seek other options that does not cost too much money. In addition, social structures and norms also prevent women to go outside the home alone. If a women want to visit a clinic for a treatment, it is important that they should be accompanied by a male, or older women particularly mother in-laws. Individuals in the society are more likely to question the character of women if they go out from home alone.

Meanwhile, lack of education as an important social factor also limit women's ability to explore better treatment options for their children's treatment. More important, young women are more dependent on male family members or elderly women of the family for finding road directions to clinics or other places. Therefore, health awareness alone would not result in satisfactory improvement in child's health.

Unsupported Hypotheses

There was no significant evidence of relationship between maternal health awareness and child malnutrition in the target population, perhaps due to restricted ranges in nutritional indicators. Most of the children in the sample were suffering from severe form of diseases. Because, the parents contacted hospital after seeking other means for the treatment. Therefore, limited variability in nutritional status made the analysis unable to draw any significant conclusion on impact of maternal awareness on child's nutrition.

Maternal health awareness and autonomy and its impact on birth interval was also not supported possibly due to other factors. Perhaps women have enough health awareness, and wants to use contraceptives, mother in-laws or husbands would not allow them to use contraceptives. Mother in-laws insist their daughter in-laws to give too many births. They also encourage their sons to have many children. Because, children are considered as a wealth and mother in-laws believe that many children will provide greater old age security (support their parents financially). The number of children also increase the influence of individuals and could be used as a force to threaten others or defend themselves. In addition, chances of child lost due to diseases and conflicts are also high. Therefore families welcome many childbirths regardless

of their economic status. Strong religious beliefs in society also prevent the use of contraceptives among the women. Many people view contraceptive use a sin.

Sanitation and hygiene hypothesis was also not supported mainly due to small number of question for measuring hygiene and sanitation. Future research on relationship of sanitation and hygiene should include various questions to fully understand the link between sanitation and hygiene, and maternal health awareness.

Behaviors of Concern

Health supportive behaviors regarding child health was concerning. Engagement of individuals in seeking immunization, initiating of breastfeeding in proper time, seeking health support from appropriate health-care provider, maintaining optimal birth intervals still have greater room for improvement.

Engagement of mothers in some cultural practices also poses threats to child health. The majority of participants (88.1%) reported that they feed their newborn baby immediately after birth with black tea, glucose, or both, before starting breastfeeding. In addition, 60.4% feed their newborn child with butter soon after the delivery. They believe that black tea and butter cleans the intestine of the child from unpleasant material. In fact, black tea and butter causes diarrhea in the newborn that may result in serious health outcomes if they delay in seeking proper health support for them.

Utilization of sleep medication was also alarming among participants. Most of the participants were involved in using Lomotil (known as green packet tablets among local individuals) for making their children fall asleep. Lomotil contains atropine (anti-cholinergic) and diphenoxylate (anti-diarrheal), and is prescribed in diarrheal diseases that are accompanied

57

with abdominal spasms. One of the side effects of the drug is drowsiness. Due to the lack of information on side effects, they take advantage from the side effect of the drug and make their child sleep. Using thumb as a sucker is unfavorable practice that increases the chances of infection transmission among the children. Almost 33% of participants reported use of thumb as a sucker to make their child calm while they were crying. However, hand-washing practices in participants were not satisfactory.

Cause for Hope

Tendency towards using modern health care both for mothers (hospital births, receiving immunization during pregnancy, and prenatal visits to health facility) and child (receiving immunization at a clinic) was significantly related to the maternal health awareness. Use of modern health care in mothers was fairly promising, but still promoting the benefits of modern health care through raising their health awareness among the population requires attention.

Limitations

The data for this particular study was collected from very specific sample. Most of the participants in the study were severely ill, and belonged to low income families. Therefore, the sample had restricted range on child's health. In addition, because of the time of the data collection, most children in the sample were suffering from respiratory tract infection that are very common in winter, and the study was not able to catch the diseases that are prevalent in summer. Lack of maternal education variability in the sample also make the sample more specific. Even the women education in the province is not very prevalent, but further research studies with great variability within the samples are recommended to fully investigate the relationship of maternal education and health awareness on child's health in the province.

Health awareness was a strong predictor of health supportive behaviors that familiarize women with fundamentals of health, and enables them to explore appropriate mean to prevent or treat childhood illnesses. Planning comprehensive and culturally acceptable strategies that specifically focus on improving health awareness among women, and also addressing the social, cultural, and economic barriers on individual and community levels will highly contribute in reduction of child mortality. Therefore, maternal health awareness requires greater attention from the government and other stakeholder to encourage proper health-seeking and disease prevention practices, and avoids adverse feeding (food and drugs) practices that further deteriorate child health. Involvement of religious healers in health sector through an incentivized system may also contribute to child health by promoting health and establishment of a referral system. In addition, further studies are required to examine the effects of herbal medicine that are widely used for various treatment purposes in the province.

Conclusion

Health awareness predicted multiple single behaviors among participants, and was a significant predictor of overall health supportive behaviors that impact child health. Investing of maternal health awareness on individual and community levels through a comprehensive strategy could be a proper solution to limit adverse health care-seeking behaviors (herbal and spiritual remedies that causes delay in seeking health care in proper time, misuse of medicine, and feeding child with harmful diets such as butter and black tea) and promote health-friendly behaviors such as immunization, breastfeeding practices, contraceptive use, use of modern health-care will lead to fall in child mortality rates. In addition to health awareness, other health determinants such as broad economic changes, investing on education of women, and providing various job opportunities to women would also impact child's health and reduce child mortality in the region. Child's nutritional status and limitation of births however were not predicted by health awareness. In this case there could be other cultural, religious and economic factors operating, and limiting the impact of health awareness over nutritional status and limitation of births.

References

Afghan Public Health Institute, Ministry of Public Health (APHI/MoPH) [Afghanistan], Central Statistics Organization (CSO) [Afghanistan], ICF Macro, Indian Institute of Health Management Research (IIHMR) [India], and World Health Organization Regional Office for the Eastern Mediterranean (WHO/EMRO) [Egypt]. (2011). *Afghanistan Mortality Survey 2010*. Calverton, Maryland, USA: APHI/MoPH, CSO, ICF Macro, IIHMR and WHO/EMRO. Retrieved from: http://dhsprogram.com/publications/publication-fr248-other-final-reports.cfm

Ali, S., Chaudry, T., & Naqvi, Q. (2011). Effect of maternal literacy on child health: Myth or reality. *Annals of Pakistan Institute of Medical Sciences*, *7*(2), 100-103. Retrieved from: http://apims.net/Volumes/Vol7-2/Effect%20of%20Maternal%20Literacy%20on%20Child%20Health-Myth%20or%20Reality.pdf

Anderson, R. M. (1992). The concept of herd immunity and the design of community-based immunization programmes. *Vaccine*, *10*(13), 928-935. Retrieved from: http://ac.els-cdn.com/0264410X9290327G/1-s2.0-0264410X9290327G-main.pdf?_tid=d4296cc0-7b68-11e5-9b8a-00000aab0f26&acdnat=1445812767 7528107f673d1fcba5fd155caf9edef4

Andre, F. E., Booy, R., Bock, H. L., Clemens, J., Datta, S. K., John, T. J., Lee, B. W., Lolekha, S., Peltola, H., Ruff, T. A., Santosham, M., & Schmitt, H. J. (2008). Vaccination greatly reduces disease, disability, death and inequity worldwide. *Bulletin of the World Health Organization*, *86*(2), 140-146. Retrieved from: http://www.ncbi.nlm.nih.gov.proxy.mul.missouri.edu/pmc/articles/PMC2647387/?tool=pmcentrez

Atal, Y. (1991) (1991).*Status of women: Afghanistan*. Geneva, Switzerland: United Nations Educational, Scientific and Cultural Organization. Retrieved from http://unesdoc.unesco.org/images/0009/000916/091693eo.pdf

Azevedo, M. J., Prater, G. S., & Lantum, D. N. (1991). Culture, biomedicine and child mortality in Cameroon. *Social Science & Medicine, 32*(12), 1341-1349. DOI:10.1016/0277-9536(91)90194-H.

Basu, A. (1994). Maternal education, fertility and child mortality: Disentangling verbal relationships. *Health Transition Review, 4*(2), 207-215. Retrieved from http://www.jstor.org/stable/40652136.

Basu, A. M., & Stephenson, R. (2005). Low levels of maternal education and the proximate determinants of childhood mortality: A little learning is not a dangerous thing. *Social Science & Medicine, 60*(9), 2011-2023. Retrieved from: *http://www.sciencedirect.com.proxy.mul.missouri.edu/science/article/pii/S027795360400468X*

Black, R. E., Morris, S. S., & Bryce, J. (2003). Where and why are 10 million children dying every year? *Lancet, 361*(9376), 2226-2234. doi: 10.1016/S0140-6736(03)13779-8

Black, R. E. , Allen, L. H. , Bhutta, Z. A., Caulfield, L. E., de Onis, M., Ezzati, M., Mathers, C., Rivera, J. (2008). Maternal and child undernutrition: Global and regional exposures and health consequences. *Lancet, 371*(9608), 243-260. doi: 10.1016/S0140-6736(07)61690-0 Retrieved from: http://www.sciencedirect.com/science/article/pii/S0140673607616900

Black, R. E., Victora, C. G., Walker, S. P., Bhutta, Z. A., Christian, P., de Onis, M., Ezzati, M., Grantham-McGregor, S., Katz, J., Martorell, R., & Uauy, R. (2013). Maternal and child under nutrition and overweight in low-income and middle-income countries. *Lancet, 382* (9890), 427-451. doi:10.1016/S0140-6736(13)60937-X Retrieved from: http://ac.els-cdn.com/S014067361360937X/1-s2.0-S014067361360937X-main.pdf?_tid=7b6983ce-7b52-11e5-922c-00000aacb35f&acdnat=1445803169_f42eb6f529fa6ac20f05a35fd225214d

Blunch, N. (2013). Staying alive: Adult literacy programs and child mortality in rural Ghana. *World Development*, *42*, 114-126. Retrieved from: http://dx.doi.org/10.1016/j.worlddev.2012.06.021

Boehmer, U., & Williamson, B. J. (1995). The impact of women's status on infant mortality rate: A cross-national analysis. *Social Indicator Research, 37*(3), 333-360. Retrieved from: https://www2.bc.edu/~jbw/documents/sc70315.pdf

Bustreo, F., Genovese, E., Omobono, E., Axelsson, H., & Bannon, I. (2005). Improving child health in post-conflict countries: Can the World Bank contribute? Washington DC: The world Bank Group. Retrieved from: http://siteresources.worldbank.org/INTCPR/Resources/ImprovingChildHealthInPost-ConflictCountries.pdf

Caldwell, J. C. (1979). Education as a factor in mortality decline: An examination of Nigerian data. *Population Studies*, *33*(3), 395-413. Retrieved from: http://www.jstor.org/stable/2173888?seq=1#page_scan_tab_contents

Cleland, G. J., & Van Ginneken, K. J. (1988). Maternal education and child survival in developing countries: The search for pathways of influence. *Social Science & Medicine, 27*(12), 1357-1368.

Desai, S., & Alva, S. (1998). Maternal education and child health: Is there a strong causal relationship? *Demography*, *35*(1), 71 – 81. Retrieved from: http://link.springer.com.proxy.mul.missouri.edu/article/10.2307%2F3004028

Dettrick, Z., Jimenez-Soto, E., & Hodge, A. (2013). Socioeconomic and geographical disparities in under-five and neonatal mortality in Uttar Pradesh, India. *Maternal and Child Health Journal, 18*(4), 960-969. Retrieved from: http://web.a.ebscohost.com/ehost/pdfviewer/pdfviewer?sid=56b57eda-94d4-4ff1-ae0c-52bb813fbae1%40sessionmgr4005&vid=5&hid=4214

Eswaran, M.. (2002). The empowerment of women, fertility, and child mortality: Towards a theoretical analysis. *Journal of Population Economics, 15*(3), 433-354. Retrieved from: http://search.proquest.com/docview/230436921?pq-origsite=summon

Gaiha, R., Kulkarni, V. S., Pandey, M. K., & Imai, K. S. (2011). On hunger and child mortality in India. *Journal of Asian and African Studies*, *47*(1), 3-17. Retrieved from: http://jas.sagepub.com.proxy.mul.missouri.edu/content/47/1/3.full.pdf+html

Grima, B. (2002). Women, culture and health in rural Afghanistan. *Expedition*, *44*(3), 34-39. Retrieved from: http://ew3dm6nd8c.search.serialssolutions.com.proxy.mul.missouri.edu /?ctx_ver=Z39.88-2004&ctx_enc=info%3Aofi%2Fenc%3AUTF-8&rfr_id=info: sid/summon.serialssolutions.com&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&rft.genre=a rticle&rft.atitle=Women%2C+culture%2C+and+health+in+rural+Afghanistan&rft.jtitle= Expedition&rft.au=Benedicte+Grima&rft.date=2002-12-01&rft.pub=University+of+ Pennsylvania%2C+University+Museum&rft.issn=0014-4738&rft.volume=44&rft. issue=3&rft.spage=34&rft.externalDocID=250364271&paramdict=en-US

Gudbrandsen, H. N. (2013). Female autonomy and fertility in Nepal. *South Asia Economic Journal, 14*(1), 157-173. Retrieved from: http://sae.sagepub.com/content/14/1/157

Hindin, M. J. (2000). Women's autonomy, women's status and fertility-related behavior in Zimbabwe. *Population Research and Policy Review, 19*(3), 255-282. Retrieved from: http://search.proquest.com/docview/206274921?pq-origsite=summon

Holland, K. (2010). The Canadian Provincial Reconstruction Team: The arm of development in Kandahar province. *American Review of Canadian Studies*, *40*(2), 276-291. DOI: 10.1080/02722011003734761

Hossain, M. B., Phillips, J. F., & Pence, B. (2007). The effect of women's status on infant and child mortality in four rural areas of Bangladesh. *Journal of Biosocial Science, 39*(3), 355-366. doi: 10.1017/S002193200600143X

Houweling, T. A. J., & Kunst, A. E. (2010). Socio-economic inequalities in childhood mortality in low- and middle-income countries: A review of the international evidence. *British Medical Bulletin, 93*(1), 7-26. Retrieved from: http://bmb.oxfordjournals.org/content/93/1/7.full#sec-10

International Vaccine Access Center. (2014). Pneumonia and diarrhea progress report 2014. Retrieved from: http://www.jhsph.edu/research/centers-and-institutes/ivac/resources/IVAC-2014-Pneumonia-Diarrhea-Progress-Report.pdf

Johnson, L. H, Liu, L., Fischer-Walker, C., & Black, E. R. (2010). Estimating the distribution of causes of death among children age 1-59 months in high mortality countries with incomplete death certification. *International Journal of Epidemiology, 39*(4), 1103-1114. Retrieved from: http://ije.oxfordjournals.org/content/39/4/1103.full.pdf+html

Kaufman, H., Skipper, B., Small, L., Terry, T., & McGrew, M. (2001). Effect of literacy on breast-feeding outcomes. *Southern Medical Journal, 94*(3), 293-296. doi: 10.1097/000076-11-200103000-00005.

Keya, K. T., Rob, U., Rahman, M.,. Bajracharya, A., & Bellows, B. (2014). Distance, transportation cost, and mode of transport in the utilization of facility-based maternity services: Evidence from rural Bangladesh. *International Quaterly of Community Health Education, 35*(1), 37-51. doi: 10.2190/IQ.35.1.d.

Kosek, M., Bern, C., & Guerrant, R. L. (2003). The global burden of diarrhoeal disease, as estimated from studies published between 1992 and 2000. *Bulletin of the World Health Organization, 81*(3), 197-204. Retrieved from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2572419/?tool=pmcentrez

Kozuki, N., & Walker, N. (2013). Exploring the association between short/long preceding birth intervals and child mortality: Using reference birth interval children of the same mother as comparison. *BMC Public Health*, *13*(S3), S6. retrieved from: http://www.ncbi.nlm.nih.gov.proxy.mul.missouri.edu/pmc/articles/PMC38 47621/?tool=pmcentrez

Kumar, A., Unnikrishnan, B., Rekha, T., Mithra, P., Kumar, N., Kulkarni, V., Holla, R., & Darshan, B. B. (2015). Awareness and attitude regarding breastfeeding and immunization practices among primigravida attending a tertiary care hospital in Southern India. *Journal of Clinical and Diagnostic Research, 9*(3), 1-5. DOI: 10.7860/JCDR/2015/11892.5616

Mashal, T., Nakamura, K., Kizuki, M., Seino, K., & Takano, T. (2007). Impact of conflict on infant immunisation coverage in Afghanistan: A countrywide study 2000-2003. *International Journal of Health Geographics, 6*(23), 1-9. doi:10.1186/1476-072X-6-23

Ministry of Public Health. (2015, April 26). *Vaccination week kicks off in Afghanistan: Closing the immunization gap saves lives*. Retrieved from: http://moph.gov.af/en/news/vaccination-week-kicks-off-in-afghanistan-closing-the-immunization-gap-saves-lives

Ministry of Rural Rehabilitation and Development (2013). *National area-based development programme: Kandahar provincial profile*. Retrieved from: http://www.mrrd-nabdp.org/attachments/article/239/Kandahar%20Provincial%20Profile.pdf

Mondal, M. N. I., Hossain, M. K., & Ali. M. K. (2009) Factors influencing infant and child mortality: A case study of Rajshahi district, Bangladesh. *Journal of Human Ecology, 26*(1), 31-39. Retrieved from: http://www.krepublishers.com/02-Journals/JHE/JHE-26-0-000-09-Web/JHE-26-1-000-09-Abst-PDF/JHE-26-1-031-09-1821-Mondal-Md-N-I/JHE-26-1-031-09-1821-Mondal-Md-N-I-Tt.pdf

Mosley, W. H., & Chen, L. C. (1984). An analytical framework for the study of child survival in developing countries. *Population and Development Review, 10*, 25-45. doi:

10.2307/2807954 Retrieved from: http://gsdl.ewubd.edu/greenstone/collect/admin-mprhgdco/index/assoc/HASH01b2.dir/P0050.pdf

Müller, O., & Krawinkel, M., (2005). Malnutrition and health in developing countries. *Canadian Medical Association Journal, 173*(3), 279-286. Retrieved from: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1180662/?tool=pmcentrez

Nigussie, M., Mariam, D. H., & Mitike, G. (2004). Assessment of safe delivery service utilization among women of childbearing age in north Gondar Zone, north west Ethiopia. *Ethiopia Journal of Health Development, 18*(3), 145-152. Retrieved from: http://ejhd.uib.no/ejhdv18-no3/145.pdf

Ouili, I. (2015). *Armed conflicts, children's education's education and mortality: New evidence from Ivory Coast*. Unpublished master's thesis, University of Montreal, Montreal, Quebec, Canada. Retrieved from: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2660879.

Onsomu, E. O., Abuya, B. A., Okech, I. N., Moore, D., & Collins-McNeil, J. (2015). Maternal education and immunization status among children in Kenya. *Maternal and Child Health Journal, 19*(8), 1724-1733. Retrieved from: http://www.ncbi.nlm.nih.gov/pubmed/25636652

Owais, A., Hanif, B., Siddiqui, A. R., Agha, A., & Zaidi, A. K. (2011). Does improving maternal knowledge of vaccines impact infant immunization rates? A community-based randomized-controlled trial in Karachi, Pakistan. *BMC Public Health, 11*(239), 1-8. Retrieved from: http://www.biomedcentral.com/content/pdf/1471-2458-11-239.pdf

Prendergast, J. A. (2015). Malnutrition and vaccination in developing countries. *Philosophical Transactions B, 370*(1671), 1-6. Retrieved from: http://rstb.royalsocietypublishing. org.proxy.mul.missouri.edu/content/370/1671/20140141

Rasooly, M. H., Saeed, K. M. I., Noormal, B., Aman, I., Arnold, F., Govindasamy, P., Rutstein, S., & Winter, R. (2013). The effect of birth intervals on causes of under-five mortality in Afghanistan. *Demographic and Health Surveys, 96*, 1-19. Retrieved from: http://dhsprogram.com/pubs/pdf/WP96/WP96.pdf

Singh, K., Haney, E., & Olorunsaiye, C. (2012). Maternal autonomy and attitudes towards gender norms: Associations with childhood immunization in Nigeria. *Maternal Child Health Journal, 17*(5), 837-841. DOI: 10.1007/s10995-012-1060-5

Smith-Greenaway, E. (2013). Maternal reading skills and child mortality in Nigeria: A reassessment of why education matters. *Demography, 50*, 1551-1561. Retrieved from: http://search.proquest.com/docview/1437144287?pq-origsite=summon

Stock, R. (1983). Distance and the utilization of health facilities in rural Nigeria. *Social Science & Medicine, 17*(9), 563-570.

UNICEF, WHO, World Bank, & United Nations. (2014). *Levels & trends in child mortality: Report 2014: Estimates developed by the UN Inter-agency Group for Child Mortality Estimation*. Retrieved from: http://data.unicef.org/corecode/uploads/document6/uploaded_pdfs/corecode/unicef-2013-child-mortality-report-LR-10_31_14_195.pdf

United Nations International Children's Fund. (2015). *Committing to child survival: A promise renewed. Progress report 2015*. Retrieved from: http://www.apromiserenewed.org/wp-content/uploads/2015/09/APR_2015_8_Sep_15.pdf

United Nations Educational, Scientific and Cultural Organization, UNESCO Institute for Statistics. (2015). *Data Center. Education: Illiterate population, adult illiterate population, 15+ years, % female*. Retrieved from: http://data.uis.unesco.org/Index.aspx?DataSetCode=EDULIT_DS&popupcustomise=true&lang=en#

van der Klaauw, B., & Wang, L. (2011). Child mortality in rural India. *Journal of Population Economics, 24*(2),   601-628. Retrieved from: http://www.jstor.org.proxy.mul.missouri.edu/stable/41488319?pq-origsite=summon&seq=1#page_scan_tab_contents

Viswanathan, K., Becker, S., Hansen, P. M., Kumar, D., Kumar, B., Niayesh, H., Peters, D. H., & Burnham, G. (2010). Infant and under-five mortality in Afghanistan: Current estimates and limitations. *Bulletin of the World Health Organization*, *88*(8), 576-583. doi: 10.2471/BLT.09.068957.

Wagstaff, A. (2000). Socioeconomic inequalities in child mortality: Comparisons across nine developing countries. *Bulletin of the World Health Organization, 78*(1), 19-29. Retrieved from: http://www.scielosp.org/pdf/bwho/v78n1/v78n1a03.pdf

Wang, L. (2003). Determinants of child mortality in LDCs: Empirical findings from demographic and health surveys. *Health Policy, 65*(3), 277-299. Retrieved from: http://www.sciencedirect.com/science/article/pii/S0168851003000393

West, K. P., Jr., Stewart, C. P., Caballero, B., & Black, R. E. (2012). Nutrition. In M. H. Merson, R. E. Black, & A. J. Mills (Eds.), *Global health: Diseases, programs, systems, and policies* (pp. 243-343). Burlington, MA, USA: Jones and Bartlett Learning.

World Health Organization. (2010). *Nutrition Landscape Information System. Interpretation guide*. Geneva, Swtizerlan: WHO. Retrieved from: http://www.who.int/nutrition/nlis_interpretation_guide.pdf

The World Bank. (2013). *Data. By Country: Afghanistan*. Retrieved from: http://data.worldbank.org/country/afghanistan

Appendix: Interview Questionnaire

Azeem Kakar, IRB Project #2004411

Section one: Patient's profile:

1. Name: ………………………	2. Age: ………………………….	3. Sex: …………………………….
4. Weight: …………………….	5. Height: ………………………	6. MUAC: …………………….
7. Current cause of admission to ward: ………………………….		

Section two: patient mother's information.

Part. 1			
1. Name:	2. Age:	3. Occupation:	4. Address:
5. Can you read and write?			YES NO
6. How many years did you attend the school?			
7. If answer to question (5) is NO, ○ Did you attend any Adult Literacy Course? ○ Did you hear of Adult Literacy Courses? ○ Did the literacy program that you joined contain any health related topic on 　　a) Immunization 　　b) Breastfeeding 　　c) Sanitation and hygiene 　　d) Handwashing			*Please circle the best answer.* YES NO YES NO YES NO YES NO YES NO YES NO
8. What best describes your spouse's job?			…………………………………………….
9. Can your spouse read and write?			◊ YES ◊ NO
10. How many years did your spouse attend the school?			

11. Where in the following range does your household monthly income fits?	◊ Below 6,000 ◊6,000 – 10,000 ◊ 10,001 - 20,000 ◊ 20,001 and above
12. Does your family have a	Please circle all, if applies. 1. Radio 2. Television 3. Mobile phone 4. Refrigerator 5. Generator for electricity 6. Car 7. Deep well
13. How many members are in the household?	
14. How many rooms do you have at your house?	
15.How many toilets do you have at your home?	
16. Do you have a separate space kitchen?	◊ YES ◊ NO
17. Number of children you gave birth to?	Boys: ………… Girls: ………
18. How many of your children are alive now?	Boys: ………… Girls: ………
19. What is the age of your oldest child?	………………….
20. What is the age of your youngest child?	………………….
21. if any of your child has died, do you remember his/her age when he/she died?	
22. Could you recall the cause that took life from your child?	Pneumonia Diarrhea Measles Other: …….. don't remember
23. How many times did your child suffer from diarrhea last summer?	
24. What best describes the source of your Child's drinking water?	Tap well stream deep well
25. Was he/she hospitalized due to diarrhea?	◊ YES ◊ NO
26. How long will it take to walk to the nearest health facility?	◊ 0-30 minutes ◊ 30 - 60 minutes ◊ more than one hour

27. How far is the nearest pharmacy from your house?	◊ 0-30 minutes ◊ 30 - 60 minutes ◊ more than one hour
Part. 2	
1. Do you have immunization card of the child? If answer to the question was no, Why you do not have immunization card for your child?	◊ YES ◊ NO
2. How old was your child at the time he/she received first vaccine shot?	◊ 0 – 4 weeks ◊ 5- 9 weeks ◊ 1Year – 5 years
3. Where do you immunize your child? If the answer was "At home" what are the main concerns that make you not to visit health facilities?	◊ Health facility ◊ At home ◊ missed immunization
4. Why did you choose not to immunize your child?	
5. Could you name any of the vaccines that you immunized your child with?	1. 2. 3. 4. 5.

6. Immunizations can protect my child from communicable diseases.

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

7. It is important to immunize my children on schedule?

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

8. Could you identify the source you learned the name of vaccines from: (e.g. Doctor, Radio, Health facility)	

9. Breast feeding will increase the chances of child survival.

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

10. Breastfeeding helps protect my child from infection. ◊Strongly Agree　　◊Agree　　◊Neutral　　◊Disagree　　◊Strongly disagree	
11. a) When did you initiate the first breastfeeding when your child was first born? ◊within first hour　　◊took several hours　　◊ within a day　◊ more than one day b) Why you choose to initiate the first breastfeeding in that particular time?	
12. Did you exclusively breastfed your child until six months of age?	◊　YES　　　　◊　NO
13. Did you continue breastfeeding your child until he was two years old?	◊　YES　　　　◊　NO
14. Did you feel obligated to feed your child other than breastfeeding?	◊　YES　　　　◊　NO
15. If the answer to question 14 is YES, who suggested you? In addition, what was suggested to initiate child is feeding with?	
16. Did you feed your child with colostrum? If not, could you mention the reason why you decided not to feed your child with colostrum?	
17. How old was your child when he/she received first weaning?	
18. A packet/can of milk will be enough for my child for ---------- time period	
19. a) Did you visit health facility while you were pregnant? ◊　YES　　　　◊　NO b) If yes, How many times did you visit health facility while you were pregnant?	
20. From whom are you seeking permission before visiting health facility for treating your child? ◊ No one　　　◊ Mother in-law　　　◊Husband　　　◊ Father in-law	
21. Would you share information on place where you give birth to your child and why do you preferred	

to give birth to in mentioned place?

22. Did you receive any vaccine while you were pregnant?	◊ YES ◊ NO

23. Taweez helps improve my child's health.

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

---

24. Taweez can cure:

a. Diarrhea

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

b. Pneumonia

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

c. Measles.

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

---

25. Folk medicine can cure :

a. Diarrhea

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

b. Pneumonia

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

c. Measles.

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

---

26. Giving birth to children within birth-spacing interval of less than two years deteriorates child's nutritional status.

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

---

27. Contraceptive method (birth spacing) will improve child health and increase child survival.

◊Strongly Agree   ◊Agree   ◊Neutral   ◊Disagree   ◊Strongly disagree

28. How many children do you wish to have?	
29. Do you have any say on deciding the number of children you should have?	
30. Do you use contraceptives?	◊ Yes ◊ No
31. Why do/don't you apply contraceptive method? From whom do you need permission from for applying contraceptive methods?	
32. Can you recall name of some of the diseases that can be averted by hand washing?	
33. If you knew that the water you use is not safe for the child, what methods will you use to purify the water? 1. 2. 3.	
34. How often do you wash your hands before breastfeeding your child?	◊Always ◊Most of the times ◊Sometimes ◊rarely ◊Never
35. How often do you use soap while washing your hands?	◊Always ◊Most of the times ◊Sometimes ◊rarely ◊Never
36. Did you ever have home delivery?	
37. Who assisted you during the labor at home delivery?	
38. Did you feed your new-born child with anything rather than breastfeeding when he was first born? If Yes, what was it?	◊ Yes ◊ No
39. Have you ever fed your child with butter shortly after he was born?	
40. Who helps you to carry or feed your child?	
41. Do you feed your child with bottle milk? If yes, when do you make the milk before feeding the	◊ Yes ◊ No

child with it?	
42. When there was no milk available, have you or any member of your family tried to give your thumb in the mouth of the child while he was crying in order to make him stop? What other techniques do you use to make the child calm?	Yes ◊ No
43. Have you ever used anything (medicine, Taweez, or folk medicine) to make your child sleep? If Yes, can you please give us more detail?	Yes ◊ No
44. Following delivery of your child, did your diet change from your normal diet? If yes, can you tell me more that how it changed compared to normal diet?	◊ Yes ◊ No
45. Who advised you what to eat following delivery or what to feed your child rather than breastfeeding?	
46. What would be the best diet for pregnant or new-mother? And why?	
47. Is there any diet that you believe would be better for child health if given immediately after birth?	
48. Have you ever taken your child to religious healer or shrine? If yes, who did you seek permission to take your child to religious healer or shrine?	
49. If your child was suffering from diarrhea, what measure do you take it home to make the disease less severe, before taking him to the health facility?	
50. Do you give any sleep medication for your child from the pharmacy? What do you give? If yes, who generally purchase it from pharmacy for you?	

Part. 3

1. Children should be fed other types of food (fed water, soup, etc.) in addition to breastfeeding when they are less than six months of age.

◊Strongly Agree ◊Agree ◊Neutral ◊Disagree ◊Strongly disagree

---

2. I would consider Taweez if my child's health does not improve with medicine.

◊Strongly Agree ◊Agree ◊Neutral ◊Disagree ◊Strongly disagree

---

3. Folk medicine should be used to treat my child's illness prior to visiting the doctor.

◊Strongly Agree ◊Agree ◊Neutral ◊Disagree ◊Strongly disagree

---

4. Folk medicine should be used to treat my child's illness in combination with scientific medicine.

◊Strongly Agree ◊Agree ◊Neutral ◊Disagree ◊Strongly disagree

---

5. When you realize your child is not feeling well, what approaches do you seek to make the child feel better?

◊ Folk medicine ◊Taking the child to Mullah ◊Contacting pharmacy
◊ Contacting doctor ◊ Contacting health facility

---

6. I give my child folk medicine if he/she is not feeling well.

◊Strongly Agree ◊Agree ◊Neutral ◊Disagree ◊Strongly disagree

---

7. Do you visit shrines or contacting mullahs for obtaining Taweez as a treatment for your child?	YES NO

8. How did you learn about folk medicine use?

---

9. Do you prefer

◊ Sons ◊ Daughters ◊ No preference

---

10. Do any of your (under-five) children attend Madrasa {religious school} for religious studies?

---

11. Have you sent any of your (under-five) children to kindergarten?

---

12. Is there any kindergarten available in the area where you live?

---

13. How much money do your (under-five) children receive from home daily, and what do they buy with it?