Psychometric Scale for Measure Mothers’ Self-Efficacy in Diarrhea Prevention

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Abstract:

Psychometric scale for measuring self-efficacy is such a critical important component of strategies to improve healthy behaviour. Social cognitive theory incorporates outcome expectancy, but emphasizes self- efficacy, or a perception of oneself being capable of performing certain skills to attain some outcome. The theory behind this model builds from the research of Bandura (1977). Self-efficacy scales have been championed as a critical component in many health disease prevention oriented programmes. Maternal, environmental and behavioral factors have been recognized as additional important determinants behavior change modeled in such approach to provide sustainable intervention in promoting self-efficacy to perceived risks. Development of Mother Self-Efficacy scale to measure this ability is critical in Diarrhea prevention and sustaining desired interventions.

The main objective of this study was to develop a Mother Self-efficacy psychometric scale to measure mothers’ perceived Diarrhea risks in five domains, namely: child feeding, feeding practices, maternal hygiene, household environment and health services awareness.

The study used a cross-sectional analytical study, which used quantitative data collection method to assess mothers’ perceived risk in relation self-efficacy. The perceived risks were measured in 5 domains which had 21 independent and 5 proximate variables items. Likert scale was used with 5 levels (Not at all confident, Not very confident, sometimes confident, confident and very confident) to measure mothers’ efficacy.

The study established that there was a correlation between the perceived risk variables of child feeding, feeding practices, maternal hygiene, household environment and the proximate variable of health service awareness and the mother self-efficacy scale with a p-value < .05. Washing hand with soap ranked highest in terms a major perceived risk in Diarrhea prevention and keeping the compound clean ranked the least as a perceived risk.

The study recommends that the Mothers Self-efficacy scale to measure perceived risks for Diarrhoea prevention need to include all the 5 domains. Policy makers intending to sustainable household Diarrhea
prevention approaches need to assess the 5 domains of perceived risks in order a balanced perspective for sustainability for the intended Diarrhoea prevention intervention.

Conclusion The outcome of this research includes a significant progress toward a fully validated scale that can measure MSE in prevention of Diarrhoea. The MSE scale is in the form of 5 domains for measuring perceived Diarrhoea risks. The MSE scale uses specific (child feeding risk, feeding practices risk maternal hygiene risks) and general domains (HH environmental risks, health services awareness). The MSE provides comprehensive perceived Diarrhoea risks for children less than 5 years. The proposed MSE scale may be adopted and modified depending with the user's perceived proximate factors that may influence the independent perceived risks.

The MSE scale can also provide policy makers with a detailed sustainable household approach in Diarrhoea prevention. Further, a breakdown of the 5 domains allows policy analysts to pinpoint areas of strength and weakness in MSE in Diarrhoea prevention, thus providing a balanced perspective in guiding Diarrhoea prevention intervention.

Community based Diarrhoea prevention programmes need to adopt the MSE scale to assess mothers’perceived risks in order to implement specific interventions that will promote and sustain Diarrhoea prevention strategies at the HH levels.

**Definition of key terms:**

1. **Psychometric Scale:**

A Likert Scale is a type of psychometric scale frequently used in psychology questionnaires. It was developed by and named after organizational psychologist Rensis Likert. On a survey or questionnaire, a typical Likert item usually takes the following format:

1. Strongly disagree  
2. Disagree  
3. Neither agrees nor disagrees  
4. Agree  
5. Strongly agree

It is important to note that the individual questions that take this format are known as Likert items, while the Likert scale is the sum of several of these items.

2. **Self-efficacy:**

Self-efficacy is the situation-specific confidence that people have that they can cope with high-risk situations without relapsing to their unhealthy or high-risk behavior. This construct was integrated from Bandura's (1982) self-efficacy theory.

3. **Mothers-Self-efficacy:**

Mother's situational-specific ability, to belief in themselves in taking appropriate action in prevention Diarrhoea at household level.

4. **Perceived self-efficacy:**

This is defined as peoples' beliefs about their capabilities to produce designated levels of performance that exercise influence over events that affect their lives. Perceived SE facilitates goal setting, effort investment, persistence in the face of barriers and recovery from setbacks. The construct of perceived SE is competence-based, prospective and operative (behavioral) in nature.
5. Self-efficacy belief:

This determines how people feel, think, motivate themselves and behave, such beliefs produce diverse effects through four major processes, namely: cognitive, motivational, affective and selection.

6. Diarrhea:

Watery stool more than three frequencies in a day

7. Primary prevention behaviors: are those further upstream to prevent the incidence of disease; secondary prevention behaviors defined as disease treatment and screenings; and tertiary prevention behaviors are rehabilitative and serve to manage the occurrence of disease.

Introduction:

The science and art of healthy behavior and education are eclectic, rapidly evolving, and reflective of an amalgamation of approaches, methods, and strategies from social and health sciences. They draw on the theoretical perspectives, research, and practice tools of such diverse disciplines as psychology, sociology and anthropology. There is increasing emphasis on identifying evidence-based intentions and disseminating them widely (Rimer, Glanz and Rasband, 2001)

Psychometric scale for measuring self-efficacy is such a critical important component of strategies to improve healthy behaviour. Social cognitive theory incorporates outcome expectancy, but emphasizes self-efficacy, or a perception of oneself being capable of performing certain skills to attain some outcome. The theory behind this model builds from the research of Bandura (1977).

Bandura hypothesized that self-efficacy is a function of performance accomplishments, vicarious experience, verbal persuasion, and diminished fear. Through multiple experiments, he showed that perceived self-efficacy was a better predictor for a certain behavior in the face of the unknown than past performance could predict. Self-efficacy has been identified as an influential factor in the practice of many preventive health behaviors, such as administration of self-breast examinations (Jirojwong and MacLennan 2003) and the behaviors caregivers use to prevent their children from getting lead poisoning (Kegler et al. 1999)

In order to realize these achievements, development of behavioral scale to determine relevant and timely intervention approaches, the self-efficacy scale will provide an answer and promote diarrheal incidences among the under-fives.

According to the Demographic Household Surveys and Multiple Indicator Cluster Surveys, global under-five deaths fell below 10 million, to 9.7 million in 2006 for the first time in modern history (UNICEF 2008). Despite all of these improvements, the world is not on track to meet the child survival Millennium Development Goal (MDG) of a two-thirds reduction in child mortality between 1990 and 2015 (UNICEF 2008). Given current rates of population growth and child mortality, if the child survival MDG were achieved, about 5.4 million child deaths would be averted each year. Significant challenges to achieving the child survival MDG exist.

Background information of Mavoko District:

Mavoko is a district among the 8 districts forming the Machakos County. The district lies on the west end of the Machakos County and borders the Nairobi and Kajiado Counties. The district covers 957.2 Km² with a population of 222,000 as per projected population of 2011. The district is divided into four (4) divisions
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namely Mavoko, Katani/Mlolongo, Lukenya and Kinanie/Mathatani divisions. Further, the district has seven (7) locations and fifteen (15) Sub-locations. (OOP, 2011). The district has a bimodal rainfall pattern characterized by short rains in the months of October to December while the long rains falling between mid-March and May. (DDP, 2008-2012)

Socio-economic and environmental aspects: The district is well placed in form of infrastructure since the major trans-highway bisects through the district and industrial development is at peak with 108 factories. (MCM, 2010).

Only 30% of households have access to piped water (DDP, 2008-2012) and latrine coverage at household level is at 76% (DPHO, 2011).

Health: Mavoko district has 1 health center and 2 dispensaries owned by the government. There are 35 private health clinics, 2 mission health facilities and 3 level 4 privately owned hospitals. (MOH, 2011). The district has repeatedly had a static pattern of top ten diseases over the last three years to date, malaria topping the list, upper respiratory infections and diarrheal diseases follow respectively. (MOH, 2010).

Morbidity Statistics pattern:

The following are the statistics for diarrhea for children under 5 years as reported in the district health records and information office; the morbidity total cases in four years were; 2007 – 1,800, 2008-2,993, 2009-5,111 and 2010 4,416 (Source: District records & Information office (2011).

Statement of the Problem:

Incidences of diarrhea in Mavoko Municipality have steadily been on the increase, statistical reflection for a period between 2007 - 2010 for diarrhea of children under 5 years as reported in the district health records and information office; 2007 accounted for 1,800, 2008 was 2,993, 2009 recorded 5,111 and lastly 2010 was 4,416 cases. Diarrhea is a preventable condition, yet no valid instruments have assessed the self-efficacy of mothers ‘ability to prevent the occurrences. Most of the self-efficacy instruments developed have focused on psychological, nutrition self- efficacy, treatment adherence this study was undertaken to develop an instrument to measure mother's self-efficacy in prevention of diarrhea. In order to realize these achievements, development of behavioral scale to determine relevant and timely intervention approaches, the self-efficacy scale will provide an answer and promote diarrheal incidences among the under-fives.

General Objective:

The Overall objective of the study was to develop a psychometric tool to measure mothers‘self-Efficacy in diarrhea prevention.

Specific Objectives:

1. To assess the relationship between mothers ‘self-efficacy in Diarrhea prevention and Perceived child hygiene risks.
2. Evaluate the relationship between mothers ‘self-efficacy in Diarrhea prevention and perceived feeding practices risks.
3. Appraise the relationship between mothers ‘self-efficacy in Diarrhoea prevention and maternal hygiene risks.
4. Compute the relationship between mother's self-efficacy in prevention diarrhea and household environmental risks.
5. Determine the relationship between mother’s self-efficacy in prevention diarrhea and health services awareness.

**Study justification:**

Of those severely affected are children as studies show chronic diarrhea in early childhood has significant effects in a child’s physical and cognitive development (Guerrant D.I et al, 1999). However, diarrhea is a common problem for which there can be effective prevention and treatment through health promotion and education. In order for the children to receive proper care for the diarrhea, their caretakers need to practice effective management, which depend on their knowledge, attitude and perception of the problem and the mode of action.

The epidemiological burden of diarrhea presents a big economic challenge to developing countries. For instance, Indonesia spends about 20% of the health budget on management of childhood diarrhea (Commitment for women & children, 20010). This does not include the household economic losses due to money for treatment and time spent in caring for the sick. This explains the strong interrelationship between diarrhea and poverty with its multifaceted manifestations. These, though daunting, are the challenges confronting researchers; to integrate various and yet inseparably intertwined aspects of problems such as diarrhea.

“Diarrheal disease is like an emergency happening every day, and it's easily preventable. Dr. Greg Allgood, Director of Children’s Safe Drinking Water, Proctor and Gamble. Relevance of the instrument to the priorities of Government, International standards and progressive development partners.

The actions target priority health concern, which is in line with the state as those of development partners and international statutes, the Millennium Development Goal (MDGs); goal 4: Reduce child mortality rates (UNICEF-WHO 2000). As the saying goes 'knowledge is power’, it is important to equip all concerned with relevant knowledge and skills for effective action. Therefore improvement of the self-efficacy of the caretakers/mothers will impact on the prevention of diarrhea. Self-efficacy has been conceptualized as a person's belief about her or his ability to organize and execute courses of actions to manage given situations. In Bandura's (1997) social learning theory, self-efficacy is a dynamic cognitive process in which an individual evaluates his/her capability to perform a given behavior. While these perceptions of self-efficacy contribute to how individuals judge their abilities to perform specific behaviors and greatly influence their choice and persistence of those behaviors. It requires that an instrument specific to the tasks associated with diarrhea prevention be used. Some of the known predictors associated with prevention of diarrhea maybe either modifiable or non-modifiable variables, and self-efficacy is one of the modifiable variables. These will provide a basis for interventions in a community set-up for interventions that are tailored towards mother's self-efficacy for prevention of diarrhea.

In addition, there is need to develop strategies to reduce the devastating costs of early childhood diarrhea and its potential long-term impact; imperatives that we can no longer afford to ignore. (Lima AAM & Guerrant RL, Clin. Infectious Disease in Press, 2004) -Knowing is not enough, we must apply; willing is not enough; we must act.‖ Johann Wolfgang von Goethe
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Scope:
The study used secondary data, which was collected in Mlolongo in Mavoko District. Only Mothers with children under 5 years were included in the study. The psychometric scale used only 31 items for diarrhea prevention with five domains, namely; Domain 1: Feeding practices; Domain 2: Household environment; Domain 3: Maternal hygiene; Domain 4: Child/infant hygiene and Domain 5: Health services.

Significance of the study
The scale that was developed would provide information envisaged to give direction in formulation of health policy in the process of intervention implementations towards diarrhea prevention

Literature Review:

Global and Sub-Saharan situation of Diarrhoea:

Each year, an estimated 2.5 billion cases of Diarrhoea occur among children under five years of age, and estimates suggest that overall incidence has remained relatively stable over the past two decades. Boschi Pinto, C., et al., _The Global Burden of Childhood Diarrhoea_, in: Ehiri, J.E., M. Meremikwu (editors), International Maternal and Child Health, 2009 (in press). More than half of these cases are in Africa and South Asia (World Health Organization, Global Burden of Disease estimates, 2004) where bouts of diarrhoea are more likely to result in death or other severe outcomes. The incidence of diarrhoeal diseases varies greatly with the seasons and a child’s age. The youngest children are most vulnerable: incidence is highest in the first two years of life and declines as a child grows older.

According to WHO, Global Burden of Disease estimates, (2004 update), mortality from diarrhoea has declined over the past two decades from an estimated 5 million deaths among children under five to 1.5 million deaths in 2004,7 which parallels downward trends in overall under-five mortality during this period. Despite these declines, Diarrhoea remains the second most common cause of death among children under five globally, following closely behind pneumonia, the leading killer of young children. Together, pneumonia and Diarrhoea account for an estimated 40 per cent of all child deaths around the world each year. Nearly one in five child deaths is due to Diarrhoea, a loss of about 1.5 million lives each year. The toll is greater than that caused by AIDS, malaria and measles combined.

Furthermore, Africa and South Asia are home to more than 80 per cent of child deaths due to Diarrhoea. Just 15 countries account for almost three quarters of all deaths from Diarrhoea among children under five years of age annually.

Situation Sub-Saharan Africa:

Globally, diarrhoea is the third largest cause of morbidity and the sixth largest cause of mortality among population of all ages (Pond K., et al, 2004). A ten-year review of the global problem of diarrheal disease has shown that there are 1 billion episodes and 3 million deaths occurring each year among under-five children (Bern C., et al.1992). It is one of the leading causes of morbidity and mortality in developing countries, especially among children under the age of five (Prüss A., et al.2002). In Africa, a child experiences five episodes of diarrhea per year, and 800,000 children die each year from diarrhea related dehydration (Woldemichael G., 2001)
In the developing world; unsafe drinking water, inadequate availability of water for hygiene and lack of access to sanitation together contribute to about 88% of deaths from diarrheal diseases or more than 1.5 million children under- five perish from diarrhea each year (Black, et al 2003). Furthermore, 24,000 children under the age of five die every day from preventable causes like diarrhea contracted from unclean water. (UNICEF, WHO 2009). A total of 1.4 million children die because of diarrhea each year. (WHO, 2008).

While diarrhea alone is accountable for 19% of childhood mortality in the developing world, it also contributes significantly to deaths caused by malnutrition and measles, which cause 21% and 7% of total childhood deaths respectively. The high prevalence of diarrhea in developing countries is associated with the squalid environment because of poor sanitary practices, lack of access to safe and adequate water, malnutrition and depressed immunity due to a plethora of infections.

The effects of diarrhea in infant mortality and health have been the focus of numerous studies. Examples are the follows: elucidating the epidemiology, nutritional impact, and causes of persistent diarrhea (PD) in early childhood identification of the long-term impact of diarrhea on cognitive development; and the relationship between infant feeding patterns and growth as modified by access to water and diarrhea.

**Situation in Kenya on diarrhea:**

In Kenya, it is the third biggest cause of death among children under five, claiming roughly 17,760 lives last year alone. Statistics from the World Health Organisation showed that the disease accounted for 16 per cent of child deaths under five in Kenya, just below that of deaths attributable to neonatal disease and child pneumonia. It is the leading cause of malnutrition in children under five.

**Child hygiene risks:**

Infant feeding practices have long been recognized as important determinants of specific infections. Gordon et al. (1963) noted the temporal relationship between the onset of weaning and increased rates of diarrhea and coined the term "weanling diarrhea" to describe this association. Since these early epidemiologic investigations, the relationships between infant feeding practices and infectious diseases have been examined in numerous additional studies. These studies have been reviewed (Jason et al., 1984).

A variety of methods are used to give foods to infants and young children that affect the exposure to diarrheal pathogens and the quantity of food the child consumes. In some cultures, the mother's hand serves as the utensil from which gruels, water or other liquids are poured into the child's mouth. In other communities, mothers use their fingers to place porridges or soft pastes in the infant's mouth. Feeding bottles have become increasingly common as infant feeding utensils in many parts of the world. Cups and spoons are also used to give foods, but since infants cannot manage these alone, busy mothers often turn to the bottle, which can be propped or easily held by an older sibling.

**Feeding practices risks:**

Until the Twentieth Century, nearly all infants were breastfed. With the widespread availability of the baby bottle and various forms of processed animal milks the initiation and duration of breastfeeding has become a significant issue. The decision to breastfeed, as well as the duration of breastfeeding, is influenced by social and individual, personal factors; among these are women's work patterns; available health care services and personnel, marketing practices of infant formula manufacturers and urbanization.
The benefits of breastfeeding on infant and child morbidity and mortality are well documented, with observational studies dating back to the 1960s and 1970s (Victora CG et al, 1989). In addition, breastfeeding reduces exposure to contaminated fluids and foods, and contributes to ensuring adequate nutrition and thus non-specific immunity.

**Oral rehydration therapy (ORT)/oral rehydration solution (ORS).**

ORT and ORS involve rehydrating children by replacing fluids and electrolytes lost through diarrhea. The broader intervention method, ORT, involves rehydrating children through increased appropriate and available fluids and continued feeding to prevent and treat diarrhea-related dehydration. ORS is a specific way of implementing ORT. It is a simple mixture of sugar; salt added to clean water and administered at home.

**Exclusive breastfeeding and optimal complementary feeding.**

Exclusive breastfeeding (no additional food and fluids) provides infants six months of age and younger with essential nutrients and immune factors that both protect them from diarrheal disease and speed diarrhea recovery when episodes occur. Optimal complementary feeding with continued breastfeeding for infants and young children ages 6 to 24 months is essential to ensure they are healthy, well nourished, and better able to survive an episode of diarrhea.

**Safe water, improved sanitation, and good hygiene.**

Dirty water and hands are two of the primary ways diarrheal disease is spread. Hand washing with soap, the safe disposal of human and animal waste, and clean drinking water all help to prevent diarrheal disease.

Excreta can contaminate water sources, and contaminated water can be drunk directly or used in food preparation. For small children, the principal victims of diarrhoeal disease, the environment is likely to be the home and its immediate vicinity. The transmission routes can be blocked by changes in domestic hygiene practice. Improved infrastructure, such as water and excreta disposal facilities, can also contribute to preventing transmission. However, public infrastructure can only be fully effective if employed in conjunction with safe hygiene practices in the home (Cairncross 1990). Interventions to encourage the safe disposal of stools and adequate hand washing after stool contact should thus pay greater dividends than those that concentrate on the secondary barriers and this are mostly behavioral in nature.

**Zinc treatment and other micronutrients.**

Treatment of diarrheal disease with zinc supplementation can reduce the severity and duration of diarrhea episodes. It may also prevent future episodes for up to three months. Other micronutrients, particularly vitamin A, are also important in controlling severe episodes.

**Vaccines.**

Vaccines that prevent rotavirus — the most common and lethal cause of diarrheal disease — have the potential to save nearly 2.5 million children’s lives in the next 20 years. Vaccines have already been approved by the WHO for use in North America, Latin America, and Europe. Once the WHO makes a global recommendation, anticipated in 2009, Africa and Asia will be eligible for GAVI financing for rotavirus vaccines.
Maternal hygiene risks:

Mothers’ personal hygiene practices have been shown to influence child health outcomes (Stanton and Clemens 1987). In Kenya, since mothers are the primary caregivers, their hygiene, sanitation, water treatment, and home treatment behaviors provide the first line of defense against child diarrheal illness. Many reasons have been offered as to why variation between mothers ‘practices exists: level of biomedical knowledge, resource limitations, socioeconomic status, erroneous beliefs, and systemic problems. Specifically for mothers ‘preventive practices for diarrheal illness, resource limitations, children not complying with mothers’ efforts, and mothers’ forgetfulness were identified as barriers, whereas level of biomedical knowledge was not (McLennan 2000).

Maternal Education:

The positive correlation between maternal education and child health outcomes is well-established. One study in Bangladesh conducted by White (2005) showed that a child whose mother completed primary school is 20% more likely to survive than a child whose mother has not received any formal schooling, and a child born to a mother who attended secondary school is 80% more likely to survive. Cleland and Van Ginneken (1988) found that each additional year of education a mother receives corresponds to a 7-9% decline in under-five mortality. Multiple conduits have been proposed to explain how increased education influences child mortality.

More years in school for a woman can translate into better outcomes, such as: marriage later in life, later first childbirth (the risk of maternal mortality is 2-5 times greater for a woman under the age of 18 than over the age of 20 (Murray 2007)), a higher chance of better nourishment, and more decision-making power in the household on health-related or child-related matters.

Maternal education has been proclaimed the single best indicator for child health outcomes. In most areas of the world, mothers continue to be the primary caregivers. Many hypotheses have been drawn as to why maternal education is so strongly correlated, one of which is that it serves as a proxy for income, household size, equitable gender roles, household decision-making ability, employment, social networking, and beliefs.

Why preventive child health, maternal beliefs, and Mavoko?

Most studies on the role of self-efficacy and motivation in health behavior change have occurred in developed nations such as the United States. Previous studies on these subjects in the developing world have been related to maternal health or adherence to drug regimens such as antiretroviral for HIV/AIDS. Other studies examining beliefs and behaviors in the developing world related to child health have examined curative elements. Preventive health has been noticeably neglected. Preventive health measures proven to improve child health outcomes are crucial to decreasing the morbidity caused by childhood diarrhea. The million-dollar question is how to get caretakers to adhere to these practices. What are predictive factors of mothers more likely to practice a certain behavior? What are the roles of public health education campaigns, and what is their impact, realistically?

Household environmental risks:

The relationship between environmental factors and the occurrence of diarrhea in children have been addressed in a number of studies. Environmental factors include water quantity, access to improved water sources, and availability of toilet facilities, compound hygiene, housing condition, and refuse disposal

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Woldemichael G (2001). Globally, more than 125 million children under-five years of age live in households without access to an improved drinking-water source, and more than 280 million children under-five live in households without access to improved sanitation facilities. In the developing world; unsafe drinking water, inadequate availability of water for hygiene and lack of access to sanitation together contribute to about 88% of deaths from diarrheal diseases or more than 1.5 million children under-five perish from diarrhea each year. Water supplies and sanitation, though necessary for the prevention of diarrheal diseases in young children, are not sufficient, unless they are accompanied by changes in domestic hygiene behavior Cairncross S. (1990).

World Health Organization (2002) indicated that 5.9 percent of deaths in developing countries are attributable to diarrhoea mainly because of unsafe water, sanitation and hygiene practices. Kosek et al. (2003) have also estimated that diarrhoea accounts for 21 percent of all deaths of children under 5 years of age annually, mostly from developing countries. Diarrhoea thus poses a major threat to child health and survival in Kenya. Besides mortality, the long-term effects of diarrhoeal illness on childhood health are extremely serious and include malnutrition and growth faltering (Brown, 2003).

Environmental risk factors account for about one-fifth of the total burden of disease in low-income countries according to recent estimates (World Bank, 2001). WHO (2002) reports that among the 10 identified leading mortality risks in high-mortality developing countries, unsafe water, sanitation and hygiene ranked second, while indoor smoke from solid fuels ranked fourth. About 3% of these deaths (1.7 million) are attributable to environmental risk factors and child deaths account for about 90% of the total. 1.5 Statement of Problem The environment, which sustains human life, is also a profound source of ill health for many of the world's people.

Health services awareness:  

A number of aspects of modern systems of maternity and newborn care are associated with decreased rates of breastfeeding initiation and poor rates of continuation among those who do initiate it (Winikoff et al., 1986b). The features of modern health care found to be associated with lower rates of breastfeeding include the following: (1) delays or interruptions of nursing; (2) routine use of supplemental formula in the hospital and its distribution to the mother at discharge; (3) fixed feeding schedules; (4) lack of knowledge about breastfeeding technique and management among medical and nursing practitioners or a lack of initiative to modify standing procedures to better assist the new mother (AAP, 1982, Lawrence, 1982).

Theories and Self-Efficacy Construct:

Behavioral Intentions (BI s):

Behavioral intentions and reported health behaviors are chosen as criteria for construct validity. According to Social Cognitive Theory (SCT; Bandura, 1997); the Health Action Process Approach (HAPA: Schwarzer, 1992, 1999, 2001) and the Health Action Process Approach (HAPA; Schwarzer, 1992, 1999, 2001) and the Health Belief Model (HBM) (Janz, N.K., and Becker, M. H. 1984) perceived SE is regarded as a suitable predictor of behavioral intentions and reported health behaviors. Therefore, there is a correlation with behavioral intentions and health behavior.

Behavioral Intentions are explicit decisions to act in a certain way and they compromise a person's motivation towards a goal in terms of direction and intensity (Sheeran, 2002). This facilitates an individuals' desire to take action that has beneficial results to their daily life and promotion. Self-efficacy
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(SE) has been conceptualized as a person's belief about his/her ability to organize and execute courses of action to manage given situations. (Bandura, 1997). As a result, SE beliefs have diverse effects on psychosocial functioning namely: determines whether coping behaviors will be initiated, how much effort will be expended and how long efforts will be sustained in the face of obstacles and aversive experiences and; affect vulnerability to emotional distress and depression (Bandura, 1997) It is clearly visible that self-efficacy is not a global entity, but rather varies across activity domains, tasks demands and situational characteristics.

Self-efficacy Scale Studies:

A review of self-efficacy scales developed and adapted for health practices have measured self-efficacy to assess its potential influences in initiating behavior change. Frequently single-item measures or very brief scales (e.g., 4 items) have been used. According to Luszczynska & Schwarzer, (2005), it is not necessary to use larger scales if a specific behavior is to be predicted. A rule of thumb is to use the following semantic structure: "I am certain that I can do xx, even if yy (barrier)" If the target behavior is less specific, one can either go for more items that jointly cover the area of interest, or develop a few specific subscales. Whereas general self-efficacy measures refer to the ability to deal with a variety of stressful situations, measures of self-efficacy for health behaviors refer to beliefs about the ability to perform certain health behaviors.

These behaviors may be defined broadly (i.e., healthy food consumption) or in a narrow way (i.e., consumption of high-fiber food).

Nutrition-Related or Dietary Self-Efficacy:

Bagozzi & Edwards, (1998); Brug, Hoppers, & Kok, (1997); Fuhrmann & Kuhl, (1998); Gollwitzer & Oettingen, (1998), the Four studies established that there was relationship to dieting, weight control, and preventive nutrition, indicating that these aspects could be governed by nutrition self-efficacy beliefs. It was further found that nutrition self-efficacy operated best in concert with general changes in lifestyle, including physical exercise and provision of social support. Self-confident clients in intervention programs were less likely to relapse to their previous unhealthy diets

Nutrition self-efficacy:

Anderson, Winett, & Wojcik, (2000), this team researched on the social-cognitive determinants of nutrition behavior among supermarket food shoppers: A structural equation analysis, using the nutrition self-efficacy, the results of the study showed a significant predictor of physical, social and self-evaluative outcome expectancies regarding healthy nutrition. According (Schnoll & Zimmerman, 2001), nutrition goal setting was linked to higher dietary fiber self-efficacy and actual fiber intake, in a study where an objective measure of nutrition behavior, namely grocery receipts, demonstrated that the effect of dietary fiber self-efficacy on fat, fiber, fruit and vegetable intake was mediated by physical outcome expectations.

In a similar study, self-efficacy to eat more fruit and vegetables as well as outcome expectancies in terms of fruit and vegetable intake predicted a 24-hour recall of actual fruit and vegetable intake (Resnicow et al., 2000). Additionally, these fruit- and vegetable-specific predictors were inversely related to an unhealthy diet, that is, high fat cooking. Besides knowledge about proper

Nutrition, dietary self-efficacy and perceived spousal support were associated with dietary behaviors amongst Type 2 diabetes patients (Savoca & Miller, 2001). Diabetes-related self-efficacy was found to be strongly
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related to maintenance of diabetes self-care (diet, exercise and glucose testing; according to Bond, 2002). The most powerful effects were observed when strong optimistic self-beliefs were combined with strong beliefs about outcomes (Bond, 2002). Nutrition and exercise self-efficacy were also connected to the maintenance of diet and physical activity in breast cancer patients (Pinto et al., 2002). The measurement of this kind of self-efficacy aimed at statements that include control over the temptation to eat too much or to choose the wrong foods.

Physical Exercise Self-Efficacy:

According to McAuley (1992, 1993), examined the role of efficacy cognitions in the prediction of exercise behavior in middle-aged adults, the study established perceived exercise self-efficacy had a major instigating force in forming intentions to exercise and in maintaining the practice for an extended time. The measurement of exercise self-efficacy may relate to a specific task, such as "I am certain that I can run for half an hour without stopping, even uphill." Alternatively, the target behavior is not directly specified in favor of explicit barriers.

A study (Motl et al., 2002) on vigorous physical activity among schoolgirls provided strong support for SCT, modest support for the theory for planned behaviour (TPB), and only weak support for the theory for reasoned action (TRA). Exercise self-efficacy was the strongest predictor of moderate and vigorous physical activity, whereas behavioral control predicted only vigorous activity.

Alcohol Consumption and Self-Efficacy:

Studies in this area have been subdivided into controlled drinking self-efficacy, drinking refusal self-efficacy, and abstinence self-efficacy. According to Christiansen, Vik, & Jarchow, (2002), a study on college student heavy drinking in social contexts versus alone, examine their Addictive Behaviors., but also primary prevention to examine how youngsters believe that they can resist the temptation to drink. Heavy drinkers had lower abstinence self-efficacy than those who drink less or who drink only in social situations.

Most of the research on self-efficacy and drinking behavior has used the Situational Confidence Questionnaire (SCQ; Annis, 1984, 1987). Ratings of self-efficacy have predicted drinking behavior (Annis & Davis, 1988). Adolescents with substance abuse, anxiety, and conduct disorder, diagnostic combinations were found to have significantly lower self-efficacy scores across all the SCQ subscales. Sitharthan, Soames Job, Kavanagh, Sitharthan, and Hough (2003) reported the factor structure of a 20-item Controlled Drinking Self-Efficacy Scale (CDES) that included four factors: negative affect, positive mood/social context, frequency of drinking, and consumption quantity. Assessing one's self-efficacy to reduce alcohol consumption follows the same pattern as in the previous examples. Items can target a highly specific behavior such as "I am certain that I can refuse a drink tonight when my buddies offer it to me." Alternatively, it can be less specific, as proposed by Schwarzer and Renner (2000). There are specific self-efficacy measures that have been developed primarily for problem drinkers who seek a moderation-drinking goal.

Smoking Cessation Self-Efficacy:

Confidence to overcome barriers (i.e., smoking cessation self-efficacy) can predict attempts to quit smoking (Dijkstra & DeVries, 2000). Nicotine abstinence of self-quitters depends on various demographic, physiological, cognitive and social factors, but only a few factors are common predictors of maintaining abstinence. These are physiological factors, such as lower nicotine dependence, longer duration of previous
abstinence, and, as a cognitive factor, high-perceived smoking cessation self-efficacy (see Ockene et al., 2000).

Poor smoking cessation self-efficacy is associated with lapses. Coping successfully with high-risk situations as they occur during the maintenance period is dependent on self-efficacy. Confidence in one's ability to abstain from smoking might refer to particular environmental or affective contexts, such as feelings of irritation or sadness, socializing with smokers, or being in a bar or a restaurant. Gwaltney et al. (2002) found that lapse episodes within a four-week abstinence period were predicted by abstinence self-efficacy. Abstinence self-efficacy differentiated between the temptation episodes in which the former smoker was able to resist smoking and situations that ended up with lapses. In a study on lapses and relapses of smokers who attempted to quit, self-efficacy was measured daily in order to analyze whether changes in optimistic self-beliefs precede lapses during 25 days after quitting smoking (Shiffman et al., 2000). On days when both groups were abstinent, persons who never lapsed during the monitoring period reported higher daily self-efficacy than those who lapsed. Daily average self-efficacy over the lapse-to-relapse interval was lower among persons who relapsed than daily average post lapse self-efficacy among those who did not. Self-efficacy after the lapse significantly predicted subsequent behavior.

Some smoking cessation self-efficacy scales were composed in a multidimensional manner. In one study (Dijkstra & De Vries, 2000), the following five subscales were constructed: Emotional self-efficacy, Social self-efficacy, Skill self-efficacy, Relapse self-efficacy and Try self-efficacy. Twenty-seven items were used in the questionnaire: Situational Self-Efficacy, 8 items; Skill Self-Efficacy, 9 items; Relapse Self-Efficacy, 5 items; Try Self-Efficacy, 5 items.

In a sample of smokers with low motivation to quit, two subsequent self-report measurements of smoking cessation self-efficacy were conducted. It was found that quitting history and smoking behavior were related to the types of self-efficacy. Number of past attempts at quitting was only related to relapse self-efficacy. Only skill self-efficacy was predictive of quitting activity between Time 1 and Time 2. Point prevalence quitting at Time 2 was predicted by Skill self-efficacy and relapse self-efficacy. The more clearly the means to accomplish the task are specified, the more valid the self-efficacy judgments were (Dijkstra, Bakker, & DeVries, 1997).

**Adherence to Medication Self-Efficacy and Rehabilitation Self-Efficacy:**

Poor compliance with recommended treatment may result partly from patients' experience of adverse side effects, but it may also be due to a lack of self-regulatory skills. Considering psychosocial factors, adherence is related to lack of social support and lack of self-efficacy beliefs about one's ability to adhere to medication (Catiz, Kelly, Bogart, Benotsch, & McAuliffe, 2000). For example, Molassiotis et al. (2002) have found that adherence to antiretroviral medication in patients with HIV was strongly related to self-efficacy (that is, optimistic self-beliefs about the ability to follow the medication regimen). These self-beliefs, together with anxiety and nausea, were related to adherence to the recommended treatment. The relation between social support and medication adherence was weaker than the relation between self-efficacy and medication adherence. Low adherence self-efficacy, together with low outcome expectancies regarding the benefits following the treatment regimen, have also been found to be related to low medication adherence in HIV symptomatic women or women with AIDS (Murphy, Greenwell, & Hoffman, 2002).
Diabetes self-efficacy was associated with a measure of metabolic control in insulin-dependent diabetes patients (Grossmann, Brink, & Hauser, 1987). Authors used a 35-item measure, the Self-Efficacy for Diabetes scale. Adolescents rated on a 5-point scale how much they were confident that they could implement tasks specific for four components of insulin-dependent diabetes management (insulin injections, blood glucose monitoring, dietary prescriptions, exercise).

A medication adherence self-efficacy scale was developed by Gbenga, Mancuso, Allegrante, and Charlson (2003) in ambulatory hypertensive African-American patients in two sequential phases. After an initial test with a 43-item self-efficacy questionnaire, 26 items were retained for the final self-efficacy scale. This scale can be used to identify risk situations in adherence to prescribed medications.

**Detective Behaviors and Self-Efficacy:**

Some studies provided evidence that both outcome expectancies and perceived self-efficacy were the best joint predictors of the intention to engage in regular breast cancer detection behaviors (Meyerowitz & Chaiken 1987; Seydel, Taal, & Wiegman, 1990).

**Summary of literature review:**

History has demonstrated that diarrheal disease interventions work. Deaths of children under the age of five have declined by nearly half since the 1980s. Nevertheless, progress has stalled, and today 1.6 million children still die from diarrhea each year. That’s too many. We know what works. What we need now is the intervention technique; a coordinated approach to address the multiple sources of infection.

Diarrhoea for the under-fives has been a matter of concern for decades. Despite ongoing efforts and intentions to improve child mortality and morbidity, some issues relating to behavioral change given the risk factors that promote childhood Diarrhoea continue to pose a challenge. The underlying goal for the development and implementation of a health interventions is to effect a positive change in the health status of the under five children.

Another important area of concern is the sustainability interventions that have been instituted to promote Diarrhoea prevention of the under five children. Global initiatives MDG, WSC Health for All in the 21st century; Agenda 2020 and NEPAD that promised an increased advantage for improvements in population health were adopted.

**Gaps in the literature review:**

Self-efficacy has been championed as a critical component in many health behavior change models, such as the health belief model and Bandura’s self-efficacy model (Bandura 1977; Elder et al. 1999). These models have been tested and modified within the context of developed-world health issues, but not as considerable, a mass of literature exists regarding self-efficacy in the developing world. While in many developing countries, mothers are the primary caretakers of the children and would have the greatest contact with under-five children.

In general, research on the process of development of a psychometric scale for measuring mother self-efficacy in Diarrhoea prevention is as important as studying risk elements related to child Diarrhoea and prevention is critical. Many of the self-efficacy scales developed are based on non-communicable and lifestyle conditions. MSE studies have been limited conducted as part of a comprehensive Diarrhoea prevention intervention.
Methodology:

Introduction:

This was analytical study, which used sought to investigate the household risk factors influencing diarrhoea diseases among children under five years in Mavoko Municipality. Data was collected from 427 households from the four municipality locations. Data was processed using SPSS and Microsoft Excel statistical computer packages.

Study design:

The study was descriptive exploratory cross sectional using quantitative data collection method. Structured household 26 items and observations were used.
The purpose of this methodological study was to develop and assess the psychometric properties (validity and reliability) of an instrument to measure mother self-efficacy towards children diarrhea prevention. Psychometrics deal with the theory and development of instruments or measurement techniques through the research process. Therefore, psychometrics deals with the measurement of a concept using reliable and valid tools. In this way, a methodological design was conducted to: define the construct or behavior to be measured, formulated the scale's items, developed instructions for users and respondents and tested the scale’s reliability and validity.

I conducted two literature reviews (one about diarrhea diseases and other about self-efficacy theory) to develop the scale items, instructions and options to answer each item. Once I completed the scale, it was necessary to complete a translation and cross cultural adaptation to Kiswahili. To complete the cross-cultural adaptation I used the protocol suggested by Beaton et al (1998).

**Quantitative data Analysis:**

Descriptive analysis was done to establish the distribution of the study variables. Mean, median and mode were used to describe the general MSE on the perceived Diarrhoea risks, which were in 5 domain (Child feeding, Feeding practices, maternal hygiene, HH environment and Health services awareness). The data were presented in tables, graphs, frequencies, using the Statistical Package for Social Science (SPSS) and Microsoft Excel computer statistical packages. Descriptive analysis was done to assess and establish relationship between the independent (Child feeding, Feeding practices, Maternal hygiene, HH environment and Health services awareness) and dependent variable MSE. Analysis was done in 3 levels. First level was to determine whether there existed a relationship between the independent and dependent. Where relationship was established, it was measured using the Chi square test ($\chi^2$). Inferential statistics were done using the Chi square test ($\chi^2$) to measure the significance goodness of fit, significance association between the independent variables and the dependent variables. The test of significance was at 0.05.

The second level was done where significance was found to exit. Coefficient of correlation was done. Correlation analysis was done to assess the degree of relationships between the independent and dependent. Karl Person’s coefficient of correlation $r$, was done to establish correlations.

The value $r$ lied between $-1$ and $+1$. Positive values of $r$ indicated a positive correlation between the independent and dependent variables. That meant that changes in the two variables were in the statement direction either positive or negative. Negative values of $r$ indicated negative correlation between the independent and dependent variables. That meant changes in the two variables taking place in different directions. One variable was either positive or the other negative.

Any value of $r$ which was nearer to $+1$ or $-1$ indicated a high degree of correlation between the independent and dependent variables. The value zero (0) of $r$ indicated there was no association between independent and dependent variables.

In the third level Simple regression analysis were done to determine statistical relationship between one independent variable (e.g. age of the caregiver) and the dependent variable (e.g. HH risk factor, which was the presence of diarrhea). Multiple regression analysis was done to determine the statistical relationship between more than two independent variables and the dependent variable.
Spearman Karl rank correlation coefficient was done to find out co variability or lack of it between the all the independent variables that had a relation with the dependent variable. This was done to rank independent variables in terms of highest and lowest household risk factor. The value of the Spearman coefficient was interpreted in the same way as Pearson's correlation coefficient. The rank ranged from + 1 and – 1. When rs was + 1 there was a complete agreement in the order of the ranks and were in the same direction. When rs was – 1 there was a complete agreement in the order of the ranks and they were in the opposite direction.

Results:

Introduction:

This chapter presents study findings on the development of a psychometric scale on mother’s attribute of self-efficacy in prevention of Diarrhoea. The Likert scale had 21 items, which were considered as independent variables while 5 were proximate variables. The studies tackled five specific objectives based on a null hypothesis. The findings of the study are presented using figures and graphs that highlight the relationship between the mother's self – efficacy (MSE) level and the perceived Diarrhoea risks using a likert scale.

The results are given in 3 stages; first the description whether there existed a relationship between the independent and dependent variables. Chi square test (x²) was used to measure whether a relationship existed. Where relationship was found the value P was less than 0.05. Second level of describes the degree of significance that exits using coefficient of correlation. Karl Person’s coefficient of correlation \( r^2 \), is used to describe the correlations. The value \( r^2 \) lied between 1 and +1.

The third level Simple regression analysis was done to determine statistical relationship between independent and dependent variable (e.g. child feeding, feeding practices, maternal hygiene and HH environmental risks) and the dependent variable (e.g. mother’s level of self - efficacy).

Multiple regression analysis done describes statistical relationship between more than two independent variables and the dependent variable. Spearman Karl rank correlation coefficient (\( r^2 \)) describes the rank ranges from + 1 and – 1.

Demographic Characteristics:

This study enrolled 427 mothers. The demographic variables of the mothers that was assessed included age in complete years, marital status, parity, level of education, main source of income, religion, relationship to the HH head, social belonging to a group.

The mean age of the mothers was 31 years and median age was 32 years. The predominate religion was Protestants with 58.3 %, while most 39.3% of the mothers level of education was secondary incomplete.

The study established that first time mother with one child were in the age category 16–20 years (6%), 21–25 years (10%), 26–30 years (11%). While second time mothers accounted for 26–30 years (15%), 31–35 years (7%) and 36–40 years (12%) and the ones with more than three children across all age category accounted for 36%.

Mothers’ self-efficacy in Diarrhea prevention and perceived child hygiene risks.

The mothers'self – efficacy level on the perceived child hygiene risks was measured using 6 behavioral items which included; washing of hands, assuring hygiene of the child, promoting nail cutting, daily baby
shower, looking after child while handling contaminated objects and daily clean clothing of the child. There was a significant relationship between the perceived child feeding risks and the MSE with a p value of < .05.

Figure 2- 7 below illustrates the relationship between MSE and perceived child feeding risks.

**Mothers self – efficacy and hand washing with soap**

Mothers who were confident accounted for 10.5 % and almost all 10 % were likely to wash their hands with soap to prevent child feedings risks to prevent Diarrhoea, as compared to mother who were who were not very confident, accounting for 53.2% and only 11.2 % were likely to wash their hand. As MSE increased likelihood to wash hands increased.

![Hand washing with soap risk awareness by mother SE](image)

**Figure 3: Hand washing with soap risk awareness by mother SE (n=427)**

**Mothers self – efficacy and child hygiene assurance:**

Mothers who were very confident accounted for 12.9 % and 8 % were likely to always assure their child hygiene to prevent child feedings risks in prevention of Diarrhoea, as compared to mother who were who were not very confident, accounting for 53.2% and only 15.5 % were likely to always assure their child hygiene. As MSE increased likelihood to always assure child hygiene decreased.
Mothers self – efficacy and promoting child nail cutting:

Mothers who were confident accounted for 10.5% and almost all 10.5% were likely to promote nail cutting of their child to avoid child feedings risks in Diarrhoea prevention, as compared to mother who were who were not very confident, accounting for 53.2% and only 11% were likely to promote nail cutting. As MSE increased likelihood to promote child hygiene by cutting nails decreased.

Figure 4: Assure baby hygiene clean wear risk awareness by mother SE (n=427)

Figure 5: Promote child hygiene by cutting nails risk awareness by mother SE (n=427)
Mothers self – efficacy and promotion of daily child shower:

Mothers who were confident accounted for 12.9 % and almost all 8 % had a possibility of promoting daily showering of their child to prevent child feedings risks in Diarrhoea prevention, as compared to mother who were who were not confident, accounting for 53.2% and only 15.5 % were likely to promote daily showering. As MSE decreased likelihood to promote daily child shower daily decreased.

![Graph](image-url)

**Figure 6: Promote child hygiene by giving a shower risk awareness by mother SE (n=427)**

MSE by looking after the child handling contaminated objects to mouth

Mothers who were confident accounted for 10.5 % and all 10.5 % had a possibility of promoting of looking after their child handling contaminated objects to mouth to prevent child feedings risks in Diarrhoea prevention, as compared to mother who were who were not very confident, accounting for 53.2% and only 11 % were likely to look after their child handling contaminated objects to mouth. As MSE decreased likelihood to look after their child handling contaminated objects to mouth decreased.
Mothers self – efficacy by clean clothing daily:

Mothers who were very confident accounted for 12.9% and almost all 8% were likely to cloth their child with clean clothes daily to prevent child feedings risks for prevention Diarrhoea, as compared to mother who were who were not very confident, accounting for 53.2% and only 15.5% were likely to cloth their child with clean clothes daily. As MSE increased likelihood to change child clothing daily increased.

Figure 7: Look after the child handling contaminated objects risk awareness by mother SE (n=427)

Figure 8: Putting on child clean cloths risk awareness by mother SE (n=427)
Mothers’ self-efficacy in Diarrhea prevention by perceived feeding practices risks.

The mothers’ self – efficacy level on the perceived feeding practices risks was measured using 5 behavioral items which included; exclusive BF for first 3 months, offering health diet after weaning, offering safe drinking water, feeding the child with plenty of fluids and maintaining food hygiene by covering food and water all the time. There was a significant relationship between the perceived feeding practices risks and the MSE with a p value of < .05.

Figure 8-12 below illustrates the relationship between MSE and perceived feeding practices risks.

**Mothers self – efficacy by exclusive FB for the first 3 months**

Mothers who were very confident accounted for 12.9 % and 6.3 % had the likelihood of offering exclusive BF for the first 3 months to prevent feedings practices risks in Diarrhoea prevention, as compared to mothers who were who were not very confident, accounting for 53.2% and only 16.2 % were likely to offer exclusive BF for the first three months. This finding indicated that as MSE decreased likelihood to offer exclusive BF for 3 months decreased.

![Graph showing exclusive BF for at least 3 months risk awareness by mother SE](image)

**Figure 9: Exclusive BF for at least 3 months risk awareness by mother SE (n=427)**

**Mothers self – efficacy by ability to offer healthy diet after weaning**

Mothers who were very confident accounted for 10.5% and all had the likelihood of offering healthy diet after weaning prevent feedings practices risks in Diarrhoea prevention, as compared to mothers who were who were not very confident, accounting for 53.2% and only 11 % were likely to offer healthy diet after weaning. This finding indicated that as MSE decreased likelihood to offer-to-offer healthy diet after weaning decreased.
Motors self – efficacy by offering safe drinking water at home

Motors who were very confident accounted for 12.9% and 6.3% were likely to always offer safe drinking water to their child to prevent feedings practices risks in Diarrhoea prevention, as compared to mothers who were who were not very confident, accounting for 53.2% and only 16.2% were likely to offer always offer safe drinking water. This finding pointed out that as MSE decreased likelihood to always offer safe drinking water at home decreased.

Figure 10: Summary being able to offer healthy diet weaning risk awareness by mother SE (n=427)

Figure 11: Offering safe drinking water to the baby risk awareness by mother SE (n=427)
Mothers self – efficacy by feeding the child with plenty of fluids.

Mothers who were very confident accounted for 12.9% and 6.3% had the likelihood of offering plenty of fluids to the child to prevent feedings practices risks in Diarrhoea prevention, as compared to mothers who were who were not very confident, accounting for 53.2% and only 16.2% were likely to offer plenty of fluids to the child. This finding indicated that as MSE decreased likelihood to always offer plenty of fluids to the child decreased.

![Graph showing risk awareness by mother SE](image)

**Figure 12: Feed the child with plenty of fluids risk awareness by mother SE (n=427)**

Mothers self – efficacy by maintaining food hygiene

Mothers who were confident accounted for 10.5% and all had the likelihood of maintaining food hygiene by covering the food and water containers at all times to prevent feedings practices risks in Diarrhoea prevention, as compared to mothers who were who were not very confident, accounting for 53.2% and only 11% were likely to offer food hygiene by covering the food and water containers at all times. This finding indicated that as MSE decreased likelihood to maintain food hygiene by covering the food and water containers at all times decreased.
Figure 13: Maintain food & water hygiene all time risk awareness by mother SE (n=427)

Mothers’ self-efficacy in Diarrhoea prevention by maternal hygiene risks.

The mothers' self – efficacy level on the perceived maternal hygiene risks was measured using 5 behavioral items which included; keeping the compound clean from feaces, wash hands with soap; after cleaning baby defecated and disposal of feaces, before feeding the child and keep family healthy. There was a significant relationship between the perceived child feeding risks and the MSE with a p value of < .05.

Figure 13-17 below illustrates the relationship between MSE and perceived child feeding risks.

Mothers self - efficacy by keeping compound clean:

Mothers who were very confident accounted for 12.9 % and 8 % were likely to keep the compound clean from feaces to prevent maternal hygiene risks in Diarrhoea prevention, as compared to mothers who were who were not very confident, accounting for 53.2% and only 15. % were likely to keep the compound clean from feaces. This indicated that as MSE decreased likelihood to always keep the compound clean from feaces decreased.
Mothers self-efficacy by washing hands with soap after cleaning baby’s defecation

Mothers who were very confident accounted for 12.9% and 8% to wash hand with soap after cleaning baby's defecation to prevent maternal hygiene risks in Diarrhoea prevention, as compared to mothers who were not very confident, accounting for 53.2% and only 15.5% were likely to wash hands with soap after cleaning baby defecation. This indicated that as MSE increased likelihood of washing hands with soap after cleaning baby's defecation increased.

Figure 14: Always keep compound clean from faeces as risk awareness by mother SE (n=427)

Figure 15: Always wash hands with soap after cleaning baby’s faeces risk awareness by mother SE (n=427)
Mothers self - efficacy by washing hands with soap after disposal of child feaces

Mothers who were very confident accounted for 12.9% and 6.1% were likely to likely to always wash hands with soap after disposal of child feaces to prevent maternal hygiene risks in Diarrhoea prevention, as compared to mothers who were who were not very confident, accounting for 53.2% and only 11% were likely to always wash hands with soap after disposal of child feaces. This indicated that as MSE decreased likelihood to always wash hands with soap after disposal of child feaces decreased.

Figure 16: Wash hands with soap after disposal of faeces risk awareness by mother SE (n=427)

Mothers self - efficacy by always washing hands with soap before feeding the child

Mothers who were very confident accounted for 12.9% and 8% were likely to always wash hands with soap before feeding the child to prevent maternal hygiene risks in Diarrhoea prevention, as compared to mothers who were not very confident, accounting for 53.2% and only 15. 5% were likely to always wash hands with soap before feeding the child. This indicated that as MSE increased the likelihood to always wash hands with soap before feeding the child increased.
Dr. M.N. Githae / Psychometric Scale for Measure Mothers’ Self-Efficacy in Diarrhea Prevention.

Figure 17: Always wash hands with soap before feeding baby risk awareness by mother SE (n=427)

Mothers self - efficacy by keeping family health with hand washing with soap

Mothers who were very confident accounted for 12.9 % and 6.1 % were likely to always keep their family healthy with hand washing with soap to prevent maternal hygiene risks in Diarrhoea prevention, as compared to mothers who were who were not very confident, accounting for 53.2% and only 11 % were likely to always keep their family healthy with hand washing with soap. This indicated that as MSE decreased likelihood to always keep the family healthy with hand washing with soap decreased.

Figure 18: Keep family healthy with hand washing with soap risk awareness by mother SE (n=427)
Mothers’ self-efficacy in prevention diarrhea and household environmental risks.

The mothers’ self – efficacy level on the perceived household environmental risks was measured using 5 behavioral items which included; keeping compound clean by; disinfecting the latrine slab, disposing the garbage way from the compound, burying or disposing in closed containers, by constructing using the utensil stand and defecating in a proper site. There was a significant relationship between the perceived household environmental risks and the MSE with a p value of < .05.

Figure 18-22 below illustrates the relationship between MSE and perceived household environmental risks.

Mothers self – efficacy by disinfecting the latrine slab

Mothers who were very confident accounted for 12.9 % and all 8 % had a possibility of uphold keeping the compound clean by disinfecting the latrine slab to prevent HH environmental risks in Diarrhoea prevention, as compared to mother who were who were not very confident, accounting for 53.2% and only 15.5 % were likely to uphold keeping the compound clean by disinfecting the latrine slab. As MSE decreased likelihood not to uphold keeping the compound clean by disinfecting the latrine slab increased.

![Diagram showing Keep compound clean by disinfection of latrine slab risk awareness by mother SE](image)

Figure 19: Keep compound clean by disinfection of latrine risk awareness by mother SE (n=427)

Mothers self – efficacy by disposing the garbage away from compound

Mothers who were confident accounted for 10.5 % and all had a possibility of always disposing the garbage away from the compound by to prevent HH environmental risks in Diarrhoea prevention, as compared to mother who were who were not very confident, accounting for 53.2% and only 11 % were likely to uphold disposing the garbage away from the compound. As MSE decreased likelihood of disposing the garbage away from the compound decreased.
Mothers self – efficacy by disposing of garbage in a closed containers

Mothers who were very confident accounted for 12.9% and all 6.3% had a possibility of always disposing garbage in closed containers to prevent HH environmental risks in Diarrhoea prevention, as compared to mother who were not very confident, accounting for 53.2% and only 16.2% were likely to always dispose garbage in closed containers. As MSE decreased likelihood not to always dispose garbage in closed container increased.

Figure 20: Bury garbage in closed containers risk awareness by mother SE (n=427)

Figure 21: Dispose garbage away from house risk awareness by mother SE (n=427)
Mothers self – efficacy by constructing and using utensil drying stand

Mothers who were very confident accounted for 12.9 % and all 6.3 % had a possibility of always keeping the compound clean by constructing; using the utensil drying stand to prevent HH environmental risks in Diarrhoea prevention. As compared to mother who were not very confident, accounting for 53.2% an only 16.2 % were likely to uphold keeping the compound clean by constructing and using the utensil drying stand. As MSE decreased likelihood not to uphold keeping the compound clean by constructing and using the utensil drying stand decreased.

![Construct utensils drying rack risk awareness by mother SE](image)

**Figure 22: Construct Utensils drying rack risk awareness by mother SE (n=427)**

Mothers self – efficacy by defecating in the proper site:

Mothers who were very confident accounted for 12.9 % and all 6.3 % had a possibility of sustaining keeping the compound clean by disinfecting in a proper site to prevent HH environmental risks in Diarrhoea prevention. As compared to mother who were who were not very confident, accounting for 53.2% and only 6.2 % were likely to not to sustain keeping the compound clean by disinfecting in a proper site. As
MSE decreased likelihood not to sustain keeping the compound clean by disinfecting in a proper site decreased.

![Keep compound clean by defecating in proper site risk awareness by mother SE](image)

**Figure 23: Keep compound clean by defecating in proper site risk awareness by mother SE (n=427)**

**Mothers’ self-efficacy by health services awareness:**

Mothers’ awareness on health services was identified as proximate variables in this study, which was anticipated to either influence or be influenced by independent variables to affect MSE in prevention of Diarrhoea. 5 proximate items that were assessed in relation to health care service awareness were the belief that the HW will always keep their child healthy, the mother can always take the child to the HF for; growth monitoring, immunization, treatment for minor ailment and Diarrhoea treatment. There was a significant relationship between the mothers’ health service awareness and MSE with a p value of < .05.

Figure 23 - 27 below illustrates the relationship between MSE and awareness of health services.

**Mothers’ self-efficacy by belief that HW will always keep the child healthy:**

Mothers who were confident accounted for 10.5% and all had a possibility to always deem that the HW would keep their child healthy to prevent Diarrhoea, as compared to mothers who were not very confident, accounting for 53.2% and only 11% likely not to always deem that the HW would keep their child healthy. As MSE decreased, the likelihood to always deem that the HW would keep their child healthy decreased.
Believe that a HW will keep the child healthy risk awareness by mother SE

Figure 24: Believe that HW will keep the child healthy risk awareness by mother SE (n=427)

Mothers’ self-efficacy by always taking child for growth monitoring

Mothers who were very confident accounted for 12.9% and all 6.1% had a possibility of always taking their child for growth and monitoring at HF to prevent Diarrhoea, as compared to mother who were not very confident, accounting for 53.2% and only 11% who were likely to take their child for growth and monitoring at the HF. As MSE decreased likelihood to always take the child for growth and monitoring at the HF decreased.

Taking child for growth monitoring at HF risk awareness by mother SE

Figure 25: Taking child for growth monitoring at HF risk awareness by mother SE (n=427)
Mothers’ self-efficacy by always taking child for immunization

Mothers who were very confident accounted for 12.9% and 8% had a possibility of always taking their child for immunization till 5 years at HF to prevent Diarrhoea, as compared to mother who were who were not very confident, accounting for 53.2% and only 11% who were likely to take their child for growth and monitoring at the HF. As MSE decreased likelihood not to always take the child for immunization until 5 years at the HF increased

Figure 26: Take child for immunization until 5 years risk awareness by mother SE (n=427)

Mothers’ self-efficacy by always taking child to HF for any ailment

Mothers who were confident accounted for 10.5% and all had a possibility of always taking their child to HF for any ailment, as compared to mother who were who were not very confident, accounting for 53.2% and only 11% who were always not likely to take their child to the HF for any ailment. As MSE decreased likelihood to always take the child to the HF for any ailment decreased
Figure 27: Take child for treatment for any ailments risk awareness by mother SE (n=427)

Mothers’ self-efficacy by always taking child to HF for Diarrhoea treatment:

Mothers who were very confident accounted for 12.9% and all 8% had a possibility of always taking their child to the HF for treatment of Diarrhoea, as compared to mother who were not very confident, accounting for 53.2% and only 15% who were likely to take their child to the HF for treatment of Diarrhoea. As MSE decreased likelihood not to always take the child to the HF for Diarrheal treatment increased.

Figure 28: Take child to HF for diarrhea treatment risk awareness by mother SE (n=427)
Summary of the key findings

Table 1: Summary of key variables that influenced MSE in prevention of Diarrhea

<table>
<thead>
<tr>
<th></th>
<th>Variables</th>
<th>df</th>
<th>p-value</th>
<th>r</th>
<th>r²</th>
</tr>
</thead>
<tbody>
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<td>1</td>
<td>Can always wash the hands with soap</td>
<td>4</td>
<td>0.000</td>
<td>-0.108</td>
<td>0.012</td>
</tr>
<tr>
<td>2</td>
<td>Can always assure the hygiene of my child</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>0.012</td>
</tr>
<tr>
<td>3</td>
<td>Promote my child hygiene cut nails</td>
<td>4</td>
<td>0.000</td>
<td>-0.109</td>
<td>0.012</td>
</tr>
<tr>
<td>4</td>
<td>Promote my child hygiene by giving a shower daily</td>
<td>4</td>
<td>0.000</td>
<td>-0.108</td>
<td>0.012</td>
</tr>
<tr>
<td>5</td>
<td>Look after my child by handling contaminated objects to mouth</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>0.012</td>
</tr>
<tr>
<td>6</td>
<td>Keep my child cleanliness by putting on clean clothes every day</td>
<td>4</td>
<td>0.000</td>
<td>-0.108</td>
<td>0.012</td>
</tr>
<tr>
<td>7</td>
<td>I can always offer exclusive BF for at least 3 months.</td>
<td>4</td>
<td>0.000</td>
<td>-0.025</td>
<td>0.012</td>
</tr>
<tr>
<td>8</td>
<td>I can always offer healthy diet to my child after weaning</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>-0.050</td>
</tr>
<tr>
<td>9</td>
<td>I can always offer safe drinking water to my baby at home</td>
<td>4</td>
<td>0.000</td>
<td>-0.025</td>
<td>-0.050</td>
</tr>
<tr>
<td>10</td>
<td>I can always feed my child with plenty of fluids</td>
<td>4</td>
<td>0.000</td>
<td>-0.025</td>
<td>-0.050</td>
</tr>
<tr>
<td></td>
<td>Maintain food hygiene by covering the food &amp; water containers at all times.</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>-0.050</td>
</tr>
<tr>
<td>11</td>
<td>I can always keep my compound clean from feaces.</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>-0.050</td>
</tr>
<tr>
<td>12</td>
<td>Wash my hands with soap after cleaning my baby defecated</td>
<td>4</td>
<td>0.000</td>
<td>-0.108</td>
<td>-0.218</td>
</tr>
<tr>
<td>13</td>
<td>I can always wash my hands with soap after disposal of feaces</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>-0.410</td>
</tr>
<tr>
<td>14</td>
<td>I can always wash my hands with soap before feeding my child</td>
<td>4</td>
<td>0.000</td>
<td>-0.108</td>
<td>-0.598</td>
</tr>
<tr>
<td>15</td>
<td>Always keep my family healthy with hand washing with soap</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>-0.598</td>
</tr>
<tr>
<td>16</td>
<td>Always keep my compound clean by disinfecting the latrine slab</td>
<td>4</td>
<td>0.000</td>
<td>-0.108</td>
<td>-0.598</td>
</tr>
<tr>
<td>17</td>
<td>Always keep my compound clean by disposing the garbage away</td>
<td>4</td>
<td>0.000</td>
<td>-0.205</td>
<td>-0.598</td>
</tr>
<tr>
<td>18</td>
<td>I can always bury or dispose my garbage in closed containers</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>-0.598</td>
</tr>
</tbody>
</table>
Dr. M.N. Githae / Psychometric Scale for Measure Mothers’ Self-Efficacy in Diarrhea Prevention.

<table>
<thead>
<tr>
<th></th>
<th>Always keep my compound clean by constructing utensils-drying</th>
<th>4</th>
<th>0.000</th>
<th>-0.025</th>
<th>-0.598</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>rack.</td>
<td>4</td>
<td>0.000</td>
<td>-0.025</td>
<td>-0.598</td>
</tr>
<tr>
<td>21</td>
<td>I can always keep my compound clean by defecating</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>-0.598</td>
</tr>
<tr>
<td>22</td>
<td>Always believe that a health worker will keep my child healthy</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>-0.598</td>
</tr>
<tr>
<td>23</td>
<td>Always take my child for growth monitoring/ HC</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>-0.598</td>
</tr>
<tr>
<td>24</td>
<td>Always take my child for immunization till 5yrs in HF.</td>
<td>4</td>
<td>0.000</td>
<td>-0.108</td>
<td>-0.598</td>
</tr>
<tr>
<td>25</td>
<td>Always take my child for treatment in the HF in case of any ailment.</td>
<td>4</td>
<td>0.000</td>
<td>-0.299</td>
<td>-0.598</td>
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</table>

Discussions:
Introduction:
This study was motivated by the realization that there is a limited research on the understanding MSE in Diarrhoea prevention among the under 5 yrs and a lack of appropriate reference theoretical framework for measuring the MSE that can acquiesce similar results among mothers managing Diarrhoea. The main objective of this study was to develop a psychometric scale that can be used to measure MSE in Diarrhoea prevention. The discussion below is based on the specific objectives of the study. The study observed 5 domains which were perceived risks, this included; feeding practices, household environment, maternal hygiene, child / infant hygiene and health service awareness.

Mothers’ self-efficacy in Diarrhea prevention and perceived child hygiene risks.
The study established that there was a significant MSE relationship between the perceived child feeding risks, which included; washing of hands, assuring hygiene of the child, promoting nail cutting, daily baby shower, looking after child while handling contaminated objects and daily clean clothing of the child.

The child feeding risk domain is imperative because it ran is a powerful predictor of how well a MSE can facility in Diarrhoea prevent in children under 5 yrs. The mother is the primary caretakers of the children and would have the greatest contact with under-five children. A mother balancing competing responsibilities would need to triage her priorities. Like any other person making decisions under conditions with limited resources, she would place more importance on the behaviors she feels would have the greatest impact.

Mothers’ self-efficacy in Diarrhea prevention and perceived feeding practices risks. There was a major relationship between the perceived feeding practices risks and the MSE. The perceived feeding practices risks was included; exclusive BF for first 3 months, offering healthy diet after weaning, offering safe drinking water, feeding the child with plenty of fluids and maintaining food hygiene by covering food and water all the time.

The decision to breastfeed, as well as the duration of breastfeeding, is influenced by social and individual, personal factors; among these are women’s work patterns; available health care services and personnel, marketing practices of infant formula manufacturers and urbanization. Infant feeding practices have long been recognized as important determinants of specific less than five years Diarrhoea as indicated by Gordon et al. (1963). The mother is noted to be a focal person in deciding the onset of weaning which has impact on
Diarrhea. Studies by (Jason et al, 1984) coined the term "weanling diarrhea" to describe this association between infant feeding practices and infectious diseases have been examined in numerous additional studies. While improved water supply and sanitation do require some behaviour modification in that facilities need to be used and maintained hygienically, it is arguably change of a more limited nature. Moreover, water supply and sanitation entail other benefits – for example, improved water supply enables safe hygiene practices such as hand washing, and there may be substantial community spillovers in terms of environmental health benefits from sanitation, as documented by Root (2001) and (2008).

Feeding practice domain provides a yard stick in assessing the MSE in Diarrhoea prevention because it focuses on key elements of child growth and development including physical, cognitive and affective. The mothers'ability to make healthy choices in feeding practices is a key element of in the scale to measure MSE in Diarrhoea prevention

**Mothers’ self-efficacy in Diarrhoea prevention and maternal hygiene risks.**

There was a correlation between MSE and perceived maternal hygiene risks which included; keeping the compound clean from faeces , wash hands with soap; after cleaning baby defecated and disposal of faeces, before feeding the child and keep family healthy.

Mothers’ personal hygiene practices have been shown to influence child health outcomes (Stanton and Clemens 1987). In Kenya, since mothers are the primary caregivers, their hygiene, sanitation, water treatment, and home treatment behaviors provide the first line of defense against child diarrheal illness. Many reasons have been offered as to why variant between mothers’ practices exists: level of biomedical knowledge, resource limitations, socioeconomic status, erroneous beliefs, and systemic problems. Specifically for mothers’preventive practices for diarrheal illness, resource limitations, children not complying with mothers’ efforts, and mothers’ forgetfulness were identified as barriers, whereas level of biomedical knowledge was not (McLennan 2000).

Maternal health risks are to date the best means of measuring mothers'ability in prevention of Diarrhoea by including the 5 elements.

**Mother’s self-efficacy in prevention diarrhea and household environmental risks.**

The mothers’ self – efficacy had a significant relation with perceived household environmental risks which included; keeping compound clean by; disinfecting the latrine slab, disposing the garbage way from the compound, burying or disposing in closed containers, by constructing using the utensil stand and defecating in a proper site.

In the developing world; unsafe drinking water, inadequate availability of water for hygiene and lack of access to sanitation together contribute to about 88 % of deaths from diarrheal diseases or more than 1.5 million children under- five perish from diarrhea each year (Black et al 2003).

Excreta can contaminate water sources, and contaminated water can be drunk directly or used in food preparation. Children under 5 years are the principal victims of diarrheal disease, the environment is likely to be the home and its immediate vicinity. Improved infrastructure, such as water and excreta disposal facilities, can also contribute to preventing transmission. However, public infrastructure can only be fully effective if employed in conjunction with safe hygiene practices in the home (Cairncross 1990).

Decreasing the burden of Diarrheoa would require the mother as the primary caregiver to consistently perceive the HH environmental risks. Hence the need to develop MSE scale factoring in the key elements in this
domain in order to assess the use latrines for defecation, young children’s feces to be disposed of properly in the latrine, and mother ability to wash hands with soap or ash after defecation and before eating (Chaggu et al. 2002). Because most diarrheal episodes are caused by pathogens that are spread through fecal-oral pathways, simple public health interventions such as safe disposal of human waste and proper hand washing can be highly effective to prevent transmission.

**Mother’s self-efficacy in prevention diarrhea and health services awareness**

Mothers’ awareness on health services had a relationship with MSE in prevention of Diarrhoea. Health care service awareness included the belief that the HW will always keep their child healthy, the mother can always take the child to the HF for; growth monitoring, immunization, treatment for minor ailment and Diarrhoea treatment.

The features of modern health care found to be associated with lower rates of breastfeeding included: (1) delays or interruptions of nursing; (2) routine use of supplemental formula in the hospital and its distribution to the mother at discharge; (3) fixed feeding schedules; (4) lack of knowledge about breastfeeding technique and management among medical and nursing practitioners or a lack of initiative to modify standing procedures to better assist the new mother (AAP, 1982, Lawrence, 1982).

Health services domain provides key elements of MSE scale to measure and promote mothers ‘ability to utilize the health services. The domain provides the second line of Diarrhoea prevention thus providing the linkage between the mothers’ability to utilize the health care services.

**Conclusion:**

The outcome of this research includes a significant progress toward a fully validated scale that can measure MSE in prevention of Diarrhoea. The MSE scale is in the form of 5 domains for measuring perceived Diarrhoea risks. The MSE scale uses specific (child feeding risk, feeding practices risk maternal hygiene risks) and general domains (HH environmental risks, health services awareness). The MSE provides comprehensive perceived Diarrhoea risks for children less than 5 years. The proposed MSE scale may be adopted and modified depending with the user’s perceived proximate factors that may influence the independent perceived risks.

**Recommendations on policy:**

The MSE scale can also provide policy makers with a detailed sustainable household approach in Diarrhoea prevention. Further, a breakdown of the 5 domains allows policy analysts to pinpoint areas of strength and weakness in MSE in Diarrhoea prevention, thus providing a balanced perspective in guiding Diarrhoea prevention intervention.

**Recommendations on programs:**

Community based Diarrhoea prevention programmes need to adopt the MSE scale to assess mothers’perceived risks in order to implement specific interventions that will promote and sustain Diarrhoea prevention strategies at the HH levels.

**References:**

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