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Child Malnutrition in a Developing Country: A Persistent Challenge in Haiti

Jeanne M. Constant-Edma
Walden University

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Walden University

College of Health Sciences

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Jeanne Constant-Edma

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Review Committee

Dr. Hadi Danawi, Committee Chairperson, Public Health Faculty

Dr. Amany Refaat, Committee Member, Public Health Faculty

Dr. Jagdish Khubchandani, University Reviewer, Public Health Faculty

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Abstract

Child Malnutrition in a Developing Country: A Persistent Challenge in Haiti

by

Jeanne Constant-Edma

MHSA, Barry University, 2009

BHSA, Barry University 2007

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

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Public Health

Walden University

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Abstract

Malnutrition is characterized by the insufficient intake of certain nutrients and the inability of the body to absorb or use these nutrients. This health problem continues to be a persistent challenge among children under 5 years of age in developing countries, including Haiti, despite food aid provided. The purpose of this study was to determine the association between dietary habits in children under 5 years of age in Haiti and their malnutrition status. Community organization theory was used to determine the association between determinants of health such as dietary habits, parents' knowledge and experience, cultural eating habits, socioeconomic status, and the outcome of malnutrition status. This study was quantitative using a cross-sectional study design. A total of 113 participants that were parents or legal guardian of children under 5 years of age were used in the data analysis. A chi-square test for association was used for analysis. The results showed a statistically significant association between dietary habits, cultural eating habits, socioeconomic status, and cultural food taboos and moderate malnutrition, with the following Pearson chi-square respectively (113.000), $p=0.000$; (5.811), $p=0.016$; (70.236), $p=0.000$; and (4.181), $p=0.041$. There was no statistically significant association between knowledge and experience and moderate malnutrition ($p=0.771$). The results of this study could bring positive social change by guiding healthcare practitioners in future practice to have a cultural approach when developing nutrition intervention programs for population in developing countries with diverse cultural background.

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Dedication

I want to dedicate this paper to my other half, J. Roosevelt Edma for his endless support throughout this long journey. His encouragement has motivated me to achieve this challenging process. How can I forget my 16 years old son, Ricard, who never stops to remind me that it is time for me to finish and graduate? He always checked on what chapter I am writing on and planned on the graduation date. And finally, Megan, my 14 years old daughter, who always ensures that my phone is away from me to prevent disturbance when I am working on a chapter. There is no way I could achieve this without your support.

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Chapter 1: Introduction to Study

Introduction

Malnutrition is described as the insufficient intake of certain nutrients and the inability of the body to absorb or use these nutrients (World Health Organization [WHO], 2014). Reports from the WHO (2014) indicated that inadequate nutrition in children under 5 years of age reduces their ability to reach their full physical and mental potential. Proper nutrition is essential for healthy growth, organ formation, and function, social and economic development (WHO, 2014). Research results also indicated that malnutrition is a resulting factor to poverty, which prevents people from learning new skills for the development of their community and economic growth (UNICEF, 2013). Proper nutrition implies the balance between the supply and intake of nutrients that are needed for body development and child growth (UNICEF, 2013; WHO, 2014).

This study was conducted to understand the reasons why malnutrition continues to be a persistent challenge for rural areas in Haiti and their inability to eradicate malnutrition health problems among children under 5 years of age. The implications of this study may motivate experts in the field to review their plan of action in the fight against child malnutrition and identify appropriate strategies when developing nutrition programs intervention that will be used in rural areas of developing countries with a diverse cultural background like Haiti.

The first section of this chapter will include a brief background of the health problem, the problem statement, the purpose of the study, research questions and hypotheses, theoretical framework, and the nature of the study. Furthermore, the chapter

will cover the definitions of the dependent and independent variables, the assumption and limitations, and the scope and delimitations. The significance, social implications, and a summary will conclude this chapter.

Background

Over the past decades, malnutrition remains a challenging health problem that continues to affect the lives of children under 5 years of age in developing countries,. Researchers argued that malnutrition continues to be a major public health issue in Haiti among children under 5 years of age (Ayoya, Heidkamp, Ngnie-Teta, Pierre, & Stoltzfus, 2013) For many years, Haiti has heavily relied on foreign aid for basic needs, including food (Buss, 2008). Besides food aid, several other options have been studied to overcome the health problems associated with malnutrition. These include ready to use therapeutic food, market-based and cash transfers, climate change, and agricultural policies to provoke independent agriculture (Awokuse, 2011; Amthor, Cole, & Manary, 2009; Bloem, Semba, & Kraemer, 2010; Kandala, Madungu, Emina, Nzita, & Cappuccio, 2011). Despite all these assistances, child malnutrition remains an ongoing crisis in Haiti, particularly in rural areas. Child malnutrition has been recently defined as a dynamic imbalance between the number of required nutrients and intake necessary for body development and child growth (Mehta et al., 2013). Middle upper arm circumference (MUAC) is the anthropometry tool mostly used in the classification of malnutrition among children under 5 years in developing countries (Shah, Shaikh, Memon, Rehman, & Nizamani, 2014). MUAC is a simple and accurate indicator of weight-for-height that classifies acute malnutrition (Shah et al., 2014).

Classified as severe or moderate, the problem of malnutrition is a contributing factor in child mortality and morbidity, including common public health problems (Amugsi, Mitlelmark, & Larte, 2013; Chang et al., 2012; Mbuh & Nembu, 2013; Garba & Mbofung, 2010). Severe malnutrition affects more than 20 million children and had been a threat to substantial progress towards the achievement of Millennium Development Goals (MDG) including MDG1 that eradicates extreme poverty and hunger, and MDG4 which is reducing mortality in children under 5 by 2015 (WHO, 2011). While researchers have reported progress for these two goals in many developing countries, many of them have not only missed the target of MDG 2015 but are also far from meeting the agenda of Sustainable Development Goals (SDGs) by 2030 because the apparent slow pace does not provide evidence for acceleration (Amugsi et al., 2013). SDGs are drawn from MDGs and are adopted with the objective for countries to mobilize efforts to end all form of poverty (United Nations, 2016). For this study, SDG2 is the goal of interest where the target is to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture (United Nation, 2016). Meanwhile, scientists argued that children with moderate malnutrition are at three times greater risk of death and morbidity from infectious diseases than those who are well-nourished (Chang et al., 2012). Many children with moderate malnutrition go on to become severely malnourished and face a life-threatening situation (WHO, 2014).

Researchers believe that the recommended food regimen for moderate malnutrition may be insufficient for full recovery (Briend & Prinzo, 2009). This issue is because the food supplements provided are high in protein and fiber, low in fat, and does

not seem to be the best food regimen for rapid growth among children with malnutrition (Briend & Prinzo, 2009). In my study, I tried to find if there is an association between dietary habits and malnutrition among children under five in Felix, Port-Salut. More specifically, I looked at the association between parents' education, cultural eating habits, socioeconomic status as independent variables, and moderate malnutrition as the outcome. While several studies on moderate malnutrition have been conducted in developing countries, none have been done in Haiti to evaluate whether the food regimen provided in the treatment of malnutrition by food aid programs is sensitive to the population's needs taking into consideration their cultural eating habits to overcome the health problem of malnutrition.

Problem Statement

Despite the investment of billion dollars of food aid in Haiti, malnutrition remains an ongoing crisis in rural areas (Buss, 2008). Several studies have been conducted before to evaluate the use of different methods to overcome the health problem of malnutrition in Haiti in terms of ready to use therapeutic food, market-based and cash transfers, climate change, agricultural policies (Awokuse, 2011; Amthor et al., 2009; Bloem et al., 2010; Kandala et al., 2011). However, research that investigates the nutritional status of children under 5 years of age before become severely malnourished is limited. It is then necessary to address this gap in the literature which could allow better health intervention programs to address severe malnutrition among this group of the population in developing countries.

Purpose of the Study

The purpose of this study was to determine the association, if any, between dietary habits, parents' knowledge and experience, socioeconomic status, cultural eating habits, and cultural food taboos (independent variables) and malnutrition status (dependent variable) among children under 5 years in this small community of Port-Salut, Haiti. Dietary habits in this study include homemade cooking, snack foods consumption, number of meals per day, and fruit and vegetable usage. Parents' knowledge and experience is defined as the level of knowledge gained through experiences on essential nutrients needed for a healthy diet. Socioeconomic status includes three components in terms of level of education, working status, and income. Cultural eating habits included traditional meal as opposed to healthy eating. Cultural food taboos included food choices of parents according to culture or religion. This will contribute to the information about the impact of nutritional choices and malnutrition status. The dependent variable of malnutrition status was defined as moderate malnutrition and was coded in this study as present (1) or absent (0).

Research Questions and Hypotheses

RQ1: What is the association between dietary habits and moderate malnutrition status as the outcome?

H_0 1: There is no statistical association between dietary habits and moderate malnutrition status as the outcome.

H_a 1: There is a statistical association between dietary habits and moderate malnutrition status as the outcome.

RQ2: What is the association between parents' knowledge and experience and moderate malnutrition status as the outcome?

H_{02} : There is no statistical association between parents' knowledge and experience and moderate malnutrition status as the outcome.

H_{a2} : There is a statistical association between parents' knowledge and experience and moderate malnutrition status as the outcome.

RQ3: What is the association between cultural eating habits and moderate malnutrition status as the outcome?

H_{03} : There is no statistical association between cultural eating habits and moderate malnutrition status as the outcome.

H_{a3} : There is a statistical association between cultural eating habits and moderate malnutrition status as the outcome.

RQ4: What is the association between socioeconomic status and moderate malnutrition status as the outcome?

H_{04} : There is no statistical association between socioeconomic status and moderate malnutrition status as the outcome.

H_{a4} : There is a statistical association between socioeconomic status and moderate malnutrition status as the outcome.

RQ5: What is the association between cultural food taboos and moderate malnutrition as the outcome?

H_{05} : There is no statistical association between cultural food taboos and moderate malnutrition as the outcome.

H_{a5}: There is a statistical association between cultural food taboos and moderate malnutrition as the outcome.

Theoretical Framework

In this study, I used community organization theory. In community organization theory, people from the community come together to discuss regular problems that affect the community, establish goals, make the most use of their resources, and make plans to achieve collective goals (Glanz, Rimer, & Viswanath, 2008). The key constructs of community organization theory include empowerment, critical consciousness, community capacity, social capital, issue selection, and participation and relevance (Glanz et al., 2008). Empowerment is the central point of community organization theory as people are called upon to remove the barriers that prevent them from identifying problems and solutions for issues that affect their lives and achieving equity (Glanz et al., 2008). This theory is summarized into three categories: empowerment, social capital, and community participation (Glanz et al., 2008). Through these three keys, people are engaged in dialogue and actively work to identify common problems to collectively improve the conditions of their life. Once these issues are well understood among all members of the community, they can create social action to modify negative outcome in the community and increase social change (Glanz et al., 2008). Glanz et al. argued that this is important to use community organization in health education because it reflects the principles of starting where the people are. Malnutrition is a health issue that starts where the people are, and therefore health education is necessary for proper nutrition among people.

Malnutrition is a health problem affected by socioeconomic determinants, and therefore, social involvement is critical to overcome the problem. In the history of community organizing, scientists argued that the strategies associated with the theory had been used to obtain social change (Glanz et al., 2008). Researchers reported that around the 1980s, the WHO had shown interest in using such a theory to empower people to take control over the determinants of their health (Glanz et al., 2008). This is believed that an increase involvement of people in the determinants of their health may create a more stable environment and process. The use of the key constructs of community organization theory linked to each variable of this study is shown in Table 1.

Figure 1

Key Constructs of Community Organization Theory

Constructs	Variables	Linkage
Empowerment	Dietary habits	People are empowered to adopt eating habits that prevent the onset of moderate malnutrition
Critical consciousness	Parents' knowledge and experience Level of education	Community leaders need to take action to educate parents in the community about proper nutrition
Community capacity	Parents' education Level of education	Identify the vehicles or channels to address the health problem associated with malnutrition to educate parents on choices for better nutrition
Social Capital	Socioeconomic status Working status	Engagement of the community to work together to improve their socioeconomic conditions
Issue selection	Cultural eating habits Cultural regimen	People come together to identify traditional meals in their culture that improve nutrition
Participation and relevance	Dietary habits	People take control of their children health by making decisions to change their dietary habits and therefore reduce the prevalence of moderate malnutrition among children under five years of age in their community.

Nature of the Study

The nature of this study was retrospective quantitative approach using a cross-sectional study design. Cross-sectional is an observational study design used to evaluate the association between several independent variables and an outcome (Creswell, 2009). Because confounding factors in child malnutrition, the choice of cross-sectional study design gave me the ability to control for multiple confounders in the analysis stage. Additionally, this study design allowed me to assess the independent variables to the outcome of nutritional status. Malnutrition is defined as the inability of the body to absorb nutrients that can properly maintain health and therefore, can result in frequent infection (WHO, 2014). Also called undernutrition, it is characterized by the inadequate intake of protein and micronutrients (Maleta, 2006). The population for this study included children under 5 years, regardless of their nutritional status. I selected retrospective quantitative with the perspective to evaluate the significance of dietary habits in the management of moderate malnutrition in the population of interest.

Operational Definitions

Cultural eating: Cultural eating is defined using the definition of culture. Culture has been defined as the set of behavior, attitudes, language, thoughts, communications, actions, customs, values, and beliefs used by an individual, racial, or social group (Nixon-Cave, K., and Meadows, 2014; Centers for Disease Control and Prevention, 2014).

Cultural food taboos: Food prohibited based on religion, culture, or societal (Meyer-Rochow, 2009). Cultural food taboos and cultural regimen will interchangeably be used throughout this paper.

Dietary habits: Dietary habits is defined using the definition of food selectivity. Food selectivity has been defined to include three domains that include food refusal, limited food repertoire, and high frequency single food intake (Bandini et al., 2010).

Education: Education can be defined as the knowledge, skill, and understanding get from school and used by individuals to interact between subjects in society (Schaffar, 2014).

Malnutrition status: The interaction between undernutrition and infection that can create a potentially lethal cycle of worsening illness and deteriorating nutritional status (UNICEF, 2013).

Socioeconomic status (SES): Socioeconomic status is defined as the social rank of an individual or group that combines income, education, and work status (CDC, 2014)

Assumptions and Limitations

In my study, there was an assumption that the participants understood and provided positive responses to the questions. Additionally, it was assumed that the researcher is culturally competent to draft the survey instrument. Moreover, the researcher is competent in participants language, and bias is minimized in translation. Meanwhile, there were some limitations including recall bias in self-report data. The limitation extended to the fact that the sample was limited to children under 5 years of age who were represented by their parents or legal guardian.

Scope and Delimitations

The scope of my study was cross-sectional and involved analysis of data collected from a pediatric hospital in the town of Felix, Port-Salut. The goal was to identify the

association of some factors that can help reduce malnutrition among children under 5 years of age. I attempted to control for confounders that can impact the nutritional status of children under 5 years of age.

Significance

Over the years, food aid to developing countries has been estimated to be billions of dollars (Buss, 2008). According to the World Food Programme (WFP), more than 3 million people require humanitarian relief, with 1.9 million in need of food assistance in 2010 (WFP, 2010). Findings of this study could be used as supporting evidence to identify appropriate food regimen supplements for the treatment of moderate malnutrition in developing countries of diverse culture. The results could also provide a better understanding of the problem to experts in the field with the persistent challenge of malnutrition in developing countries and help them develop better nutrition intervention for this group of the population.

Social Implications

The results of my study could enhance the knowledge of experts in the field for a better approach when developing nutrition intervention program for a population with diverse cultural eating habits from developing countries. An adapted program could also help prevent unnecessary food assistance programs and therefore develop intervention programs to educate parents on proper nutrition, and children under 5 years of age could benefit from high nutrition value. Consequently, child mortality rate could be reduced, and future generations will be protected from continuous infectious diseases resulting from malnutrition.

Summary

Malnutrition is a health problem that significantly contributes to child mortality rate in developing countries. This could prevent the achievement of the MDGs to reduce children mortality by 2015 (WHO, 2011). This study aimed at determining the association between dietary habits and malnutrition status. The findings would add to the knowledge for experts to identify adapted health education programs that can be applied in population of diverse cultural background that continue to experience persistent challenge of malnutrition. Community organizing theory was used because this theory can empower people to take control of their life and their environment. This theory has been used in the past in health education and promotion program due to the fact it reflects the principle of starting with the people. This theory also increase the involvement of people in taking control of the determinants of their health for a more stable environment.

Chapter 2 includes an overview of malnutrition status among children under five in developing countries. Chapter 3 includes the research design, methodology, the procedure of sample size and recruiting participants, and details on data collection and analysis. Additionally, this chapter includes survey instrument and procedure of development and validation. Chapter 4 provides the results of the study, and Chapter 5 includes the interpretation, recommendation, implications, and conclusion.

Chapter 2: Literature Review

Introduction

Malnutrition is defined as the imbalance between the intake of nutrients needed for body development and the inability of the body to absorb or use these nutrients (WHO, 2014). Malnutrition remains a challenging and persistent health problem that continues to affect the lives of children under 5 years of age in Haiti (Ayoya et al., 2013). Several options have been explored to overcome the health problems associated with malnutrition including billion dollars of food assistance program (Awokuse, 2011; Anthor et al., 2009; Bloem et al., 2010; Kandala et al., 2011). There is limited research that investigates the nutritional status of children under 5 years of age before they become severely malnourished. Classified as severe or moderate, malnutrition is a contributing factor in child mortality and morbidity, including common public health problems (Amugsi et al., 2013; Chang et al., 2012; Garba & Mbofung, 2010; Mbuh & Nembu, 2013). Severe malnutrition affects more than 20 million children and creates a major challenge in achieving the MDG of reducing mortality in children under five by 2015 (WHO, 2011) and is also a target of United Nation Millennium Goals (MDG1) that is to almost eliminate hunger by 2015 among more than 99 million of undernourished and underweight children under 5 years of age (United Nations, 2014).

Purpose

The purpose of this study was to determine the association between dietary habits, parents' education, cultural eating habits, socioeconomic status, level of education, cultural regimen, and working status (independent variables) and malnutrition status

(dependent variable) among children under five in the small community of Félix, Port-Salut. This section reviewed the literature that supported and guided this study. The review focused on the association between malnutrition status and some variables such as dietary habits, parents' education, cultural eating habits, cultural food taboos, and socioeconomic status. The review also discussed the theoretical framework used in this study of moderate malnutrition among children less than 5 years of age.

Preview of Chapter

The literature review began with a detailed history of the theoretical framework and is followed by a description of the country of choice and a discussion of articles on malnutrition among children under 5 years of age in developing countries and the factors associated to malnutrition. The review was centered on articles that focus on the association between malnutrition status and dietary habits, parents' education, cultural eating habits, cultural food taboos, level of education, working status, and socioeconomic status. I also reviewed and discussed articles related to the theoretical framework of the dissertation that is community organization theory. Because of the large number of articles available for the study, I focused only on articles discussing malnutrition among children less than 5 years of age in developing countries.

Literature Search Strategy

Articles were searched from Academic Search Premier, ScienceDirect, Proquest Central, Cochrane Database, and Google Scholar. A commercial search engine, such as Google, was also used. The key terms used included *malnutrition*, *child malnutrition*, *severe malnutrition*, *moderate malnutrition*, *dietary habits*, *education*, *culture*, *cultural*

food taboos, socioeconomic, and developing countries. These key terms were used in combination or alone throughout the research for this topic. I reviewed more than 150 articles that were mostly published less than 5 years ago. They were a few articles older than 5 years that were used because of relevant information for this study. I also reviewed some books in the field of nutrition, notes from experts, educators, and papers from scholars. The articles were then classified according to the variables needed for this study.

Theoretical Framework

Community Organization Theory

The theoretical framework for this study is community organization theory. Community organization theory is defined as "a planned process to activate a community to use its own social structures and any available resources to accomplish community goals that are decided primarily by community representatives and generally consistent with local values" (Bracht, 1999, p. 86). People from the community are motivated to participate together in achieving program goals, using multiple strategies to promote community health. In community organization theory, primary prevention is emphasized on the people (see, Glanz et al., 2008). In the history of community organizing, scientists argued that the strategies associated with the theory had been used to obtain social change (Glanz et al., 2008). Glanz et al. (2008) reported that the WHO had shown interest in using such theory to empower people to take control over the determinants of their health around the 1980s. This is believed that an increase involvement of people in the determinants of their health may create a more stable environment and process.

Empowerment is the central point of community organization theory as people are called upon to remove the barriers that prevent them from identifying problems and solutions for issues that affect their lives and achieving equity (Glanz et al., 2008). Glanz et al. suggested that community organizing is the most important theory to use when doing health education because it starts with the people. It is more likely to be successful in changing health behavior when the education addresses and begins with the community's needs.

History of community organizing theory

The term of community organization was first used in the late 1800s by American social workers when there was a need to coordinate services for newly arrived European immigrants (Glanz et al., 2008). Meanwhile, the theory of community organizing originated in the late of the 19th century with several movements that include the post-Reconstruction period, the populist movement, and most importantly with the direct social action movement by Alinsky in the 1930s (Cohen, Chavez, & Chehimi, 2010; Glanz et al, 2008). The results of the direct social movement have created better work conditions and better health for all factory workers. The most remarkable result with community organizing theory in public health happened with healthcare professionals, Geiger and his colleagues at the Mississippi Healthcare Center noticed a large number of malnutrition and stunted growth cases among infants and young children visiting the health center (Cohen et al., 2010). These healthcare providers reacted by writing a prescription for food to these malnourished and stunted children, recruiting local Black-owned grocery stores to fill those prescriptions, and later on used the funds on healthcare

pharmacy budget to reimburse these grocery stores (Cohen et al., 2010). Their actions provoked a furious reaction from officials whom later had no other choice than acquire acres of land to grow crops and allowed families to share in the plants to prevent Geiger and his colleagues to use the pharmacy's budget for the treatment of malnutrition in the community (Cohen et al., 2010). This demonstrated that community action can bring people together for common good.

Although community organizing theory has been historically dominated by White male organizers, the model has been adopted throughout the 1960s and 1970s by a community of color (Glanz et al., 2008). The WHO adopted this theory around the mid 1980s to increase awareness and incite people to take over the control of the determinants of their health and to reduce health disparities (Cohen et al., 2010; Glanz et al., 2008). While there is no precise model for community organizing, there are five key concepts central to this approach. They include participation and relevance, empowerment, critical consciousness, community competence, and issue selection (Glanz et al., 2008). Glanz et al. argued that empowerment is the central point of community organization. People in the community should be aware of the issues affecting their health and decide to take over control of the determinants of their health. As soon as the problem is identified by the community, people can develop action plans and participate in the change process to solve the problem.

Haiti and Child Malnutrition

Haiti is one of the poorest countries in the Western Hemisphere, with a population of over 10 million (USAID, 2014). About 1.2 million are children under 5 years of age,

with an estimated of 11% being malnourished (USAID, 2014). Researchers indicated that Haiti has the highest rate of child malnutrition in the Caribbean and Latin America and remain a major and silent public health concern (Ayoya, Heidkamp, Ngnie-Teta, Pierre, & Stoltzfus, 2013). Ayoya et al. (2013) stated that despite some progress made in the fight of child malnutrition among children under 5 years of age in Haiti, there is a potential for pocket of malnutrition in certain rural areas across the country which is not different for the target city of Port-Salut. Port-Salut is a city located in the coastal region of the southern department of Haiti. The population is about 65,000, with half of them estimated to be children (No Time for Poverty, 2014). Children in this area, particularly in the town of Felix, are dying from treatable conditions such as diarrhea, pneumonia, and malnutrition (No Time for Poverty, 2014). Hence, the reason to conduct this study in this town.

Dietary Habits

Researchers argued that food choices are often based on a combination of genetic and environmental factors (Scaglioni, Arrizza, Vecchi, & Tedeschi, 2011). Since parents have great influences on their children environment, there is a good opportunity to model their children good or wrong eating habits. Scaglioni et al. (2011) stated that food choices among children are based on taste, and this can play a major role in nutrition regimen. Children are more likely to reject vegetables that are rich in essential nutrients and favor sweets and food with high fat that can be detrimental to their nutrition status (Scaglioni et al., 2011). Children will also eat food they are familiar, which can reduce the acceptability of foods that can provide a balanced diet (Scaglioni et al., 2011).

Contrarily, Sekiyama, Roosita, and Ohtsuka (2012) conducted a study to determine snack food consumption among children in rural Indonesia and revealed that Indonesian children consumed snack food for energy intake. While the authors agreed that some snack foods are high in fat and iron, it lacks essential micronutrients like calcium, vitamin A, and C. for balanced nutrition (Sekiyama, 2012). Intake deficiency of these vitamins provokes linear growth impairment among children less than 5 years of age (WHO, 2011). Sekiyama et al. (2012) stated that the results of the study showed that the z-score of height for age among these Indonesian children was significantly lower than those who consumed fewer snack foods. Z-score of height for age is an anthropometric tool defined by the WHO to measure malnutrition status among children less than 5 years of age (WHO, 2011).

Furthermore, in a study conducted by Zhou, Wang, Ye, Zeng, & Wang (2012), it was revealed that while exclusive breastfeeding was frequently used among mothers right after birth, this was significantly reduced at 5 to 6 months of age to introduce solid, semisolid or soft foods. This has provoked a high prevalence of stunting among infants of 6 to 8 months old because they were introduced too early to semisolid food (Zhou et al., 2012). Zhou et al. explained that the quality of food received by children of this age was in part responsible for malnutrition in this community. Furthermore, Nnakwe and Onyemaobi (2013) suggested that eating patterns are often associated with food insecurity. Food insecurity means limited access to adequate and safe food (Nnakwe & Onyemaobi, 2013). When access to adequate food is limited, people will adhere to what

is available to them and therefore develop eating habits only to satisfy their hunger. This creates poor intake of micronutrients necessary to a balanced nutrition.

Although these researchers have established an association between dietary habits and child malnutrition, they did not review the association between dietary habits and moderate malnutrition, which is one stage before severe malnutrition. In this study, I evaluated the association between dietary patterns and moderate malnutrition among children under 5 years of age in the small town of Felix. I also examined the practice of breastfeeding at the very early age among children under 5 years of age with moderate malnutrition, and the association of food security and moderate malnutrition among children under 5 years of age in the town of Felix.

Parents' Knowledge

According to Scaglioni et al. (2011), parents education has a significant impact on children eating habits. They often use various methods to introduce food that is sometimes counterproductive in children under 5 years of age (Scaglioni et al.,2011). The control or pressure for food acceptance can reduce the willingness to try new food items containing good nutrients but can be less tasty than unhealthy food (Scaglioni et al.,2011). The authors argued that pediatrician should strive to educate parents on how to introduce healthy food to their small children (Scaglioni et al.,2011). Similarly, Vereecken and Maes (2010) argued that a lack of nutritional education appeared to have a detrimental impact on children food regimen. The nutritional knowledge of parents, particularly young mothers, is essentially important to improve the dietary intake of children under 5 years of age. Vereecken and Maes stated that parents with a lack of

nutritional knowledge believed that healthy foods are too expensive or take an extra workload to prepare healthy meals. As a result, they will choose a traditional meal that could be unhealthy or run to pick up snack food (Vereecken and Maes, 2010). My research study tried to support or reject these authors findings in regards of the contribution of parents knowledge and experience to the onset of moderate malnutrition.

In a separate study, some researchers investigated on the association between an increase nutrition knowledge in mothers and increase in children growth and found out that maternal nutritional knowledge positively impacts anthropometric measures in children under 5 years of age (Ali et al., 2015). Preventive health care is often used by parents who have some type of nutritional education (Ali et al., 2015). Aslam and Kingdon (2012) agreed with the fact that parents' education impacts the well-being of their children in many ways. An educated father is more likely to ensure that his children get the immunization needed while an educated mother with health knowledge will have better control on their children height and weight (Mengesha & Ayele, 2012). These studies have reported on the association between parents' nutritional knowledge but did not specify the stage of child malnutrition. In this study, I evaluated the status of nutritional knowledge and experience among parents of children less than 5 years of age affected by moderate malnutrition.

Socioeconomic Status

Scientists argued that malnutrition is often associate with poverty (Nnakwe & Onyemaobi, 2013). People are often limited to obtain the quality and quantity of food needed or desired because of financial difficulties. Parents will use food items that are

accessible to them just to control the hunger of their children that are most of the time low in essential nutrients (Nnakwe & Onyemaobi, 2013). Furthermore, Ying, Lininger, Ung, and Ying (2015) conducted a study in developing countries including Haiti to investigate on living conditions and malnutrition; it was found that children living in poorer conditions are more likely to suffer from stunting, being underweight, and limited access to care. Preventive intervention is also very limited among children of poorer family than those in wealthier family (Ying et al., 2015). These preventive interventions include immunization, nutrition counseling, growth monitoring, and micronutrient supplementation. In a further study, Khan and Raza (2014) argued that household size and income play an important role in children nutritional status. A household with many children has fewer resources to share and then increase the risk of stunting while a family with fewer children tend to have a lesser risk of wasting food.

On the other hand, Keding, Msuya, Maass, and Krawinkel (2011) claimed that the power of decision making in a household is the most important point to consider than wealth. The person deciding on nutrition for the family may know about proper nutrition but is not able to apply this knowledge for the well-being of children living in this household. Researchers from these studies have indicated the association between socioeconomic status and malnutrition but did not report on whether this association applies to moderate or severe malnutrition among children under 5 years of age (Keding et al., 2011). In my study, I examined the effect of decision-making power, household income, and size on moderate malnutrition among children under 5 years of age living in those households to help mitigate the gap found in previous research.

Level of Education

Scientists argued that the literacy level of parents, particularly mothers, has an important impact on the nutritional status of children under five years of age (Khan & Raza, 2014, Garcia et al., 2013). This is because parents with poor education are more likely to have unhealthy behavior, inappropriate health care practice, or limited living conditions (Khan et al., 2014). In line with other researchers, Abuya et al., (2012) found out that parents with formal education can identify an illness in their children and seek medical treatment as early as possible. Formal education also allows parents to read medical instructions and apply the treatment as directed (Abuya et al., 2012). Abuya et al. did not evaluate the association between level of education and moderate malnutrition among children under five years of age, I examined how the level of education of parents affect the nutritional status of children under five years of age.

Working Status

Researchers reported that parental working status is a contributing factor in malnutrition among children under five years of age (Wong, Moy, & Nair, 2014; Srivastava, Mahmood, Srivastava, Shrotriya, & Kumar, 2012; Bose, 2011; Haque, Uddin, Khan, & Islam, 2014). Wong et al., (2014) argued that children under five years of age living in a household with high income often experience poor nutritional outcome due to the lack of care practices and poor dietary quality. The non availability of parents does not allow them to monitor the quality of food items provided to their children under five years of age (Wong et al., 2014). Similarly, Bose (2011) reported from a study conducted in India that children of working mothers were more likely to be diagnosed

with malnutrition than those of non-working mothers. Children are often left with love ones who do not share the same interest in the nutrition of the children (Bose, 2011).

Moreover, results from a separate study conducted by Haque, Uddin, Khan, and Islam (2014) a few years later also demonstrated that children under five years of age of non-working mothers have better nutritional status than those of working mothers. Again, this is because non-working mothers have more time dedicated to the care of their children than those who are working (Haque et al, 2014). Haque et al. argued that while working mothers may bring food security in their household, they are not available for in the decision making for nutritious food choice of their children. All these studies have demonstrated the association between parental working status and malnutrition but did not elaborate on the association between working status and moderate malnutrition, a step before severe malnutrition. In this study, I examined the association between working status and moderate malnutrition in developing countries.

Cultural Eating

Culture is a dynamic process that affects the eating habits of a population and keeps changing overtime due to ecological and economic factors (Fieldhouse, 2013). While some food may be the most recommended for a balanced diet in some culture, it may represent bad food items for other culture (Fieldhouse, 2013). This explains that culture may be an issue in following international guidelines to prevent malnutrition among children under five years of age. In a study conducted by Pemunta and Fubah (2014) among infant with malnutrition in Cameroon, it is reported that the feeding practices to introduce traditional weaning foods to infants is a contributing factor to

malnutrition and growth retardation. This is because these foods do not necessarily have the essential nutrients needed for children of early age (Pemunta & Fubah, 2014).

Furthermore, Singh and Vaidya (2015) reported in a study conducted among children under 5 years of age in a small city of India that weaning practices were one of the major contributing factors of malnutrition. Singh and Vaidya had some concerns about the nutritional value in the traditional weaning food provided to children at early ages. Mengesha and Ayele (2015) argued that food regimen is often determined by nutritional needs as well as cultural beliefs. Certain foods with essential nutrients may be prohibited by some culture only because they are considered as profane, lower or higher class, or simply taboo (Mengesha & Ayele, 2015). The authors continued to say that certain other foods may be encouraged because they are the symbol of sacred thing in their religion, hence detrimental to their nutrition. Mengesha and Ayele (2015) concluded to say that nutritional and cultural beliefs create a high risk of malnutrition. Findings of these studies reported on the association between malnutrition and cultural eating habits but not moderate malnutrition among children under 5 years of age. In this study, I evaluated the association between cultural eating habits and moderate malnutrition among children under 5 years of age.

Cultural Food Taboos

According to Perez and Garcia (2013), cultural taboos in food regimen are considered to be contributing factors to the onset of malnutrition status in some developing countries. Findings from Perez and Garcia study conducted in the city of Gambia, Africa demonstrated that expecting cultural norms in feeding practices prevent

parents from providing to their children essential nutrients necessary to balanced nutrition. This explained that nutritional taboos could be considered as a barrier in the choice of nutritious items for children under 5 years of age, and also prevented pregnant mothers and children to consume some food groups that are main sources of vitamin A and C, iron and protein needed for their diet (Perez & Garcia, 2013).. Perez and Garcia continued to say that although most of the food taboos are often affordable to the poorest families and contain the nutritious values to the health of their children, they will choose to respect their tribes to the detriment of wellbeing of their children.

Furthermore, some researchers argued that cultural practices were responsible for the quality of nutritional patterns among children under 5 years of age in some developing countries (Chege, Kimiywe, & Ndungu, 2015). Cultural practices among Maasai in Kenya forbid families to consume food product rich in nutrients needed for stable nutrition Chege et al., 2015). These include fish that is a source of omega three fatty acids, chicken and green vegetables. Additionally, cultural practices of families in certain areas of Kenya required men, who are the sole provider of their families, to leave for a long time seeking pasture, and leave the mothers behind struggling to feed their children under five years of age (Chege et al., 2015). This caused limited access to food for adequate nutrition and therefore lead the household to food insecurity, which is a contributing factor to malnutrition status (Chege et al., 2015).

Moreover, babies in Maasai culture are fed a fatty concoction two weeks after birth because exclusive breastfeeding is not a practice (Chege et al., 2015). Exclusive breastfeeding is a recommendation of WHO for children under six months to prevent

malnutrition (WHO, 2016). While these studies have evaluated the association between cultural food taboos and malnutrition, the authors have not filled the gap to determine the association between cultural food taboos and moderate malnutrition, which is one stage before severe malnutrition. In my study, I evaluated the association between cultural food taboos and moderate malnutrition among children under five years of age.

Summary and Conclusion

Malnutrition is a health problem that affects more than 20 million children in a developing country (WHO, 2011) and is classified as one of the leading cause of death among children under five years of age (Amugsi, Mitlelmark, &Larte, 2013; Chang et al., 2012; Garba&Mbofung, 2010; Mbuh&Nembu, 2013; Scaglioni et al., 2011; Sekiyama et al., 2012; Verecken & Maes, 2010;). Researchers indicated that child malnutrition is associated with a variety of contributing factors including dietary habits, parents' education, culture, and socioeconomic (Abuya et al., 2012; Ali et al., 2015; Garcia et al., 2013; Khan & Raza, 2014; Keding et al., 2011; Mengesha & Ayele, 2015; Nwakwe & Onyemaobi, 2013; Pemunta & Fubah, 2014; Scaglioni et al., 2011; Sekiyama et al., 2012; Verecken & Maes, 2010; Ying et al., 2015; ; Zhou et al., 2012;). Inappropriate feeding practices have been identified as one of the major contributing factor to the onset of child malnutrition that prevents growth and full development among children less than five years of age (Kandala et al, 2011; Scaglioni et al, 2011; Sekiyama et al., 2012; Zhou et al., 2012). Eating habits are categorized as a result of genetic and environmental factor. It is then important to note that malnutrition is a complication of the quality of food provided to children rather than the quantity. Regardless of the quantity of food supplied,

it is necessary that the essential nutrients for growth and physical development be included in the regimen.

Food preferences in children are often based on the influences of parents. Some of the strategies used by parents to encourage feeding may be inappropriate for proper nutrition. The types of controls vary by education and culture. Parents nutritional knowledge is essential to improve dietary intake. This can also help in making an informed decision on nutrition intervention and facilitate better food choices for their children (Ali et al., 2015; Verecken & Maes, 2010). Nutritional knowledge gives parents the ability to use preventive measures in the nutrition of children under 5 years of age and therefore increase anthropometric measures. Children are also fed according to their parents' cultural beliefs. Traditional feeding regimen may lack essential nutrients needed for a balanced diet. Some foods with necessary nutrients may be prohibited in dietary habits because of cultural beliefs and therefore detrimental to the nutrition of children under 5 years of age.

Furthermore, literacy level and socioeconomic status play an important role in the health problem of malnutrition among children under five years of age (Nnakwe Onyemaobi, 2013). Parents with a limited level of education may have difficulties to read and apply instructions as directed on food labeling. They are often prone to unhealthy behavior toward their children. Additionally, these parents will most likely get low-income jobs or no job at all, live in poorer conditions and find themselves unable to meet basic needs (Khan & Raza, 2014; Ying et al., 2015).

Although researchers have demonstrated through the literature the association between the factors mentioned above and child malnutrition, none of them have researched on the association between dietary habits, parents' knowledge and experience, socioeconomic status, cultural food taboos, and moderate malnutrition among children under 5 years of age in developing countries. Children under 5 years of age who reached the degree of severe malnutrition could be prevented if moderate malnutrition is identified on time. Research is needed to determine the association between these known contributing factors and moderate malnutrition among children under 5 years of age. The results from this study could help experts in the field to have a better approach for adapted nutrition programs to address this stage of child malnutrition before getting to a more life-threatening situation. The nature of this study was retrospective quantitative using a cross-sectional study design.

Chapter 3: Research Method

Introduction

This study was to determine the association between dietary habits, parents' knowledge and experience, socioeconomic status, cultural eating habits, cultural food taboos, (independent variables) and moderate malnutrition (dependent variable) among children under 5 years of age in the small community of Port-Salut, Haiti. Dietary habits in this study included homemade cooking, snack foods consumption, number of meals per day, and fruit and vegetable usage. Parents' knowledge and experience are defined as the level of knowledge gained through experiences on essential nutrients needed for a healthy diet. Socioeconomic status included three components in terms of the level of education where parents of children under 5 years of age are classified as school educated or no school educated, working status, and income. Cultural eating habits included traditional meal as opposed to healthy eating. Cultural food taboos include food choices of parents according to culture or religion. This will contribute to the information about the impact of nutritional choices and malnutrition status. The dependent variable of malnutrition status is defined as moderate malnutrition and is coded in this study as present (1) or absent (0).

Chapter 3 includes details on the research study design and rationale in terms of the dependent and independent variables, the choice of the design, how data is collected and analyzed. I also described the target population, sampling strategy and procedure, and recruitment strategy for this study. I also talked about the reliability and validity of the study and ethical procedures for the study.

Research design and rationale

In this study, I used a cross-sectional study design to investigate on the association between the dependent variable of moderate malnutrition among children under 5 years of age and the independent variables of dietary habits, parents' knowledge and experience, socioeconomic status, cultural eating habits, and cultural food taboos. A cross-sectional study design was appropriate for this study because this study involved only one group of the population that was not be treated or exposed. Since there may be confounding factors in child malnutrition, the choice of cross-sectional study design gave me the ability to control for multiple confounders in the analysis stage. Researchers also indicated that a cross-sectional study is more appropriate for quick data collection due to limited resources and time constraints (Checkoway, Pierce, & Kriebel, 2007). The cross-sectional study design is often used to study persistent condition and useful for public health planning (Checkoway et al., 2007). Malnutrition among children under five years of age is a persistent health problem in developing countries, particularly rural areas in Haiti. Researchers using a cross-sectional approach often employ questionnaires or interviews for many studies (Creswel, 2009; Frankfort-Nachmias, & Nachmias, D., 2008), hence the appropriateness to this study because participants answered questions on the nutrition of their children under 5 years of age.

The design allowed me to examine the association between the dependent variable of moderate malnutrition and the independent variables of dietary habits, parents' knowledge and experience, socioeconomic status cultural eating habits, and cultural food taboos, rather than testing a theory or evaluating causality. The cross-sectional design is

also the selected choice for me because it is relatively quick and economical (see Creswel, 2009; Frankfort-Nachmias, & Nachmias, D., 2008). Additionally, the design helped in identifying an association between variables that can be studied later more rigorously using a different study design such as cohort study design or randomized controlled study (see Mann, 2003).

Methodology

Population

When conducting quantitative research studies, it is important for researchers to ensure that the population of interest is properly defined and identify the characteristics that will provide answers to the research question (Frankfort-Nachmias & Nachmias, 2008).. Frankfort-Nachmias and Nachmias, defined population as a complete set of data in which an investigator is interested in finding explanations to a social issue The population for this study included the parents of children under 5 years of age living in the town of Felix, Port-Salut acting as a proxy for their children. Participants were included regardless of their nutritional status. The characteristics that were attributed to this population included occupation, education, and income.

Sampling and Sampling Procedures

After defining the population, the next step was to look at the elements needed to determine the sample size approximately. To do this, it was important to identify the sampling strategy that provided the best answer to the research question. With a perspective to increase the level of accuracy in my findings, simple random sampling of probability sample design was used. This sampling method allowed me to eliminate

systematic bias from the selection procedure (see Frankfort-Nachmias & Nachmias, 2008). The sample was drawn from a center of child malnutrition of a pediatric hospital located in the town of Felix, Port-Salut, Haiti. This center provides treatment to children with a diagnosis of moderate and severe malnutrition. Children with no diagnosis of malnutrition are also treated at this facility. The sample included parents and legal guardians of children under 5 years of age living within the town of Felix, Port-Salut regardless of their malnutrition status. Parents and legal guardians of children who have been diagnosed with severe malnutrition were excluded from the sample of the study.

To find out the size of the sample, I determined the statistical power, the confidence interval or alpha, and the effect size for the intervention. The statistical power assists me in the detection of a real treatment effect or real association between variables. Alpha, also called confidence interval, is the level of confidence that I wanted to have to determine whether to reject the null hypothesis or not (see Ellis, 2010). Effect size has been used in research to determine the degree of association between variables (Ellis, 2010). Researchers also indicated that the magnitude of the effect size is important to demonstrate the rigor in findings and achieve adequate statistical power (Brand & Bradley, 2016; Heide, 2015). For this study, the statistical power was set at 80%, a confidence interval of 95%, and a medium effect size of 0.15. Using Cohen G*Power 3.1.9 calculation, with a linear logistic regression and F test statistic, a sample size of 103 participants has been used.

Pilot Study

Although the semistructured questionnaire was based on an existing instrument, a few questions were added from me to answer some of the research questions. As a result, a pilot study was needed to determine whether these questions would provide the responses that they are intended to. Before conducting the pilot study, the added questions were reviewed by the committee members for validation. After validation, the pilot study was conducted to assess reliability. Researchers indicated that 10% of the projected sample size for the larger study is needed (Connelly, 2008). Therefore, I conducted the pilot study with 10 participants that represent 10% of 92 participants needed for the larger study.

Procedure for Recruitment, Participation, and Data Collection Using Archival Data

A semistructured questionnaire was developed using questions from two different surveys that have been used in previous studies to evaluate health and nutrition among children under five years of age. These include the Multiple Indicator Cluster Survey (MICS; UNICEF, 2014), and Household Dietary Diversity Score (HDDS; Food and Agriculture Organization (FAO), 2011). These questionnaires have been used to assess the dietary quality of food consumption and nutrient adequacy in households and among children less than 5 years of age (UNICEF, 2014; Food and Agriculture Organization, 2011). Before requesting access to the participants for the study, a letter was sent to the medical and administrative hospital of to inform them about the study and requested a letter of cooperation to gain access to meet with participants on the clinic site to complete

the survey. I did not review any records at the facility. I used completed surveys for data collection for the study. Some participants refused to complete the anonymous survey.

Consequently, I talked about the study with selected participants in a private room at the facility before handing out the survey. The participants had time to ask questions before deciding to complete the survey. Participants also had the option to complete the survey at the time of visit or take it home and to return the completed survey to a locked drop-box at the facility to which only I had access. I talked to 130 participants and therefore handed out 130 questionnaires. I retained 113 participants out of 120 returned questionnaires that were enough for the number of participants needed for the study. The survey was completed by the parent or legal guardian of the child diagnosed with moderate malnutrition. I could easily identify the children diagnosed with moderate malnutrition, as the facility treat the moderate malnourished children under 5 years of age on special clinic days that are different from children with severe malnutrition. Participants were instructed to withdraw at any time if they feel threatened by uncomfortable.

I do not have any type of association with the potential participants. Since the survey was anonymous, informed consent was not necessary. However, a completed survey was considered as implied consent for the study. I will share the results of this study with community stakeholders who oversee community education since access to the website or social media page may be limited to the population in this area of the country. I will also post the results of the study in the nutrition education room of the facility so that participants can review the findings of the study.

Instrumentation and Operationalization of Constructs

I used two instruments for this study that included HDDS and MICS. The HDDS was designed in 2006 by Food and Nutrition Technical Assistance (USAID, 2015). HDDS is a tool that was developed to assist researchers when measuring household dietary diversity (FAO, 2011). This tool provided an approach to better estimate the quality of diet through an assessment of the number of food groups consumed in the household rather than the quantity of food consumed. Swindale and Bilinsky (2006) reported that it is more important to know if the household has some diversity on the food groups consumed that can indicate a balanced nutrition rather than knowing that the different food used was from only one group. One of the important aspects of HDDS, the questions on dietary diversity, can be done at the individual level as well and is also used as a proxy measure for the socioeconomic level of the household which is one of the independent variables of this study (USAID, 2015). HDDS has been used for different purposes such as to monitor the seasonal changes in household food access or as an indicator for early warning system (USAID, 2015). This instrument has often been used in population-based survey to measure nutrient adequacy and balanced nutrition (USAID, 2015). In this study, I wanted to evaluate the quality of diet for children under 5 years of age that have been diagnosed with moderate malnutrition. Therefore, this instrument was appropriate to assess diet quality among children under 5 years of age.

The second instrument, MICS, was developed by UNICEF in response to the World Summit for Children and was first used in 1995 in more than 60 countries (UNICEF, 2014). The purpose was to be able to evaluate the progress of countries

toward the achievement of the goals established together to improve the situation of children and women (UNICEF, 2014). The instrument has been used extensively around the world to influence the public about their opinion in the situation of children and women (UNICEF, 2014). This has also been used as a basis for policy decision-making and intervention program (UNICEF, 2014). The questionnaire includes different versions; for this study, I used the version for children under 5 years of age, MISC5. In the questionnaire, only the questions under breastfeeding and dietary intake section were appropriate for this study because the responses of these questions helped me to evaluate the dietary intake of children under 5 years of age and attempt to understand the dietary habits of the target population. As a result, only the questions from this section was used in the structured questionnaire when collecting data for this study. After selecting the questions needed in these two questionnaires, I selected a certified translator to translate the document into the participants' language.

Validity and Reliability

One of the first validation of HDDS questionnaire was a study in 10 countries that demonstrates a strong correlation when measuring the number of food groups consumed and the dietary energy availability in a household (Cafiero, Melgar-Quinonez, Ballard, & Kepple, 2014). Several other studies have validated HDDS measure by showing that dietary diversity is associated with food security, including some indicators of socioeconomic status (FAO, 2008; Thorne-Lyman, Valpiani, Sun, et al., 2010). However, the reliability of the tool to determine the optimal number of food groups needed to assess nutrient adequacy was questionable. Researchers believe that while the

measures are not comprehensive, HDDS can provide a general understanding of food security and its influence on dietary habits when paired with another nutrition instrument measure (Cafiero et al., 2014).

Scientists reported that MICS had been used in about 60 countries around the world in the objective to provide key information on women and children in terms of nutrition, education, health and many more (Hancioglu & Arnold, 2013). MICS is often used by agencies at the national and international level to develop intervention strategies aimed at improving women and children health (UNICEF, 2014). Malnutrition is a public health problem that continues to affect the health of children under 5 years of age in developing countries (Ayoya et al., 2013). Therefore, MICS was a suitable tool that can assist in identifying some of the contributing factors of moderate malnutrition. According to UNICEF (2014), MICS has been used extensively in several developing countries to measure progress toward children health. The tool has also been used to evaluate early childhood development in developing countries and provide positive results (McCoy, Peet, Ezzati, et al., 2016).

Operationalization of Variables

The independent variables that were used in this study allowed me to evaluate the association between certain factors and the dependent variable of moderate malnutrition among children under five years of age in developing countries. The dependent and independent variables are defined as followed:

Cultural eating: Cultural eating is defined using the definition of culture. Culture has been defined as the set of behavior, attitudes, language, thoughts, communications,

actions, customs, values, and beliefs used by an individual, racial, or social group (Nixon-Cave, K., and Meadows, 2014; Centers for Disease Control and Prevention, 2014). In the context of the study, cultural eating was defined as the set of behavior, attitudes, customs, and beliefs applied by an individual in food choices. Cultural eating was referred to preference to traditional cooking (1) Yes, and (0) No.

Cultural food taboos: Food prohibited based on religion, culture, or societal (Meyer-Rochow, 2009). Cultural food taboos and cultural regimen will interchangeably be used throughout this paper. Cultural food taboos were measured to following cultural norms (1) Yes, and not following cultural norms (0).

Dietary habits: Dietary habits is defined using the definition of food selectivity. Food selectivity has been defined to include three domains that include food refusal, limited food repertoire, and high frequency single food intake (Bandini et al., 2010). For this study, these three domains were summarized as the behavioral pattern or routine that is repeated regularly. In dietary habits section, several food groups was listed associated with a numerical value in terms of snack food (1), fruits (2), vegetable (3), dairy products (4), homemade cooking (5).

Malnutrition status: The interaction between undernutrition and infection that can create a potentially lethal cycle of worsening illness and deteriorating nutritional status (UNICEF, 2013). Malnutrition status is classified as mild, moderate, or severe. In this study, I concentrated on moderate and severe malnutrition. Malnutrition status was coded as MM for moderate malnutrition and was measured based on the answer provided

as to whether a participant is diagnosed with moderate malnutrition. The answer was coded as (1) for Yes, and (0) for No.

Socioeconomic status (SES): Socioeconomic status is defined as the social rank of an individual or group that combines income, education, and work status (CDC, 2014).

Socioeconomic status was evaluated at three levels, such as:

- income: (0) no income - 0-9,999 HTG, (1) low income - 10,000 - 19,999 HTG, (2) moderate income - 20,000 - 29,999 HTG; (3) high income 30,000 HTG or higher.
- level of education: (0) no education, (1) basic education, (2) secondary education, (3) university education or higher
- Working status: (0) not working, housewife (1) not working, looking for job, (2) working, merchant, (3) business.

Data Analysis Plan

I used SPSS latest version to enter collected data. Data were screened to ensure that there were no duplicates. Demographic characteristics of the study sample were described using descriptive statistic, continuous and nominal data were measured using the percentage of participants sex, occupation, education, and income.

Research questions

1. RQ1. What is the association between dietary habits and moderate malnutrition status as the outcome?

Hypothesis

H_0 -1: There is no statistical association between dietary habits and moderate malnutrition status as the outcome.

H_a -1: There is a statistical association between dietary habits and moderate malnutrition status as the outcome.

2. RQ2. What is the association between parents' knowledge and experience and moderate malnutrition status as the outcome?

Hypothesis

H_0 -2: There is no statistical association between parents' knowledge and experience and moderate malnutrition status as the outcome.

H_a -2: There is a statistical association between parents' knowledge and experience and moderate malnutrition status as the outcome.

3. RQ3. What is the association between socioeconomic status and moderate malnutrition status as the outcome?

Hypothesis

H_0 -3: There is no statistical association between socioeconomic status and moderate malnutrition status as the outcome.

H_a -3: There is a statistical association between socioeconomic status and moderate malnutrition status as the outcome.

4. RQ4. What is the association between cultural eating habits and moderate malnutrition status as the outcome?

Hypothesis

H_0 -4: There is no statistical association between cultural eating habits and moderate malnutrition status as the outcome.

H_a -4: There is a statistical association between cultural eating habits and moderate malnutrition status as the outcome.

5. RQ5. What is the association between cultural food taboos and moderate malnutrition as the outcome?

Hypothesis

H_0 -5: There is no statistical association between cultural food taboos and moderate malnutrition as the outcome.

H_a -5: There is a statistical association between cultural food taboos and moderate malnutrition as the outcome.

Binary logistic regression analysis was first conducted to assess if dietary habits, parents' knowledge and experience, socioeconomic status, cultural eating habits, and cultural food taboos, are associated with moderate malnutrition among children under five years of age. A multiple linear logistic regression analysis was also performed at the end to predict the most parsimonious model. Logistic regression is the appropriate statistical test to use to conduct data analysis when there is a need to evaluate the extent of the association among a set of dichotomous and categorical variables. In this study, the dependent variable of moderate malnutrition was labeled to be a dichotomous variable where participants chose number 0 or 1 to report whether or not a child is diagnosed with moderate malnutrition. The answers to the independent variables such as dietary habits, parents' knowledge and experience, socioeconomic status, cultural eating habits, and

cultural food taboos were binary. Logistic regression was also selected to help reduce Type I error, which is the probability to reject the null hypothesis while the null is true.

Threats to External and Internal Validity

One of the main concerns when conducting a study is the threat to external and internal validity of the results. By external validity, I am looking for generalizability from the findings. To improve external validity of this study, I used random sampling in the population of interest and tried to keep a low dropout rate. As for threat to internal validity, there were two aspects of concern. The first one was selection bias, which occurs when I draw a sample that is not representative of the population being studied. In this study, I randomly selected a sample of participants from a pediatric clinic center providing treatment to children under five years of age with malnutrition. The other aspect that could be a threat to internal validity of this study was the response rate. This happens when the participants responding to the surveys differ one from another. Since the study was conducted among participants with the same health problem, I did not expect to have a threat to external validity. Additionally, the survey was a combination of two different measurement tools.

Ethical Procedure

Several points need to be addressed in the ethical procedure. First and foremost, a written letter was sent to the direction of the facility requesting permission to talk to the parents of children under five years of age receiving care for malnutrition and hand out questionnaires to them to collect data for the study. The facility did not require an

agreement from the Internal Review Board to have access to their patients or to collect data on participants. The subjects accepted to participate in the study voluntarily.

Furthermore, data were anonymous to maintain confidentiality. I used a numeric code to identify the subjects. After a few interactions with the medical staff at the facility, I understood that literacy was an issue among some of the participants because of limited or no school education. As a result, I provided all the explanation needed about the study to all participants inclusively, including details about their confidentiality. I used the service of a certified translator to translate the questionnaire used with the participants in the study.

Summary

This was a cross-sectional study design aimed at investigating the association between the dependent variable of moderate malnutrition among children under 5 years of age and the independent variables of dietary habits, parents' knowledge, socioeconomic status, cultural eating habits, and cultural food taboos,. Cross-sectional has been the design of choice because the study involved only one group that was not going to be exposed or treated. This design also allowed the research to gather data quickly and at low cost. Additionally, cross-sectional design gave me the ability to control for multiple confounders at the analysis stage.

The questionnaires that were used in the study include the HDDS developed by Food and Nutrition Technical Assistance and MICS developed by UNICEF. Both have been used in previous research to evaluate children nutrition, health, and education. The sample was randomly selected from the parents of children under 5 years of age at a

facility center in Felix, Port-Salut, after obtaining permission from the direction of the hospital to talk to the parents and collected data. Approval from the IRB was not required. I also reviewed in this chapter the validity and reliability of the instruments that was used, discussed the potential threats to internal and external validity of the study and how I intended to improve these threats in the study.

Chapter 4 includes a review of the purpose, research questions, and hypothesis, followed by pilot testing results, data collection, and analysis of findings. I provided a report and an evaluation of statistical analysis and assumption and then summarize the results on the research questions.

Chapter 4: Results

Introduction

The purpose of this study was to determine the association between dietary habits, parents' knowledge and experience, cultural eating habits, socioeconomic status, cultural food taboos (independent variables) and moderate malnutrition status (dependent variable) among children under five in the small community of Félix, Port-Salut. Five research questions were used as the basis for data analysis with a subsequent hypothesis as a guide for this research.

RQ1. What is the association between dietary habits and moderate malnutrition status as the outcome?

H_01 : There is no statistical association between dietary habits and moderate malnutrition status as the outcome.

H_a1 : There is a statistical association between dietary habits and moderate malnutrition status as the outcome.

RQ2. What is the association between parents' knowledge and experience and moderate malnutrition status as the outcome?

H_02 : There is no statistical association between parents' knowledge and experience and moderate malnutrition status as the outcome.

H_a2 : There is a statistical association between parents' knowledge and experience and moderate malnutrition status as the outcome.

RQ3. What is the association between socioeconomic status and moderate malnutrition status as the outcome?

H_03 : There is no statistical association between socioeconomic status and moderate malnutrition status as the outcome.

H_a-3 : There is a statistical association between socioeconomic status and moderate malnutrition status as the outcome.

RQ4. What is the association between cultural eating habits and moderate malnutrition status as the outcome?

H_04 : There is no statistical association between cultural eating habits and moderate malnutrition status as the outcome.

H_a4 : There is a statistical association between cultural eating habits and moderate malnutrition status as the outcome.

RQ5. What is the association between cultural food taboos and moderate malnutrition as the outcome?

H_05 : There is no statistical association between cultural food taboos and moderate malnutrition as the outcome.

H_a5 : There is a statistical association between cultural food taboos and moderate malnutrition as the outcome.

This chapter summarized the pilot study results, recruitment of participants and data collection process, the demographic sample, and the proportion of the sample to the larger population. This chapter concludes with a discussion on the findings and the analyses performed.

Pilot Testing

A pilot study was conducted to ensure validity and reliability of the survey. A small sample of 10 participants was selected to conduct the pilot survey. According to Connelly(2008), a pilot study sample should 10% of the projected larger study. The number of 10 participants represented about 10% of the sample size of 92 participants for the larger study. Scientists indicated that the most common measure of scale reliability for the pilot survey is Cronbach's alpha returning a value of $\alpha = 0.7$ or more (Field, 2009). Cronbach's alpha is a measure of reliability to determine internal consistency between questions in a survey with scale measurement (Field, 2009). Cronbach's alpha was then conducted with the collected data from the pilot study which and return a low value. Consequently, I conducted a reliability and validity test one more time with a different group of 10 participants using variables with scale measurement including education, occupation, income, cultural food taboos, cultural eating habits, and knowledge and experience. The result showed one more time a value of 0.54, which is unacceptable (Table 1).

Table 1

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of items
.549	.616	6

Researchers suggested that Cronbach's alpha value can be improved by doing an item analysis to see if one or more items can be deleted (Field, 2009). An item analysis was then performed to improve internal consistency and reliability. Table 2 shows that the deletion of variable cultural food taboos will improve reliability to $\alpha = 0.803$.

Table 2

Cronbach's Alphas for EDUC, OCCUP, INCOME, FOODTB, KNOWEX, CULTHB

	<i>Scale Mean if Item Deleted</i>	<i>Cronbach's Alpha if Item Deleted</i>
Education	6.80	.456
Occupation	6.70	.231
Income	6.90	.340
Cultural food taboos	5.40	.803
Knowledge & experience	5.90	.373
Cultural eating habits	4.80	.524

Since the original research question for cultural food taboos was already approved for this study and could not be removed, the research question was reformulated to be answered as a binary variable to "What is the association between cultural food taboos and moderate malnutrition as the outcome?" Meyer-Rochow (2009) defined cultural food taboos as food prohibited based on religion, culture, or societal. Cultural food taboos are defined here as expecting cultural norms in feeding practices that prevent parents from providing to their children essential nutrients necessary to balanced nutrition. This is coded as 0 for not following cultural norms, and 1 for following cultural norms. Based on the pilot study results, the original question was problematic and included too many variables, which made the assessment unreliable. As a result, the research question was formulated to be a binary independent variable and therefore, to

evaluate whether there is an association between cultural food taboos and moderate malnutrition status. The pilot study was then conducted again with another group of 10 participants using variables with scale measurement including education, occupation, income, traditional cooking, knowledge and experience, and cultural food taboos as binary independent variable with nominal measurement. Cronbach's alpha result showed high internal consistency with a value of $\alpha = 0.722$ (Table 3). As determined by Cronbach's alpha of 0.722, the scale has a high level of reliability. Therefore, the newly developed instrument is acceptable to proceed with the research study.

Table 3

Reliability Statistics - b

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N. of Items
.722	.754	6

With the high level of reliability for the newly developed instrument, I proceeded with the larger study that included all the independent variables from the pilot study (Table 4). The socioeconomic status that included education, income, and occupation were coded as scale measurement following by cultural eating habits, and knowledge and experience. Cultural food taboos were coded as a dichotomous independent variable with yes/no answer.

Table 4

Independent Variables for the Study

Variables	Nature	Measure
Socioeconomic Status		
Education	Nominal	Scale
Income	Nominal	Scale
Occupation	Nominal	Scale
Cultural Food Taboos	Categorical	Nominal
Knowledge and Experience	Nominal	Scale
Cultural Eating Habits	Nominal	Scale

Sample Demographics

Over the end of January and beginning of February 2019, I handed out 130 anonymous survey questionnaires to participants who attend care at the pediatric facility. This facility provides care to children under 5 years of age with moderate and severe malnutrition. The clinic for children under 5 years of age with moderate malnutrition is held on Wednesday, and the clinic for those with severe malnutrition is held on Monday. Survey questionnaires were collected throughout the beginning of February 2019 from a locked box located in a conference room of the facility. After selection, seven participants were excluded because these returned questionnaires reported caring for children older than 5 years of age. I needed 92 participants for the study but opted to continue the analysis with the remaining 113 completed questionnaires. The response rate was about 92.3% with 120 completed questionnaires returned out of 130.

The demographic of characteristics of the study sample are presented in Table 5. Most of the parents or legal guardians are female with 92.9% compare to 7.1% for male. Among the children less than 5 years of age, 54% were female, and 46 % were male. There were about 57% of participants with basic education and 33.6% with no education while most of them are not working with 38.9% looking for job and 24.8% being a housewife. More than half of respondents have income less than ten thousand gourdes (59.3%) that is the equivalent of 125 U.S. dollars at an exchange rate of 80 gourdes for 1 USD, and 29% earn less than 20,000 gourdes or 250 USD.

Table 5

Demographic characteristics of the study sample (N =113)

Characteristics	Participants N	Percentage
Sex (parent)		
Male	8	7.1
Female	105	92.9
Sex (child)		
Male	52	46
Female	61	54
Education		
No education	38	33.6
Basic education	64	56.6
Secondary education	11	9.7
Occupation		
Not working, housewife	28	24.8
Not working, looking for job	44	38.9
Working, merchant	32	28.3
Business	9	8
Income		
0 - 9,999 HTG (US\$125)	67	59.3
10,000 - 19,999 (US\$250)	33	29.2
20,000 - 29,999 (US\$375)	11	9.7
30,000 - 39,999 (US\$500)	2	1.8

For statistical purposes, and to facilitate me in responding the research questions, the responses to dietary habits, parents' knowledge and experience, socioeconomic status, and cultural eating habits have been recoded and regrouped as binary independent variables with yes/no answer. The classification of dietary habits has been based on the Food Pyramid Model of the Mediterranean diet. Researchers agreed that adherence to the Mediterranean diet provides benefits to health and contribute to a reduction of mortality rate (Ruini et al., 2015). The Mediterranean diet includes a blend of vegetables and fruits, grains, and limited meat, fish, or fats. Therefore, participants who responded positively to the consumption of fruits, vegetables, and grains, which represents the base or the largest part of the Food Pyramid are classified under good dietary habits (1) and those who reported consumption of the smallest part that includes meat, fish, fats, or sweets are classified under poor dietary habits (0) . For parents' knowledge and experience, participants who answer correctly to only one question is classified under none to little knowledge and coded as (0), and those who answered to two and more questions correctly are categorized under good knowledge and coded as (1). Socioeconomic status included three factors such as education, occupation, and income of parents. Participants with no education or basic education and not working are classified as low socioeconomic status and coded as (0), and those with secondary education, working (merchant or small business), and income more than 20,000 gourdes are classified as moderate economic status and coded as (1). Cultural eating habits was originally coded as a scale measurement, and participants who responded disagree or

strongly disagree are coded as No (0), and those who responded agree or strongly disagree are coded as Yes (1)

Table 6 represents an overview of dietary habits for parents and their children under 5 years of age. Parents or legal guardians consumed more of other foods like sweets and snacks. Parents and children under 5 years of age consumed about 94% of other types of food than food with essential micronutrients. Food consumption among participants caring for children under 5 years of age was about 34% for grains, cereals, or tubers, 16% for vegetables and fruits, 14% for meat, poultry, and eggs, and 0% for dairy products. The numbers were the same when feeding their children, except for milk and milk products where the number was 16.8%. Starchy staples were used only by 32%, 6.2% for vegetables and fruits, and 11.5% for meat and fish.

Table 6

Descriptive characteristics of the study sample (N = 113)

Characteristics	Participants Yes N(%)	Participants No N(%)
Dietary Habits (parents)		
Grains, roots, tubers	38 (33.6)	75 (66.4)
Vegetables & fruits	18 (15.9)	95 (84.0)
Meat & poultry	16 (14.2)	97 (85.8)
Dairy products	0 (0.0)	113 (100)
Others	107 (94.7)	6 (5.3)
Dietary habits (children)		
Starchy staples	36 (31.9)	77 (68.1)
Vegetables & fruits	7 (6.2)	106 (93.8)
Meat & fish	13 (11.5)	100 (88.5)
Milk & milk products	19 (16.8)	94 (83.2)
Others	106 (93.8)	7 (6.2)

Data Analysis

As indicated in Chapter 3, I planned and conducted a binary logistic regression modeling using SPSS, followed by a multiple logistic regression for this study. However, the results returned an odds ratio that was troublesome with a value zero for three of the independent variables. Consequently, with the perspective to move on with the study and to avoid a prolonged process, I conducted a chi-square test for data analysis in order to determine whether there was any statistical association between the independent variables of dietary habits, parents' knowledge and experience, cultural eating habits, socioeconomic status, and cultural food taboos and the outcome of moderate malnutrition. According to Field (2009), chi-square test, also referred as Pearson's chi-square test, can be used to test whether there is a relationship between two categorical variables. This is done by comparing the frequencies observed in certain categories to the frequencies expected to get in those categories by chance (Field, 2009). This change in the data analysis plan was agreed upon by the committee members and has allowed me to complete the study in a reasonable time and maintain the time limit of my educational requirements.

Results

Research Question 1

1. What is the association between dietary habits and moderate malnutrition status as the outcome?

Hypothesis

H_0 1: There is no statistical association between dietary habits and moderate malnutrition status as the outcome.

H_a 1: There is a statistical association between dietary habits and moderate malnutrition status as the outcome.

A chi-square test analysis was conducted to evaluate the association between dietary habits and moderate malnutrition status as the outcome. When using a chi-square test, two important assumptions have to be made (Field, 2009). First, I have to make the assumption about the independence of data, and second, the expected cells frequencies should be greater than five. The chi-square test was done and the results showed that the assumption that all expected cells frequencies should be greater than five has been met. As mentioned earlier, Pearson's chi-square test evaluates whether there is an association between two categorical variables. The results showed that there was a statistically significant association between dietary habits and moderate malnutrition, $\chi^2 = 113.000$, $p = .000$ (Table 7). Therefore, I rejected the null hypothesis.

Table 7

Chi-Square test for Dietary Habits and Moderate Malnutrition

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	113.000 ^a	1	.000		
Continuity Correction ^b	107.101	1	.000		
Likelihood Ratio	116.866	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	112.000	1	.000		
N of Valid Cases	113				

a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 5.10.

b. Computed only for a 2x2 table_b

Research Question 2

2. What is the association between parents' knowledge and experience and moderate malnutrition status as the outcome?

Hypothesis

H_0 -2: There is no statistical association between parents' knowledge and experience and moderate malnutrition status as the outcome.

H_a -2: There is a statistical association between parents' knowledge and experience and moderate malnutrition status as the outcome.

A chi-square test was conducted to determine the association between parents' knowledge and experience and moderate malnutrition. Knowledge and experience are defined as the fact that parents of participants know the benefits of some food because of familiarity gained through experience. This was coded as 0 for none to little knowledge and experience, and 1 for good knowledge and experience. The results demonstrated a violation of the assumption that all expected cell frequencies should be greater than five. Scientists recommended to use Fisher's exact test when the expected frequencies are too low (Field, 2009). Therefore, Fisher's exact test was used to determine whether there is an association between knowledge and experience and moderate malnutrition. The results showed that there was no statistically significant association between knowledge and experience and moderate malnutrition as assessed by Fisher's exact test, $p = .771$ (Table 8). Therefore, I failed to reject the null hypothesis.

Table 8

Chi-Square test between Knowledge and Experience and moderate malnutrition

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	.102 ^a	1	.750		
Continuity Correction ^b	.001	1	.881		
Likelihood Ratio	.100	1	.752		
Fisher's Exact Test				.771	.476
Linear-by-Linear Association	.101	1	.751		
N of Valid Cases	113				

a. 1 cells (.25%) have expected count less than 5. The minimum expected count is 4.46.

b. Computed only for a 2x2 table_b

Research Question 3

RQ3. What is the association between socioeconomic status and moderate malnutrition status as the outcome?

Hypothesis

H_0 -3: There is no statistical association between socioeconomic status and moderate malnutrition status as the outcome.

H_a -3: There is a statistical association between socioeconomic status and moderate malnutrition status as the outcome.

A chi-square test was performed to evaluate the association between socioeconomic status and moderate malnutrition. Socioeconomic status includes working status coded as occupation, education, and income. The results indicated that the assumption that all expected cells frequencies should be greater than five has been met. There was a statistically significant association between socioeconomic status and moderate malnutrition, $\chi^2 = 70.236$, $p = .000$ (Table 9). Therefore, I rejected the null hypothesis.

Table 9
Chi-Square Test between Socioeconomic Status and Moderate Malnutrition

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	70.236 ^a	1	.000		
Continuity Correction ^b	65.602	1	.000		
Likelihood Ratio	62.603	1	.000		
Fisher's Exact Test				.000	.000
Linear-by-Linear Association	69.614	1	.000		
N of Valid Cases	113				

a. 0 cells (0%) have expected count less than 5. The minimum expected count is 5.10.

b. Computed only for a 2x2 table.

Research Question 4

RQ4. What is the association between cultural eating habits and moderate malnutrition status as the outcome?

Hypothesis

H_0 -4: There is no statistical association between cultural eating habits and moderate malnutrition status as the outcome.

H_a -4: There is a statistical association between cultural eating habits and moderate malnutrition status as the outcome.

For this study, cultural eating habits is referred to the preference for traditional cooking that is influenced by customs, traditions, and culture. Therefore, cultural eating habits were defined as the set of behavior, attitudes, customs, and beliefs applied by an individual in food choices. A chi-square test was performed to assess the association between cultural eating habits and moderate malnutrition. The results showed that all expected cells frequencies are greater than five. There was a statistically significant association between cultural eating habits and moderate malnutrition, $\chi^2 = 5.811$, $p = .016$ (Table 10). Therefore, I rejected the null hypothesis.

Table 10
Chi-Square Test between Cultural Eating Habits and Moderate Malnutrition

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.811 ^a	1	.016		
Continuity Correction ^b	4.624	1	.032		
Likelihood Ratio	5.387	1	.020		
Fisher's Exact Test				.021	.018
Linear-by-Linear Association	5.760	1	.016		
N of Valid Cases	113				

a. 0 cells (0%) have expected count less than 5. The minimum expected count is 6.37.

b. Computed only for a 2x2 table.

Research question 5

5. What is the association between cultural food taboos and moderate malnutrition as the outcome?

Hypothesis

H_0 -5: There is no statistical association between cultural food taboos and moderate malnutrition as the outcome.

H_a -5: There is a statistical association between cultural food taboos and moderate malnutrition as the outcome.

Cultural food taboos have been defined as the dynamic process of prohibiting certain food in a diet based on religion, culture, or societal. A chi-square test was performed to determine whether there is an association between cultural food taboos and moderate malnutrition. All expected cells frequencies were greater than five. There was a statistically significant association between cultural food taboos and moderate malnutrition, $\chi^2 = 4.181, p = .041$ (Table 11). Therefore, I rejected the null hypothesis.

Table 11

Chi-Square Test between Cultural Eating Habits and Moderate Malnutrition

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	4.181 ^a	1	.041		
Continuity Correction ^b	3.125	1	.077		
Likelihood Ratio	3.832	1	.050		
Fisher's Exact Test				.054	.042
Linear-by-Linear Association	4.144	1	.042		
N of Valid Cases	113				

a. 0 cells (0%) have expected count less than 5. The minimum expected count is 5.31.

b. Computed only for a 2x2 table_b

Summary

I presented in this chapter the findings of the analysis done from a survey conducted among a population of parents of children less than 5 years of age in the town of Felix, Port-Salut. The study evaluated whether there was an association between dietary habits, knowledge and experience, cultural eating habits, socioeconomic status, cultural food taboos (independent variables) and moderate malnutrition (dependent variable). As mentioned above, I have planned to use logistic regression for data analysis. However, the logistic regression analysis returned some odds ratio values of zero that prevented me to make an acceptable conclusion on whether there was a statistically significant association between the independent variables and the dependent variable. Consequently, my doctoral committee and I agreed to run chi-square testing to determine the significance of all statistical of associations of all the independent variable with the outcome variable in this study. Chi-square testing is recommended by researchers to use when doing data analysis for nominal categorical variables (Field, 2009). The results showed that there was a statistically significant association between dietary habits, cultural eating habits, socioeconomic status, cultural food taboos and moderate malnutrition, with the following Pearson chi-square test respectively, (113.000), $p = .000$, (5.811), $p = .016$, (70.236), $p = .000$, (4.181), $p = .041$. The expected cells frequencies for these four independent variables were greater than five. There was no statistically significant association between knowledge and experience and moderate malnutrition. The assumption of expected cells frequencies greater than five

was violated for the independent variable of knowledge and experience. Therefore, the Fisher's exact test was reported, $p = .771$.

Chapter 5 included a discussion of the key findings and interpretation of the results, state the study limitations, the implication for social change, and recommendation for further research.

Chapter 5: Discussion, Recommendations, and Conclusion

Introduction

The purpose of this study was to determine the association, if any, between dietary habits, knowledge and experience, socioeconomic status, cultural eating habits, and cultural food taboos (independent variables) and malnutrition status (dependent variable) among children under 5 years of age in this small community of Port-Salut. This study was necessary to contribute to the information about the impact of nutritional choices on malnutrition status. The dependent variable of malnutrition status was defined as moderate malnutrition and was coded in this study as present (1) or absent (0).

This study was a quantitative research method using a cross-sectional study design. The choice of cross-sectional design was helpful to evaluate the association between several independent variables and a dependent variable as the outcome (see Creswell, 2009) in a limited time. A cross-sectional design was also used to allow quick data collection for a large population with limited resources.

There was a statistically significant association between dietary habits, cultural eating habits, socioeconomic status, cultural food taboos, and moderate malnutrition among children less than 5 years of age in the town of Felix, Port-Salut. However, there was no statistically significant association between knowledge and experience and moderate malnutrition as the outcome. In this chapter, I will first interpret the findings of this research study, and second present the limitations of the study, recommendations, implications for social change, and a conclusion.

Interpretation of the Findings

The study was conducted with 113 participants that included parents or legal guardians of children under 5 years of age in the town of Felix, Port-Salut. The demographic data revealed that most parents caring for children under 5 years of age in this area is female. The findings also revealed that children under 5 years of age are more likely to consume foods that are prepared for everyone who lived in the house. There is no special nutrition for children. Almost 100% of children under 5 years of age with moderate malnutrition had poor dietary habits. This explains that parents or legal guardians do not make the extra effort to provide their children foods with essential nutrients needed for their development. Furthermore, parents are well influenced by cultural norms practices when feeding their children and disregard the health benefits that can be found in a recommended balanced diet. I found that 78.7% of parents fed their children based on their traditional practices. Besides traditional cooking from the cultural norm practices of parents, the nutrition of their children is influenced by some taboos imposed in the community they live. About 82% of children with moderate malnutrition are fed according to the cultural beliefs of their parents. Additionally, the results provided an understanding that the socioeconomic status of parents may prevent them from accessing food supplies fortified with essential supplements for better nutrition. Even with the goodwill to protect their children from being malnourished, the resources are very limited. Therefore, they are left with the only option to feed their children whatever is available at home to protect them from starvation.

Furthermore, although a statistical significant association was established between dietary habits, socioeconomic status, cultural eating habits, cultural food taboos, and moderate malnutrition using a chi-square test of association, I believe a much better analysis could have been done using simple logistic regression, followed by a multiple logistic regression for the parsimonious model, with a larger sample size and longer period of time. This could be the case for finding a statistical association between knowledge and experience and moderate malnutrition.

Dietary Habits

The results of this research study found a statistically significant association between dietary habits and moderate malnutrition. These findings are consistent with previous findings of Sekiyama et al. (2012), who found that dietary habits was associated with moderate malnutrition due to high consumption of snack foods that are high in energy but low in essential nutrients. The results of this study are also supportive of Scaglioni et al. (2011) findings who reported that the presence of moderate malnutrition among children under 5 years of age was due to the high consumption of sweets and foods with high fat. Children were more likely to reject food rich with essential nutrients that are less tasty (Scaglioni, 2011). The findings of my research study reported 78.8% of poor eating habits among children under 5 years of age.

In my study, I emphasized on the importance of empowerment from community organization theory to understand the risks of poor dietary habits in developing moderate malnutrition among children under 5 years of age. The results of my study demonstrated that community leaders could use the concept of empowerment from community

organization theory to organize activities and develop appropriate nutrition programs to empower parents on making food choices that are beneficial to their children under 5 years of age (Glanz et al., 2008).

Knowledge and Experience

I found no statistically significant association between knowledge and experience and moderate malnutrition. These findings did not align with previous findings from Ali et al. (2015), who reported that maternal knowledge and experience positively impact anthropometric measures in children under 5 years of age. This difference is probably due to the large sample size of 862 participants of the study from Ali et al. compared to the small sample size of 113 participants of my research study. Additionally, Ali et al. used a much longer questionnaire with more specific questions that focused on nutritional knowledge among parents compared to a short questionnaire with only two questions focusing on nutritional knowledge. Scientists should be more aware of the sample size of a research study when assessing for the association between the independent variable of knowledge and experience and moderate malnutrition. Contrarily, the findings of my study were consistent with Verecken and Maes (2010) who argued that the nutritional knowledge of parents has a significant impact on the dietary intake of children under 5 years of age.

In this study, I highlighted the importance of community organization theory where one of the constructs, critical consciousness, deals with actions from community leaders to bring awareness among individuals and enhance their education in proper nutrition. While this construct of the theory did not result in significant findings between

knowledge and experience and moderate malnutrition, it remains an important indicator when there is a need to bring people in a community together to work for the benefit of everybody. More specifically, it is necessary to define strategies to identify how to establish a system that will be beneficial to the health of their children under 5 years of age.

Socioeconomic status

There was a statistically significant association between socioeconomic status and moderate malnutrition. This finding confirmed previous study results from Ying et al. (2015), who found that children living in poorer conditions are more likely to suffer from stunting and underweight. Socioeconomic status included education, income, and occupation. About 60% of the participants are living with little income. This has demonstrated that poverty is a contributing factor in moderate malnutrition. Parents are more likely to feed their children whatever is available to ease their hunger but does not include any supplement for their good health. This is also consistent with Abuya et al. (2012), who found that parents with poor education are more likely to have unhealthy behavior and limited living conditions. Although parents might have living conditions with limited income, they could provide better nutrition to their children if they had the necessary education (see Abuya, 2012). Therefore, it is important that community leaders work with the population to educate them on proper nutrition and advise on how to use crops filled with essential nutrients that are around them.

The results of this study are supportive of the application of the construct of social capital in community organization theory to engage the community in working together

to improve their socioeconomic conditions. People in the community should work together in focus group to reflect and identify possible solutions for parents with limited education and income on how to nourish their children and prevent them from malnutrition.

Cultural Eating Habits

There was a statistically significant association between cultural eating habits and moderate malnutrition. This finding was consistent with Pemunta and Fubah (2014), who found that feeding practices to introduce traditional weaning foods to infants were a contributing factor to child malnutrition. Very often, feeding practices are based on cultural recommendations that may lack the nutrients needed for growth and development (Pemunta & Fubah, 2014). The findings of my research study reported that 78.7% of families feed their children according to local tradition. The result of this current study also confirmed previous findings from Sing and Vaidya (2015), who reported that weaning practices were one of the major contributing factors of child malnutrition. The results of my research indicate that parents feed their children based on what is common practice in the community whether it is beneficial to the nutritional needs of their children.

This result supports the use of issue selection from community organization theory. This construct implies that people should come together to identify traditional meals that contribute to the nutritional needs of their children (see Glanz et al., 2008). It is important that parents support each other for the well-being of their children and help in decreasing the rate of moderate malnutrition in their community.

Cultural Food Taboos

The finding of my study indicated that there is a statistically significant association between cultural food taboos and moderate malnutrition. This is in line with Perez and Garcia (2013), who indicated that food taboos influenced the amount, frequency, and quality of nutrients that mothers and children consumed. According to Perez and Garcia (2013), cultural norms, taboos, and beliefs were the risks factors of child malnutrition in the city of The Gambia among the Fulla ethnic group. In my study, about 82% of participants with moderate malnutrition followed their cultural norms when feeding their children under five years of age. This explains that cultural food taboos in this community were considered a barrier in food choices among children under 5 years of age. The findings on my study are also consistent with previous findings from Chege et al. (2015), who indicated that cultural food taboos prevent families from eating foods that are rich in nutrients needed for good nutrition.

Again, the construct of issue selection of community organization theory is important in this finding. This should motivate parents in the community to come together to identify feeding practices that may be prohibited based on their beliefs or tribe and decide together for the good of their children.

Limitations of the Study

In my study, I attempted to fill the gap in the literature in terms of finding the association between dietary habits, knowledge and experience, socioeconomic status, cultural eating habits, and cultural food taboos and moderate malnutrition. However,

there are several limitations to this study. There may be recall bias because the study used self-reporting data. Self-reporting can lead to inaccuracies and missing information. Furthermore, the sample size was limited to parents or legal guardian of children under 5 years of age within the small town of Feliz who attend the pediatric facility. Therefore, the study setting may be biased as not all children in the community get care at this facility. Additionally, caution is required when concluding the results of non-significant association of some of the independent variables in terms of knowledge and experience. The sample size may be too small to generalize the findings. Therefore, caution is needed in the applicability of the findings. Furthermore, the use of logistic regression returned inaccurate values of the odds ratio which led to a change of the statistical measure to determine the association between the independent variables and the dependent variable. This was also due to the small sample size. Therefore, logistic regression could be used for the same research study with a larger sample size. In addition, there may be misunderstanding among the participants when completing the survey. Literacy may constitute a barrier among respondents due to the high rate of limited education.

Recommendations

Based on the results of my study, future research is needed to better explore the association between dietary habits, knowledge and experience, and cultural eating habits using a larger sample size and less restricted time. A study that includes a different questionnaire with a face-to-face interview would provide a more detailed explanation of the patterns of eating habits of respondents. Additionally, a face-to-face interview would

also provide a better evaluation of the knowledge and experience of respondents, including cultural norms, taboos, and beliefs. This study was quantitative, and therefore, it is recommended that researchers consider a mixed-method research study design for future studies on determining the association between the independent variables and the dependent variable of moderate malnutrition. Adding a qualitative method to the quantitative data could provide more details among participant with literacy issue, which probably could allow a generalizability in the findings. Ali et al. (2015) found out that knowledge and experience were significantly associated with moderate malnutrition using a much larger sample size and a longer questionnaire that focused specifically on knowledge and experience. Therefore, future studies are needed with a larger sample size. Future studies that involve one independent variable at a time with the dependent variable of moderate malnutrition as the outcome could return more accurate findings.

Implications

The results of my study could lead healthcare practitioners in future practice to have a better approach when developing a nutrition intervention program for people with diverse cultural background. The campaign to reduce malnutrition status among children under 5 years of age does not mean food aid programs, but it could rather be beneficial to develop adapted intervention program to educate people on eating habits based on their cultural background. Additionally, in terms of methodology, the findings of this study should encourage researchers to extend the target population to more than one city as well as using a larger sample size in order to have a better evaluation of findings. Furthermore, the choice of a mixed-methods study design in future studies are

recommended while using one independent variable at a time with a longer questionnaire for an in-depth exploration of the impact on the outcome of moderate malnutrition.

In addition, the findings of my study should contribute to positive social change by developing custom-made health intervention programs for communities with limited resources while taking into account their living conditions. The results of my study have the potential to help parents of children under 5 years of age to modify their eating behavior and adopt healthful diet for the benefits of their children growth and development. These results also support one of the objectives of Healthy 2020 which is to maintain good nutrition in order to help reduce the risks of health conditions including malnutrition (Office of Disease Prevention and Health Promotion, 2019).

Using the community organization theory, it is important to engage community leaders to empower individuals to fight against continuous infectious diseases resulting in malnutrition and therefore reduce child mortality rate in their community. It is upon people living in the same community sharing the same culture, tribe, and beliefs, to identify issues that are detrimental to their children and together make the decision to reduce or to eradicate the problem. Therefore, healthcare practitioners are encouraged to work together with the community to determine the best approach rather than imposing a program that is not expected to give positive results. With a larger sample size, the use of community organization theory could provide a better understanding of the impact of the independent variables in this study on the dependent variable of moderate malnutrition.

Conclusion

Despite all the assistance food programs that have been provided to many developing countries, child malnutrition remains a great challenge that is life-threatening among children under five years of age. The results of my study demonstrated that socioeconomic status is statistically associated with moderate malnutrition.

Consequently, the findings suggested that action be taken by authorities to improve the socioeconomic conditions of the target population. Socioeconomic conditions could be improved by creating jobs to allow individuals to have sufficient income so that they can care for their families. This also suggested that education programs be available to increase literacy in the community. With a better education, people may have sharpened critical thinking skills that will enable them to make an informed decision in feeding practices for their children under 5 years of age.

Although the findings of my study have demonstrated a statistically significant association between dietary habits, cultural eating habits, cultural food taboos, and moderate malnutrition, it is important that healthcare practitioners worked together with people in communities to develop adapted nutritional programs to fight against malnutrition among children under 5 years of age, regardless of the status. All these three variables are linked to educational programs to develop the skills needed to provide better care to children. Therefore, I reiterate the need to conduct further studies with a much larger sample size for a longer period of time. This could probably allow researchers to generalize on the findings for a statistical association between dietary

habits, knowledge and experience, cultural eating habits, socioeconomic status, cultural food taboos, and moderate malnutrition as the outcome.

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Appendix A: Survey instrument developed from the Multiple Indicator Cluster Survey
and Household Dietary Diversity Score

Anonymous survey

I) Circle the correct response

1. How old is your child?
2. Is your child male or female? 1 = Male 2 = Female
3. Are you (parent or legal guardian) male or female? 1 = Male 2 = Female
4. What is your marital status? 1 = single 2 = married
5. How many children do you have?

II) Please describe the foods (meals and snacks) that you or anyone in your household ate yesterday during the day and night, whether at home or outside the home.

1. Maize, rice, millet, wheat 0 = No 1 = Yes 2 = don't know
2. pumpkin, carrots, squash, or sweet potatoes that are orange inside 0 = No 1 = Yes 2 = don't know
3. white potatoes, white yams, white cassava, or other foods made from roots 0 = No 1 = Yes 2 = don't know
4. dark green/leafy vegetables, including spinach, taro, okra, or yucca leaves, "lianne panier", "lalo", "bonbon kodenn". 0 = No 1 = Yes 2 = don't know
5. Any other vegetables including tomato, onion, eggplants, chayote. 0 = No 1 = Yes 2 = don't know
6. Fruits including ripe mangoes, papaya, abricot, carambola, sapodilla, carambola 0 = No 1 = Yes 2 = don't know
7. Any organ meat including liver, kidney, heart or other organs. 0 = No 1 = Yes 2 = don't know
8. Any flesh meat including beef, pork, lamb, goat, rabbit, chicken, duck, or other birds. 0 = No 1 = Yes 2 = don't know
9. Any eggs from chicken, duck, guinea hen, guinea fowl 0 = No 1 = Yes 2 = don't know
10. Any fish, dried fish, salted fish, or shellfish 0 = No 1 = Yes 2 = don't know
11. Any legumes, nuts, or seeds including beans, peas know 0 = No 1 = Yes 2 = don't know
lentils, nuts, seeds or foods made from these.
12. Any milk and milk products including cheese, yogurt, or other milk products 0 = No 1 = Yes 2 = don't know
13. Any oils and fats including butter added to food or used for cooking 0 = No 1 = Yes 2 = don't know
14. Any sweets including sugar, honey, sweetened soda or sugary foods such as chocolates, candies, cookies and cakes 0 = No 1 = Yes 2 = don't know
15. Any spices, condiments, beverages including black pepper know 0 = No 1 = Yes 2 = don't know
salt, maggi bouillon, accent, zafran, coffee, tea, or alcoholic beverages

III) Please answer by yes or no

1. Has your child ever been breastfed? 1 = Yes 0 = No 2 = don't know
2. Is your child still being breastfed? 1 = Yes 0 = No 2 = don't know
3. Yesterday, during the day or night, did your child drink 1 = Yes 0 = No 2 = don't know

anything from a bottle with a nipple?

4. Did your child drink oral rehydration solution yesterday during the day or night? 1 = Yes 0 = No 2 = don't know
5. Did your child drink or eat vitamin or mineral supplements or any medicines yesterday, during the day or night? 1 = Yes 0 = No 2 = don't know

Now I would like to ask you about all other liquids that your child may have had yesterday during the day or the night. Please include liquids consumed outside of your home.

5. Did your child drink any of the following yesterday during the day or the night?
- | | | | |
|--|--------|---------|----------------|
| Plain water? | 0 = No | 1 = Yes | 2 = don't know |
| Juice or juice drinks | 0 = No | 1 = Yes | 2 = don't know |
| Infant formula such as Allacta, Celia? | 0 = No | 1 = Yes | 2 = don't know |
| Milk from animals, such as fresh, tinned, or powdered mild | 0 = No | 1 = Yes | 2 = don't know |
| Any other liquids such as sodas, tampico, or jugoo | 0 = No | 1 = Yes | 2 = don't know |

Now I would like to ask you about everything that your child ate yesterday during the day or the night. Please include foods consumed outside of your home.

7. Did your child eat any of the following food during the day or night yesterday?
- | | | | |
|--|--------|---------|----------------|
| A) Yogurt made from animal milk | 0 = No | 1 = Yes | 2 = don't know |
| B) Any baby food like Nourisoy, Nutrigou, Nutriban? | 0 = No | 1 = Yes | 2 = don't know |
| C) Bread, rice, noodles, porridge, or other foods made from grains? | 0 = No | 1 = Yes | 2 = don't know |
| D) Pumpkin, carrots, squash, or sweet potatoes that are yellow or orange inside? | 0 = No | 1 = Yes | 2 = don't know |
| E) White potatoes, white yams, cassava, or any other foods made from roots? | 0 = No | 1 = Yes | 2 = don't know |
| F) Any dark green, leafy vegetables, such as spinach, liane panier, lalo? | 0 = No | 1 = Yes | 2 = don't know |
| G) Ripe mangoes or ripe papayas ? | 0 = No | 1 = Yes | 2 = don't know |
| H) Any other fruits or vegetables? | 0 = No | 1 = Yes | 2 = don't know |
| I) Liver, kidney, heart or other organ meats? | 0 = No | 1 = Yes | 2 = don't know |
| J) Any other meat, such as beef, pork, lamb, goat, chicken, duck or sausages made from these meats | 0 = No | 1 = Yes | 2 = don't know |
| K) Eggs? | 0 = No | 1 = Yes | 2 = don't know |
| L) Fish or shellfish, either fresh or dried? | 0 = No | 1 = Yes | 2 = don't know |
| M) Beans, peas, lentils or nuts, including any foods made from these? | 0 = No | 1 = Yes | 2 = don't know |
| N) Cheese or other food made from animal milk? | 0 = No | 1 = Yes | 2 = don't know |
7. How many times did your child eat any solid, semi-solid or soft foods yesterday during the day or night?
3times 0 = none; 1= < 3 times; 2 = >
8. Did you feed your child any food made with oil, fat, or butter? 0 = No 1 = Yes 2 = don't know
9. Did you feed your child any cookies, chips, crackers, or biscuits yesterday during the day or night?
How many times did you feed your child these types of food?
0 = none; 1= < 3 times; 2 = > 3times
10. I feed my child food made at home based on my customs, values, or beliefs.
1 = yes; 0 = no
11. I follow cultural norms when feeding my child.
3= strongly agree; 2 = agree; 0 = disagree; 1 = strongly disagree

12. A well-balanced nutrition includes whole grains, fruits, and vegetables and legumes.
4 = strongly agree; 3 = agree; 0= neither agree nor disagree; 2 = disagree; 1 = strongly disagree
13. The daily meal of my child always include some of the essential nutrients like protein, carbohydrates, fat, fiber, minerals, vitamins, and water.
4 = strongly agree; 3 = agree; 0= neither agree nor disagree; 2 = disagree; 1 = strongly disagree
14. Most of the causes of malnutrition include low intake of essential micronutrients, poverty, and socio-political problems.
4 = strongly agree; 3 = agree; 0= neither agree nor disagree; 2 = disagree; 1 = strongly disagree

IV) Please circle the correct response

Now I would like to ask you some questions about your occupation, income, and level of education

1. Which of the following best describe your current occupation
- 0 = not working, housewife
 - 1 = not working, looking for job
 - 2 = working, merchant
 - 3 = business
2. What best describe the total income of your household?
- 0 = \$0 - \$9,999
 - 1 = \$10,000 - \$19,999
 - 2 = \$20,000 - \$29,999
 - 3 = \$30,000 - \$39,999
 - 4 = \$40,000 - \$49,999
 - 5 = \$50,000 or more
3. What is the highest level of school you have completed or highest degree you received?
- 0 = No education
 - 1 = Completed basic education
 - 2 = Completed high school
 - 3 = Completed university level or more

Appendix B: IRB Approval

Walden IRB approval number: 10-27-17-0276857.