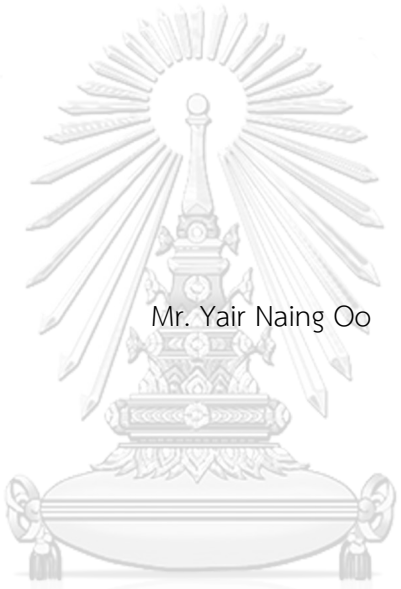
Factors related to behavior of mothers in child care influencing on diarrhea among children aged under 2 years in Myanmar

Mr. Yair Naing Oo



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A Thesis Submitted in Partial Fulfillment of the Requirements
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ปัจจัยที่เกี่ยวข้องกับพฤติกรรมของมารดาในการเลี้ยงดูลูกที่ส่งผลต่อการเกิดโรคอุจจาระร่วงในเด็กอายุต่ำกว่า 2 ปี ประเทศเมียนมา

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วิทยานิพนธ์นี้เป็นส่วนหนึ่งของการศึกษาตามหลักสูตรปริญญาสาธารณสุขศาสตรมหาบัณฑิต
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ปัจจัยที่เกี่ยวข้องกับพฤติกรรมของมารดาในการเลี้ยงดูลูกที่ส่งผลต่อการเกิดโรคอุจจาระร่วงในเด็กอายุต่ำกว่า 2 ปี ประเทศเมียนมา . (Factors related to behavior of mothers in child care influencing on diarrhea among children aged under 2 years in Myanmar)

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โรคอุจจาระร่วงในเด็กอายุต่ำกว่า 2 ปียังคงเป็นความท้าทายอย่างมากสำหรับประเทศเมียนมา เนื่องจากโรคนี้เป็นสาเหตุการเสียชีวิตอันดับที่สี่ของเด็กอายุต่ำกว่า 5 ปี การศึกษาในครั้งนี้มีวัตถุประสงค์เพื่อหาความสัมพันธ์ระหว่างพฤติกรรมของมารดาในการเลี้ยงดูลูกและโรคอุจจาระร่วงในเด็กอายุต่ำกว่า 2 ปีในประเทศเมียนมา ข้อมูลภาคตัดขวางได้มาจากการสำรวจประชากรและสุขภาพของชาวเมียนมา พ.ศ. 2558 ได้ถูกนำมาใช้ในการศึกษา เด็กทั้งหมดที่มีอายุระหว่าง 0 ถึง 23 เดือนและมีที่อายุน้อยที่สุดและอาศัยอยู่กับมารดาจำนวน 1655 คน ได้ถูกคัดเลือกเพื่อการศึกษาในครั้งนี้ ความชุกของโรคอุจจาระร่วงในเด็กชาวเมียนมาที่อายุต่ำกว่า 2 ปีคือ 13.6% อายุของเด็ก [AOR = 2.2; 95% CI = 1.5–3.1] การเลี้ยงดูลูกด้วยนมแม่ในระยะเริ่มต้น [AOR = 1.3; 95% CI = 1.0–1.8] และการเลี้ยงดูลูกด้วยนมแม่อย่างเดียว [AOR = 3.1; 95% CI = 1.4–6.8] ล้วนสัมพันธ์กับโรคอุจจาระร่วงในเด็กอายุต่ำกว่า 2 ปีในประเทศเมียนมาอย่างมีนัยสำคัญ การเผยแพร่สุขศึกษาเกี่ยวกับพฤติกรรมการเลี้ยงดูลูกด้วยนมแม่และปัจจัยที่เกี่ยวข้องนั้นสามารถลดความชุกของโรคอุจจาระร่วงในเด็กอายุต่ำกว่า 2 ปีในประเทศเมียนมา

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สาขาวิชา	สาธารณสุขศาสตร์	ลายมือชื่อนิสิต .....
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Yair Naing Oo : Factors related to behavior of mothers in child care influencing on diarrhea among children aged under 2 years in Myanmar. Advisor: ANUCHIT PHANUMARTWIWATH, Ph.D.

Diarrhea among children aged under 2 years remains a huge challenge for Myanmar because it is the fourth leading cause of death among children aged under 5 years. This study aimed to find the association between maternal behavior in childcare and diarrhea among children aged under 2 years in Myanmar. Cross-sectional data was obtained from the 2015 Myanmar Demographic and Health Survey used for the study. A total of 1655 children, aged 0–23 months and who are the youngest and lived with their mothers, were selected for this study. The prevalence of diarrhea among Myanmar children under two years old was 13.6%. The child's age [AOR = 2.2; 95% CI = 1.5–3.1], early initiated breastfeeding [AOR = 1.3; 95% CI = 1.02–1.8], exclusive breastfeeding [AOR = 3.1; 95%CI = 1.4–6.8] were all significantly associated with diarrhea among children aged under 2 years in Myanmar. Dissemination of health education about breastfeeding behavior to mothers and related factors can reduce the prevalence of diarrhea among children aged under 2 years in Myanmar.

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CHAPTER I
INTRODUCTION

1.1 Rationale and Justification

In recent years, global environment is remarkably changing due to increase population and rapid urbanization. It can affect to all surrounding environment of people living in worldwide. A change of global environments causes global warming, air pollution and water impurification. Climate changing may lead to increase waterborne and vector-borne diseases, distinctly see in low socio economic people(1). Especially in low- and middle-income countries, most of the people are living in rural and slum areas with poor urban conditions. Climate change can increase the breeding of climate-sensitive infectious diseases which are malaria, diarrhea and dengue. Children are more infected by waterborne diseases due to poor sanitation and drinking impurified water. In both slum and rural areas, infection of waterborne diseases is more severe during disaster such as flood because of lacking basic drainage system; most of the drinking water sources are sealed after floor(2). In Myanmar, most of the people are living in rural and slam areas. In some regions and states, there are frequently occurring armed conflicts, and local people are suffering collateral damage from armed conflicts and live in refugee camps or some of them are migrated to other region. With the above reason, migrants and rural people are mostly infected by waterborne disease due to poor sanitation condition. In 2016, life expectancy at birth in Myanmar is 64.7 years which is the lowest one among ASEAN countries. The under-five mortality rate(U5MR) is 72 deaths per 1000 livebirths which is too high, by comparing with 29 in Cambodia and 12 in Thailand. Infant mortality rate is 62 per 1000 livebirth, as compared to 11 in Thailand and 25 in Cambodia. Diarrhea is one of the common causes of under-five mortality death(3).

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Globally, among waterborne diseases, children are mostly suffered by diarrhea. Approximately 1.7 billion of children in the world have history of having diarrhea and among them, and 525,000 children die because of diarrhea(4). Most of the early childhood death are prevented and treated such as diarrhea. Diarrhea is mostly infected to children via impurified food and water. In Sustainable Development Goal

(SDG), it mentions to decrease preventable deaths of newborns and children by 2030. Therefore, we need to decrease about ten million of number of under-five death between 2017 and 2030. In one of the report of World Health Organization (WHO), death from diarrhea can be prevented by effective health intervention and services(5). In Myanmar, Ministry of Health is striving to reduce under-five mortality rate to align with sustainable development goals in 2030. Comparing with the last decade, in 2015, under five mortality rates is reduced 103 to 72 deaths per 1000 livebirth. Related with socio demographic data, one in five households in Myanmar drink impurified water and 11% of households have no improved toilet facilities. Above facts are leading to answer why diarrhea is more common water borne disease comparing with other waterborne diseases in Myanmar(6).

Among under five children, children aged under 2 years are more likely to have disease due to inadequate immune system. In low-income countries, children under three years old suffer diarrhea averagely three time every year. As a result, cases of malnourished children are increased after illness due to diarrhea due to deprivation of nutrition which is necessary for growth(7). In Southeast Asia region, diarrhea is still a main problem which can cause high mortality and morbidity among children under 5 years of age, especially highest in children aged under 2 years of age. Among 85.4% of rural population who have experience of diarrhea, 39% of them are under five children(8). Comparing with neighborhood countries, prevalence of diarrhea in Indonesia is 17.6% in under-two children which is higher than in Myanmar in which prevalence of diarrhea is 17% in 12–23 months children(4). In Myanmar, neonatal mortality rate is 25 deaths per 1000 live births, and infant mortality rate is 40 deaths per 1000 livebirths. Above data means that, before reaching the first Birthday, 1 in 25 children are dead(6). Among the causes of under five children death, diarrhea is the fourth leading cause of death. But, in Myanmar, prevalence of diarrhea among children aged under 6-month, 6–11-month,12-23-month, 24–35-month, 36–47-month and 48–59-month are 6%, 14%, 17%, 12%, 8% and 5%, respectively. Above data point out that prevalence of diarrhea is highest in children aged 0–23 months among any other age groups(6).

Mother is a very important person in the life of the children. They know more well about basic needs of their children than father, mostly. In biologically,

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mother and their children are connected each other with a strong bond. Therefore, the role of mother is mandatorily needed to decrease mortality and morbidity of children. Behavior of mother is highly influenced in child health. Children of mother with high income have a lower risk to get diarrhea comparing with children of mother with poor income. Maternal education and health literacy level have a remarkably relationship with prevalence of diarrhea. Mother with lower education have 1.61 times higher for their children to get diarrhea than mother with higher education(5). Among the maternal behavior, breastfeeding practice also plays in an important role to prevent diarrhea. Globally, death of 823,000 children(<5yr) are related with the non-presence of breastfeeding according to recommendation(9). Children aged under 2 years must need to get recommended breastfeeding according to WHO. Recommended breastfeeding practice according to WHO are an early initiation of breastfeeding, exclusive breast feeding and continuation of breastfeeding(10). According to some research, Children(0-5mth) who were not breastfed have a 165% risk to get diarrhea(11).

Children cannot get sufficient nutrition requirement from breastfeeding when the children are 6 months old. Therefore, complementary food is needed to fill the gap of daily energy requirement of children. But contaminated food can cause diarrhea to children. Hygienic behavior of mother in feeding to children play an important role to prevent their children from getting diarrhea. Poor food hygienic practice can cause 70% of diarrhea episodes in developing countries. 88% of child death are related with poor sanitation, impurified water supplies and poor personal hygiene. Some evidence shows that if complementary food is prepared unhygienically, it can be highly contaminated by pathogen which can cause diarrhea and undernutrition to children(12). Giving updated vaccination to children according to their age is also important for child health and mother is responsible for this mandatorily. According to World Health Organization and UNICEF report, it is clearly mentioned that measles vaccination can decrease the incidence of pneumonia and the associated mortality(13). In the study of Pakistan and India, it mentions that children who get measles vaccination reduce the risk about 12–22% to be infected by diarrhea(13). Additionally, children aged between 6–59 months must take a high dose of vitamin A supplementation to boost their immune system. Children who get two high dose vitamin A supplementation

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every year until they become five years old can reduce 15 % of prevalence of diarrhea(14).

According to UNICEF report of diarrhea in 2018, in South Asia and sub-Saharan Africa, most deaths from diarrhea occur among children aged between 0 to 23 months old (14). In our country, Myanmar, prevalence of diarrhea is higher in children aged between 0 to 23 months old than any other age groups of under 5 children like mentioned above. In this study, researcher wants to focus on which behavior of mother is associated with prevalence of diarrhea among children aged between 0 to 23months old. Most of the research of countries including Myanmar are focusing to find causal factors of diarrhea in children aged under five years old. There are some few literatures which is researched influencing of maternal behavior on diarrhea among children aged under 2 years old but they cannot be applied in Myanmar because of the differences in demography, economic and financial status.

1.2 Research Questions

1.2.1 What are behavior of mother in giving child care related with diarrhea to children aged under 2 years in Myanmar?

1.2.2 What is the prevalence of diarrhea among children aged under 2 years in Myanmar?

1.2.3 How do behavior of mother in child care in Myanmar affect diarrhea among children aged under 2 years in Myanmar?

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1.3 Research Objectives

1.3.1 General Objective

To determine the influence of maternal behavior in child care on diarrhea among children aged under 2 years in Myanmar.

1.3.2 Specific Objectives

(a) To explore behavior of mother (breastfeeding, presence of hand washing facilities, water and latrine sanitation, practices of child

feces disposal, practices in child healthcare) related with diarrhea to children aged under 2 years in Myanmar.

(b) To identify the prevalence of diarrhea among children aged under 2 years in Myanmar.

(c) To find association between maternal behavior in child care and diarrhea in children aged under 2 years in Myanmar.

1.4 Research Hypothesis

There is association between maternal behavior in child care and diarrhea in children aged under 2 years in Myanmar.

1.5 Operational Definitions

1.5.1 Dependent Variables

Diarrhea among children aged under 2 years means that children aged between 0-23 months suffer the passage of three or more loose or liquid stools per day in last 2 weeks (15).

1.5.2 Independent Variables

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Demographic data

Child's sex in this study mean the biological characteristics that define humans as female or male(16).

Child's age in this study means that the completed months of the child's age on the day of the interview.

Place of residence in this study means where the mothers are lived. In this study, it is categorized into urban (people who are living in wards) and rural (people who are living in village).

Mother's age means the completed year of the mother's age on the day of the interview.

Socioeconomic Status

Maternal education level in this study refers to the completed highest-level education of mother. This data will be grouped into four; 1) No education, 2) Primary, 3) Secondary and 4) Higher.

Maternal occupation means usual or principal work such as household chores or business of mother, especially as a means of earning a living.

Household Wealth Status in this study means that a measure of a household's cumulative living standard. In the DHS guide book, it explained like that the wealth index of a household is calculated based on selected assets such as television and bicycles, household construction material, type of water and toilet facilities. The wealth index can be categorized into poorest, poorer, middle, richer and richest(17).

Breastfeeding Behavior of Mother

Early Initiating of Breastfeeding means giving breastmilk of mother to children within one hour after delivery by putting the children near to the breast of mother(18).

Exclusive Breastfeeding in this study refers giving the child no other food or drink ,not even water, except breast milk for 6 months of life, but oral rehydration salt, drops and syrups of medicines are allowed(19).

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Continued Breastfeeding for 2 years means that giving breastfeeding to children for up to 2 years while eating safe and adequate complementary foods(10).

Healthy environment

Healthy environment in this study means that assessing hygienic behavior of mother in child care such as toilet facilities, source of drinking water, ways of child feces disposal and present of hand washing facilities.

Type of Toilet facilities in this study means level of sanitation facilities using in a household based on type of toilet in a household according to the WHO/UNICEF joint monitoring program's criteria for level of sanitation facilities(6). It is classified into two group: improved (flushing feces to piped sewer system, septic

tank pit latrine with slab, ventilated improved pit and composting toilet) and unimproved (flush feces to somewhere and pit latrine without slab).

Sources of drinking water in this study means level of accessing to the source of drinking water in a household according to the definition of joint monitoring program (JMP) for water supply and sanitation(6). It is classified into two groups: improved and unimproved drinking water sources. Improved water source means that people drink water from piped water, public tap, tube well, protected dug well, rain water, protected well and bottle water.

Ways of child feces disposal in this study means practice of study children's mother to dispose their child feces. It was classified into two ways: 1) appropriate method and 2) inappropriate method. Children's feces are considered to be disposed of appropriately if the fecal matter was put or rinsed into a toilet or latrine, or if it was buried (6).

Presence of hand washing facilities in this study refers to having the facility to wash hands of mother. Observation is done 3 places (place to wash their hands, presence of water, presence of soap for handwashing). It is consisted of three categories: basic (having hand washing space, soap and water), limited (having hand washing space, but having no soap and water), having no facilities.

Practices of Mother for child health care

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Practices of Mother for child health care means practices of mother for her child to get adequate health care such as measles vaccination and vitamin A supplementation.

Measles vaccination in this study refers that all children aged 9-23 months receive measles vaccination at least one time. In Myanmar, measles is vaccinated at 9 months and 18 months of child's age.

Antigen	Child's Age
Measles	9 months
MR	18 months

Table 1.1 Immunization schedule in Myanmar by WHO, 2016(20)

Vitamin A supplementation in this study means receiving vitamin A in the six months for children aged 6-23 months.

1.6 Conceptual Framework

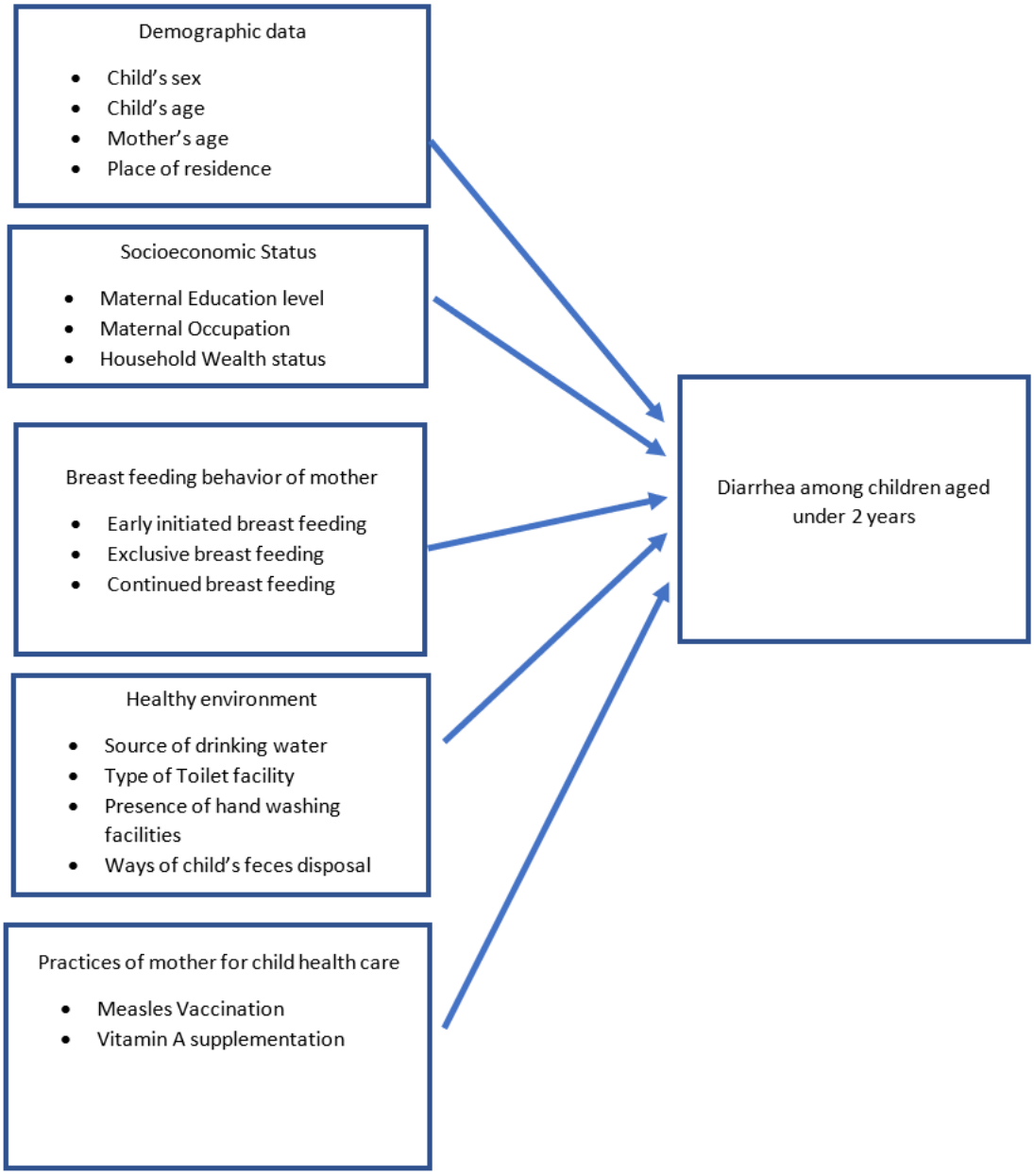

Figure 1.1 Conceptual framework modified by Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD)(14).

CHAPTER II
LITERATURE REVIEW

2.1 Diarrhea

According to definition of WHO, diarrhea means passing of three or more loose or watery stool within 24 hours. Diarrhea is caused by gastrointestinal infection. It is mostly caused by various types of bacteria, some viral infection such as measles and some parasites infection. Mode of transmission is eating or drinking of contaminated foods and waters. Diarrhea can spread from person to person due to poor hygiene status and unhealthy environments(21). Children living in low-income communities owe highest risk for infecting diarrhea. According to WHO, diarrhea can prevent by effective intervention on sanitation and hygiene behavior changes. As a response to prevent diarrhea disease around the world, WHO set a plan together with UNICEF namely The Integrated Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD). Objective of this plan is to combat as an integrated approach to the two diseases, diarrhea and pneumonia together which are leading cause of under-five mortality in globally. In this plan, intervention such as exclusive breastfeeding for up to six months, measles vaccine, handwashing behavior of mother, drinking purified water can reduce the child's deaths due to preventable disease like diarrhea. As a result of integrated approach of GAPPD, causing diarrhea in children aged under five years is reduced efficiently. WHO and UNICEF set a goal to reduce deaths from diarrhea to less than 1 in 1000 by 2025. WHO and UNICEF believed that this goal can only be achieved by collaboration of local government, wide range of actors of respective countries(22). In a report of Center of Disease Control and Prevention report, it mentions that investments on intervention such as hygiene and sanitation, breastfeeding and vaccination are so efficient which means that every 1$ invest can get 25.5$ profits on average(23).

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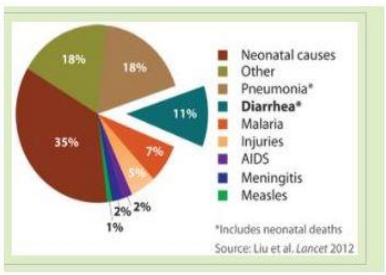
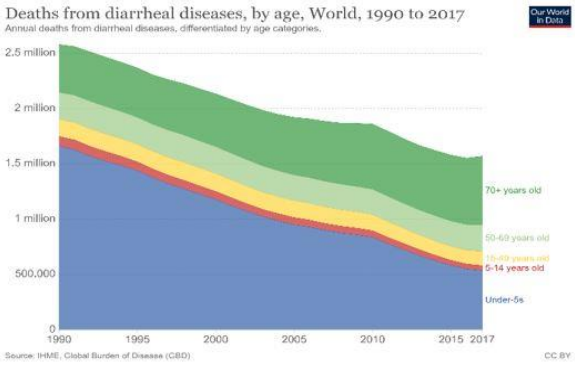
2.1.1 Global Situation

According to WHO, diarrhea disease is the second leading cause of death in children aged under five years. There are 1.7 billion of children suffer diarrhea disease and among them, 525,000 children are dead due to diarrhea(15). According to one report of Centre of Disease Control and Prevention report, 2195 children around the world are dead everyday due to diarrhea(23). According to Figure (1.2), causes of death in children aged under five years because of diarrhea is 11% in world, that percentage is more than AIDS and malaria. According to figure (1.3), one third of total population who is dead by diarrhea is children aged under five years. While looking back and forward of three decades, majority causes of death in children aged under five years is diarrhea. In 1990, there were 1.7 million of children aged under five years whom they were dead due to diarrhea and in 2017, 5.4 million of under five children were dead due to diarrhea(24).



Figure(1.2)Causes of U5 mortality



Figure(1.3).Prevalence of diarrhea in U5 children

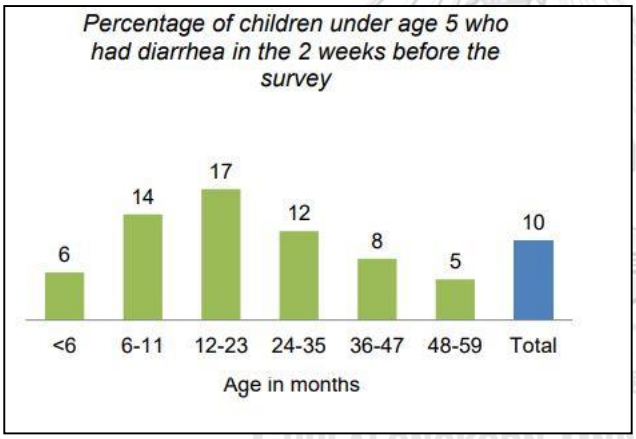
Source of Figure-Figure 1.2(23), Figure 1.3 (24)

2.1.2 Regional Situation

In East Asia and Pacific Region, 15433 children were dead due to diarrhea in 2018. In other words, 13 children among 100000 were dead due to diarrhea every year according to Global Burden of Diseases report, 2018. Each under 5 children suffer 0.88–1.25 episodes of diarrhea in 2018(25).

2.1.3 Country Situation/ Study Area

In Myanmar, diarrhea is the fourth leading casue of under five mortality. According to MDHS(2015-2016) data,10% of children aged under five years suffer diarrhea. According to figure(1.4) in Myanmar,among the aged group of under five years, aged group between 12–23 months of children is highest in prevalence of diarrhea which is 17%. In 7 regions,7 states and Nay Pyi Daw of Myanmar, Chin state was highest in prevalence of diarrhea. According to MDHS(2015-2016) report, there is difference in prevalence of diarrhea between lowest household wealth and highest houshold wealth. Children living in lowest household wealth (13% in prevalence of diarrhea) is twice higher in prevalence of diarrhea than children living in highest household wealth (7% in prevalence of diarrhea)(6).



Figure(1.4)-Source:Myanmar Demographic Health Survey(2015-2016)(6).

2.2 Review on the Theoretical Models

2.2.1 Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD)

Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea includes variety of intervention which can prevent children from not only causing diarrhea but also can reduce the mortality effectively.

In this plan, it mentions that breastfeeding behavior of mother, hygiene behavior of mother in child feeding and willingness of mother for seeking child health

care are very important for preventing diarrhea in children aged under five years(14).GAPPD include three main health activities to prevent diarrhea among children aged under five years. Three main health activities are mentioned like that firstly, protecting children by establishing promoting good health practices, preventing children from becoming ill from diarrhea by ensuring universal coverage of immunization and healthy environments as a second, treating children who are ill from diarrhea with appropriate treatment lastly. In this study, researcher mainly aimed for protective and preventive intervention of GAPPD for diarrhea among children aged under 2 years from behavior of mother. In protective intervention, it includes systematic breastfeeding practice of mother (exclusive breastfeeding, early initiated breastfeeding, continued breastfeeding) and Vitamin A supplementation. As preventive intervention for diarrhea, in GAPPD, it includes measles vaccination, hygienic behavior of mother in child care such as toilet facilities, source of drinking water, ways of child feces disposal and present of hand washing facilities(14, 26).

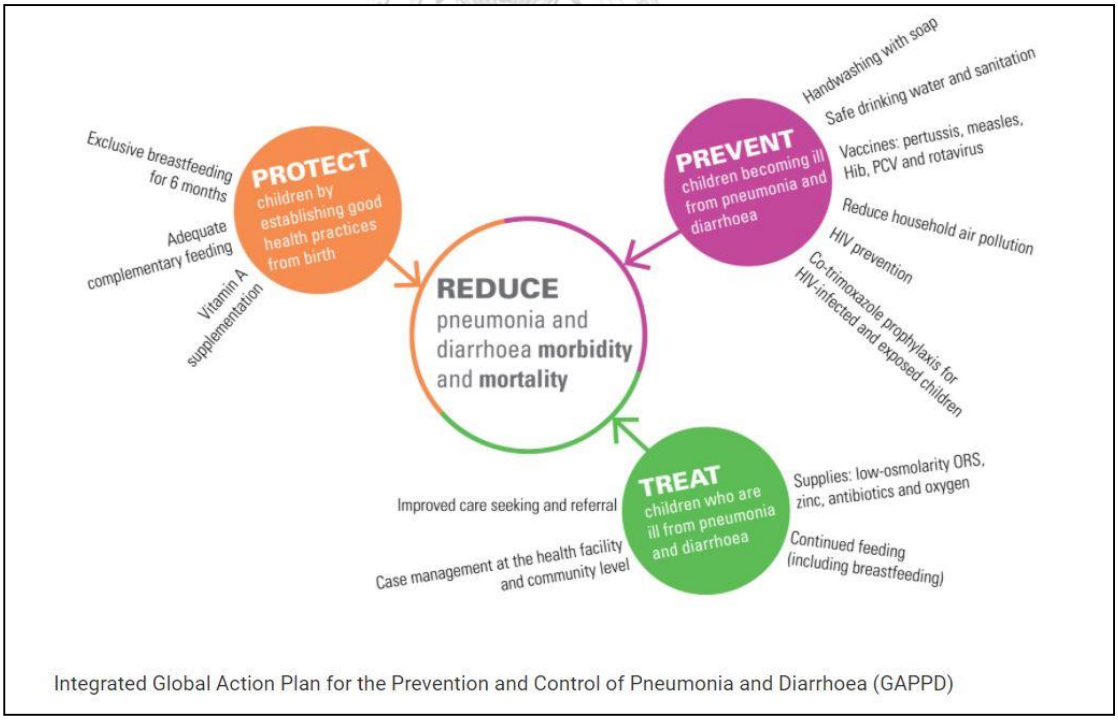


Figure (1. 5)-Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD)

Source: UNICEF. Diarrhea(14)

2.3 Demographic data

2.3.1 Mother age

Mother age is associated with prevalence of diarrhea among children aged under 2 years. In the research from Indonesia done by Sanitka, 2012, it mentions that prevalence of diarrhea is significantly associated with mother's age. In that research, children living with mothers aged between 15–24 years have a risk about 1.63 times higher to cause diarrhea than children who live with mother aged between 35–49 years(4). In the study of Cambodia done by Vong Pisey, it mentions that if age of mother is increasing one year, prevalence of diarrhea among children aged under 2 years reduce 15%(AOR = 0.85; 95%CI: 0.78–0.93) to cause diarrhea(27).

2.3.2 Child age

According to Santika research from Indonesia, children aged under 5 years are at high risk of having diarrhea. Among them, children aged under 2 years are highest to get diarrhea. According to that study, prevalence of diarrhea in children aged between 12–23 months is 20%, and the second highest aged groups is children aged 6–11 months who has 19% prevalence of diarrhea. In that research, researcher suggest that children aged under 2 years are needed efficient intervention to prevent causing diarrhea because of high under 2 mortality of due to diarrhea(4). In some studies, it describes that prevalence of diarrhea is reduced when children are increasing the age(28). In one of Cambodia study done by Vond Pisey, the prevalence of diarrhea is reduced 14%(AOR = 0.86; 95%CI: 0.78–0.94) when the children are increasing one year aged(27).

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2.3.3 Child gender

In some studies, it mentions that, among children aged under 5 years, male children (51.14%) are suffered diarrhea more than female children (48.86%)(4). In one study of Cambodia, it describes children gender are associated with prevalence of diarrhea. Male children are more suffering diarrhea than female children(27). In one MICS study done in Thailand, it also mentions that male children cause diarrhea more than female children because of a natural predisposition of males(29).

2.3.4 Place of residence

In Myanmar, 70% of children are living in rural area and only 30% are living in urban area. Different place of residence has impact on prevalence of diarrhea. In some literature reviews, prevalence of diarrhea among children aged under 2 years

are different where they live such as living in rural or urban. In the study of Ni Komang Ayu Santika which is done in Indonesia, place of residence (urban and rural) of children aged under 2 years is associated with prevalence of diarrhea. Prevalence of diarrhea is higher in children living in rural area than children in urban area(4). In the literature of Thomas Sinmegn Mihrete which is done in Ethiopia, prevalence of diarrhea in children who is living in rural area is 91.6% which is remarkably higher than children who is living in urban area in which prevalence is only 8.4%. In Myanmar, 70% of children are living in rural area(30).

2.4 Socioeconomic Status

2.4.1 Maternal education level

In Myanmar, 46% of women are attended secondary school or higher. Women living in urban area is five time more likely than women living in rural area to get higher education. Young mother aged between 15–24 years are twice more likely to complete secondary school or higher than mother aged between 45–49years(6). In some study mentions that, mother with low education level cannot get health knowledge information from media, newspaper and books(5). According to some research studies done in Africa, children living with mother who has no formal education have 1.4 times higher (AOR = 2.4, 95% CI 1.1–4.9) to be died by diarrhea than children living with mother who has formal education. In that study, it mentions that mother with lacks of education can cause them reducing confident in child health care and education intervention for mother can get huge impact not only for decreasing child mortality due to diarrhea but also for improving child health(31). According to Santika's research from Indonesia, children living with mother who has education with primary level is 1.8 time(AOR = 1.80; 95% CI = 1.35–2.40) higher to get diarrhea than children living with mother who complete higher education(4).

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2.4.2 Maternal occupation

In Myanmar, reproductive-aged women (15–49 years) are working as unskilled manual labor (34%) and working in agriculture is 20%(6). According to the study of Cambodia done by Vong, occupation status of mother is significantly associated with prevalence of diarrhea in childhood diarrhea. In that study, unemployed

mother has 43 % (AOR = 1.43; 95% CI: 1.14–1.78; p = 0.002) higher to suffer diarrhea in their children than employed mother(27). In the study of Santika and Astutik, maternal occupation is positively associated with prevention of childhood diarrhea(4, 5). In the study of North West Ethiopia, working mothers have a two-time (AOR: 1.76, 95% CI (1.28, 2.43)) higher risk for prevalence of diarrhea in their children than jobless mother(30).

2.4.3 Household Wealth Status

In Myanmar,56% of urban people has wealthiest household wealth status but ,for rural people, only 26% has wealthiest household status(6). In the study which is done in Indonesia by Sumampouw, poor people suffer more prevalence of diarrhea due to unable to access health services(28). In the study of Hasan S Merali, it mentions that wealth status of people has an association with prevalence of diarrhea in children aged under five years(32).

2.5 Breastfeeding behavior of mother

2.5.1 Early Initiated Breastfeeding

Early initiating of breast feeding is important to prevent causing diarrhea in children aged under 2 years. Children must need to get breastmilk which contain colostrum within first hour after birth. In Myanmar, percentage of receiving breastmilk within first hour after birth in male and female children aged under 5 years is 64.4% and 69.5% respectively(6). After delivery, children need skin to skin contact with mother to stimulate the breast to come out colostrum. Colostrum is also called first vaccine for children. It is yellowish in color and contain huge rich in nutrient and antibodies. According to UNICEF report, if children delay for receiving colostrum a few hours, it increases the chances for life threatening disease. In that report, it mentions that children who received breastfeeding within one hour after delivery are 33% lesser for mortality than children who received breastfeeding between two and 23 hours after delivery(33). From the study of Sheniak which is done in Bangladesh, it mentions that if children received breastmilk within first hour after birth, it become protective factors for preventing deaths due to diarrhea. In that study, researcher found that children living in rural areas receive early initiation of breastfeeding higher than children living in urban areas. This is because of that most of rural mothers are delivering child normally

but doing caesarean section for delivering baby in urban mother(34). Other study done In India also found that children aged under 2 years who has early initiation of breastfeeding reduce the prevalence of diarrhea(35).

2.5.2 Exclusive Breastfeeding

Children aged between 0–5months needs to take only breastmilk and no need to take additional food, and liquid except medicines and mineral drops. According to WHO, only 41% of children aged between 0–5 month get exclusive breastfeeding globally. Therefore, WHO set infant young child feeding interventions for the goal to get 50% coverage of exclusive breastfeeding in children aged between 0–6 month in 2025(10). In the study of Siregar done in Indonesia, only 42% of children aged between 0-5 months get exclusive breastfeeding for six months. In that study, it also describes that 5377 of infants death per year can be prevented by exclusive breastfeeding(9). According to Sanitika's research, exclusive breastfeeding is important intervention for children aged between 0-5moths to prevent diarrhea in Indonesia and it can protect pathogens which can cause diarrhea. Exclusive breastfeeding in children aged under 2 years is significantly associated with diarrhea. Children who get exclusive breastfeeding have three time less to cause diarrhea than children with non-exclusive breastfeeding(4). In the study of Ethiopia done by Akila, children with non-exclusive breastfeeding are 2.32 time [AOR = 3.32; 95% CI (1.21,9.14] higher to be infected by diarrhea than children with exclusive breastfeeding. Similarity, in the study done in Saudi done by Areb, children who have breastfed exclusively are 56% lesser (AOR = 0.447, 95% CI:0.261–0.911) to cause diarrhea than children who have not breastfed exclusively(36).

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2.5.3 Continued breastfeeding for 2 years

According to WHO recommendation for breastfeeding, although children are not got enough daily energy from breast feeding after 6 months of their age, children are importantly needed to breastfeed continuously until 2 years of their age. Children aged between 12–23 months get 35–40% of daily energy from 500g of breastmilk and got essential vitamins and fatty acid from breastmilk(37). In the study done in Bangladesh, continuation of breastfeeding is strongly associated in decreasing

prevalence of diarrhea. Children who are breastfed continuously to 2 years old are lower about 1.49 time(AOR 1.49; 95% CI 1.02, 2.17) to be infected by diarrhea than children who are not breastfed continuously(34). In the study done in Ethiopia, it mentions that continuation of breastfeeding until 2 years of child's aged can be protective factors for causing diarrhea. Children who got continuously breastfeeding to 2 years are 1.57 time (AOR 1.57; 95% CI 1.12, 2.21) fewer to be infected by diarrhea than Children who did not get continuously breastfeeding to 2 years(38).

2.6 Healthy Environment

2.6.1 Sources of drinking water

According to GAPPD plan done by combination of UNICEF and WHO, 60% of children aged under five years old are dead due to diarrhea which is caused by drinking unsafe water. If children drinks safe water, the risk of causing diarrhea can be reduced to 40%.Therefore, drinking water from improved water source are seriously important to stop transmission of diarrhea(14). In Myanmar, 89% of urban households and 77% of rural households have safe drinking water sources(6). Improvement in safe water is recommended intervention for prevention of diarrhea. In the study of Ethiopia, children drinking water from no improved water source are 2.85 times (AOR = 2.85; 95% CI (1.27,6.42)) higher risk to be infected by diarrhea than children drinking water from improved water source(39).From cross sectional study done by Thomas, children who drinks water from improved and safe water source reduces 2.22 times (AOR: 2.22, 95% CI (1.62, 3.06)) less from causing diarrhea than children who drinks from unsafe water sources(30). From the study of Aleilign in Ethiopia, 88% of childhood death are caused by poor water sanitation(12).

2.6.2 Type of toilet facilities

Mostly in low income and middle-income countries, latrines are not hygienic and become main source of diarrhea transmissions. In Myanmar, only 50% of total households have latrine with improved facilities(6). According to GAPPD plan

which is done to prevent diarrhea occurring in children, using improved latrine as a hygienic method is best ways to reduce child mortality which is caused by diarrhea(14). In the study of Pisey done in Cambodia, lack of improved latrine facilities is strongly associated with prevalence of diarrhea. Children using improved toilet latrine are 1.17 times lesser (AOR = 1.17; 95% CI: 1.05–1.31) to be infected by diarrhea than children with using unimproved latrine facilities. (27).In the case-control study done in Ethiopia, children using not improved latrine are 2.08 times (AOR = 2.08; 95% CI:1.24–3.88) higher to be infected by diarrhea than children using improved latrine(39). From the study of Thomas done for determinants of diarrhea among children aged under 2 years, it mentions that children who use improved toilet facilities are 5.9 times (AOR = 5.9; 95% CI: 3.93–8.86) lesser to suffer from diarrhea than children who use unimproved toilet facilities(30).

2.6.3 Presence of hand washing facilities

Children starts to eat complementary feeding after 6 months old. Therefore, hygienic behavior for preparation of food is important to protect contamination of foods. Among the hygienic behavior, hand washing practices of mother is the most important behavior to prevent causing diarrhea to children aged under 2 years old. According to UNICEF, hand washing behavior of mother can reduce 40% prevalence of diarrhea in children aged under 2 years(14). In Myanmar 95% of household in urban area and 80% of household in rural areas have handwashing facilities(6). In the case-control study done for determinant of acute diarrhea in Ethiopia, children who live in household which has handwashing facilities are 5.47 times (AOR = 5.47; 95% CI:1.68,17.8) lesser to cause diarrhea than children who live in household with no handwashing facilities(39). Similarly, in the study of Northwest Ethiopia, it mentions that children living without hand washing facilities are 6.75 times (AOR = 6.75; 95% CI: 3.16,14.41) higher to develop diarrhea than children living with hand washing facilities(12).

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2.6.4 Ways of child's feces disposal

Among the hygienic practice of mother who have children aged under 2 years, practice of mother for disposing child's feces is also important to control transmission of diarrhea. According to UNICEF, systematic disposing child feces can stop spreading of diarrhea among children(14, 39). In Myanmar, 59% of rural mother and 74% of urban mother dispose child's feces systematically(6). In the study of Mekdes done in Ethiopia, mothers who dispose child's feces with unsafe methods are 4.12 times (AOR = 4.12; 95% CI: 1.25,13.5) higher to develop diarrhea in their children than children living with mother who dispose feces with safe methods. In the study of Cambodia, it mentions also that mothers whose ways of child's feces disposal is unhygienic are 1.32 times (AOR = 1.32; 95%CI: 1.06–1.64) greater to be infected by diarrhea in their children than mothers whose ways of child's feces disposal is hygienic(27). From the study of Thomas, mothers who has behavior of disposing child's feces in unhygienic ways are 2.05 times (AOR = 2.05; 95% CI: 1.36–3.1) higher than children living with mothers who dispose their children feces improper ways(30).

2.7 Practices of mother for child health care

2.7.1 Measles Vaccination

Children aged under 2 years are prone to get infection because their immune system is not fully developed. Therefore, they must need to take vaccination according to WHO guideline to prevent deaths from vaccine preventable diseases Among the vaccination, measles vaccination is seriously important to prevent diarrhea(40). In Myanmar, 77% of children aged under 2 years get 2 dose of vaccination according to standard immunization schedule(6). According to study of Rahul Bawankule, children aged under 2 years in India and Pakistan who get measles vaccination get protective [(India-AOR = 0.88; 95%CI: 0.81–0.99), Pakistan (AOR = 0.81; 95%CI: 0.69–0.96)] effect from infection of diarrhea(13).

2.7.2 Vitamin A supplementation

Children aged under 6 months old received enough vitamin A via breastmilk of mother if mother takes vitamin A supplementation at the first 2 months after delivery. In Myanmar, only 35% of reproductive aged women take Vitamin A supplementation at the first 2 months after delivery according to MDHS data. Children aged between 6–23months need to get vitamin A supplementation two times per year for their immune system development(6). In the study of Ittamar Grotto, children who received vitamin A supplementation has no prominently protective effect (AOR = 1; 95%CI: 0.94–1.07) for preventing diarrhea(41). In the case-control study of Kurt Z. Long done in Mexican, children age between 5–15 months who received vitamin A supplementation are more protective(AOR = 0.3; 95%CI: 0.13–0.67) from infection of diarrhea than children aged between 5–15 months who received placebo treatment(42).

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CHAPTER III
RESEARCH METHODOLOGY

3.1 Study Design and Data Source

This study is reviewed as a secondary data from Myanmar Demographic Health Survey (MDHS) 2015-16. MDHS survey is cross sectional study represented the whole nation of Myanmar. It described and analyzed factor associated to behavior of mothers in child care on prevalence of diarrhea among children aged under 2 years in Myanmar. This data was collected from December 7,2015 to July 7, 2016. ICF gave technical assistance for the DHS program. MDHS-2015 data is the most updated nationwide survey for heath. In Myanmar, Ministry of Health and Sport does a nationwide data survey in every five years. Therefore, next data collection as a representative for whole nation will be 2021 in Myanmar. Permission to analyze MDHS-2015 data is requested by a researcher to Demographic Health Survey Program for this study. DHS program approve to analyze data and send the link https://dhsprogram.com/Data/ for downloading the data.

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3.2 Study Population

The study population was 0–23 months old children who is living with their mothers in each household in Myanmar. There were 1655 children aged between 0 to 23 months old who is living with their mothers in this study.

3.3 Inclusion and Exclusion Criteria

3.3.1 Inclusion criteria

1. The youngest children aged 0–23 months old who are alive and living with their mothers are included.
2. All children aged under 2 years with permanent residence are included.
3. All children aged under 2 years with disability are included.

3.3.2 Exclusion criteria

1. Mothers who are mentally disordered.
2. All children aged under 2 years living in institution such as hotel, barracks.

3.4 Study area and Justification

The Study area is (Myanmar) is included in ASEAN countries under the region of East Asia Pacific (Figure 3.1). The total population was 50,279,900 based on 2014 census data(43). Rural population is 70% and the rest 30% are urban population.

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Figure 1. 6 Map of Myanmar by Ministry of Health and Sports, 2017

Source: Ministry of Health and Sport, Myanmar Demographic and Health Survey 2015-2016, 2017 (6).

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Sample is collected from 7 States, 7 Regions and Nay Pyi Taw around country (6) : Kachin State, Kayah State, Kayin State, Chin State, Mon State, Rakhine State, Shan State, Sagaing Region, Tanintharyi Region, Magway Region, Mandalay Region, Yangon Region, Ayeyarwady Region, Bago Region, Naypyidaw. The sample included those from migrants and refugees' camps. Institutional populations: persons in hotels, barracks and prisons are excluded (6).

3.5 Sampling Strategies

In Myanmar Demographic Health Survey 2015-2016 (MDHS), to be representative for nationwide, MDHS data was stratified by two-stage sample. Firstly,

442 clusters from rural and urban areas of seven States and eight Regions are selected randomly by using enumeration areas or village or ward tract. As a second stage, thirty households from each cluster (total = 13,260 households) are chosen by using systematic sampling with equal probability. In this study, all children aged under-five years are selected and then, exclude the missing data firstly. Then, all youngest children aged between 0 to 23 months are selected from total population of children aged under-five years after exclusion of not alive children (0 children), children not living with mother (0 children). The final total population of children aged between 0 to 23 months is 1,655 children (N = 1,655). In Figure 1.7, steps of selecting sample size and exclusion procedure are explained.

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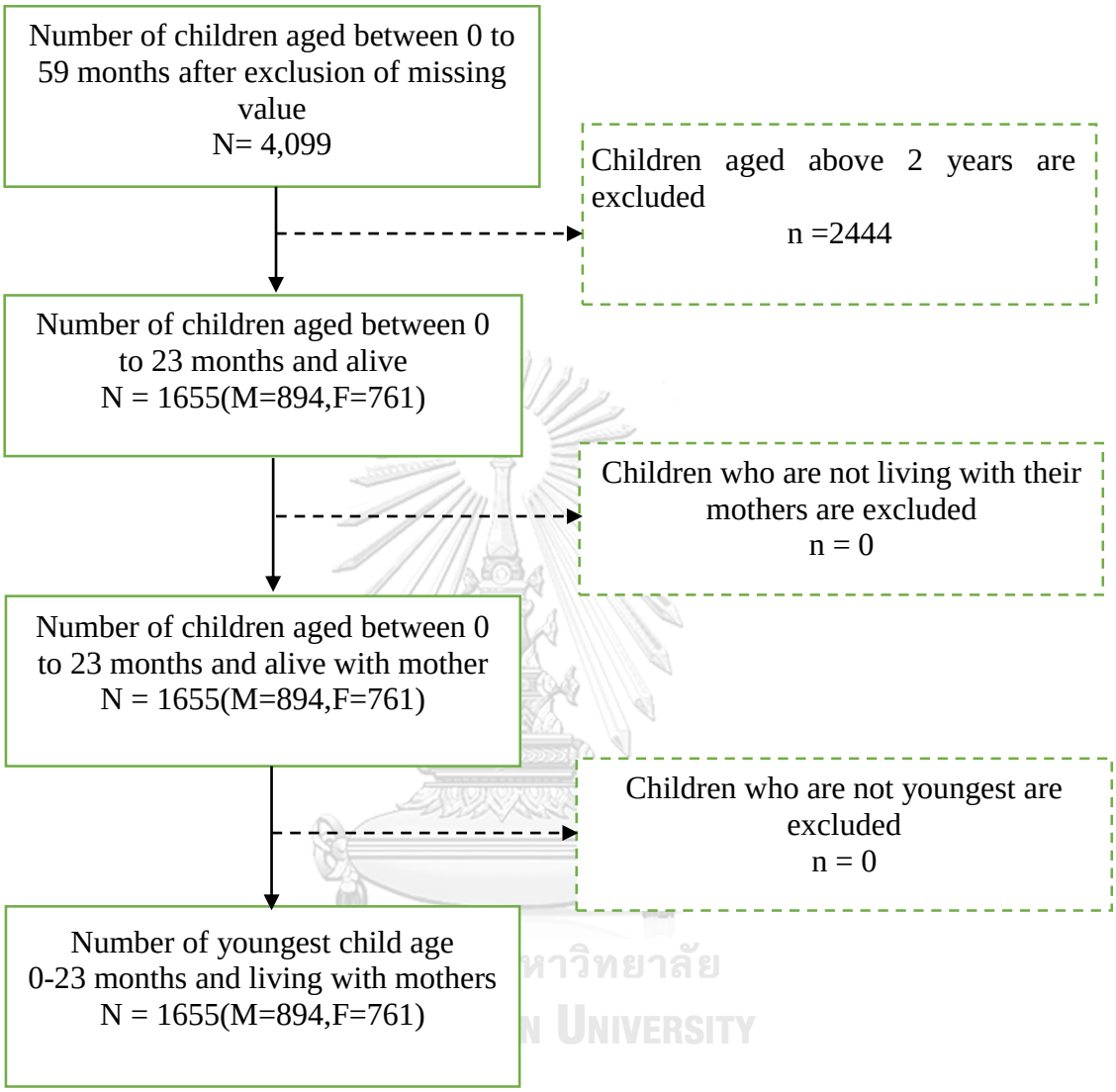

Figure 1.7 Flow charts for sample size selection of the 2015-2016 MDHS survey

3.6 Research Instruments

In MDHS 2015-16 data, there are three set of data namely household questionnaire, women's questionnaire and man's questionnaire. Questionnaire are modified from worldwide questionnaire of DHS program to contextualize with culture of Myanmar and country specific issues. During designing phase of questionnaire for MDHS, many stakeholders such as international non-governmental organization,

United Nation agencies, donor groups are grouped as MDHS technical committee for supporting as technical assistance under the supervision of Ministry of Health and Sport. MDHS technical committees approved final question sets and translated in both Myanmar and English Languages(6, 17).

In this study, the researcher uses questionnaire of women and household for data analysis which is expressed in appendix but questionnaire which are not related with this study such as men's questionnaire are not used for analysis.

3.7 Data Management and Analysis

3.7.1 Data collection

MDHS 2015-2016 data was collected by one hundred and forty-eight field staff from both government and non-government sectors. Those staff are given training by nine master trainers from the Department of Public Health who was given TOT training by DHS program staff, to collect high accuracy and systematic data(6, 17).

One hundred and forty-eight field staff are grouped into nineteen team. Each team include one supervisor, one field editor, three to four female interviewers and one male interviewers. Duration of data collection time is starting from December 7, 2015 to July 7, 2016(6, 17).

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3.7.2 Data processing

In MDHS 2015–2016 data, the collected data by paper is entered into tablet after edition missing data under the supervision of supervisor. After checking by supervisor, data are sent to data processing center which is located in Ministry of Health and Sport (MOHS) central office, Nay Pyi Daw. After reviewing questionnaire at data processing centre, data entry is done by thirteen staff who is specially trained for this. To be 100% verification, all data are entered twice, once in field-by-field staff and other is in data processing centre. For secondary editing the data for resolving computer-identified inconsistencies and to code open-ended questions, CSpro software is used. The advantage of concurrent processing the data is becoming error-free and high

accuracy data. DHS program data processing specialist do clean data to reach final stage.

3.7.3 Response rate

In MDHS, 12500 households are interviewed among 12780 households, response rate is 98%. Response rates for eligible women and men are is 96% and 91%, respectively. The response rate is higher in rural area than in urban area(6).

3.7.4 Data analysis

In this study, the researcher used SPSS version 25 for data analysis. To describe frequency, mean, median, mode, standard deviation and percentage of the variables, researcher uses descriptive statistic. For finding the association between dependent and independent variables, inferential static method is used.

Before doing analysis, researcher weighted the datasets to become national level representative survey according to demographic health survey guideline. In order to answer the specific objectives, the following statistical methods which were shown in Figure (1.8) were used to analyze the data. The descriptive statistic was used to get prevalence of diarrhea among children aged under 2 years and second objectives which explore maternal behavior. Then, inferential statistic was used to answer third objectives. Binary logistic regression and chi square were used to analyze the association between maternal behavior in child care and prevalence of diarrhea among children aged under 2 years.

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Objectives	Statistical Methods
To explore behavior of mother related with diarrhea among children aged under 2 years.	Descriptive statistic
Prevalence of diarrhea among children aged under 2 years	Descriptive statistic
Association between maternal behavior and diarrhea among aged under 2 years	Inferential statistic (binary logistic regression and chi square)

Figure 1.8 Objectives and Statistical analysis

3.8 Timeline for study

Researcher start doing from that study from August,2020 and end up July, 2021.Approximate duration of study is 11 months. Detail process of workplan can be seen in Figure (1.9). No funding is needed because of secondary data analysis.

	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July
Proposal draft submission												
Proposal examination												
Final proposal submitting												
Ethical Board Passing												
Data cleaning and analysis												
Results												
Discussion												
Final thesis examination												
Final Thesis submitting												

Figure 1.9 Timeline for study

3.9 Benefit of Study

The information got from this study will be very useful for Ministry of health and sports (MOHS) in Myanmar for strategy drawing, planning, monitoring and evaluation activities to reducing under 5 children morbidity and mortality.

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3.10 Ethical Consideration

The MDHS survey are approved by Department of Medical Research, Ministry of Health and Sport and ICF Institutional Review Board. Permission to analyzed MDHS-2015 data is requested by researcher to Demographic Health Survey Program for this study(6). DHS program approve at 7/1/2021 to analyze data and send the link https://dhsprogram.com/Data/ for downloading the data. This survey is also approved by The Research Ethic Review Committee of Chulalongkorn University at 2/3/2021. Both of two approval letters can be seen in appendices.

CHAPTER IV
RESULTS

This research was performed with secondary data analysis using the data of Myanmar Demographic and Healthy Survey 2015–2016. The 1,849 of 0-23 months old children and their caregivers were the samples studied. The results from the study were presented in 3 parts as follows;

Part 1 To explore behavior of mother (breast feeding, present of hand washing facilities, water and latrine sanitation, practices of child feces disposal, practices in child healthcare) influencing on diarrhea among children aged under 2 years in Myanmar.

Part 2 To identify the prevalence of diarrhea among children aged under 2 years in Myanmar.

Part 3 To find association between maternal behavior in child care and diarrhea in children aged under 2 years in Myanmar.

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4.1 Descriptive Statistics of demographic and socioeconomic status

Descriptive statistics of demographic and socioeconomic status was shown in Table 4.1. One thousand six hundred and fifty-five children aged under 2 years were included in this survey. Proportion of male children (54%) were more than that of female children (46%). Most of proportion of the children in this survey were 6–23 months old (71.4%). Most population of mothers (51.6%) were between 25 to 34 years old. Most population of mothers (74.9% of total population) were living in rural areas. Most of the mothers had primary and secondary education levels, whose proportion were 43.8% and 31.8% respectively. Majority of mothers were living in the poorest and poorer wealth status household which were 26.7% and 21.7%, respectively. The proportion of mothers who are not working (52.9%) were higher than that of mothers who are working (47.1%).

Table 4.1 Demographic and socioeconomic status among children aged under 2 years in Myanmar

Variables	N	%
Child's sex(N=1655)		
Male	894	54
Female	761	46
Child's age(N=1655)		
0-5 month	473	28.6
6-23 month	1182	71.4
Min=0mth, Max=23mths, Median=11mths		
Mother's age(N=1655)		
15-24 years	436	26.3
25-34 years	854	51.6
35-47 year	365	22.1
Min=15 yr, Max=47 yr, Median=29		
Place of residence(N=1655)		
Urban	415	25.1
Rural	1240	74.9
Maternal Education level(N=1655)		
No education	260	15.8
Primary	726	43.8
Secondary	526	31.8
Higher	143	8.6

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Variables	N	%
Household wealth status(N=1655)		
Poorest	442	26.7
Poorer	360	21.7
Middle	285	17.2
Richer	295	17.8
Richest	273	16.5
Maternal Occupation(N=1654)		
Working	779	47.1
Not Working	875	52.9

4.2 Descriptive Statistics of maternal behavior among children aged under 2 years in Myanmar

Maternal behavior among children aged under 2 years in Myanmar were presented in Table 4.2. Majority of mothers who gave early initiated breastfeeding to her children was 65.9%. Among children aged 0–5 months old, the proportion of not getting exclusive breastfeeding (55.1%) was more than that of getting exclusive breastfeeding (44.9%). Most population of mothers (86%) gave breastfeeding continuously. Majority of mothers (78%) were drinking water from improved water sources. The proportion of mothers living in households which unimproved toilet facilities (42.5%) was more than that of households with improved toilet facilities (41.6%). Most population of mothers (55.6%) had disposed feces inappropriately. Nearly seventy-five percent of mothers were living in households which had basic handwashing facilities. Majority of children aged 9–23 months (70.2%) had taken measles vaccination at least one time. Most population of children aged under 2 years (51%.) received vitamin A supplementation. Missing values in source of drinking water and type of toilet facilities were aimed for separate categories according to DHS (2015-2016) guideline.

Table 4.2 Maternal behavior related with diarrhea among children aged 0-23 months in Myanmar

Variables	N	%
Breastfeeding Behavior		
Early Initiated Breastfeeding(N=1655)		
No	564	34.1

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Variables	N	%
Yes	1091	65.9
Exclusive Breastfeeding(N=473)		
No	261	55.1
Yes	212	44.9
Continued Breastfeeding(N=1655)		
No	232	14.0
Yes	1423	86.0
Healthy Environment		
Source of drinking water(N=1610)		
Improved	1291	78
Unimproved	319	19.3
Type of Toilet Facilities(N=1392)		
Improved	688	41.6
Unimproved	704	42.5
Presence of handwashing facilities(N=1655)		
Having basic facilities	1240	74.9
Having limited facilities	289	17.5
Having no facilities	126	7.6
Ways of child's feces disposal (N=1655)		
Appropriate	735	44.4
Inappropriate	920	55.6
Practices of mother for child health care		
Measles vaccination (N=1048)		
Yes	726	70.2
No	312	29.8
Vitamin A supplementation (N=1182)		
Yes	603	51
No	579	49

a Exclusive breastfeeding variable is analyzed among children aged 0-5months

b Vitamin A supplementation variable is analyzed among children aged 6-23 months

c Limited facilities = presence of a handwashing place but lack water and/or soap, no facilities = lack handwashing place or water or soap, basic facilities = present of handwashing place with water and soap or detergents.

d. Missing values of all variables are handled according to DHS guideline.

e. Measles vaccination variable is analyzed among children aged 9-23 months.

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4.3 Diarrhea status among children aged under 2 years in Myanmar

In Table 4.3, diarrhea status among children aged under 2 years in Myanmar were presented. According to Table 4.3, the prevalence of diarrhea among children aged under 2 years was 13.6%.

Table 4.3 Diarrhea status among children aged under 2 years in Myanmar

Variables	N	%
Diarrhea status(N=1655)		
No	1430	86.4
Yes	225	13.6

4.4 Association between maternal behavior and diarrhea among children aged under 2 years in Myanmar

4.4.1 Bivariate analysis to find association between maternal behavior and diarrhea

Table 4.4 represented the result of bivariate analysis between maternal behavior and diarrhea among children aged under 2 years in Myanmar. After bivariate analysis with Pearson's chi square test, p-value of child's age, place of residence, household wealth status, maternal occupation, early initiated breastfeeding, exclusive breastfeeding, continued breastfeeding, source of drinking water, presence of handwashing facilities and vitamin A supplementation were less than 0.25. Therefore, those independent variables had statically significant or clinically important with diarrhea among children aged under 2 years. P-value of some independent variables such as child's sex, mother's age, maternal education level, type of toilet facilities, ways of child feces disposal, measles vaccination were greater than 0.25. Those independent variables were not statically significant or clinically important with diarrhea among children aged under 2 years in Myanmar.

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Table 4.4 Bivariate analysis to find association between maternal behavior and diarrhea

Variables	Diarrhea		P-value
	No N(%)	Yes N(%)	
Demographic status			
Child's sex(N=1655)			

Variables	Diarrhea		P-value
	No N(%)	Yes N(%)	
Male	773(46.7)	121(7.3)	0.938
Female	657(39.7)	104(6.3)	
Child's age(N=1655)			
0-5 month	435(26.3)	37(2.3)	0.001
6-23 month	995(60.1)	188(11.4)	
Mother's age(N=1655)			
15-24 years	378(22.8)	58(3.5)	0.859
25-34 years	739(44.7)	115(6.9)	
35-47 year	312(18.9)	53(3.2)	
Place of residence(N=1655)			
Urban	366(22.1)	50(3)	0.218
Rural	1063(64.3)	176(10.6)	
Socioeconomic status			
Maternal Education level(N=1655)			
No education	227(13.7)	34(2.1)	0.816
Primary	620(37.5)	105(6.3)	
Secondary	456(27.6)	70(4.2)	
Higher	126(7.6)	17(1)	
Household wealth status(N=1655)			
Poorest	373(22.5)	69(4.2)	0.063
Poorer	301(18.2)	59(3.6)	
Middle	247(14.9)	38(2.3)	
Richer	267(16.1)	28(1.7)	
Richest	241(14.6)	32(1.9)	
Maternal Occupation(N=1654)			
Working	772(46.6)	103(6.3)	0.025
Not Working	657(39.7)	122(7.4)	
Breastfeeding Behavior			
Early Initiated Breastfeeding(N=1655)			
No	474(28.6)	90(5.4)	0.049
Yes	955(57.7)	136(8.2)	
Exclusive Breastfeeding(N=473)			
No	231(48.8)	30(6.3)	0.002
Yes	204(43.1)	8(1.7)	
Continued Breastfeeding(N=1655)			
No	194(11.7)	38(2.3)	0.191
Yes	1235(74.6)	188(11.4)	
Healthy Environment			
Source of drinking water(N=1610)			
Improved	1124(69.8)	167(10.4)	0.116
Unimproved	267(16.6)	52(3.2)	
Type of Toilet Facilities(N=1393)			

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Variables	Diarrhea		P-value
	No N(%)	Yes N(%)	
Improved	596(42.8)	92(6.6)	0.894
Unimproved	609(43.7)	96(6.9)	
Presence of handwashing facilities(N=1655)			
Having basic facilities	111(6.7)	15(0.9)	0.034
Having limited facilities	236(14.3)	53(3.2)	
Having no facilities	1083(65.4)	157(9.5)	
Ways of child's feces disposal (N=1655)			
Appropriate	634(38.3)	101(6.1)	0.877
Inappropriate	796(48.1)	124(7.5)	
Practices of mother for child health care			
Measles vaccination (N=1048)			
Yes	621(59.3)	115(11)	0.871
No	262(25)	50(4.8)	
Vitamin A supplementation (N=1182)			
Yes	478(40.4)	101(8.5)	0.134
No	517(43.7)	86(7.3)	

* P-value was got from analyzing by Pearson 'chi square test.

4.4.2 Multivariate analysis to find association between maternal behavior and diarrhea

Table 4.5 represented the result of multivariate analysis by binary logistic regression between maternal behavior and diarrhea among children aged under 2 years in Myanmar. After bivariate analysis with Pearson's chi square test, independent variables such as child's age, place of residence, household wealth status, maternal occupation, early initiated breastfeeding, exclusive breastfeeding, continued breastfeeding, source of drinking water, presence of handwashing facilities and vitamin A supplementation had statically significant or clinically important with diarrhea among children aged under 2 years. According to result of Table 4.5, children aged 6–23 months likely to cause diarrhea about 2.2 times more than children aged 0–5 months. Children aged between 0–23 month who did not get early initiation of breastfeeding likely to suffer diarrhea about 1.3 times more than Children aged between 0–23 month who got early initiation of breastfeeding. Children aged between 0–5 months who were

not exclusively breastfed likely to cause diarrhea about 3.1 times more than children aged between 0–5 months who exclusively breastfed.

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Table 4.5 Multivariate analysis to find association between maternal behavior and diarrhea

Variables	Diarrhea		P-value	aOR 95%CI
	No N(%)	Yes N(%)		
Demographic status				
Child's age(N=1655)				
0-5 month	435(26.3)	37(2.3)	reference	
6-23 month	995(60.1)	188(11.4)	0.001	2.2(1.5–3.1) *
Place of residence(N=1655)				
Urban	366(22.1)	50(3)	0.812	1.1(0.7–1.6)
Rural	1063(64.3)	176(10.6)	reference	
Socioeconomic status				
Household wealth status(N=1655)				
Poorest	373(22.5)	69(4.2)	0.303	1.3(0.8–2.4)
Poorer	301(18.2)	59(3.6)	0.185	1.5(0.8–2.5)
Middle	247(14.9)	38(2.3)	0.605	1.2(0.7–2.1)
Richer	267(16.1)	28(1.7)	0.423	0.8(0.5–1.4)
Richest	241(14.6)	32(1.9)	reference	
Maternal Occupation(N=1654)				
Working	772(46.6)	103(6.3)	reference	
Not Working	657(39.7)	122(7.4)	0.081	0.8(0.6–1.1)
Breastfeeding Behavior				
Early Initiated Breastfeeding(N=1655)				
No	474(28.6)	90(5.4)	0.04	1.3(1.02–1.8) *
Yes	955(57.7)	136(8.2)	reference	
Exclusive Breastfeeding(N=473)				
No	231(48.8)	30(6.3)	0.005	3.1(1.4–6.8) *
Yes	204(43.1)	8(1.7)	reference	
Continued Breastfeeding(N=1655)				
No	194(11.7)	38(2.3)	0.201	1.3(0.9–1.9)
Yes	1235(74.6)	188(11.4)	reference	
Healthy Environment				
Presence of handwashing facilities(N=1655)				
Having basic facilities	111(6.7)	15(0.9)	reference	
Having limited facilities	236(14.3)	53(3.2)	0.403	1.6(0.9–2.9)
Having no facilities	1083(65.4)	157(9.5)	0.098	1.3(0.7–2.2)
Source of drinking water(N=1610)				

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Variables	Diarrhea		P-value	aOR 95%CI
	No N(%)	Yes N(%)		
Improved	1124(69.8)	167(10.4)	reference	
Unimproved	267(16.6)	52(3.2)	0.180	0.8(0.6–1.1)
Practices of mother for child health care				
Vitamin A supplementation (N=1182)				
Yes	478(40.4)	101(8.5)	reference	
No	517(43.7)	86(7.3)	0.138	1.3(0.9–1.7)

aOR adjusted odds ratio, CI confidence interval

* Significant predictors at p-value < 0.05. Variables with P-value < 0.25 in the bivariate analysis were included to final model adjustment (AOR).

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CHAPTER V
DISCUSSION

This chapter discussed diarrhea status among 0–23 months old children in Myanmar and the key findings of maternal behavior influencing on diarrheal among children aged under 2 years in Myanmar.

5.1 Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD) and Findings of Study

Global Action Plan for the Prevention and Control of Pneumonia and Diarrhea (GAPPD) gave the information about how to prevent and control diarrhea among children aged under 2 years. In that model, it clearly mentioned that breastfeeding behavior, health seeking behavior and behavior of mother for healthy environment can prevent causing diarrhea among children aged under 2 years(26).

Among all of studied variables of that research, breastfeeding behavior such as early initiated breastfeeding, exclusive breastfeeding has a significant association with diarrhea among children aged under 2 years in Myanmar. In contrast with GAPPD, behavior of mother for healthy environment and vitamin A supplementation and measles vaccination have no significantly association with diarrhea among children aged under 2 years in Myanmar.

Diarrhea Status and maternal behavior influencing on diarrheal among children aged under 2 years in Myanmar

5.2 Diarrhea Status among children aged under 2 years in Myanmar in Myanmar

Data for the present study focused on Myanmar because diarrhea is fourth leading cause of death among children aged under 5 years in Myanmar. Additionally, the under-five mortality rate(U5MR) was 72 deaths per 1000 livebirths which was too high comparing with 29 in Cambodia and 12 in Thailand. Infant mortality rate is 62 per

1000 livebirth, compared to 11 in Thailand and 25 in Cambodia. Diarrhea was one of the common causes of under-five mortality death(3).

According to the result, the prevalence of diarrhea among children aged under 2 years in Myanmar is 13.6%. It means that one in six children aged under 2 years in Myanmar suffers diarrhea. In neighboring countries like in Indonesia, the prevalence of diarrhea among children aged under 2 years was 17.16% in 2018 which is relatively high comparing with diarrhea status among children aged under 2 years in Myanmar(4). Comparing with Ethiopia country in 2018 which is similar financial and economic condition with Myanmar, the prevalence of diarrhea among children aged under 2 years in Ethiopia (16%) was also high comparing with Myanmar.(44).

5.3 Maternal behavior influencing on diarrheal among children aged under 2 years in Myanmar

Data related with maternal behavior influencing on diarrheal among children aged under 2 years in Myanmar in that study includes demographic data, socioeconomic data, breastfeeding behavior, maternal behavior for healthy environment and maternal practice for seeking child health care. Related with GAPPD model, among protect, prevent, treat activities, protect activities such as exclusive breastfeeding had significant association with diarrhea among children aged under 2 years in Myanmar. This finding was valuable in strategic planning to decrease prevalence of diarrhea among children aged under 2 years in Myanmar.

Among the demographic and socioeconomic variables, child's age showed significant association with diarrheal status among children aged under 2 years in Myanmar. As per result, children aged 6–23 months can cause diarrhea about 2.2 time more than children aged 0–5 months old. This finding was same with research of Santika from Indonesia, which mentioned that prevalence of diarrhea was highest in children aged 12–23 months(4). But the finding was opposite with Cambodia research done by Vond Pisey. In that, they mentioned about that prevalence of diarrhea was reduced when the children are increasing the age(27). This finding pointed out that health education and intervention about infant and young child care is urgently needed in Myanmar.

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Breastfeeding behavior of mother in that research included early initiated breastfeeding, exclusive breastfeeding and continued breastfeeding. Among that, early initiated breastfeeding and exclusive breastfeeding have a significant association with diarrhea status among children aged under 2 years in Myanmar. According to result, Children aged between 0–23 month who did not get early initiation of breastfeeding can suffer diarrhea about 1.3 times more than children aged between 0–23 month who got early initiation of breastfeeding. This finding was same with the research which is done in Bangladesh and India. Both researchers found that receiving early initiation of breastfeeding can be protective factor to prevent diarrhea(34, 35). Additionally, in UNICEF report, it explored that all children aged under 2 years who received early initiated of breastfeeding can reduce the 33% mortality. Therefore, the findings in this study indirectly agreed the UNICEF report because diarrhea was fourth leading cause of death in children aged under five years(33). Related with exclusive breastfeeding, children aged between 0–5 months who were not exclusively breastfed can cause diarrhea about 3.1 times more than children aged between 0–5 months who exclusively breastfed. Similarly, in the research from Saudi done by Areb, Indonesia done by Sanitika, Ethiopia done by Akila , they revealed that exclusive breast feeding can reduce the prevalence of diarrhea among children aged 0–5 months(4, 36, 44). Coincidently, WHO set infant young child feeding interventions for the goal to get 50% coverage of exclusive breastfeeding in children aged between 0–6 month in 2025(10). The findings in this study about breastfeeding behavior of mother identified that mothers who has children aged under 2 years will critically needed to promote their knowledge about breastfeeding.

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According to the result of this research, hygienic behavior for healthy environment of mother in child care such as toilet facilities, source of drinking water, ways of child feces disposal and present of hand washing facilities have no significant association with diarrhea status among children aged under 2 years in Myanmar. This finding contradicted with the research from Cambodia and Ethiopia in which hygienic behavior for healthy environment of mother in child care had significant association with diarrhea among children aged under 2 years(27, 39). The finding is similar with Emma R.N Weaver research which is done in Myanmar.In that research, it mentioned that having toilet and having handwashing station had no significant

association between diarrhea among school children(45). For health seeking behavior of mother such as measles vaccination and vitamin A supplementation, in this research, it showed no significant association with diarrhea among children aged under 2 years in Myanmar. That finding was opposite with the research from Pakistan and Mexican. In those research, measles vaccination and vitamin A supplementation has significant association with diarrhea among children aged under 2 years(13, 42). The findings in this study suggested that sanitation intervention and measles vaccination and vitamin A supplementation cannot reduce the prevalence of diarrhea among children aged under 2 years in Myanmar.

5.4 Recommendation

The findings in this study from discussion identified that breastfeeding behavior of mother, child's age influence diarrhea status among children aged under 2 years in Myanmar. For policy maker, increasing more coverage of infant and young child health services are recommended, especially in rural areas according to objective of Myanmar National Health Plan(3). Additionally, policy maker needs to advocate for publishing a policy about setting breastfeeding space at work for mothers. For project implementer, dissemination health education about systematic breastfeeding practice to mother are recommended. Mothers who have children aged under 2 years are encouraged to give early initiated breastfeeding and exclusive breastfeeding to their children. Related with Global Action Plan for Prevention Pneumonia and Diarrhea (GAPPD), activities in protect portion of GAPPD such as promoting exclusive breastfeeding are more effective to reduce the prevalence of diarrhea among children aged under 2 years in Myanmar.

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CHAPTER VI
CONCLUSION

6.1 Conclusion of the study

This study is aimed for finding association between maternal behavior in child care influencing on diarrhea status among children aged under 2 years in Myanmar. Child's age, occupational status of mother, early initiated of breast feeding and exclusive breastfeeding remain significant association with diarrhea among children aged under 2 years in Myanmar. Dissemination of health education about breastfeeding behavior to mothers, increasing coverage of infant and young child health care services especially in rural areas, advocating for setting breastfeeding space at work for mothers can reduce the prevalence of diarrhea among children aged under 2 years in Myanmar.

6.2 Limitation of study

6.2.1 In this study, researchers cannot find the association between rotavirus vaccination and prevalence of diarrhea because this survey was done in 2015 and rotavirus vaccine was firstly included in routine immunization schedule in Myanmar, 2020.

6.2.2 As the study population of this study was only 0–23 months old children, the data was collected from mother's reports and health card. Therefore, some questions can cause overtaxing memory of mothers.

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