

KNOWLEDGE ATTITUDE AND PRACTICES OF HYGIENE BEHAVIORS
AMONG NARGIS CYCLONE SURVIVORS OF LAPUTTA TOWNSHIP
AYEYARWADDY UNION OF MYANMAR

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ความรู้เจตคติ และการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัยในหมู่ผู้รอดชีพจากพายุไซโคลนนาเก็ส
ที่ลาพุดตาทาวนชิพ เอยาวัดดี เมียนมาร์

นายอ่อง เมียว มิน

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อ่อง เมียว มิน: ความรู้เจตคติ และการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัยในหมู่ผู้รอดชีพจากพายุไซโคลนนาเกิส ที่ลาพุดตาทาวน์ชิพ เอยาวัดดี เมียนมาร์ (KNOWLEDGE ATTITUDE AND PRACTICES OF HYGIENE BEHAVIORS AMONG NARGIS CYCLONE SURVIVORS OF LAPUTTA TOWNSHIP AYEYARWADDY UNION OF MYANMAR) อ.ที่ปรึกษาวิทยานิพนธ์หลัก: ผศ.ดร.ประเทือง หงสรานากร, 111 หน้า.

การศึกษานี้เป็นการศึกษาภาคตัดขวางเพื่อศึกษาปัจจัยทางสังคม-ประชากร ปัจจัยที่มีอิทธิพลต่อความรู้เจตคติ และการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัย (KAP) และความรู้ เจตคติ ความพร้อมในการปฏิบัติ และการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัย ในหมู่ผู้รอดชีพจากพายุไซโคลนนาเกิส ที่ลาพุดตาทาวน์ชิพ เอยาวัดดี เมียนมาร์ การศึกษาข้างสำรวจความสัมพันธ์ระหว่างปัจจัยทางสังคม-ประชากร ปัจจัยที่มีอิทธิพลต่อ KAP เกี่ยวกับพฤติกรรมสุขอนามัย และความรู้ เจตคติ ความพร้อมในการปฏิบัติ และการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัย เก็บข้อมูลระหว่างเดือนมีนาคม 2556 การสุ่มตัวอย่างใช้วิธีการ cluster sampling และ simple random sampling เพื่อให้ได้กลุ่มตัวอย่างจากหมู่บ้านที่ศึกษาในการวิจัยเชิงปริมาณ แบบสำรวจเป็นแบบสอบถามอย่างมีโครงสร้างและใช้วิธีการถามเพื่อให้กลุ่มตัวอย่างจำนวน 440 รายให้คำตอบ กลุ่มตัวอย่างเป็นทั้งเพศชายและเพศหญิงและมีอายุระหว่าง 18-59 ปี การวิเคราะห์ข้อมูลใช้สถิติเชิงพรรณนาและสถิติเชิงอ้างอิง (สถิติทดสอบไคสแควร์) เพื่อทดสอบความสัมพันธ์ระหว่างตัวแปรอิสระและตัวแปรตาม

ผลการวิจัยพบว่า (ร้อยละ 41.6) ของกลุ่มตัวอย่างมีความรู้ระดับสูง และ (ร้อยละ 69.5) มีเจตคติที่เป็นเชิงบวกต่อการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัย หากแต่ (ร้อยละ 30.2) เท่านั้นที่มีการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัยในระดับสูง ความสัมพันธ์อย่าง มีนัยสำคัญทางสถิติที่ ($P\text{-value} = <0.05$) กับความรู้ เจตคติ และความพร้อมในการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัย ได้แก่ ปัจจัยทางสังคม-ประชากรที่เป็นระดับการศึกษา อาชีพ และรายได้ครัวเรือน ; ปัจจัยที่มีอิทธิพล เช่น จำนวนศูนย์สุขภาพจำนวนกิจกรรมทางการส่งเสริม/ทางการศึกษาด้านสุขอนามัย อุปกรณ์ที่ใช้ในการทำความสะอาดน้ำดื่ม จำนวนส้วมแบบป้องกันแมลงวัน และอุปกรณ์ที่ใช้สำหรับล้างมือ มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติที่ ($P\text{-value} = <0.05$) กับความรู้และเจตคติเกี่ยวกับพฤติกรรมสุขอนามัย และการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัย นอกจากนี้ ความรู้ เจตคติ ความพร้อมในการปฏิบัติ และการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัยยังมีความสัมพันธ์ระหว่างกันอีกด้วย ($P\text{-value} = <0.05$).

เพื่อการเสริมสร้างการปฏิบัติเกี่ยวกับพฤติกรรมสุขอนามัยที่ดีขึ้น ในหมู่ผู้ได้รับผลกระทบจากพายุไซโคลน ควรมีมาตรการเพื่อการปรับปรุงเปลี่ยนแปลงพฤติกรรมอย่างยั่งยืนซึ่งนำไปใช้จริงในทางปฏิบัติ การเกณฑ์บุคลากรด้านการดูแลสุขภาพให้มากขึ้นกว่าที่มีอยู่ พร้อมกับการสร้างศูนย์สุขภาพที่ใช้งานได้จริง พร้อมกับการมียาที่ได้คุณภาพควรถือเป็นความสำคัญลำดับแรกๆ กิจกรรมเพื่อการศึกษาด้านสุขอนามัยอย่างยั่งยืนควรมีการนำไปปฏิบัติจริงด้วยการจัดให้มี โปรแกรมการศึกษาที่ครอบคลุมถึงการฝึกอบรม การสนทนากลุ่ม และการออกเยี่ยมตามบ้าน

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PRACTICES/ HYGIENE BEHAVIORS/ NARGIS CYCLONE SURVIVORS/
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AUNG MYO MIN: KNOWLEDGE ATTITUDE AND PRACTICES OF
HYGIENE BEHAVIORS AMONG NARGIS CYCLONE SURVIVORS OF
LAPUTTA TOWNSHIP AYEYARWADDY UNION OF MYANMAR

ADVISOR: ASST. PROF. PRATHURNG HONGSRANAGON, Ph.D., 111 pp

The study was descriptive cross-sectional study to learn about socio-demographic factors, influencing factors on hygiene knowledge, attitude, practices of hygiene behaviors (KAP), and knowledge, attitude, readiness to practices, and practices of hygiene behaviors among Nargis cyclone survivors of Laputta Township, Ayeyarwaddy, Union of Myanmar. It also explored the relationship among socio-demographic factors, influencing factors on KAP of hygiene behaviors and knowledge, attitude, readiness to practices, and practices of hygiene behaviors. The study was conducted during March 2013. The cluster sampling and simple random sampling methods were used to identify appropriate respondents in the study village for quantitative research. Face-to-face and structured interview questionnaire survey was applied with 440 respondents, both males and females, age 18-59 years old. Data analysis employed descriptive statistics and inferential statistics (Chi-square test) to find the relationship between dependent and independent variables.

The result revealed that (41.6%) of the respondents had high level of knowledge and (69.5%) had positive level attitude towards hygiene behaviors, but only (30.2%) had high level of practices of hygiene behaviors. Three socio-demographic factors, namely, education, occupation, and household income indicated statistically significant relationship (P -value= <0.05) with knowledge, attitude, readiness to practices, and practices of hygiene behaviors. The influencing factors, such as, presence of health center, presence of hygiene promotion/education activities, presence of water safety items, fly-proof latrine, hand washing facilities, all demonstrated statistically significant relationship (P -value = <0.05) with knowledge, attitude, readiness to practices, and practices of hygiene behaviors. In addition, knowledge, attitude, readiness to practices, and practices of hygiene behaviors showed statistically significant relationship among each other (P -value = <0.05)

To build better hygiene behaviors of the cyclone affected populations, sustainable behavioral change hygiene improvement measures should be implemented. Additional recruitment of health care personnel along with building of functioning health centers equipped with quality drugs should be prioritized. Sustainable hygiene education activities should be implemented by organizing education package including training course, focus group discussion and home visit.

Field of Study:Public Health..... Student's Signature

Academic Year:2012..... Advisor's Signature.....

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CHAPTER I

INTRODUCTION

1.1 Background and rationale

Improved sanitation facilities had been accessed only by the 59% of the global population in 2004. It means 4 out of 10 people have no chance to access adequate sanitation all over the world. Many of the world populations have no fly proof latrines and appropriate sanitary wares that they have to defecate in open place or use unhygienic facilities; leading to severe risk of hygiene related diseases. In contrast, sanitation coverage increase from 49% in 1990 to 59% in 2004, great efforts still need to achieve coverage of 75% MDG target level in 2015. (WHO & UNICEF, 2006)

In the mainland region of South East Asia, Myanmar is one of the largest, least developed and at the western border region of the nation, the coastline is estimated 2,400 km, which largely forms the eastern coast of the Bay of Bangal. The (3) main rivers namely the Ayeyarwaddy, Sittaung and Thanlwin flow from northern part of the country to the south and form numerous tributaries in the Ayeyarwaddy Division.

Cyclone Nargis (category 3, tropical cyclone) which developed in the Bay of Bangal made land fall to Myanmar on 2nd and 3rd May 2008. The wind speed of the cyclone was up to 200 km/hr and also associated with up to 12 foot (3.6 meter) high giant tidal surges and heavy rain. The Delta region had been most severely affected (Post Nargis Joint Assessment, 2008). Homes and basic social infrastructures, including hospital, schools, transportation roads, bridges, jetties, communication systems, water and sanitation facilities and electronic supplies were destructed by the disaster. The trees and power lines were tore down by the strong wind while accompanying giant storm surge submerged countless homes and villages (Post Nargis Joint Assessment, 2008).

37 townships in Ayeyarwady and Yangon Divisions were significantly affected by the cyclone. Out of an estimated 7.35 million people living in affected townships, 2.4 million people were severely affected by the cyclone. In Ayeyarwaddy, the cyclone affected region was around 23,500 kilometer squared, almost twice the area of Lebanon. In the history of natural disaster profile that was

affected to Myanmar, Nargis was the worst one; moreover recorded as the 8th deadliest in the world and the most devastating that stroke Asia since 1991 (Post Nargis Joint Assessment, 2008).

In addition to the mass destruction of shelters, livelihoods, communication and basic social infrastructures, the great damages to the water sources and sanitation facilities superimposed the burden of water-borne and hygiene related diseases among the affected local communities.

Damages to primary sources of drinking water (community ponds) and storage tanks; Before the cyclone made landfall, the usual way of drinking water supplement was through self provision systems, including house hold level rain water collection with storage tanks, community rain water ponds, and even from river water in some particular period of dry seasons. During the cyclone, almost all the household water collection tanks were destroyed and subsequent storm surge and flooding caused salination of community drinking water ponds in most of the affected villages in Ayeyarwaddy. In the region of Ayeyarwaddy Division, the salination affected up to the 43 percent of the total ponds. The current access to clean water had been considered inadequate by the 63% of surveyed people and estimated 1.8 million people were in need of safe water supply (Post Nargis Joint Assessment, 2008).

Destruction to the fly-proof latrines; In Ayeyarwaddy rural area; because of the floods and tidal surge, most of the latrine existed had been destructed. Consequently, practicing of open and unsanitary defecation almost became doubled and combination of usage of river water for the purpose of drinking led to raise health risks in the area (PONJA, 2008).

High prevalence of diarrheal diseases; Water and food borne diseases were the risk for immediate disease outbreaks for the cyclone survival population. For example: outbreak of cholera, typhoid and diarrhea (WHO, 2008).

The Health Management Information System (HMIS) mentioned that diarrhea and dysentery posed the highest post-cyclone disease burden in the affected communities of ten study townships, including Laputta (Ngapudaw, Laputta, Bogale, Phyapon, Dedaye, Mawlamyaingkyun, Kyitelat in Ayeyarwaddy Division and Kunyangon, Kawnmu, Twanty in Yangon Division). The incidence rate of acute diarrhea showed increasing trend as 571.4 cases per 100,000 persons per year in

2007, 683.44 cases per 100,000 persons per year in the four pre-Nargis months of 2008, 798.81 cases in the post-Nargis months of 2008, and declined to 610.6 per 100,000 in 2009 among those ten study townships, including Laputta. The seasonal peak for diarrhea cases in 2007 and 2009, the years before and after Cyclone Nargis, were from March to May; in contrast, the 2008 peak for diarrhea cases was from May to July, immediately following the Nargis incident. In addition, prevalence of diarrhea was noted down in more than 30 % of respondents in Laputta (PONJA, 2008). The above mentioned increased case morbidity rate of diarrhoea in cyclone affected areas strongly associated with WHO statement “inadequate safe water supply, lack of latrine and poor hygiene and sanitation conditions linked to even around 88% of diarrheal associated diseases”. (WHO, 2004)

Because of the high prevalence of diarrhea associated diseases in the post-cyclone situations, the immediate promotion of fly proof latrine, public rain water ponds rehabilitation, restoration of household level rain water collecting system and awareness raising of individual level hygiene knowledge, attitude and practices (personal hygiene, water clean, food clean, latrine clean, hand clean) were the priority areas for the humanitarian response in needs (Post Nargis Joint Assessment, 2008).

Hygiene promotion, awareness raising and behaviour change; Improvement of hygiene behaviours and sanitation situation of populations is one of the key factors to control high prevalence of diarrhoeal diseases (Esrey et al., 1991). Even estimated one quarter to one third decreasing of diarrhea cases could be achieved by implementing water, sanitation, and hygiene improvement activities (Esrey et al., 1991; Fewtrell et al., 2005”). Both hygiene education software activities regarding messages to gain sanitary and safe hygiene knowledge and hardware provision of sanitation facilities (latrines, water tanks etc) should be provided to the cyclone affected communities. (WHO, 2008)

Among the cyclone affected townships, Laputta was the most affected one that all the majority of basic infrastructures including sanitary facilities had been severely destructed (Post Nargis Periodic Review IV, 2010). Post Nargis Recovery and Preparedness Plan (PONREPP) recommended that Laputta is one of the top three townships along with Pyapon and Ngaputaw to be prioritized in sanitation. In these three townships, only one in three household were using improved sanitation facilities

(Post Nargis Periodic Review II, 2009). Moreover, as one of the worst results in delta, regarding the hygiene practices of inhabitants, less than half of the households were using safe (improved) sanitation facilities in Laputta Township was reported.(Post Nargis Periodic Review I, 2008)

Immediately after Nargis; national government, international humanitarian aids organizations and local non-government agencies had implemented series of hygiene integrated projects including provision of necessary sanitary facilities (water storage tanks, soaps) in the Laputta Township. It has been more than four years the series of projects have been implemented and some activities are continuing going onwards. But to achieve complete fulfillment of safe hygiene practices is still in needs because of the gaps associated with socio-demographic characteristics (not rich enough to have water tanks etc), influencing factors such as availability of hygiene promotion/education services (local health services), hygiene facilities (working in the farm far from latrine etc) and knowledge, attitude and practices of good hygiene behaviors. As a consequence, even after four years of the cyclone, the affected community would still suffer health risks mainly associated with sanitation and diarrheal diseases.

This study accessed the knowledge, attitude and hygiene practices level of Nargis Cyclone Survivors, residing in the Laputta Township after four years that the cyclone had been made landfall. It also explored whether hygiene knowledge, attitude, and practices level has relationship with socio-demographic factors and influencing factors (availability of hygiene information and education services, availability of hygiene facilities).The study enabled us to study socio-demographic factors and influencing factors on hygiene knowledge, attitude, and practices, knowledge, attitude and practices level of hygiene behaviors, the relationship between socio-demographic factors, influencing factors and hygiene knowledge, attitude and practices and relationship among hygiene knowledge, attitude, practices each other.

1.2 Research Questions

- I. What are the **personal profiles (socio-demographic factors)** among respondents in Laputta Township, Ayeyarwaddy, Union of Myanmar?
- II. What are the **influencing factors** on hygiene knowledge, attitude and practices of hygiene behaviors among respondents in Laputta Township, Ayeyarwaddy, Union of Myanmar?
- III. What is the hygiene **knowledge, attitude, readiness to practices, and practices of hygiene behaviors level** among respondents in Laputta Township, Ayeyarwaddy, Union of Myanmar?
- IV. What is the **relationship** among **personal profiles (socio-demographic factors), influencing factors** on hygiene knowledge, attitude, practices of hygiene behaviors and **level of hygiene knowledge, attitude, readiness to practices and practices** of hygiene behaviors among respondents in Laputta Township, Ayeyarwaddy, Union of Myanmar?

1.3 Research hypothesis

- H0: There are **no relationship** between independent factors and dependent factors among respondents in Laputta Township, Ayeyarwaddy, Union of Myanmar.
- H1: There are **relationship** between independent factors and dependent factors among respondents in Laputta Township, Ayeyarwaddy, Union of Myanmar.

1.4 Objectives of the study research

- I. To study the **personal profiles (socio-demographic factors)** among respondents in Laputta Township, Ayeyarwaddy, Union of Myanmar
- II. To study the **influencing factors** on hygiene knowledge, attitude, practices among respondents in Laputta Township, Ayeyarwaddy, Union of Myanmar

- III. To access the hygiene **knowledge, attitude, readiness to practices and practice level** among respondents in Laputta Township, Ayeyarwaddy, Union of Myanmar
- IV. To explore the **relationship** between **personal profiles (socio-demographic factors),influencing factors** on hygiene knowledge, attitude, practices and **level of hygiene knowledge, attitude, readiness to practices and practices** among respondents in Laputta Township, Ayeyarwaddy, Union of Myanmar

1.5 Variables in the study

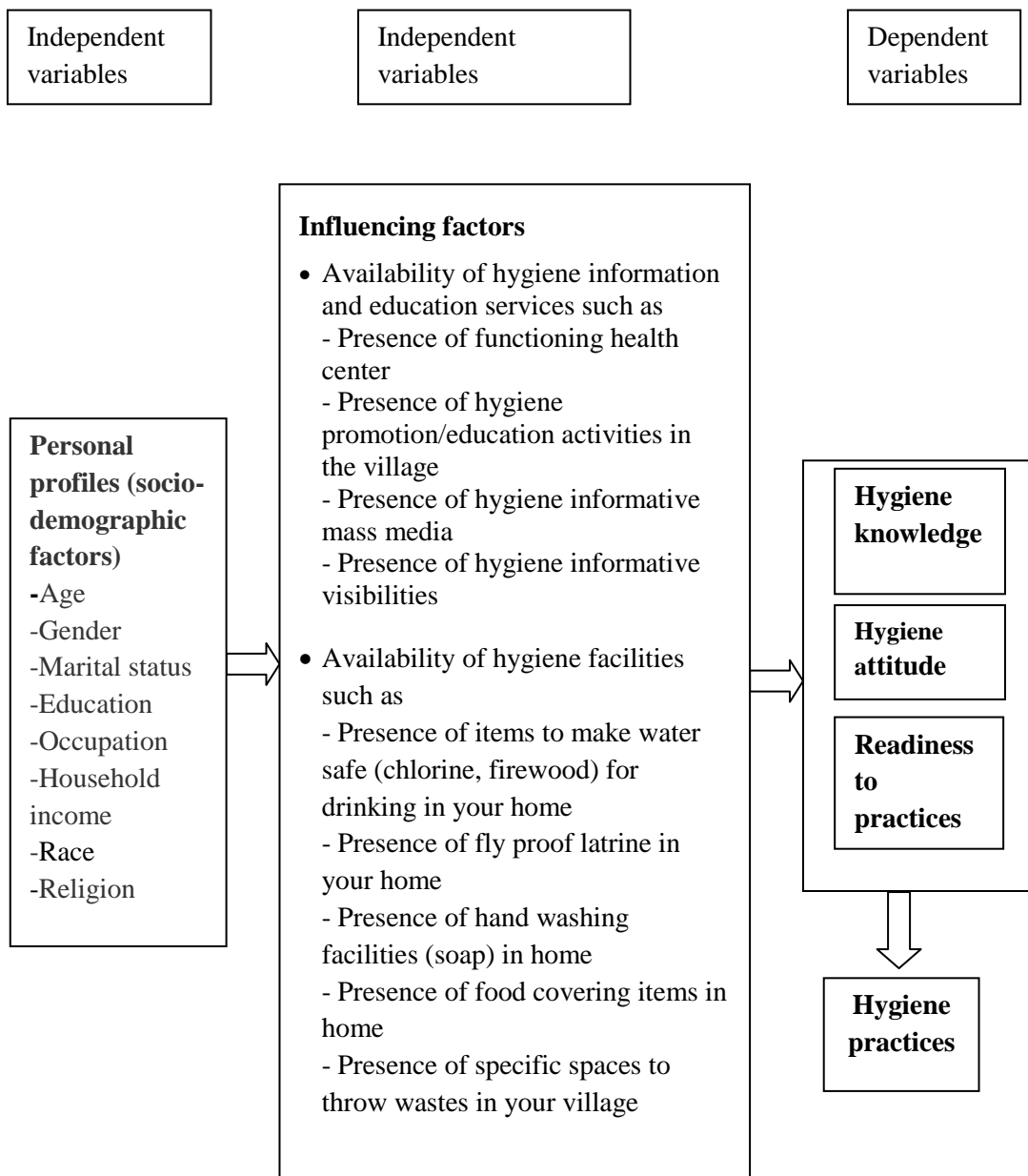
1.5.1. Independent variables

- I. Personal profiles (socio-demographic factors) - Age, Gender, Marital status, Education level, Occupation, average total HH income per month, Race, Religion.
- II. Influencing factors on hygiene knowledge, attitude, practices of hygiene behaviors - Availability of hygiene information and education services and availability of hygiene facilities.

1.5.2. Dependent variables

- I. Hygiene knowledge, attitude, readiness to practices and practices level

1.6 Conceptual framework



1.7. Operational definitions

1.7.1. Independent variables

Personal profiles (socio-demographic factors)

- Age: how old the respondent is at the time of interview.
- Education level: the highest education level achieved by the respondents at the time of interview, categorized into no education, basic monastery/primary (Grade1-4), middle (Grade 5-8), high (Grade 9-10), university level and others (specified).
- Occupation: refers to respondents' income generation/professional job.
- Household income: refers to respondents' and his family members (who financially support or share with him/her) income/month in Myanmar Kyats (MMK).
- Race: A group of people who share the same language, history, culture etc
- Religion: respondents' religious belief into Buddhist, Christian, Hindu, Islam or others.

Influencing factors

- Availability of hygiene information and education service: means available hygiene information and education services for the respondents in his/her village; such as presence of health care staffs/health volunteer, hygiene promotion/education activities, I/LNGOs doing hygiene related activities, media providing hygiene knowledge, awareness raising visibilities (posters, wall sheets)etc
- Availability of hygiene facilities: means available hygiene facilities for the usage of respondents in his/her village/home; such as presence of items to make water safe for drinking (i.e. firewood for boiling drinking water OR chlorine OR reliable water filter), fly proof latrine, hand washing facilities (soap), food covering items (fly proof sieve etc), particular spaces to throw waste etc

1.7.2. Dependent variables

- Hygienic Knowledge means any kind of knowledge related to hygiene: personal hygiene, food clean, water clean, hand clean and latrine clean etc
- Hygiene attitude means the way of thinking and feeling towards hygiene: personal hygiene, food clean, water clean, hand clean and latrine clean etc
- Readiness to practices: means preparation to act (the preparation steps of Stage-of-Change (SOC) behavioral change model)
- Hygiene practices: include varieties of hygienic behaviors especially refers to safe drinking water usage and proper treatment methods, usage of fly-proof latrine, hand washing practices; washing hands before handling of foods and after toilet, foods safety practices; foods are washed/cooked/prepared properly and store in a fly-proof cabin and/or cover with sieve to protect from vectors.

CHAPTER II

LITERATURE REVIEW

The literature review will explore personal profiles (socio-demographic factors), influencing factors, knowledge and attitude factors that greatly influence the hygiene practices of study population in cyclone affected areas and based on relevant approaches and article published previously, the standardized hygiene practices is highlighted as a focus.

2.1 Vulnerable ‘Cyclone Survivors’ and Unsafe ‘Hygiene Practices’

“Whether in time of peace or in emergencies, access to safe water and sanitation is human right” declared by the United Nations. People have to leave their homes in emergency situations to look for safer places and environment. In the new places, the water, sanitation and hygiene conditions are not adequately safe for many instances. In other case, basic social infrastructures including hygiene, water and sanitation facilities have been destroyed or damaged even people still live in their hometown. Stress, fatigue and malnourished, illness and injuries are the symptoms that disasters affected populations have to suffer. In addition hygienically unsafe living conditions such as lack of safe water and sanitary facilities superimpose the health risks and make vulnerable to multiple communicable diseases.

2.2 ‘Hygiene Practices’ and ‘Diarrheal associated communicable diseases’

World Bank defines hygiene as the “set of human behaviours related to safe management of excreta, e.g. washing hands with soap at appropriate times, the safe disposal of faeces, etc.”(World Bank, 2007)

Communicable diseases mainly attribute a large portion of world morbidity and mortality. (WHO, 2009) In Southeast Asia, 31% of all deaths are due to infectious diseases (Curtis, et al., 2009). Diseases associated with diarrhea are major leading cause of not only morbidity but also mortality in many developing countries of Asia, Africa and Oceania, especially in less than 5 years old children (Bern, et al., 1992). In Bangladesh, more than 100,000 under 5 children are killed with diarrheal associated

diseases every year. Diarrheal outbreak occurs twice in a year as an average. (Bern, et al., 1992) One of the major cause of deaths among young children is intestinal infection (one of major communicable infection) and especially notable in developing countries (WHO, 2009)

Unclean sanitary conditions and hygiene practices lead to increase burden of communicable diseases in developing countries (Vivas, et al., 2010). Because of unsafe hygienic practices, poor sanitary conditions and lack of clean water 6,000 children are dying every day from the diarrheal associated disease (UNEP, 2003). Lack of hygienic practices, unsafe water supply, especially drinking water, and poor sanitation conditions are linked to estimated 88% of diseases associated with diarrhea. (WHO, 2004) The major underlying causes of diarrheal associated diseases can be controllable and preventable. The majority of preventative measures related to personal hygiene practices, clean water supply and good sanitation.

Hand washing by using soap and clean water can reduce diarrheal morbidity rate up to 44%. (Curtis, et al., 2009; UNICEF, 2009) Availability of soap, water, and sanitation facilities as well are the two major necessities associated with hand washing practices among children. But even with adequate facilities and resources for good hygienic practices, knowledge and attitude towards hygiene are still compulsory for good personal hygiene. (Bern, et al., 1992) To reduce mortality and morbidity, hygiene practices provide a greater impact than safe water supply and good toilet facilities (Cairncross, et al., 2006). Improvement of hygiene practices may have a great impact in controlling diarrheal diseases (Esrey, et al., 1991).

However, it is observed that people have a very poor understanding regarding the link between poor hygiene practices and diseases (Water Aid Bangladesh, 2003). Research indicates that considerable number of people builds latrines for their convenience, privacy and social status rather than sanitation and health (Water Aid Bangladesh, 2003). In rural areas, some people tend to defecate in open places despite they have sanitary latrines. (ICDDR B, 2008) In order to achieve fulfilment, morally charged and culturally embedded hygiene practices; many increasing resources are being brought around the world but it is still far and not ensure yet. (Curtis, et al., 2009)

2.3 'Consumer Behavior'

Consumer behavior is the study of individuals, groups, or organizations and the processes they use to select, secure, and dispose of products, services, experiences, or ideas to satisfy needs and the impacts that these processes have on the consumer and society. It blends elements from psychology, sociology, anthropology, and economics. It attempts to understand the decision-making processes of buyers, both individually and in groups. It studies characteristics of individual consumers such as demographics and behavioral variables in an attempt to understand people's wants. It also tries to assess influences on the consumers from groups such as family, friends, reference groups, and society in general.

Customer behavior study is based on consumer buying behavior, with the customer playing the three distinct roles of user, payer and buyer. Research has shown that consumer behavior is difficult to predict, even for experts in the field.

Relationship marketing is an influential asset for customer behavior analysis as it has a keen interest in the re-discovery of the true meaning of marketing through the re-affirmation of the importance of the customer or buyer. A greater importance is also placed on consumer retention, customer relationship management, personalization, customization and one-to-one marketing. Social functions can be categorized into social choice and welfare functions.

Black box Model

environmental factors		BUYER'S BLACK BOX		BUYER'S RESPONSE
Marketing Stimuli	Environmental Stimuli	Buyer Characteristics	Decision Process	
Product Price Place Promotion	Economic	Attitudes	Problem	Product choice
	Technological	Motivation	recognition	Brand choice
	Political	Perceptions	Information	Dealer choice
	Cultural	Personality	search	Purchase timing
	Demographic	Lifestyle	Alternative	Purchase
	Natural	Knowledge	evaluation	amount

			Purchase decision Post-purchase behavior	
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The black box model shows the interaction of stimuli, consumer characteristics, decision process and consumer responses. It can be distinguished between interpersonal stimuli (between people) or intrapersonal stimuli (within people). The black box model is related to the black box theory of behaviorism, where the focus is not set on the processes *inside* a consumer, but the *relation* between the stimuli and the response of the consumer. The marketing stimuli are planned and processed by the companies, whereas the environmental stimuli are given by social factors, based on the economical, political and cultural circumstances of a society. The buyers' black box contains the buyer characteristics and the decision process, which determines the buyers' response.

The black box model considers the buyers response as a result of a conscious, rational decision process, in which it is assumed that the buyer has recognized the problem. However, in reality many decisions are not made in awareness of a determined problem by the consumer.

Informational search

Once the consumer has recognized a problem, they search for information on products and services that can solve that problem. Belch and Belch (2007) explain that consumers undertake both an internal (memory) and an external search.

Sources of information include:

- Personal sources
- Commercial sources
- Public sources
- Personal experience

The relevant internal psychological process that is associated with information search is perception. Perception is defined as "the process by which an individual

receives, selects, organizes, and interprets information to create a meaningful picture of the world".

The selective perception process -

Stage Description

- Selective exposure consumers select which promotional messages they will expose themselves to.
- Selective attention consumers select which promotional messages they will pay attention to.
- Selective comprehension consumer interprets messages in line with their beliefs, attitudes, motives and experiences.
- Selective retention consumers remember messages that are more meaningful or important to them.

The implications of this process help develop an effective promotional strategy, and select which sources of information are more effective for the brand.

Evaluation of alternatives

At this time the consumer compares the alternative. Consumers evaluate alternatives in terms of the functional and psychological benefits that they offer. The marketing organization needs to understand what benefits consumers are seeking and therefore which attributes are most important in terms of making a decision.

Purchase decision

Once the alternatives have been evaluated, the consumer is ready to make a purchase decision. Sometimes purchase intention does not result in an actual purchase. The marketing organization must facilitate the consumer to act on their purchase intention. The organization can use a variety of techniques to achieve this. The provision of credit or payment terms for required facilities (by closely coordination with local dealer) may encourage purchase, or a sales promotion such as the opportunity to receive a premium or enter a competition may provide an incentive to buy now. The relevant internal psychological process that is associated with purchase decision is integration. Once the integration is achieved, the organization can influence the purchase decisions much more easily.

There are 5 stages of a consumer buying process they are: The problem recognition stage, meaning the identification of something a consumer needs. The

search for information, which means you search your knowledge bases or external knowledge sources for information on the product. The possibility of alternative options means whether there is another better or cheaper product available. The choice to purchase the product and the real purchase shows the complete process that a consumer will most likely, go through when they go to buy a product.

Post-purchase evaluation

The EKB (Engel, Kollat, Blackwell) model was further developed by Rice (1993) which suggested there should be a feedback loop, Foxall (2005) further suggests the importance of the post-purchase evaluation and that it is key because of its influences on future purchase patterns.

Other influences

Consumer behavior is influenced by internal conditions such as demographics, psychographics (lifestyle), personality, motivation, knowledge, attitudes, beliefs, and feelings. Psychological factors include an individual's motivation, perception, attitude and belief, while personal factors include income level, personality, age, occupation and lifestyle.

Behaviors can also be affected by external influences, such as culture, sub-culture, locality, royalty, ethnicity, family, social class, past experience reference groups, lifestyle and market mix factors.

2.4 Personal profiles (socio-demographic factors)

The knowledge, attitude and perception of a population are pivoted on the basic demographic and socio-economic characteristics such as religious, educational, household income and occupation status etc. On the other way, the practice of particular behaviour as well is significantly influenced by the people's knowledge level and perception towards, along with availability and accessibility of facilities. So, the demographic and socio-economic factors have great impact on hygiene practices of the particular community through the knowledge level and attitude towards. (Curtis, et al., 2009)

The health status of the particular group of people is largely influenced by social determinants such as the native place of birth, the pattern of the growth and live, work, and their age. The distribution of money, power and resources at global,

national, and local levels shapes the social circumstances under the influenced of international, national or government policies. (Curtis, et al., 2009)

2.4.1 Educational level

One study in Kenya shows that higher literacy associated with higher hand-washing with soap. (WHO, 2009)

With increasing level of education, better hygiene practices of population can be seen. Highest level of good practices can be seen in graduated and further graduated educational status. IN vice versa, worst hygiene practices can be found in illiterate and non formal schooling populations. (University of San Diego State, 2005)

2.4.2 Race and Religion

Hygiene practices can also be greatly varied depending on multiple racial influences and religious beliefs. High rates of hand washing practices had been found in some area of Muslim population like Mombasa, Kenya. (WHO, 2009)

Noticeable example of racial influence in hygiene practice is bathing; the variation of bathing practices vary greatly from one racial group to another and it can be seen easily as people from one racial group wash the body day by day but different trends in people from another racial group. (Municipality, 2005)

2.4.3 Household income

Hygiene practices improved with increasing household income (economic level). One of the studies in India showed that higher level of hygiene practices as 51%, 44%, 39% could find in population of high, middle and lower economic class respectively. (WHO, 1987)

2.5 Influencing factors on hygiene knowledge, attitude and practices

2.5.1 Availability of hygiene information and education services

2.5.1.1 Hygiene education (or) social mobilization

The concept involving series of social movements (group discussion in leisure time etc) that initiate to encourage any particular matter (or) development process is social mobilization. For instance; hygiene education services by local health center.

The social mobilization can be at household level, local, divisional and even up to national level by promoting available resources and encouraging all possible actors/populations to be participated. Social mobilization can be both mass campaign, small group discussion and one by one communication as well. Social mobilization can achieve real changes of good hygiene practices against alarming bad hygiene status with no violent social conflict.

In case of social mobilization for hygiene promotion, all the people; different levels of societies in the community and local delivery services as well (eg: local resources are recommended to use for sustainability of the programme) are encouraged to involve because community participation is compulsory matter for sustainability and achievement of any development programme like hygiene promotion. (UNICEF, 2000)

Simple knowledge and awareness are not adequate to ensure safe hygiene practices of the population. Sustainable efforts on continuous social mobilization are needed to achieve behavioral pattern changes or have critical level of perception and attitude of the community. It is no doubt that social mobilization largely affects the behavioral changes of the hygiene practices but it needs enough time for the remarkable changes. (UNICEF, 2000)

2.5.1.2 Media services

The media services are very effective way of communication in relying information to the mass population. The multi system media services (TV, radio, newspaper, journal, IT service etc) can be used effectively to promote the one's knowledge. After the knowledge has been raise the attitude becomes change and the good practices have also been achieved slowly as a consequence.

The multi system media service can largely impact on the hygiene behaviors, both in urban and rural settings. The analytical study in rural villages of Kenya shows that media services greatly influenced the hand-washing hygiene practices. Even the educational level of population is low; the media services can largely relay information about good hygiene practices to the community. It clearly showed in that survey that association between education and hand-washing practices had been

reduced when the safe hygiene practices had been mediated through media services. (WHO, 2009)

Another study in Ghana showed that mass media campaign activities can use to spread hygiene promotion information to the population of different status and resulting noticeable changes of attitude towards hygiene and practices as well. (WHO, 2009)

In general multiple communication and media services complement each other, by reaching to the different sections of the people with multi socio-economic and demographic backgrounds. It has great influence in giving any information; with a very effective ways. So every possible use of available (mass) media services supports the wide spread of health and hygiene information nationwide and achievement of fulfill hygiene practices in the population.(WHO, 2009)

A greater result can be achieved if a single behavior is targeted to promote. Even the studies are relatively less, it clearly showed that too many message giving in the hygiene promotion sessions is not much effective. In recent years WHO identified only three main message regarding safety water-related behaviors to be promoted; (WHO, 2009) cleansing of hands after toilet, cleaning babies/young children's bottom and before eating/handling of foods (Curtis, et al., 2009)sanitary disposal of feces especially those of young children and diarrheal patients, (WHO, 2009) safe drinking water free of fecal contaminants. (UNICEF, 2009)

2.5.2 Availability and accessibility of hygiene facilities

Hardware structural availability and accessibility such as clean water resources, fly proof latrines etc are partly associated with hygiene practices. The poor hygiene practices can be seen predominantly in the lowest category of each factor. Availability of water sources in the house is associated with significantly higher hand washing rates than those don't have water in the house. (WHO, 2009)

One of the studies in India shows that hygiene practices positively correlate with availability and accessibility of sanitation facilities. (WHO, 1987)

2.6 Hygiene knowledge, attitude and practices

2.6.1 Safe drinking/domestic water supplies

Clean water is very important basic necessities for human beings. Availability and accessibility of clean water supplies or resources is compulsory for healthy and dignified life and also the right of people. People well beings, health and economy as well largely depend on sanitation facilities including clean water supply. Proper sanitary situations could lead to healthy life of human beings with more productive and working abilities. Accessibility to the clean water supplies and/or resources and minimum standardized sanitation facilities must be ensured to eliminate the poverty of the world. (WHO, 2000; UNICEF, 2000)

Shifting of population to the urbanized places, rapid population growth and changing of climates as well may cause negative effect to clean water resources in the future and on the other hand increased amount of human excretion and solid waste become hard to manage because of mass migration to the urban area. (Sanitation topics Sanitation Connection, 2005)

Usage of inadequate/unsafe drinking water and/or poor hygienic practices resulting from lack of clean water resources can lead to outbreak of diarrhea and other intestinal related infections. (WHO, 2000; UNICEF, 2000). Young aged children are remarkable more prone to infections than adults and can lead to malnutrition which may be acute or chronic. (Diarrhea Rehydration Project, 2005; WHO, 2005) Some main factors influencing diarrhea transmission are inadequate clean drinking water, crowded population density, poor personal hygiene and practices of bottle-feeding as substitution of breast-feed (in breast feeding children). (Diarrhea Rehydration Project, 2005; WHO, 2005)

Even in these days diarrhea and other intestinal related infections epidemics (cholera, typhoid etc) can be found not only in least developing countries but also in developed countries. (WHO, 2000; UNICEF, 2000)

In the region of inadequate water resource bacterial eye infections and skin infections are one of the most common diseases due to the lack of good hygiene

behaviors and/or washing practices. Then the infections can spread through person to person direct exposure or through infected water. (WHO, 2000; UNICEF, 2000)

World Health Organization and UNICEF pointed out that “from year 1990 to 2002, number of people who could access proper basic sanitation had been increased from 49 % to 58% but still estimate 2 out of 5 people could not yet access to such proper sanitation facilities.” (i.e.; equals to 2. 6 billion people) Moreover, those people who mentioned above are mostly residing especially in the rural areas of Asia and thus Asia (rural regions) can assume as one of the most vulnerable place to ensure proper basic sanitation facilities whereas approximately half of the population are residing without proper sanitation and clean water facilities.(WHO, 2000; UNICEF, 2000)

The number seventh Millennium Development Goal is referred and associated with health and sanitation and mentioned clearly as following: “Halve the proportion of people suffering the lack of access to safe drinking water and basic sanitation by 2015” To ensure adequate amount of clean water supply, one of the literature clearly defines that “people need to have access to safe and clean water supply and a possibility to acquire enough water for drinking, food preparation and hygiene purposes”(Lenton, 2003)

Treatment of household drinking water: is treatment of water at the point of storage or use; not treatment at the point of water sources like ponds. It influences greatly on water quality and can decrease the prevalence of diarrheal diseases if we treat drinking water in systematic way. The best way of water treatment option depends on local situations and availability such as existing conditions of water (sources), sanitation situations, natural water quality, feasibility of items for the treatment, available technology and other local determinants.

Safe storage: Once water has been collected, treated and become safe to use, it is important to prevent recontamination of water. Safety storage means storage of clean water in containers that can prevent it from recontaminations. Ceramic, metal or plastic tanks are widely used for the safe storage of water in which following characteristics are needed to ensure to serve as physical barriers to prevent water to be re-contaminated:

- (i) Tanks should have small opening with sealed cover or lid that can prevent potentially contaminated items (cups, waste materials, hands) entering into the stored water.
- (ii) The stored water in the tanks should be easily and safely accessed without hands or objects need to insert into the tanks.
- (iii) The permanent message about the tanks and instruction for cleaning purpose should have easily visible place of the tanks.

Additionally water should not be stored over a very long period of time in containers because insects and pathogens can breed in them. Water tanks and also tank covers should regularly clean in proper way.

2.6.2 Hand washing practices

Hand washing is simple but most cost effective important way in preventing diarrheal and intestinal related infections. Hands should be washed with running water and soap in particular time like before eating and after going latrine, after handling young children excreta and cleaning their bottom, after handling dust and unclean water because of the chances of contact with pathogens.

2.6.3 Food safety practices

Food should be prepared with clean hand to avoid contamination of pathogens and also need to store in storage can cover with insect nets to prevent from flies. Care should be given more to meat and milk products where many pathogens can reproduce in it.

Understanding of food safety knowledge, attitude and practices are compulsory for food handlers to reduce mass transmission of food-borne diseases and epidemics. (WHO, 2000)

2.7 Transtheoretical OR Stage-of-Change (SOC) model approach to health-behavior change

Lomas and Haynes identified a wide range of potential barriers that could affect one's practices. It includes economic, administrative, time pressure, educational

barriers, barriers related to human factors and lack of relevant particular guidelines for practice. (Lomas & Haynes, 1988)

Models and theories such as the Health Belief Model (Becker, 1974; Janz, 1984), Cognitive/Information Processing (Joss & Hickam, 1990), The Theory of Reasoned Action (Ajzen & Fishbein, 1975; Ajzen & Fishbein, 1980), Social Cognitive Theory (Bandura, 1986 & 1989), Social Support Theories (Gonzalez, et al., 1990), Behavior Modification (Skinner, 1953; Holland & Skinner 1961; Bandura 1969; Miller 1980; Elder, et al., 1994) and Kanfer's Parallel Self-Management Model (Kanfer, 1975) guide much of current health promotion practices. Although cast as distinct, in application, the above theories overlap to a considerable extent.

Many of the theories included above share the following factors: intention to behave, environmental constraints impeding the behavior, skills, outcome expectancies, norms for the behavior, self-standard, affect, and self-confidence with respect to the behavior. In short, the person must (1) have a strong positive intention or predisposition to perform a behavior; (2) face a minimum of information processing and physical, logistical, and social environmental barriers to performing the behavior; (3) perceive her/himself as having the requisite skills for the behavior; (4) believe that material, social, or other reinforcement will follow the behavior; (5) believe that there is normative pressure to perform and none sanctioning the behavior; (6) believe that the behavior is consistent with the person's self image; (7) have a positive affect regarding the behavior; and (8) encounter cues or enables to engage in the behavior at the appropriate time and place (Elder, et al., 1998). Efforts to change one's behavior must take these factors into account and address those deemed relevant to the individual and their problems.

Not all the human beings are ready to embark on any behavior-change (Cooke, 1995). According to Prochaska and DiClemente's (Prochaska & DiClemente, 1983) Transtheoretical OR Stage-of-Change (SOC) model, cognitive/behavioral change progresses as the individual moves through the following stages: **pre-contemplation** (benefits of lifestyle change are not being considered); **contemplation** (starting to consider change but not yet begun to act on this intention); **preparation (readiness to practice the behavior and preparation to act)**; **action** (making the initial steps

toward behavior change); and **maintenance** (maintaining behavior change while often experiencing relapses).

Recent revisions of the SOC model breaks down the pre-contemplation stage into unaware (no idea that there is problem behavior), uninvolved (knows that the behavior needs to be changed but does not perceive the problem as salient), and undecided (considering the positive and negative consequences of the behavior change) (Weinstein, et al., 1998). This modification allows for even greater specificity of the individual's stage and thus how to target behavior change. Providers are encouraged to match behavioral prescriptions to how 'ready' the one is to change.

According to Clark and his colleagues, (Clark, et al., 1996) the population in the precontemplation stage generally have no intention of losing weight in the next 6 months. Those in the contemplation stage are considering weight loss within the next 6 months but are not prepared to engage in a weigh loss program. Persons in the contemplation stage are considering weight loss but are currently undecided on the issue. Individuals in the preparation stage intend to loss weight within the next 30 days and are likely to benefit from training efforts. Those in the action stage are engaging in weigh-loss behaviors and are also good candidates for specific interventions. Finally, population in maintenance stage need assisatnce in preventing relapse and consolidating gains.

Similar levels of intention to change have been observed in physical-activity intervention with providers (Goldstein, et al., 1999; Marcus, et al., 1997). Individuals in the contemplation stages are more likely to benefit from cognitive approaches to increase their motivation for engaging in behavior change. This can include discussing the benefits of weight loss and providing written materials illustrating the steps necessary to begin the change process (Clark, et al., 1996). Those in the remaining stages are more likely to benefits from behavioral-skills training such as learning how to eat low fat meals (Clark, et al., 1996). Creating an awareness of the benefits of physical activity for those in the contemplation stages and providing specific information to all others on how to increase physical activity result in higher physical-activity scores overall (Marcus, et al., 1997). Differences in the strategies that should be employed based on the stage of change suggest that attempting an active intervention with an individual who has no intention of changing his/her is not likely

to result in behavior change. Similarly, simply providing tips for how to become physically active would not be salient to an individual already engaged in physical activity.

It may be difficult to assess the one's stage of change. As noted earlier, we can optimize one behavior-change efforts by ensuring that (1) he/she has a strong positive intention to perform the behavior; (2) face a minimum of barriers to performing the behaviors; (3) perceive themselves as having the requisite skills; (4) believe that reinforcement will follow the behavior; (5) believe that there is normative pressure to perform and none sanctioning the behavior; (6) believe that the behavior is consistent with their self-image; (7) have a positive affect regarding the behavior; and (8) encounter cues or enables to engage in the behavior (Elder, et al., 1998). Incorporating these theory based tenets into one's practice is not a substitute for professional judgement. Rather, it should be used as a tool to help efficient use of resources (D'Onofrio, 1992) and to facilitate lifestyle changes.

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Design

Cross-sectional, descriptive study design was used for quantitative research study; to indicate the hygiene knowledge level, attitude level and hygiene practices among the population in Laputta Township, Ayeyarwaddy, Union of Myanmar

3.2 Study area

The study was conducted in Laputta Township, Ayeyarwaddy, Union of Myanmar, one of the most severely affected areas during Cyclone Nargis.

- Among the cyclone affected townships in Ayeyarwaddy Divisions; Laputta Township, the target area, was the most affected one that all the majority of basic infrastructures including sanitary facilities had been severely destructed. (Post Nargis Periodic Review 4, July 2010)
- Partly as a consequent of losing basic sanitation facilities, the worst results regarding hygiene practices of inhabitants, showing that less than half of the households were using safe (improved) sanitation methods, had been reported in Laputta Township. (Post Nargis Periodic Review 1, December 2008).
- In addition, high prevalence of diarrhea case among children (prevalence more than 40% of children) in Laputta Township expected to be mainly related with unsafe sanitary situations and lack of good hygiene practices. (Post Nargis Periodic Review 1, December 2008)

Study (data collection) period: March 2013

3.3 Study population

The study population was respondents among general population (head of household OR housewife OR representative of household) residing in Laputta Township, Ayeyarwaddy, Union of Myanmar, with following inclusion criteria.

- Agree volunteer participation (willing to participate) in the study

- “Permanent stay”- Currently staying in the study area at least since 2008 (Nargis made landfall 2008) without any interest of staying or not staying during time of Nargis cyclone
- Available time; around one hour (without any consequent negative impact to his/her personal life or professional job) to participate in the study
- Able to give voluntary signatory and verbal consent to ensure voluntary participation and clear understanding of the nature of the contents in the research study.

Exclusion criteria;

- Temporary residences in the study area
Scope of temporary residences includes two groups of people;
 - 1) Migrated businessmen from other areas
 - 2) Migrated NGO workers from other areas
- Persons with psychological disorder (psychosis, dementia, mental retarded etc)
- Disabled persons
- Very sick persons
- Persons with communication defects like hearing/speech impairments
- Persons who cannot understand/speak Myanmar (native) language

Withdrawal situation: Respondents who want to withdraw from the study, with or without any reasons; could withdraw from the study at any time with no consequent negative impact on him/her. In case of that situation, researcher re-started the interview procedure with another respondent to replace him/her.

3.4 Sample size calculation

The (estimated) total population in Laputta Township is 494,914. (Ref; Post Nargis Periodic Review IV)

Yamane method (equation) (at 95% level of significant) was used to calculate appropriate sample size, (Yamane, 1967:886)

$$n = \frac{N}{1 + N (e)^2}$$

n =sample size

N = total population residing in target area

e^2 = acceptable error = 0.05

$$n = \frac{494,914}{1 + 494,914 (.05)^2} = 399.67 \approx 400$$

- Sample size = 400+ 10 % to add-up in case of any missing value or to prevent drop out; so 440 participants would be interviewed.

3.5 Sampling method/technique

The cluster sampling and simple random sampling were used to identify respondents in the study village.

Cluster Sampling

- In Laputta Township, altogether 684 villages (115 village tracts).
- Clustering did according to township local admin set-up that reflects homogeneous presence of schools, health centers, basic sanitary structures etc
- After making clusters, we get 2 groups of villages; centered villages and non-centered villages.
- There were 115 centered villages (there is 1 center village for each village tract); it was 16.8 % \approx (17%) of the total villages in target area.
- The rest were 569 non-centered villages; \approx (83 %) of the total villages.
- Total sample size (n) = 440

Respondents represent for centered villages = 17% of 440 is 74.8 \approx 75 people

Respondents represent for non-centered villages = 440 - 75 = 365 people

Simple Random Sampling

- Assigned numbers for every centered village; randomly picked up 1 village by using random numbered table to get representative sample 75 persons.
- Assigned numbers for every non-centered village; randomly picked up 10 villages by using random numbered table to get representative sample 365 persons.

- Then, simple random sampling was applied to identify households/respondents in the study village.

3.6 Measurement tool

The data were collected with the interviewer-administered structure done by one (face-to-face) interview questionnaires. The questionnaires were developed by researcher himself. The draft questionnaires were pilot tested before actual data collection; 20 questionnaire sets were piloted with the samples with similar baseline and socio-demographic data. The prepared questionnaire sets were make sure to comprise questions in relation to or that measure independent and dependent variables as follow;

- Socio-demographic factors: age, gender, marital status, education, occupation, HH income, race, religion
- Influencing factors (availability of hygiene information and education services, availability and accessibility of hygiene facilities)
- Hygiene knowledge
- Hygiene attitude
- Readiness to practices
- Hygiene practices

The measurement scale and scoring of independent and dependent variables

Variables	Measurement scales and scoring criteria
Independent variables	
Part 1: Personal profiles (socio-demographic factors)	
Age	Ratio
Gender	Nominal Male =1 Female =2
Marital status	Nominal Married = 1 Single = 2 Widow = 3 Divorced/separated = 4 Others =5
Education	Ordinal Never join to school (No education) = 1 Attend basic monastery school or primary school (read and write) = 2 Attend middle school = 3 Attend high school = 4 Attend university = 5 Others =6
Occupation	Nominal General/random laborer (agriculture/ livestock/salt farming/factory) = 1 Own business (merchant, own shop, own agricultural/livestock farm) = 2 Public workers (clerks, teachers, authorities etc) = 3 No occupation (students, youths etc) = 4 Others (please specify) = 5

HH income	Ratio
Race	Nominal Bamar = 1 Kayin = 2 Chinese =3 Others = 4
Religion	Nominal Buddhist = 1 Christian =2 Hindu =3 Islam =4 Others =5
Part 2:Influencing factors	Ordinal 'Yes' answer = 2 'No' answer = 0 'Don't know' answer = 1
Dependent variable	
Part 3: Hygiene knowledge	Ordinal True = 1point False = 0 point Don't know = 0 point For the questions with reverse answer; (backward score) True = 0 point False = 1point Don't know = 1 point
Part 4: Hygiene attitude	Ordinal Agree = 2 point Neutral/Not sure = 1point Disagree = 0 point

	<p>For the questions with reverse answer; (backward score)</p> <p>Agree = 0 point Neutral/Not sure = 1point Disagree = 2 point</p>
Part 5: Readiness to practices	<p>Ordinal</p> <p>Yes = 2 point No= 0 point Don't know/Not sure = 1 point</p> <p>For the questions with reverse answer; (backward score)</p> <p>Yes = 0 point No = 2 point Don't know/Not sure = 1 point</p>
Part 6: Hygiene practices	<p>Ordinal</p> <p>Regularly = 2 point Occasionally = 1point Rarely = 0 point</p> <p>For the questions with reverse answer; (backward score)</p> <p>Regularly = 0 point Occasionally = 1point Rarely = 2 point</p>

Part 3: Hygiene knowledge

Range of possible scores = 0- 22 points

After calculation of scores, total scores will be used to compare with following criteria;

High level knowledge = Total score 18-22 (more than 80%)

Moderate level knowledge = Total score 14-17 (60%-80%)

Low level knowledge = Total score 0-13 (less than60%)

Reference: Bloom (Bloom, 1968:60) scoring range by Prof. David E. Bloom

Part 4: Hygiene attitude

Range of possible scores = 0- 20 points

$$\text{Interval} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of level}}$$

We have 3 level scorings (maximum = 2 to minimum = 0), so;

$$\text{Interval} = \frac{2-0}{3} = 0.66$$

After calculation of scores, average will be used to compare with following criteria;

Average 0.00 to 0.66= Negative hygiene attitude

Average 0.67 to 1.33 = Neutral hygiene attitude

Average 1.34 to 2.00= Positive hygiene attitude

Reference: Kanlaya Wanichbuncha. 2012. Statistics for Research. 6th ed. Bangkok: Chulalongkorn University Book Store)

Part 5: Readiness to practices

Range of possible scores = 0- 36 points

$$\text{Interval} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of level}}$$

We have 3 level scorings (maximum = 2 to minimum = 0), so;

$$\text{Interval} = \frac{2-0}{3} = 0.66$$

After calculation of scores, average will be used to compare with following criteria;

Average 0.00 to 0.66= Low level readiness to hygiene practices

Average 0.67 to 1.33 = Moderate level readiness to hygiene practices

Average 1.34 to 2.00= High level readiness to hygiene practices

Reference: Kanlaya Wanichbuncha. 2012. Statistics for Research. 6th ed. Bangkok: Chulalongkorn University Book Store)

Part 6: Hygiene practices

Range of possible scores = 0- 36 points

$$\text{Interval} = \frac{\text{Maximum score} - \text{Minimum score}}{\text{Number of level}}$$

We have 3 level scorings (maximum = 2 to minimum = 0), so;

$$\text{Interval} = \frac{2-0}{3} = 0.66$$

After calculation of scores, average will be used to compare with following criteria;

Average 0.00 to 0.66= Low level of hygiene practices

Average 0.67 to 1.33= Moderate level of hygiene practices

Average 1.34 to 2.00 = High level of hygiene practices

Reference: Kanlaya Wanichbuncha. 2012. Statistics for Research. 6th ed. Bangkok: Chulalongkorn University Book Store)

3.7 Validity and reliability test

Validity test

The questionnaires were sent and validity had been checked by following 3experts with rich knowledge and extensive experiences in areas of public health, behavioral change and hygiene issue.

1) DR. MELGABAL SB CAPISTRANO (Country Program Coordinator and Regional Adviser on DRR for Asia Region, Malteser International–Myanmar Country Program)

2) MR. BIJAY LAL SHRESTHA (Programme Coordinator, Malteser International –Myanmar Country Program)

3) DR. KHINE SOE LIN (Senior Programme Associate, International Organization for Migration (IOM), Myanmar)

Reliability test

The questionnaires had been pilot tested with respondents of same demographic characteristics. Then reliability of questionnaires was statistically tested with KR21 for hygiene knowledge questionnaires (resultant KR 21 was 0.7824) and Cronbach's Alpha for hygiene attitude questionnaires (resultant Cronbach's Alpha

coefficient was 0.787) (coefficient more than 0.7). After statistically tested, questionnaires were revised again with inputs/suggestions from experts.

3.8 Data collection

Data were collected by interviewer-administered structured one by one (face-to-face) interview questionnaires. Questionnaires were read to respondents and asked for the answer, then re-checked both question and respective answer to avoid any error or misunderstanding between interviewer and respondent.

All the questionnaires were developed in English; clearly and exactly translated to local language, with a back translation in English by the professional.

5 interviewers (research assistants) were recruited to conduct interview. The interviewers were former staffs of INGO that worked in the target area for 3 years and also colleagues (junior staffs) of researcher. The researcher himself trained the interviewers for 2-3 days to conduct interviews, about the study criteria, ways of discussing issue in structured face to face (one by one) interview and approaching technique to participants. Role play piloting exercises were secured before conducting field interview. The (educational) qualification background of researcher is medical doctor with extensive experience in humanitarian relief and development works along with INGO particularly in the study area. The (educational) qualification background of interviewers is high school level (grade 11) with 1-2 years experience in humanitarian relief and development works with INGO in the study area.

Only single interviewer conducted throughout the entire interview for each respondent. Once interview was finished, the interviewer checked accuracy and completeness of the questionnaires with respective answer. Then the researcher re-checked entire set of questionnaires and respective answers.

3.9 Data analysis (Statistics)

After examining interviewed questionnaires form and clean the data, all the questionnaires were coded before data entry and then analyzed by using licensed version of SPSS 17.0 software (licensed for Chulalongkorn University). The descriptive statistic and inferential statistic (chi-square test) with level of significant

(ALPHA) 0.005 were used in order to explain relationship among the variables of the study.

3.10 Ethical consideration

In regard of ethical consideration, to secure confidentiality of data/information, only serial numbers were used in interview sheets instead of respondents' name.

Participants' information form clearly mentioned the nature of study and guaranteed that:

- ✓ Respondents' clear understanding about the nature of questionnaires regarding hygiene knowledge, attitude and practices
- ✓ Voluntary agreement of participation.
- ✓ Opportunities to ask any questions before giving signature in informed consent form and even after giving signature the participants can ask any questions anytime or if would like to obtain more information, the researcher will be reached at all time.
- ✓ If researcher have new information regarding benefits of the study, participants will be informed as soon as possible.
- ✓ The right of respondent to withdrawal from study at anytime without giving any reasons, with no bad impact upon that participant.(still receive same usual services)
- ✓ The procedure acted upon respondents will be exactly same with mentioned in participants' information form.

Voluntary signatory consent from the respondents were collected as **informed consent form** to ensure voluntary participation and clear understanding of the nature of the contents in the research study.

In addition, the study research was passed through The Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University and secured approval prior to the field interview to ensure study research was ethically approved.

3.11 Limitations

- Time limitation
- Social desirability bias on questions related to (personal) hygiene

3.12 Expected benefits and applications

- Study will enable us to access the socio-demographic factors among study population in Laputta Township, Ayeyarwaddy, Union of Myanmar
- Study will enable us to explore the influencing factors on hygiene knowledge, attitude, practices among study population in Laputta Township, Ayeyarwaddy, Union of Myanmar
- Study will enable us to indicate the hygiene knowledge, attitude and practice level among study population in Laputta Township, Ayeyarwaddy, Union of Myanmar
- Study will enable us to elaborate the relationship between socio-demographic factors, influencing factors on hygiene knowledge, attitude, practices and level of hygiene knowledge, attitude and practices among study population in Laputta Township, Ayeyarwaddy, Union of Myanmar
- As useful tool for possible scaling up to achieve fulfill hygiene practices in the study population.

3.13 Provision of assistance

Researcher provided correct information sheet regarding hygiene knowledge and practices to the low KAP score respondents.

3.14 Obstacles and contingency plans

Obstacles	Contingency plans
<ul style="list-style-type: none"> ➤ Approval of township authority 	<ul style="list-style-type: none"> ➤ Need to secure the approval prior to the field interviews by advocating and clarifying that the study is for the use of non-political purpose, as a consequent this is perceived a low risk.

CHAPTER IV

RESULTS

The study was descriptive cross-sectional study concerning knowledge, attitude and practices of hygiene behaviors among Nargis cyclone survivors of Laputta Township, Ayeyarwaddy, Union of Myanmar.

This chapter presents findings of the research data. The findings of the study are divided into following as below.

4.1 Descriptive findings

4.1.1 Distribution of personal profiles (socio-demographic factors) of the study population

4.1.2 Distribution of influencing factors on hygiene knowledge, attitude, practices among study population

4.1.3 Distribution of hygiene knowledge of the study population

4.1.4 Distribution of hygiene attitude of the study population

4.1.5 Distribution of readiness to hygiene practices of the study population

4.1.6 Distribution of hygiene practices of the study population

4.1.7 Distribution of knowledge, attitude, readiness to practices, practices level

4.2 Relationship among variables

4.2.1 Relationship among personal profiles (socio-demographic factors), influencing factors and hygiene knowledge, attitude, readiness to practices, practices of the study population

4.2.2 Relationship among hygiene knowledge and hygiene attitude of the study population

4.2.3 Relationship among hygiene knowledge and readiness to hygiene practices of the study population

4.2.4 Relationship among hygiene knowledge and hygiene practices of the study population

4.2.5 Relationship among hygiene attitude and readiness to hygiene practices of the study population

4.2.6 Relationship among hygiene attitude and hygiene practices of the study population

4.2.7 Relationship among readiness to hygiene practices and hygiene practices of the study population

4.1 Descriptive findings

4.1.1 Personal profiles (socio-demographic factors) of the study population

The description of personal profiles (socio-demographic factors) of the study population includes age, gender, marital status, educational level, occupation, average total household income per month, race and religion.

A total 440 respondents were interviewed with interviewer-administered structured questions.

Table 4.1 Number and percentage distribution of personal profiles (socio-demographic factors) of the study population

Personal profiles	Number (n=440)	Percentage (%)
Age (Years)		
18-24 years	81	18.4
25-29 years	19	4.3
30-34 years	94	21.4
35-39 years	45	10.2
40-44 years	65	14.8
45-49 years	57	13.0
50-54 years	21	4.8
55-59 years	58	13.2
TOTAL	440	100.0
MEAN = 38.15SD = 11.181		
Minimum age = 19 yrs Maximum age = 59 yrs		
Gender		
Male	214	48.6
Female	226	51.4
TOTAL	440	100.0

Table 4.1 (continued) Number and percentage distribution of personal profiles (socio-demographic factors) of the study population

Personal profiles	Number (n=440)	Percentage (%)
Marital status		
Married	329	74.8
Single	55	12.5
Widow	45	10.2
Divorced/Separated	11	2.5
TOTAL	440	100.0
Educational level		
Illiterate	0	0.0
Primary school level	71	16.1
Middle school level	191	43.4
High school level	134	30.5
University	44	10.0
TOTAL	440	100.0
Occupation		
General/random laborer	250	56.8
Own business	50	11.4
Public workers/government staffs	111	25.2
No occupation	29	6.6
TOTAL	440	100.0
Average total HH income per month (Kyat)		
50,000-100,000	309	70.2
100,001-150,000	70	15.9
150,001-200,000	24	5.5
200,001-250,000	30	6.8
250,001-300,000	7	1.6
TOTAL	440	100.0
MEAN = 1.13E5, SD = 49558.853, Minimum = 65,000, Maximum = 290,000		

Table 4.1 (continued) Number and percentage distribution of personal profiles (socio-demographic factors) of the study population

Personal profiles	Number (n=440)	Percentage (%)
Race		
Bamar	304	69.1
Kayin	136	30.9
TOTAL	440	100.0
Religion		
Buddha	347	78.9
Christian	93	21.1
TOTAL	440	100.0

As presented in table 4.1, the mean age of respondents was 38.15. Most of the respondents were age group between 30-34 years.

48.6% of the respondents were male and 51.4% were female.

74.8% of the respondents were married, 12.5% were single, 10.2% were widow and only 2.5% were divorced or separated.

There was no illiterate respondent, 16.1% were primary school level, 43.4% were middle school level, 30.5% were high school level and 10% were university level.

56.8% of the respondents were general/random laborer (agriculture/livestock/salt farming/factory), 11.4% had own business (merchant, own shop, own local grinding factory, own agricultural/livestock farm), 25.2% were public workers (clerks, teachers, authorities etc), 6.6% had no particular jobs; students, youths etc.

Regarding average total household income per month of the respondents, 70.2% earned 50,000-100,000 Kyats, 15.9% earned 100,001-150,000 Kyats, 5.5% earned 150,001-200,000 Kyats, 6.8% earned 200,001-250,000 Kyats and 1.6% earned 250,001-300,000 Kyats. Minimum income among the respondents was 65,000 Kyats and maximum income was 290,000 Kyats.

69.1% of the respondents were Bamar, 30.9% were Kayin.

78.9% of the respondents were Buddhist and 21.1% were Christian.

4.1.2 Influencing factors on hygiene KAP of the study population

Table 4.2 Number and percentage distribution of the study population by presence of influencing factors of hygiene knowledge, attitude and practices

Influencing factors	Number (n=440)	Percentage (%)
Presence of functioning health center/staffs		
Yes	75	17.00
No	363	83.00
TOTAL	440	100.00
Time to access to the nearest health center		
Less than one hour	75	17.00
Two - three hours	255	58.00
Three – four hours	110	25.00
TOTAL	440	100.00
Presence of hygiene promotion/education activities		
Yes	404	91.80
No	36	8.20
TOTAL	440	100.00
Presence of hygiene related mass media		
Yes	374	85.00
No	66	15.00
TOTAL	440	100.00
Presence of hygiene information visibilities (at public places and home)		
Yes	404	91.80
No	36	8.20
TOTAL	440	100.00
Presence of items to make water safe for drinking		
Yes	384	87.30
No	56	12.70
TOTAL	440	100.00

Table 4.2 (continued) Number and percentage distribution of the study population by presence of influencing factors of hygiene knowledge, attitude and practices

Influencing factors	Number (n=440)	Percentage (%)
Presence of fly proof latrine/hand washing facilities		
Yes	170	38.60
No	270	61.40
TOTAL	440	100.00
Presence of food covering items		
Yes	384	87.30
No	56	12.70
TOTAL	440	100.00
Presence of particular waste throwing places in village		
Yes	75	17.00
No	363	83.00
TOTAL	440	100.00

17% of respondents had functioning health center in their village but 83% did not have. From that 83% of respondents who did not have health center in their own village, 58% needed 2-3 hours travelling time to access to the health center in nearby village and 25% needed 3-4 hours travelling time to access to the health facilities.

91.8% of respondents could benefit hygiene promotion (distribution of hygiene facilities) and hygiene education activities but 8.2% could not benefit.

85% of respondents could receive hygiene knowledge from kinds of mass media (newspaper, radio etc) but 15% could not benefit.

91.8% of respondents had hygiene visibilities in their home and also at public places of their village but the rest 8.2% did not have.

87.3% of respondents had items to make water safe for drinking, 38.6% had fly proof latrine and hand washing facilities, 87.3% had food covering items at their home.

Only 17% of respondents had particular waste throwing place in their village, the rest 83% did not have such particular place.

4.1.3 Hygiene knowledge of the study population

Table 4.3 Number and percentage distribution of the Hygiene knowledge of the study population

No.	Statement	True n (%)	False n (%)
1.*	River water is safe for drinking.	258 (58.6)	182 (41.4)
2.	Rain water is safe for drinking.	375 (85.2)	65 (14.8)
3.	Characteristics of safe drinking water are absence of smell, color, taste, and clear.	202 (45.9)	237 (53.9)
4.	We can treat water to make it safe for drinking by applying water guard (chlorine).	272 (61.8)	168 (38.2)
5.*	We can treat water to make it safe for drinking by filtering with ordinary cloth filter.	300 (68.2)	140 (31.8)
6.*	Once water has been treated for safe drinking, it is not important keeping in any containers with or without secured cover to prevent it from re-contamination.	129 (29.3)	311 (70.7)
7.	We should take out water from the drinking containers by tap.	267 (60.7)	173 (39.3)
8.*	We should take out water from the drinking containers by cup with scoop (or) cup without scoop, not important.	171 (38.9)	269 (61.1)
9.	Usage of fly proof latrines is important to prevent transmission of diarrhea related diseases.	333 (75.7)	107 (24.3)
10.	Characteristics of sanitary latrine are - fly proof, presence of enough water, hand washing facilities and superstructure.	233 (53)	207 (47)

Table 4.3 (continued) Number and percentage distribution of the Hygiene knowledge of the study population

11.	Latrines should be constructed from the water sources (ponds etc) at least 50 ft.	308 (70)	132 (30)
12.	Hand washing practices with soap is important to prevent transmission of diarrhea related diseases.	300 (68.2)	140 (31.8)
13.*	Hand washing is needed only in case when hands are apparently very dirty.	155 (35.2)	285 (64.8)
14.	We should wash our hands with soap in ALL the following conditions - a) Before handling of foods/eating b) after toilet c) after handling children excreta/ after cleaning their bottom.	314 (71.4)	126 (28.6)
15.	Cooking/boiling of the foods (meat, vegetables) thoroughly is needed to prevent diarrheal related intestinal diseases.	300 (68.2)	140 (31.8)
16.	Food should cover with fly proof sieve to prevent diarrheal related intestinal diseases.	281 (63.9)	159 (36.1)
17.	Kitchen surfaces and utensils should keep cleaning to prevent diarrheal related intestinal diseases.	282 (64.1)	158 (35.9)
18.	We should store raw meet in separate container.	277 (63)	163 (37)
19.	We should not keep cooked food more than one day (24 hrs) in normal room temperature.	289 (65.7)	151 (34.3)
20.	One of the main causes of diarrhea associated diseases is poor hygiene practices.	292 (66.4)	148 (33.6)
21.	Children excreta can transmit diseases.	228 (51.8)	212 (48.2)
22.	Unsystematic throwing of household rubbish can transmit diseases.	321 (73)	119 (27)

* Question with reverse answer

4.1.4 Hygiene attitude of the study population

Table 4.4 Number and percentage distribution of the hygiene attitude of the study population

No.	Statement	Agree n (%)	Neutral/ Not sure n (%)	Dis- agree n (%)
1.	Community drinking water sources (ponds) should be fenced to prevent it from reaching of animals	330 (75)	110 (25)	0 (0.0)
2.	Community drinking water sources (ponds) should be preserved by the respective community	205 (46.6)	163 (37)	72 (16.4)
3.	Access to and way of taking water from the public drinking water ponds should be more systematic and hygienic way to prevent contamination of the water sources	317 (72)	117 (26.6)	6 (1.4)
4.*	Habit of taking water from public drinking ponds, filtering into pot and drinking after keeping 1 night in the pot is ok; needs no more treatment method to make it safe	69 (15.7)	132 (30)	239 (54.3)
5.	Latrine promotion programme is needed in the village you are living.	268 (60.9)	142 (32.3)	30 (6.8)
6.	Families in the village should invest some more money in building sanitary latrine.	118 (26.8)	150 (34.1)	172 (39.1)
7.	Every household in the village should build own sanitary latrine.	309 (70.2)	130 (29.5)	1 (0.2)
8.	Systematic hand washing (with soap) should be more practiced in the village you are living.	319 (72.5)	118 (26.8)	3 (0.7)
9.	We should take shower everyday if we are not in conditions like fever, illness etc	394 (89.5)	46 (10.5)	0 (0.0)

Table 4.4 (continued) Number and percentage distribution of the hygiene attitude of the study population

10.	We should use soap to clean our body whenever we take shower.	349 (79.3)	90 (20.5)	1 (0.2)
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* Question with reverse answer

4.1.5 Hygiene readiness to practices of the study population

Table 4.5 Number and percentage distribution of the hygiene readiness to practices of the study population

No.	Statement	Yes n (%)	No n (%)	Don't know n (%)
1.*	Will you drink river water without applying any treatment methods?	23 (5.2)	417 (94.8)	0 (0.0)
2.	Will you drink water from safe drinking water resources?	440 (100)	0 (0.0)	0 (0.0)
3.	Will you drink treated drinking water with one of the proper treatment methods? (boiling, treated with chlorine etc)	275 (62.5)	165 (37.5)	0 (0.0)
4.	Will you cover your drinking water pots/tanks.	384 (87.3)	56 (12.7)	0 (0.0)
5.	Will you take out drinking water from a container by using a tap or a cup with scoop?	306 (69.5)	134 (30.5)	0 (0.0)
6.	Will you use fly proof sanitary latrine in your house?	161 (36.6)	279 (63.4)	0 (0.0)
7.	Will you wash your hands with soap before handling foods/eating?	133 (30.2)	307 (69.8)	0 (0.0)
8.	Will you wash your hands with soap after toilet?	170 (38.6)	270 (61.4)	0 (0.0)
9.	Will you wash your hands with soap after handling children excreta/ after cleaning their bottom?	133 (30.2)	307 (69.8)	0 (0.0)
10.	Will you use soap in washing hands?	150 (34.1)	290 (65.9)	0 (0.0)
11.	Will you eat thoroughly cooked/boiled foods?	368 (83.6)	71 (16.4)	0 (0.0)

Table 4.5 (continued) Number and percentage distribution of the hygiene readiness to practices of the study population

12.	Will you cover foods with fly proof sieve?	275 (62.5)	165 (37.5)	0 (0.0)
13.	Will you keep kitchen surfaces and utensils clean?	305 (69.3)	134 (30.5)	1 (0.2)
14.	Will you use separate containers to store raw meat?	370 (84.1)	70 (15.9)	0 (0.0)
15.	Will you throw children excreta systematically (burn, bury, reservoirs etc)?	102 (23.2)	338 (76.8)	0 (0.0)
16.	Will you throw household rubbish systematically (burn, bury, reservoirs etc)?	102 (23.2)	338 (76.8)	0 (0.0)
17.	Will you regularly use soap when you take shower?	344 (78.2)	96 (21.8)	0 (0.0)
18.	In general, will you keep your body clean and practice personal hygiene behaviors (take shower every day, nail clipping etc)?	344 (78.2)	96 (21.8)	0 (0.0)

* Question with reverse answer

4.1.6 Hygiene practices of the study population

Table 4.6 Number and percentage distribution of the hygiene practices of the study population

No.	Statement	Regular n (%)	Occasional n (%)	Rarely n (%)
1.*	You drink river water without applying any treatment methods?	0 (0.0)	23 (5.2)	417 (94.8)
2.	You drink water from safe drinking water resources?	417 (94.8)	23 (5.2)	0 (0.0)
3.	You drink treated drinking water with one of the proper treatment methods. (boiling, treated with chlorine etc)	275 (62.5)	165 (37.5)	0 (0.0)
4.	You cover your drinking water pots/tanks.	384 (87.3)	56 (12.7)	0 (0.0)
5.	You take out drinking water from a container by using a tap or a cup with scoop.	306 (69.5)	134 (30.5)	0 (0.0)
6.	You use fly proof sanitary latrine in your house.	161 (36.6)	9 (0.2)	270 (61.4)
7.	You wash your hands with soap before handling foods/eating.	133 (30.2)	0 (0.0)	307 (69.8)
8.	You wash your hands with soap after toilet.	135 (30.7)	35 (8.0)	270 (61.4)
9.	You wash your hands with soap after handling children excreta/ after cleaning their bottom.	133 (30.2)	0 (0.0)	307 (69.8)
10.	You use soap in washing hands.	133 (30.2)	17 (3.9)	290 (65.9)

Table 4.6 (continued) Number and percentage distribution of the hygiene practices of the study population

11.	You eat thoroughly cooked/boiled food/vegetables.	368 (83.6)	72 (16.4)	0 (0.0)
12.	You cover foods with fly proof sieve.	275 (62.5)	109 (24.8)	56 (12.7)
13.	You keep kitchen surfaces and utensils clean.	0 (0.0)	306 (69.5)	134 (30.5)
14.	You use separate containers to store raw meat.	370 (84.1)	70 (15.9)	0 (0.0)
14.	You throw children excreta systematically (burn, bury, reservoirs etc).	0 (0.0)	102 (23.2)	338 (76.8)
15.	You throw household rubbish systematically (burn, bury, reservoirs etc).	0 (0.0)	102 (23.2)	338 (76.8)
17.	You use soap regularly when you take shower.	344 (78.2)	96 (21.8)	0 (0.0)
18.	In general, you keep your body clean and practiced personal hygiene behaviors (take shower every day, nail clipping etc).	344 (78.2)	96 (21.8)	0 (0.0)

* Question with reverse answer

4.1.7 Hygiene knowledge, attitude, readiness to practices, practices level

Table 4.7 Number and percentage distribution of the hygiene knowledge, attitude, readiness to practices and practices level of the study population

Level	Number (n=440)	Percentage (%)
Low level of hygiene knowledge (Total score 0-13, < 60% of total score)	134	30.5
Moderate level of hygiene knowledge (Total score 14-17, 60-80% of total score)	123	28.0
High level of hygiene knowledge (Total score 18-22, > 80% of total score)	183	41.6
TOTAL	440	100.0
Negative hygiene attitude (Average score 0.00 -0.66)	0	0
Neutral hygiene attitude (Average score 0.67 - 1.33)	134	30.5
Positive hygiene attitude (Average score 1.34 - 2.00)	306	69.5
TOTAL	440	100.0
Low level readiness to hygiene practices (Average score 0.00 - 0.66)	105	23.9
Moderate level readiness to hygiene practices (Average score 0.67 - 1.33)	182	41.4
High level readiness to hygiene practices (Average score 1.34 - 2.00)	153	34.8
TOTAL	440	100.0
Low level hygiene practices (Average score 0.00-0.66)	22	5.0
Moderate level hygiene practices (Average score 0.67 - 1.33)	285	64.8
High level hygiene practices (Average score 1.34 - 2.00)	133	30.2
TOTAL	440	100.0

Regarding hygiene knowledge, the minimum score of the study population was 3, the maximum score was 21 and the mean was 13.78. 30.5% of the respondents had low level hygiene knowledge, 28.0% had moderate level and 41.6% had high level hygiene knowledge.

Regarding hygiene attitude, the minimum average score of the study population was 0.70, the maximum average score was 2.0 and the mean was 1.5668. 30.5% of the respondents had neutral hygiene attitude, 69.5% had positive hygiene attitude.

Regarding readiness to hygiene practices, the minimum average score of the study population was 0.22 and the maximum average score was 2 and the mean was 1.2034. 23.9% of the respondents had low level readiness to hygiene practices, 41.4% had moderate level readiness to hygiene practices and 34.8% had high level readiness to hygiene practices.

The minimum average score of the study population regarding hygiene practices was 0.61, the maximum average score was 1.83 and the mean was 1.2359. 5.0% of the respondents had low level hygiene practices, 64.8% had moderate level and 30.2% had high level hygiene practices.

4.2 Relationship among variables

4.2.1: Relationship among personal profiles, influencing factors (independent variables) and level of hygiene knowledge, attitude, readiness to practices and practices (dependent variables) of the study population

Table 4.8 Relationship among personal profiles, influencing factors (independent variables) and level of hygiene knowledge, attitude, readiness to practices and practices (dependent variables) of the study population

Independent variables	P-value (by using chi-square test)			
	Knowledge	Attitude	Readiness to practices	Practices
Age	0.068	0.030	0.183	0.498
Gender	0.253	0.971	0.167	0.670
Marital status	0.441	0.132	0.615	0.750
Educational level	0.000	0.000	0.000	0.008
Occupation	0.000	0.000	0.000	0.000
Average total HH income	0.000	0.000	0.000	0.000
Race	0.246	0.150	0.484	0.248
Religion	0.295	0.556	0.553	0.086
Presence of health center	0.000	0.000	0.000	0.000
Presence of hygiene promotion activities	0.000	0.000	0.019	0.021
Presence of hygiene education activities	0.000	0.000	0.019	0.021
Presence of mass media providing hygiene messages	0.049	0.022	0.000	0.000
Presence of hygiene informative visibilities	0.000	0.000	0.019	0.021

Table 4.8 (continued) Relationship among personal profiles, influencing factors (independent variables) and level of hygiene knowledge, attitude, readiness to practices and practices (dependent variables) of the study population

Presence water safety items	0.041	0.014	0.000	0.000
Presence of fly proof latrine	0.007	0.002	0.000	0.000
Presence hand washing items	0.007	0.002	0.000	0.000
Presence food covering items	0.041	0.014	0.000	0.000
Presence of particular waste throwing places	0.000	0.000	0.000	0.000

The study showed that there was no statistically significant relationship among gender, marital status, race, religion and knowledge, attitude, readiness to practices and practices of hygiene behaviors (P-value = >0.05). Age showed statistically significant relationship with hygiene attitude (P-value = <0.05) but no statistically significant relationship with hygiene knowledge, readiness to practices and practices (P-value = >0.05).

The study showed that there was statistically significant relationship among educational level, occupation, average total household income per month and knowledge, attitude, readiness to practices and practices of hygiene behaviors (P-value = <0.005).

In the study, availability of hygiene information and education services such as - presence of functioning health center in respondents' village, presence of hygiene promotion/education activities, presence of hygiene informative visibilities and presence of hygiene informative mass media showed statistically significant relationship with knowledge, attitude, readiness to practices and practices of hygiene behaviors (P-value = <0.005).

Availability of hygiene facilities such as - presence of items to make water safe for drinking, fly-proof latrine, hand washing facilities, food covering items in respondents' home and presence of particular waste throwing in respondents' village showed statistically significant relationship with knowledge, attitude, readiness to practices and practices of hygiene behaviors (P-value = <0.05).

4.2.2 Relationship among hygiene knowledge and hygiene attitude

Table 4.9 Relationship among hygiene knowledge and hygiene attitude

Knowledge-level	Attitude-level		Total
	Neutral	Positive	
High	0	183	183
	.0%	100.0%	100.0%
Low	134	0	134
	100.0%	.0%	100.0%
Moderate	0	123	123
	.0%	100.0%	100.0%
Total	134	306	440
	30.5%	69.5%	100.0%

Chi square = 4.400E2

P value = 0.000

The study showed that there was statistically significant relationship among hygiene knowledge and hygiene attitude (P-value = <0.05).

4.2.3 Relationship among hygiene knowledge and readiness to practices

Table 4.10 Relationship among hygiene knowledge and readiness to practices

Knowledge-level	Ready to Practices-level			Total
	High	Low	Moderate	
High	94	0	89	183
	51.4%	.0%	48.6%	100.0%
Low	0	105	29	134
	.0%	78.4%	21.6%	100.0%
Moderate	59	0	64	123
	48.0%	.0%	52.0%	100.0%
Total	153	105	182	440
	34.8%	23.9%	41.4%	100.0%

Chi square = 3.253E2

P value = 0.000

The study showed that there was statistically significant relationship among hygiene knowledge and readiness to hygiene practices (P-value = <0.05).

4.2.4 Relationship among hygiene knowledge and hygiene practices

Table 4.11 Relationship among hygiene knowledge and hygiene practices

Knowledge-level	Practices-level			Total
	High	Low	Moderate	
High	80	0	103	183
	43.7%	.0%	56.3%	100.0%
Low	0	22	112	134
	.0%	16.4%	83.6%	100.0%
Moderate	53	0	70	123
	43.1%	.0%	56.9%	100.0%
Total	133	22	285	440
	30.2%	5.0%	64.8%	100.0%

Chi square = 1.190E2 P value = 0.000

The study showed that there was statistically significant relationship among hygiene knowledge and hygiene practices (P-value = <0.05).

4.2.5 Relationship among hygiene attitude and readiness to practices

Table 4.12 Relationship among hygiene attitude and readiness to practices

Attitude-level	Ready to Practices-level			Total
	High	Low	Moderate	
Neutral	0	105	29	134
	0%	78.4%	21.6%	100.0%
Positive	153	0	153	306
	50.0%	0%	50.0%	100.0%
Total	153	105	182	440
	34.8%	23.9%	41.4%	100.0%

Chi square = 3.249E2 P value = 0.000

The study showed that there was statistically significant relationship among hygiene attitude and readiness to hygiene practices (P-value = <0.05).

4.2.6 Relationship among hygiene attitude and hygiene practices

Table 4.13 Relationship among hygiene attitude and hygiene practices

Attitude-level	Practices-level			Total
	High	Low	Moderate	
Neutral	0	22	112	134
	.0%	16.4%	83.6%	100.0%
Positive	133	0	173	306
	43.5%	0%	56.5%	100.0%
Total	133	22	285	440
	30.2%	5.0%	64.8%	100.0%

Chi square = 1.190E2 P value = 0.000

The study showed that there was statistically significant relationship among hygiene attitude and hygiene practices (P-value = <0.05).

4.2.7 Relationship among readiness to hygiene practices and hygiene practices

Table 4.14 Relationship among readiness to hygiene practices and hygiene practices

Ready to practices-level	Practices-level			Total
	High	Low	Moderate	
High	133	0	20	153
	86.9%	.0%	13.1%	100.0%
Low	0	22	83	105
	.0%	21.0%	79.0%	100.0%
Moderate	0	0	182	182
	.0%	.0%	100.0%	100.0%
Total	133	22	285	440
	30.2%	5.0%	64.8%	100.0%

Chi square = 4.210E2 P value = 0.000

The study showed that there was statistically significant relationship among readiness to hygiene practices and hygiene practices (P-value = <0.05).

CHAPTER V

SUMMARY, DISCUSSION AND RECOMMENDATION

5.1 Summary

The study was descriptive cross-sectional study to access personal profiles (socio-demographic factors), influencing factors on hygiene knowledge, attitude, practices and knowledge, attitude and practices of hygiene behaviors among Nargis cyclone survivors of Laputta Township, Ayeyarwaddy, Union of Myanmar. It also attempted to explore the relationship among each factor of socio-demographic characteristics, influencing factors and knowledge, attitude, practices (KAP) of hygiene and among the hygiene knowledge, attitude, practices each other as well. Once questionnaires had been developed by the author, it was approved by Thesis Exam Board of College of Public Health Sciences, Chulalongkorn University, The Ethics Review Committee for Research Involving Human Research Subjects, Health Science Group, Chulalongkorn University (ECCU) and external experts with rich knowledge in studied field. The cluster sampling and simple random sampling method were applied to recruit the appropriate samples. Then, the samples were interviewed with interviewer-administered structured one by one interview questionnaires by experienced and trained research assistants. The interviewed data was analyzed by using licensed version of SPSS 17.0 software (licensed for Chulalongkorn University). The author expressed the data as two major parts: 1) descriptive part showing distribution of variables and 2) relationship among variables.

The study showed that the mean age of the respondents was 38.15. Most of the respondents were age group between 30-34 years. 48.6% of the respondents were male and 51.4% were female. 74.8% of the respondents were married, 12.5% were single, 10.2% were widow and only 2.5% were divorced or separated. There was no illiterate respondent, 16.1% were primary school level, 43.4% were middle school level, 30.5% were high school level and 10% were university level. 56.8% of the respondents were general/random laborer (agriculture/ livestock/salt farming/factory, 11.4% had own business (merchant, own shop, own local grinding factory, own agricultural/livestock farm), 25.2% were public workers (clerks, teachers, authorities etc) and 6.6% were students and youths with no professional jobs. Regarding average total household

income per month of the respondents, 70.2% earned 50,000-100,000 Kyats, 15.9% earned 100,001-150,000 Kyats, 5.5% earned 150,001-200,000 Kyats, 6.8% earned 200,001-250,000 Kyats and 1.6% earned 250,001-300,000 Kyats. Minimum income among the respondents was 65,000 Kyats and maximum income was 290,000 Kyats. 69.1% of the respondents were Bamar, 30.9% were Kayin. 78.9% of the respondents were Buddhist and 21.1% were Christian.

17% of respondents had functioning health center in their village but 83% did not have. From that 83% of respondents who did not have health center in their own village, 58% needed 2-3 hours travelling time to access to the health center in nearby village and 25% needed 3-4 hours travelling time to access to the health facilities. 91.8% of respondents could benefit hygiene promotion (distribution of hygiene facilities) activities but 8.2% could not benefit. 91.8% of respondents could benefit hygiene education activities but 8.2% could not benefit. 85% of respondents could receive hygiene knowledge from kinds of mass media (newspaper, radio etc) but 15% could not benefit. 91.8% of respondents had hygiene visibilities in their home and also at public places of their village but the rest 8.2% did not have. 87.3% of respondents had items to make water safe for drinking, 38.6% had fly proof latrine and hand washing facilities, 87.3% had food covering items at their home. Only 17% of respondents had particular waste throwing place in their village, the rest 83% did not have such particular place.

Regarding hygiene knowledge, 30.5% of the respondents had low level hygiene knowledge, 28.0% had moderate level and 41.6% had high level hygiene knowledge. Regarding hygiene attitude, 30.5% of the respondents had neutral hygiene attitude, 69.5% had positive hygiene attitude. Regarding readiness to hygiene practices, 23.9% of the respondents had low level readiness to hygiene practices, 41.4% had moderate level readiness to hygiene practices and 34.8% had high level readiness to hygiene practices. Regarding hygiene practices, 5.0% of the respondents had low level hygiene practices, 64.8% had moderate level and 30.2% had high level hygiene practices.

The study showed that there was no statistically significant relationship among gender, marital status, race, religion and knowledge, attitude, readiness to practices and practices of hygiene behaviors (P -value = >0.05). Age showed statistically

significant relationship with hygiene attitude (P-value = <0.05) but no statistically significant relationship with hygiene knowledge, readiness to practices and practices (P-value = >0.05). The study indicated that there was statistically significant relationship among educational level, occupation, average total household income per month and knowledge, attitude, readiness to practices and practices of hygiene behaviors (P-value = <0.005).

In the study, availability of hygiene information and education services such as - presence of functioning health center in respondents' village, presence of hygiene promotion/education activities, presence of hygiene informative visibilities and presence of hygiene informative mass media showed statistically significant relationship with knowledge, attitude, readiness to practices and practices of hygiene behaviors (P-value = <0.005). Availability of hygiene facilities such as - presence of items to make water safe for drinking, fly-proof latrine, hand washing facilities, food covering items in respondents' home and presence of particular waste throwing in respondents' village showed statistically significant relationship with knowledge, attitude, readiness to practices and practices of hygiene behaviors (P-value = <0.005).

Moreover, the study showed that hygiene knowledge, attitude, readiness to practices and practices were significantly related to each other as well. (P-value = <0.005)

5.2 Discussion

Regarding personal profiles of the study population, male and female samples were almost equally distributed (total male = 48.6% and total female = 51.4%). In regards of marital status, 74.8 % of the total samples were married and it was noteworthy that percentage of divorced/separated sample was very few in the study population (only 2.5 % of the total samples). It might be due to the facts of religious related socio-cultural factor (Buddhism and Eastern Cultural of single marriage) and socio desirability bias of the sample during the interview as well.

Regarding educational level of the study population, 43.4% of the total samples were middle and 30.5% of the total samples were high school level with no illiterate respondents (i.e. all respondents were at least primary school level) though university level samples were only 10% of the total samples in the study population. That figure of no illiterate respondents might depend on the fact of presence of

monastery based primary educational system among the rural population of Myanmar; like Laputta Township. In many studied villages of Laputta Township, almost all the school-aged children went to the monastery to learn the basic education, religious norms and beliefs even though they could not join the government schools because of the economic vulnerability and many other socio-geographic limitations.

In regards of average total income per month, it could easily be seen that incomes of the study population were very low if compared with basic living costs and household expenses (i.e. market prices of the rice, foods, clothes and other compulsory expenses like transportation fees, medical charges etc). (E.g. 70.2% of the respondents had income 50,000-100,000 Kyat and one meal for 4 family members cost at least 1,000-1,500 Kyat).

Up to 30.9% of Kayin people were identified in the study even though the main group of local population was Bamar because many Kayin groups of families moved and settled in that area even many decades before.

The study showed that only 17% of the total study population had functioning health centers in their own village. In addition, that 17% of the sample represented the single centered village and the rest 83% of the sample whose did not have the functioning health centers were from the ten different non-centered villages (i.e. only centered village had functioning health center and non-centered villages did not have such facility). That finding regards low percentage of health center in the study villages (especially in outreach and poorer non-centered villages) connected to the findings of Post Nargis Joint Assessment (PONJA), surveyed in July 2008 which mentioned that estimated 75% of primary health facilities including rural health centers in the affected townships were destroyed by the Cyclone Nargis and most of those damaged facilities were serving more remote and poorer rural populations. Secondly, that low result of presence of health center in the study villages also connected with Post Nargis Joint Assessment highlighted point -the least access to the health facilities concentrated in Laputta and Bogale.

83% of respondents did not have health center in their own village. From that 83%, 58% of respondents had to travel two to three hours and 25% of respondents need to travel three to four hours with motorized boats to access to the nearest health center. It would take time and need money for travelling. In addition, it would be very

risky for the patient and his attendants if needed to travel emergency at night or windy situation across the river. It might superimpose economic burden, stress and unwilling mind of the financially vulnerable population to go to the health center.

Except 8.2% of total respondents, the rest of all the respondents (91.8%) could benefit hygiene promotion and education activities by L/INGOs and government health department as well. Regarding hygiene promotion, study population had been periodically distributed hygienic wares (food covering items, water guard, soap etc) with irregular basis but various types of hygiene education sessions (mass campaign, focus group discussion etc) were conducted by government and L/INGOs staffs regularly one time per month.

Implementation of hygiene promotion along with education interventions for better hygiene behaviors created environment for promoting better sanitation and hygiene practices within the targeted community and motivated positive behavior changes towards desirable practices. Complementary activities of hygiene promotion and education lead the community to behave better hygiene practices, easier accessibility of hygiene infrastructures (hand washing facilities and latrine), and moreover which in turn results blocking the various transmission routes of hygiene related diseases (EHP, 2004). Some researches indicated that focusing single behavioral changes was better and greatest impact on health status (Curtis and Cairncross, 2003). On the other way, some researches proved complementary interaction among education and provision of infrastructures like latrine, water supply. These complementary interaction produced significant reduce in the incidence of diarrhea among children (Buraer and Esrey, 1995). In addition it is important that the public health personnel need to think more attractive edutainment ways for mobilizing community and conducting education sessions according to the lesson learnt experiences of previous interventions (Cater, 1991).

91.8% of the total study population had health and hygiene information visibilities in their home and in the public places of the village as well. High percentage in presence of hygiene education and information visibilities could be referenced to the fact in the Post Nargis Periodic Review IV that the most affected areas had been targeted for the distribution of hygiene related items and information services by the authority and humanitarian agencies.

Practices are reflex behaviors to particular cues. Placing of educative visibilities in hand washing sites of clinics could be effective in cueing hand washing behaviors (Naikokba et al, 15). Similarly, placing hand washing items at the exit of public toilet may be helpful as well. Placing of reminding visibilities in public places of community and easily noticeable places of residence is also feasible and effective way. It is better if mini posters or stickers including hygiene messages could be distributed as wrappers of hygienic items.

The study showed that 85% of total respondents could receive hygiene message through mass media (newspaper, journals, radio etc) whereas 15% could not.

The approach of providing information through mass media is less cost intensive measure compare to a community based approach. Mass media is always being a worth in addition to the public based education and provision of hardware facilities. Moreover mass media approach has additional effects as changing towards positive socio-behavioral norms and the attitude of key persons among the community (e.g. teachers, village leader etc) which in turn affect the behaviors of large scale community members.

The study research showed that 87.3% of respondents had items to make water safe for drinking (firewood for boiling water) but only 62.5% of respondents regularly drank properly treated water. That result could be compared with Post Nargis Periodic Review IV finding that only 76% of the surveyed household treated their drinking water adequately to make sure for safe drinking. Over time, the proportion of households using boiling as water treatment method increased from 27% in Periodic Review I to 75% in Periodic Review IV.

According to the study, presence of fly-proof latrine was still low among the study population. Only 38.6% of total population had fly-proof latrine and 36.6% regularly used fly-proof latrine even 75.7% had knowledge regarding important of fly-proof latrine usage to prevent diarrheal related diseases transmission. That study result could be referred to the finding in the Post Nargis Joint Assessment which mentioned that most of the toilet facilities had been destructed and unsafe defecation practiced such as open defecation, using floating or direct drop latrines without pits had been noted in up to 40 % of cyclone affected surveyed population. The shift to the unsafe defecation was most common in lower Delta area including Laputta.

The study showed that only 38.6% had hand washing facilities (soap) and 30.2 regularly used soap in washing hands though 71.4% had knowledge about the various necessary conditions required to wash hands with soaps. That result opposed with finding of Post Nargis Periodic Review IV surveyed in May 2010 which showed that 91 % of the surveyed household had soap. This could be due to the fact that the result of the study only represented Laputta Township, one of the most affected area of the Nargis Cyclone whereas the result of Periodic Review IV represented 30 townships with different level of effect by the cyclone.

Socio-economic burden of the study population might mainly responsible for those low percentages of fly-proof latrine and hand washing facilities coverage among the study population. Practices of hygiene messages by the families in the community were differed with education, occupation, household income, life styles and socio-economic status (Jenkin and Curtis, 2005). Without improvements of socio-economic level, conduction health education activities alone was not effective for behavioral change of the community (Taha et al, 2000). Education activities along with provision of infrastructures (like latrines) in a area with poor latrine coverage could gain high, sustainable level of uptake and initiate future demand for sanitation (Simms et al, 2005).

The study showed that only 17% of the respondents; all were exactly from single centered village, had particular waste throwing space and the rest 83% of the respondents from 10 different non-centered villages did not have such particular waste throwing place. That result indicated that no one from village local authority or health department take a leading role in identifying a particular waste throwing space important for the community health and hygiene status. As a consequence, up to 76.8% of the respondents did not throw the waste systematically; instead they used to throw the waste unsystematically into the river or surroundings. Similar results in practices of proper solid waste disposal also denoted in Post Nargis Periodic Review II, III and IV that only 16%, 27% and 45 % of the households reported proper dispose of solid waste. The method of throwing waste into the river water was unsafe; it could pollute the water resources and affect the community downstream as well. In Periodic Review III which had been surveyed in rainy season, the method of throwing waste into the river was widely reported up to 40% as it might have seasonal attraction in a

way that with faster flowing of river water stream during the rainy season the waste could be washed out more quickly.

58.6% of respondents answered river water is safe for drinking. That answer might be based on their real-life experience that in some particular regions of the delta where the ground water sources were salty, salinated or in some years of longer dry season and delay rain when all the ground water sources are dried up, there was no other choice and people had to use river water as a source of drinking water since the time of their grandparents. That local vulnerable situation might make them to believe that river water is safe for drinking.

68.2% of respondents had wrong knowledge that drinking water could be made it safe by filtering with ordinary cloth filter. Generally the ordinary cloth filter could filter sediment and particles but most in-home filters could not filter the microorganism like *Esch Coli* which is one of the main causal parasites for diarrhea. Post Nargis Periodic Review II, III and IV also highlighted that estimated 90% of household water treatment method was limited to filtering through a clean cloth and holding water in an earthen pot for one night before drinking which is inadequate method for cleaning the water against bacterial contamination.

The study explored that 48.2% of respondents had incorrect knowledge towards children excreta; they did not know children excreta could transmit diarrhea and other infectious diseases because they still had false old-fashioned knowledge that children excreta is clean. Moreover, up to 76.8% of the respondents did not dispose children excreta systematically. As a relevant data, Post Nargis Periodic Review IV mentioned that among 539 households with at least one child less than 5 years of age, only 52% of households disposed children excreta systematically whereas 59, 59 and 54% disposed systematically in Periodic Review I, II and III respectively.

39.1% of respondents were “disagree” and 34.1% answered “not sure” to invest some money to build own fly-proof latrine. Very limited income and financial constraints might be the major factors responsible for that negative attitude of the respondents. To overcome this economic challenge, township health authority should encourage and advocate I/LNGOs, private donors and commercial services for regular periodic provision of hygienic wares discount sales activities for the vulnerable local community.

The study research showed that 94.8% of respondents regularly used safe drinking water sources. That result could be compared with series of Post Nargis Periodic Review which indicated increasing trend of household proportion using safe drinking water sources, i.e. increasing from estimated 66% in Periodic Review II (July, 2009) and Periodic Review III (January, 2010) to 72 % in Periodic Review IV (July, 2010).

Almost half of the total mortality reduction in major cities, two third of child mortality reduction and three quarters of infant mortality reduction could be gained from provision of clean water supply (Cutler and Miller, 2005). In determining household water quality, only the source of water appeared to be a significant factor. (Trevett et al, 2004). Knowledge regarding the importance of safe drinking water would encourage, support and facilitate the ultimate goal of providing all the world' s population with community piped water that is affordable, safe and accessible. (WHO, 2000)

In regards of gender and KAP of hygiene behaviors, even though there was no statistically significant relationship, it was observed that female samples were more in the high level group of readiness to practices (male = 31.3%, female = 38.1%) and practices (male = 26.2%, female = 34.1%) though the knowledge level (male % in high level knowledge group =38.3%, female % in high level knowledge group=44.7%) and attitude level (male positive attitude = 69.6%, female positive attitude = 69.5%) were almost the same. This could be discussed in a way that even though with enough knowledge and positive attitude towards hygiene, male samples had lesser chances to practice good hygiene behaviors because they had to work in the working places like farm, river or local grinding factory where there were no appropriate hygiene facilities. On the other way; as a general, most of the rural females were dependent housewives or household attached shop keepers or public workers like teacher where their work places were equipped with appropriate hygiene facilities that they had more chances to practices good hygiene behaviors than the male samples.

There was statistically significant relationship among educational level of the respondents and hygiene KAP (P-value = <0.005). Moreover, that result highlighted that once educational level was higher, hygiene KAP become higher as well and vice

versa. For example: only 22.5% of respondents had high level hygiene knowledge and up to 57.7% had low level knowledge in group of primary school level respondents whereas 52.3% of respondents had high level knowledge and no one had been identified in low level knowledge group in university level respondents.

One study in Kenya showed that higher literacy associated with higher hand-washing with soap (WHO, 2009). With increasing level of education, better hygiene practices of population can be seen. Highest level of good practices can be seen in graduated and further graduated educational status. In vice versa, worst hygiene practices can be found in illiterate and non formal schooling populations. (University of San Diego State, 2005)

The types of respondents' occupation and average total household income per month showed statistically significant relationship with hygiene KAP (P-value = <0.005). The results mentioned that when income was higher, hygiene KAP level was higher and vice versa (i.e. higher earners had higher KAP level). This could be explained as once income was higher, got more chances to have hygiene facilities and more opportunity to have higher level hygiene practices. For example: only 15.9% of respondents had high level hygiene practices in respondents with income group 50,000-100,000 whereas 100% of respondents had high level hygiene practices among income group 200,000-250,000 and above. Similarly, only 22.8% of respondents had high level hygiene knowledge in the group of general laborer respondents with low income whereas 64% of respondents had high level knowledge in respondents with higher income own business. As a relevant data, one of the studies in India showed that higher level of hygiene practices as 51%, 44%, 39% could be found in population of high, middle and lower economic class respectively (WHO, 1987).

In here, there is rising of one important question since long time back concerning the focusing of public health intervention that whether the whole population or rather the population at risk (vulnerable population) should be targeted for implementation of public health activities (Rose, 1985).

In the study, availability of hygiene information and education services such as - presence of functioning health center in respondents' village, presence of hygiene promotion/education activities, presence of hygiene informative visibilities and

presence of hygiene informative mass media showed statistically significant relationship with knowledge, attitude, readiness to practices and practices of hygiene behaviors (P-value = <0.005).

The result of sustainable health education for improvement of knowledge, attitude, and practices was studied in previous several researches. In Bangladesh, families whose could benefit hygiene interventions became significant improvement regards personal hygiene and sanitation knowledge if compare to households without no intervention activities (Mascie-Taylor et al, 2003). The research in Zimbabwe also showed similar significant improvement of hygiene behaviors among the community members who received the interventions through health education and promotion activities (Waterkeyn and Cairncross, 2005). Water and Sanitation programme South Asia (2000) suggested that software education interventions should not end once the particular period of intervention ends because post provision support is crucial.

Availability of hygiene facilities such as - presence of items to make water safe for drinking, fly-proof latrine, hand washing facilities, food covering items in respondents' home and presence of particular waste throwing in respondents' village showed statistically significant relationship with knowledge, attitude, readiness to practices and practices of hygiene behaviors (P-value = <0.005).

Hardware structural availability such as clean water resources, fly proof latrines etc are partly associated with hygiene practices. The poor hygiene practices can be seen predominantly in the lowest category of each factor. Availability of water sources in the house is associated with significantly higher hand washing rates than those don't have water in the house (WHO, 2009). One of the studies in India showed that hygiene practices positively correlated with availability and accessibility of sanitation facilities. (WHO, 1987)

In the study, 41.6% of total respondents had high level hygiene knowledge, 69.5% had positive attitude towards hygiene but only 30.2% had high level hygiene practices. The results implied that simple knowledge and awareness were not adequate to ensure safe hygiene practices of the population. It might be due to the following factors -

- 1) Low level availability of hygiene infrastructures and items like fly-proof latrine, soaps etc (only 38.6% had fly-proof latrine) - financial burden would mainly contribute low percentage of fly-proof latrine presence among the study population.
- 2) Though the study population had high level knowledge and attitude, it was difficult to practice the good hygiene behaviors as a regular basis because of many social limitations (e.g. working in the far farm for the whole day and there is no fly-proof latrine nearby)
- 3) Used to with traditional pattern of behaviors that was difficult to change instantly (e.g. behaviors of throwing waste into river etc).
- 4) Though human being had rich knowledge and positive attitude; it was difficult to practice the new (good) behaviors - because of the hard-core human nature and/or undesirable mindset to the new changes/things.

Sustainable efforts on continuous education and social mobilization measures are needed to achieve behavioral pattern changes or have critical level of perception and attitude of the community. It is no doubt education and social mobilization largely affects the behavioral changes of the hygiene practices but it needs enough time for the remarkable changes. (UNICEF, 2000)

5.3 Recommendation

5.3.1 Policy Implication

To build up better hygiene behaviors of the cyclone affected populations, sustainable behavioral change hygiene improvement measures should be implemented for the local community with considering of the concepts outlined below.

1. A well-prepared set of guiding principle focusing on effectiveness, transparency, accountability, independence, capacity building (strengthen community) and vulnerable group of people should govern the long term implementation plan for hygiene improvement activities designed to address sustainable behavioral change of the cyclone affected community.
2. Every step of implementation activities (i.e. from assessment to monitoring and evaluation) should cover all the affected communities including vulnerable people (female, the poor, handicapped etc) and populations from hard to reach area.

3. Common standard and approaches should be established to ensure accountability of the behavioral change implementation activities.
4. Township level close coordination mechanism among all stakeholders and coherent approaches should be secured to ensure the efficacy of resources allocation, fill the gap and avoid overlap.
5. Include local community at all stages in planning and management of the behavioral change implementation activities including decision-making, feedback on impact and quality of the efforts.
6. The local initiatives, resources and capacities should be used maximally. The implementation should be based according to availability of local skills, materials and methods.
7. Capacity building and progressive scaling up of the local community at every stage is crucial with recognition of limited absorptive capacity.
8. Implementation steps of behavioral change activities should be people centered, gender responsive, vulnerable inclusive and cultural sensitive respecting the local customs and traditional cultural.
9. Secure sensible and realistic implementation measures; avoid radical redesign and restructuring of settlements in implementation strategy.

5.3.2 Suggested areas to be focused

- As only 17% of the respondents had functioning health center/health care staffs at their own village, additional recruitment of field based health care personnel (midwives, health assistant etc) along with setting up of functioning health centers equipped with quality drugs and required facilities should be prioritized(especially in hard to reach area).
- Primary health care services should be strengthened with particular pay attention to epidemiological surveillance of the disease outbreak, infectious diseases prevention and control especially for vector and water borne diseases, health promotion/education including vulnerable and outreach populations.
- Capacity building refresher training is also needed to ensure quality service of the field based health care staffs.
- In any future civil and rural development plan for cyclone affected populations, priority should always go to water, sanitation and hygiene sectors

especially safe drinking water supply, adequate sanitation and systematic excreta disposal.

- Complete rehabilitation of all the communal drinking water ponds and household rain water harvesting system among the study area should be focused.
- The study showed that still 5.2% of respondents had to drink river water occasionally when there was no other choice. For that vulnerable situation, the local community should be sensitized easiest and reliable way to make water safe for drinking. The most efficient way is boiling method if chlorine or water guards are not available.
- Contingency plan should be reserved for safe drinking water supply during the dry seasons especially for vulnerable villages with no safe drinking water sources.
- 16.4% of respondents were “disagree” and 37% were “not sure” in response to the question regards preservation of public assets like community drinking water ponds should do by the community members themselves. That unwilling attitude of the respondents reflected lack of ownership minded. More encouragement and education measures are needed to gain ownership minded of the community towards public assets.
- For the preservation and repairing of public assets like communal drinking water ponds at village level, some cashes should be set up as village fund under the management of village authority and reliable representatives.
- In the study area, as the coverage of fly-proof latrine was still low (only 38.6% of total respondents had fly-proof latrine), provisions of latrine construction materials to the economically vulnerable households is suggested. If there is fund limitation to provide latrine construction materials as a large scale measure, provision of public latrine at the particular places of the village like schools, markets etc are highly recommended.
- To achieve wider coverage of hygiene facilities at the household level, discount sales for varieties of hygiene facilities should be regularly provided periodically to the economically vulnerable cyclone affected community.

- Along with provisions of hardware hygiene infrastructures, sustainable behavioral change hygiene education activities should be implemented by organizing attractive education package like mass media, leaflets, training course, workshop, focus group discussion, home visit session etc.
- As the behavioral change needs a lot of time; even many years, sustainable implementation of hygiene improvement measures are highly recommended.
- Formation of community task forces like village hygiene committee etc should be initiated. After organizing relevant capacity building trainings, they would become the focal persons to disseminate appropriate hygiene knowledge to the peers, lead the hygiene related public campaign activities and encourage the community for better hygienic behaviors.
- Local authority should encourage L/INGOs, private donors and mass media (journals, newspaper etc) to be focused on community based hygiene promotion, education and information activities.
- All the development services including hygiene promotion/education should ensure the coverage of all the hard to reach populations.
- As children should be targeted for better hygienic behaviors, awareness raising activities and information should be widely disseminated to schools and school aged children via child friendly approaches and easily understandable visibilities.

5.3.3 Limitation of the study and recommendation for future research

Actual hygiene attitude and practices of the respondents is difficult to explore with interview questionnaires. Social desirability bias of human nature likely to make fake-answer in questionnaires studies (i.e. under-reported of bad attitude and practices). Respondents may try to give impressive answers and express their book learning attitude and practices. For example – when faced with question regard “do you take shower every day?”

Secondly, when we asked about respondents’ practices, they need to draw back the memory how often (regularly, occasionally or rarely) they practiced the particular behaviors. We cannot completely rely or statistically link reported brain memory and real practices.

The followings are recommendations for future research -

1. In depth qualitative anthropological study is recommended to explore more determinants of hygiene knowledge, attitude and practices in details.
2. Integrated with dimension of common hygiene related diseases like diarrhea is suggested.
3. Hygiene KAP studies for school going aged children should be done for consideration of future intervention and education purposes because one's knowledge, attitude and practices initiated at that age.

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APPENDICES

APPENDIX A
Form of
Patient/ Participant Information Sheet

Title of research project: “KNOWLEDGE ATTITUDE AND PRACTICES OF HYGIENE BEHAVIORS AMONG NARGIS CYCLONE SURVIVORS OF LAPUTTA TOWNSHIP AYEYARWADDY UNION OF MYANMAR”

Principle researcher’s name...Mr. Aung Myo Min... **Position ...**MPH student.....

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Local contact persons: Mr. Aung Ko Chan **Telephone:**-.....

1. You are being invited to take part in a research project. Before you decide to participate it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and do not hesitate to ask if anything is unclear or if you would like more information.
2. This research project involves “the study of knowledge attitude and practices level of hygiene behaviors among Nargis Cyclone Survivors of Laputta Township Ayeyarwaddy Union of Myanmar”
3. Objective (s) of the project.
 - 3.1 To study the personal profiles (socio-demographic factors) among study population in Laputta Township, Ayeyarwaddy, Union of Myanmar
 - 3.2 To study the influencing factors (availability of hygiene information, education services (local health services) and hygiene facilities) on hygiene knowledge, attitude, practices among study population in Laputta Township, Ayeyarwaddy, Union of Myanmar

3.3 To indicate the hygiene knowledge, attitude and practice level among study population in Laputta Township, Ayeyarwaddy, Union of Myanmar

3.4 To access the relationship between personal profiles (socio-demographic factors), influencing factors (availability of hygiene information, education services (local health services) and hygiene facilities) and level of hygiene knowledge, attitude and practices among study population in Laputta Township, Ayeyarwaddy, Union of Myanmar

4. Details of participant.

The participants will be respondents among general population (head of household OR housewife OR representative of household) residing in Laputta Township, Ayeyarwaddy, Union of Myanmar, with following inclusion criteria.

- Agree volunteer participation (willing to participate) in the study
- “Permanent stay”- Currently staying in the study area at least since 2008 (Nargis made landfall 2008) without any interest of staying or not staying during time of Nargis cyclone
- Available time; around one hour (without any consequent negative impact to his/her personal life or professional job) to participate in the study
- Able to give voluntary signatory and verbal consent to ensure voluntary participation and clear understanding of the nature of the contents in the research study.

Exclusion criteria;

- Temporary residences in the study area
 - Scope of temporary residences includes two groups of people;
 - 1) Migrated businessmen from other areas
 - 2) Migrated NGO workers from other areas
- Persons with psychological disorder (psychosis, dementia, mental retarded etc)
- Disabled persons
- Very sick persons
- Persons with communication defects like hearing/speech impairments
- Persons who cannot understand/speak Myanmar (native) language

Withdrawal situation: Respondents who want to withdraw from the study, with or without any reasons; can withdraw from the study at any time with no consequent negative impact on him/her. In case of that situation, researcher will re-start the interview procedure with another respondent to replace him/her.

This study needs minimum 440 eligible participants.

4-5 interviewers (research assistants) will be recruited to conduct interview. The interviewers will be former staffs of INGO that worked in the target area for 3 years and also colleagues (junior staffs) of researcher. The researcher himself will train the interviewers for 2-3 days to conduct interviews, about the study criterions, ways of discussing issue in structured face to face (one by one) interview and approaching technique to participants. Role play piloting exercises will also be secured before conducting field interview. The (education) qualification background of researcher is medical doctor with extensive experience in relief, humanitarian and development works with INGO particularly in the study area. The (education) qualification background of interviewers is high school level (grade 11) with 1-2 years experience in relief, humanitarian and development works with INGO in the study area.

To approach potential participants; first, interviewer will go and meet with village local authorities and explain about the nature of research. Then will request the list of households in the village and choose the potential participants' households with random basis. Then on arrival of randomly selected household, choose the potential participants again on random basis.

5. The interviewer will explain to you the purpose of study. Once you agree to participate in study you will be asked series of questions regarding general information (including personal profile), services available regarding hygiene, knowledge, attitude and practices of hygiene behaviors in structured face to face (one by one) interview. The interviewing time will be around 30-45 minutes; can extend few minutes to have more information. Confidentiality of data/information will be secured by using code number instead of name in the questionnaires form. Only results of the study will be reported as total picture and the rest of information will be kept confidential. Any information which could be able to identify participant will not appear in the report.

6. Process of providing information which also be stated in the proposal.

6.1 The researcher or interviewer will provide you verbally all the explanation about the purpose of project through this sheet, which you can one copy for you. If you agree voluntary participation, you will be requested to sign on informed consent form which one copy will provide to you.

6.2 You will be asked in your free time apart from your working hour.

7. You will not harm due to the participation of this study. The participation in this study is voluntary and you have right to refuse or withdrawal it at any time with no reasons.

8. You may stop the questions throughout any interview time if you feel uncomfortable to answer.

9. There will be no remuneration or gift for participant in study research.

10. Information related directly to you will be kept confidential. Results of study will be reported as overall statement.

11. In case you have any inquire or need more information, please contact researcher at all time. If the researcher has any information that may harm or benefit regarding the study the researcher will inform you immediately so that research subject may review if they are still voluntary to participate in the research study.

12. Provision of assistance

Researcher will provide correct information sheet regarding hygiene knowledge and practices to the low KAP score respondents.

13. If researcher does not perform upon participants as indicated in the information, the participants can report the incident to the Ethics Review Committee for Research Involving Human Research Subjects, Health Sciences Group, Chulalongkorn University (ECCU). Institute Building 2, 4th Floor, Soi Chulalongkorn 62, Phayathai Rd., Bangkok 10330, Thailand, Tel: +66-2218-8147 Fax: 0-2218-8147
E-mail: eccu@chula.ac.th

APPENDIX B
Form of
Informed Consent Form

Address.....

Date

Code number of participant

I who have signed here below agree to participate in this research project

Title: “KNOWLEDGE ATTITUDE AND PRACTICES OF HYGIENE BEHAVIORS AMONG NARGIS CYCLONE SURVIVORS OF LAPUTTA TOWNSHIP AYEYARWADDY UNION OF MYANMAR”

Principle researcher’s nameMr. Aung Myo Min.....

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No 12, Aung Tha Pyay Street, Sanchaung Township 11111, Yangon (Myanmar)

Telephone: +66-8043-7209-5 (Thailand), +95-9503-2886 (Myanmar)

I have **read or been informed** about rationale and objective(s) of the project, what I will be engaged with in details, risk/harm and benefit of this project. The researcher has explained to me and I **clearly understand with satisfaction**.

I willingly **agree** to participate in this project and consent the researcher to ask series of questions in this structured face to face interview which covers general information, working condition, information and education services available regarding hygiene, accessibility to hygiene facilities, knowledge, attitude and practices of hygiene behaviors.

The interview time will be last estimated 30-45 minutes and will be done one time only.

I have the right to withdraw from this research project at any time as I wish with no need to give any reason. This withdrawal will not have any negative impact upon me (e.g. still receive the usual services).

Researcher has guaranteed that procedure(s) acted upon me would be exactly the same as indicated in the information. Any of my personal information will be kept confidential. Results of the study will be reported as total picture. Any of personal information which could be able to identify me will not appear in the report.

If I am not treated as indicated in the information sheet, I can report to the Ethics Review Committee for Research Involving Human Research Subjects, Health Sciences Group, Chulalongkorn University (ECCU). Institute Building 2, 4 Floor, Soi Chulalongkorn 62, Phayathai Rd., Bangkok 10330, Thailand, Tel: +66-2218-8147 Fax: 0-2218-8147 E-mail: eccu@chula.ac.th,

I also have received a copy of information sheet and informed consent form.

APPENDIX C
QUESTIONNAIRE

Questionnaire on “KNOWLEDGE ATTITUDE AND PRACTICES OF HYGIENE BEHAVIORS AMONG NARGIS CYCLONE SURVIVORS OF LAPUTTA TOWNSHIP AYEYARWADDY UNION OF MYANMAR”

By Mr. Aung Myo Min

College of Public Health Sciences, Chulalongkorn University, 2012

Date:

Interviewer code No:

Respondent code No:

Instruction for interviewer: Please make a tick in box provided best fit with respondent’s answer. Please also write down respondent’s answer exactly in the provided blank space wherever necessary.

Part 1: Socio-demographic factors

1. Age ----- years

2. Gender Male Female

3. Marital status

- 1. Married
- 2. Single
- 3. Widow
- 4. Divorced/separated
- 5. Others (please specify) -----

4. Educational level

- 1. Never join to school (No education)
- 2. Attend basic monastery school or primary school (read and write)
- 3. Attend middle school
- 4. Attend high school
- 5. Attend university
- 6. Others (please specify) -----

5. Occupation

- 1. General/random laborer (agriculture/ livestock/salt farming/factory)
- 2. Own business (merchant, own shop, own agricultural/livestock farm)
- 3. Public workers (clerks, teachers, authorities etc)
- 4. No occupation (students, youths etc)
- 5. Others (please specify) -----

6. Average total household income per month ----- Myanmar Kyat

7. Race

- 1. Bamar
- 2. Kayin
- 3. Chinese
- 4. Others (please specify) -----

8. Religion

- 1. Buddhist
- 2. Christian
- 3. Hindu
- 4. Islam
- 5. Others (please specify) -----

Part 2: Influencing factors on hygiene knowledge, attitude and practices

Instruction for interviewer: Please make a tick in column best fit with respondent's answer.

1. "Tick in 'Yes' column if respondents answer 'Yes'.
2. "Tick in 'No' column if respondents answer 'No'.
3. "Tick in 'don't know' column; if respondents cannot decide, after doing his/her best,"

No.	Statement	Yes	No	Don't know
	Availability of hygiene information, education services and hygiene facilities			
1.	Are there any functioning health center/ health care staff/ community health volunteer in your village?			
	If NOT, how long it takes to reach nearest health care provider ----- -----			
2.	Are there any hygiene promotion activities in your village (or) area around your village? e.g. discount sales of hygienic items, distribution of hygienic wares etc			
	If YES, which type of activity? Discount sales <input type="checkbox"/> Distribution <input type="checkbox"/> Others <input type="checkbox"/> please mention: ----- How many times per months? -----			
3.	Are there any hygiene information (or) education activities in your village?			
	If YES, which type of activity? Mass campaign <input type="checkbox"/> Focus group discussion <input type="checkbox"/> House to house visit <input type="checkbox"/> Others <input type="checkbox"/> please mention: ----- How many times per months? -----			

4.	Can you available health/hygiene related messages in your village?			
	If YES, from where? Health care staff (midwife etc) <input type="checkbox"/> Community health educator/volunteer <input type="checkbox"/> Peers (family members, relatives, friends, etc) <input type="checkbox"/>			
5.	Are there any I/LNGOs doing/had done hygiene related activities in your village.			
	If YES, which activities they are doing/had done? Education <input type="checkbox"/> Distribution of hygiene wares <input type="checkbox"/> Direct treatment of hygiene related diseases <input type="checkbox"/> Others <input type="checkbox"/> please mention: -----			
6.	Are there any kinds of media providing/had provided hygiene knowledge to you?			
	If YES, which kinds of media are providing/had provided? TV/radio <input type="checkbox"/> Newspapers <input type="checkbox"/> Journals/magazines <input type="checkbox"/> Others <input type="checkbox"/> please mention: -----			
7.	Are there any hygiene information visibilities (posters, signboards etc) at the public place of your village? (school, monastery, video showroom etc)			
8.	Are there any hygiene information visibilities (posters, signboards etc) in your house?			
9.	Are there any safe drinking water sources (ponds, wells etc) in (or) around your village?			
10.	Do you have required items to make water safe for drinking? i.e., drinking water pot with cover plus burning materials for boiling (or) reliable quality filters (or) water-guard (or) chlorine.			
11.	Fly proof latrine available at your house?			
12.	Are there hand washing facilities (soap and enough water) at your house?			
13.	Do you have required covering items to make the food safe? (sieve, cover etc)			
14.	Are there any specific spaces to throw wastes in your village?			
	If Yes, please mention: ----- If No, how you throw waste? -----			

Part 3: Hygiene knowledge factors

Instruction for interviewer: Please make a tick in column best fit with respondent's answer.

1. "Tick in 'True' column if respondents answer the statement is correct."
2. "Tick in 'False' column if respondents answer the statement is not correct."
3. "Tick in 'don't know' column; if respondents cannot decide, after doing his/her best,"

No.	Statement	True	False	Don't know
	Drinking water resources, treatment and storage			
1.*	River water is safe for drinking.			
2.	Rain water is safe for drinking.			
3.	Characteristics of safe drinking water are absence of smell, color, taste, and clear.			
4.	We can treat water to make it safe for drinking by applying water guard (chlorine).			
5.*	We can treat water to make it safe for drinking by filtering with ordinary cloth filter.			
6.*	Once water has been treated for safe drinking, it is not important keeping in any containers with or without secured cover to prevent it from re-contamination.			
7.	We should take out water from the drinking containers by tap.			
8.*	We should take out water from the drinking containers by cup with scoop (or) cup without scoop, not important.			
	Latrine usage			
9.	Usage of fly proof latrines is important to prevent transmission of diarrhea related diseases.			
10.	Characteristics of sanitary latrine are - fly proof, presence of enough water, hand washing facilities and superstructure.			
11.	Latrines should be constructed from the water sources (ponds etc) at least 50 ft.			
	Hand washing practices			
12.	Hand washing practices with soap is important to prevent transmission of diarrhea related diseases.			

13.*	Hand washing is needed only in case when hands are apparently very dirty.			
14.	We should wash our hands with soap in ALL the following conditions - a) Before handling of foods/eating b) after toilet c) after handling children excreta/ after cleaning their bottom.			
	Food safety			
15.	Cooking/boiling of the foods (meat, vegetables) thoroughly is needed to prevent diarrheal related intestinal diseases.			
16.	Food should cover with fly proof sieve to prevent diarrheal related intestinal diseases.			
17.	Kitchen surfaces and utensils should keep cleaning to prevent diarrheal related intestinal diseases.			
18.	We should store raw meet in separate container.			
19.	We should not keep cooked food more than one day (24 hrs) in normal room temperature.			
	General hygiene knowledge			
20.	One of the main causes of diarrhea associated diseases is poor hygiene practices.			
21.	Children excreta can transmit diseases.			
22.	Unsystematic throwing of household rubbish can transmit diseases.			

* Question with reverse answer

Part 4: Hygiene Attitude

Instruction for interviewer: Please make a tick in column best fit with respondent's answers.

1. "Tick in 'Agree' column if respondents answer he/she absolutely agrees about the statement."
2. "Tick in 'Disagree' column if respondents answer he/she totally disagrees about the statement."
3. "Tick in 'Neutral/not sure' column if respondents answer he/she is not certain about the statement."

No.	Statement	Agree	Neutral /Not sure	Dis-agree
1.	Community drinking water sources (ponds) should be fenced to prevent it from reaching of animals			
2.	Community drinking water sources (ponds) should be preserved by the respective community			
3.	Access to and way of taking water from the public drinking water ponds should be more systematic and hygienic way to prevent contamination of the water sources			
4.*	Habit of taking water from public drinking ponds, filtering into pot and drinking after keeping 1 night in the pot is ok; needs no more treatment method to make it safe			
5.	Latrine promotion programme is needed in the village you are living.			
6.	Families in the village should invest some more money in building sanitary latrine.			
7.	Every household in the village should build own sanitary latrine.			
8.	Systematic hand washing (with soap) should be more practiced in the village you are living.			
9.	We should take shower everyday if we are not in particular conditions like fever, illness etc			
10.	We should use soap to clean our body whenever we take shower.			

* Question with reverse answer

Part 5: Readiness to practices

Instruction for interviewer: Please make a tick in column best fit with respondent's answer.

1. "Tick in 'Yes' column if respondents answer 'Yes'.
2. "Tick in 'No' column if respondents answer 'No'.
3. "Tick in 'Don't know/not sure' column; if respondents answer he/she is not certain about the statement."

No.	Statement	Yes	No	Don't know/ Not sure
	Drinking water resources, treatment and storage			
1.*	Will you drink river water without applying any treatment methods?			
2.	Will you drink water from safe drinking water resources?			
3.	Will you drink treated drinking water with one of the proper treatment methods? (boiling, treated with chlorine etc)			
4.	Will you cover your drinking water pots/tanks.			
5.	Will you take out drinking water from a container by using a tap or a cup with scoop?			
	Latrine usage			
6.	Will you use fly proof sanitary latrine in your house?			
	Hand washing practices			
7.	Will you wash your hands with soap before handling foods/eating?			
8.	Will you wash your hands with soap after toilet?			
9.	Will you wash your hands with soap after handling children excreta/ after cleaning their bottom?			
10.	Will you use soap in washing hands?			
	Food safety			
11.	Will you eat thoroughly cooked/boiled foods?			
12.	Will you cover foods with fly proof sieve?			
13.	Will you keep kitchen surfaces and utensils clean?			
14.	Will you use separate containers to store raw meat?			

	General hygiene			
15.	Will you throw children excreta systematically (burn, bury, reservoirs etc)?			
16.	Will you throw household rubbish systematically (burn, bury, reservoirs etc)?			
17.	Will you regularly use soap when you take shower?			
18.	In general, will you keep your body clean and practice personal hygiene behaviors (take shower every day, nail clipping etc)?			

* Question with reverse answer

Part 6: Hygiene practices

Instruction for interviewer: Please make a tick in column best fit with respondent's answer.

1. "Tick in 'Regularly' column if respondents answer he/she perform the statement equal to (or) more than 80% of his/her available time."
2. "Tick in 'Occasionally' column if respondents answer he/she perform the statement between 30-80% of his/her available time."
3. "Tick in 'Rarely' column if respondents answer he/she perform the statement equal to (or) less than 30% of his/her available time."

No.	Statement	Regul arly	Occa sional ly	Rarely
	Drinking water resources, treatment and storage			
1.*	You drink river water without applying any treatment methods?			
2.	You drink water from safe drinking water resources? Please mentioned your drinking water resources? -----			
3.	You drink treated drinking water with one of the proper treatment methods. (boiling, treated with chlorine etc) Please mentioned how do you treat your drinking water? -----			
4.	You cover your drinking water pots/tanks.			

5.	You take out drinking water from a container by using a tap or a cup with scoop.			
	Latrine usage			
6.	You use fly proof sanitary latrine in your house.			
	Hand washing practices			
7.	You wash your hands with soap before handling foods/eating.			
8.	You wash your hands with soap after toilet.			
9.	You wash your hands with soap after handling children excreta/ after cleaning their bottom.			
10.	You use soap in washing hands.			
	Food safety			
11.	You eat thoroughly cooked/boiled food/vegetables.			
12.	You cover foods with fly proof sieve.			
13.	You keep kitchen surfaces and utensils clean.			
14.	You use separate containers to store raw meat.			
	General hygiene			
14.	You throw children excreta systematically (burn, bury, reservoirs etc).			
15.	You throw household rubbish systematically (burn, bury, reservoirs etc).			
17.	You use soap regularly when you take shower.			
18.	In general, you keep your body clean and practiced personal hygiene behaviors (take shower every day, nail clipping etc).			

* Question with reverse answer

Thank you for your time.

APPENDIX D

BUDGET

No.	Activities	Unit	Price (Baht)	Unit (number)	Total budget (baht)
1.	Photocopy for pilot testing	Question form	10 baht/1 form	30 forms	300
				subtotal	300
2.	Data collection				
	Photocopy for question forms	Question form	10 baht/1 form	500 forms	5,000
	Per diem for interviewers	Person	400 baht × 5 persons/day	15 days	30,000
	Accommodation (researcher)	Person	600 baht/day	7 days	4,200
	Transportation car ticket fees (2 ways) to research area	lump sum	1500 baht	-	1,500
	Communication cost	Network/Tel	50 baht/ day	14 days	700
				subtotal	41,400
3.	Documentation				
	Print out	Page	5 baht/page	800 page	4,000
	Photocopy	Page	1 baht/page	1500 page	1500
	Stationary	Set	400 baht/set	2 set	800
	Binding paper	Set	200 baht/set	6	1800
				subtotal	8,100
	Grand total				49,800

APPENDIX E
TIME SCHEDULE

Procedure	Time frame (Months)							
	Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13
1. Literature review								
2. Writing thesis proposal								
3. Submission for proposal exam								
4. Ethical consideration from Chulalongkorn University (CPHS)								
5. Pretest questionnaires								
6. Field preparation and data collection								
7. Data analysis								
8. Thesis writing								
9. Final thesis exam								
10. Submission for article for publication								
11. Submission of thesis								

VITAE

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 Graduated from University of Medicine 1, Yangon, Myanmar in the year 2006

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Working experiences : May 2008 to June 2008
 : Medical Officer, Cyclone Nargis Emergency Relief Mission (Phyapon Township, Myanmar)
 : Amara Health Care Foundation (National NGO)

: Jun 2008 to Dec 2008
 : Field Medical Officer, Cyclone Nargis Emergency Relief Programme (Laputta Township, Myanmar)
 : Malteser International (Internatinal NGO)

: Jan 2009 to Aug 2010
 : Health Programme Manager, Cyclone Nargis Development programme (Laputta Township, Myanmar)
 : Malteser International (Internatinal NGO)

: Sep 2010 to Jun 2011
 : Officer in Charge for programme office, Cyclone Nargis Development Programme (Laputta Township, Myanmar)
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: Jul 2011 to Apr 2012
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