

**EFFECT OF INTENSIVE EDUCATION ON FREQUENCY AND
QUALITY OF HAND WASHING AMONG HOUSEHOLDS WITH
INFLUENZA POSITIVE CHILD IN URBAN, THAILAND**



Miss Suchada Kaewchana

**A Dissertation Submitted in Partial Fulfillment of the Requirements for the
Degree of Doctor of Philosophy Program in Research for Health Development**


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ในครัวเรือนของผู้ป่วยเด็กโรคไขหวัดใหญ่ เขตเมือง ประเทศไทย



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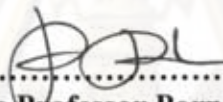
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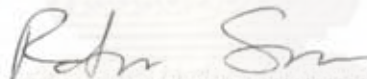
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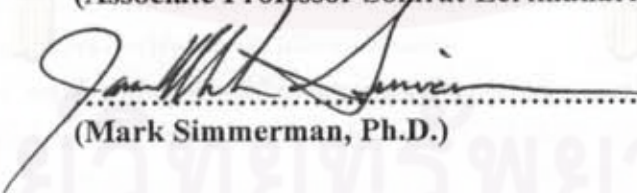

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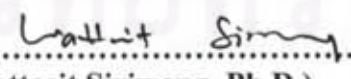
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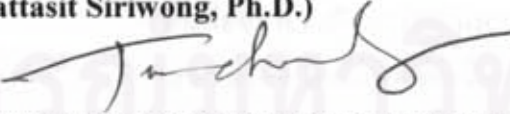

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สุชาดา แก้วชนะ: ประสิทธิภาพของการให้ความรู้แบบเข้มข้นเพื่อเพิ่มความถี่และคุณภาพในการล้างมือ ในครัวเรือนของผู้ป่วยเด็กโรคไขหวัดใหญ่ เขตเมือง ประเทศไทย (Effect of intensive education on frequency and quality of hand washing among households with influenza positive child in Urban, Thailand) อ. ที่ปรึกษาวิทยานิพนธ์หลัก: ผู้ช่วยศาสตราจารย์ ดร. รัตนา สำโรงทอง, อ. ที่ปรึกษาวิทยานิพนธ์ร่วม: รองศาสตราจารย์ สมรัตน์ เลิศมหาฤทธิ์, Mark Simmerman, Ph.D., 120 หน้า.

ความเป็นมา: การให้ความรู้แบบเข้มข้นเพื่อปรับปรุงพฤติกรรมการล้างมือในครัวเรือนไทยยังมีการศึกษาไม่เพียงพอ การศึกษานี้จึงมุ่งศึกษาประสิทธิภาพของการให้ความรู้แบบเข้มข้นเพื่อเพิ่มความถี่และคุณภาพในการล้างมือ ตลอดจนศึกษาการเปลี่ยนแปลงความรู้ ทักษะ และพฤติกรรมการปฏิบัติเกี่ยวกับโรคไขหวัดใหญ่และการล้างมือ

วิธีการศึกษา: การวิจัยนี้ดำเนินการให้ความรู้แก่ครัวเรือนที่มีผู้ป่วยเด็กโรคไขหวัดใหญ่ ในเขตเมือง ระหว่าง เมษายน 2551 ถึง กรกฎาคม 2552 ภายใต้โครงการวิจัยแบบ Randomized Controlled Trial เรื่องการป้องกันโรคไขหวัดใหญ่ กลุ่มเป้าหมายในการประเมินพฤติกรรมการล้างมือคือสมาชิกครัวเรือนอายุตั้งแต่ 7 ปีขึ้นไป ที่เข้าร่วมโครงการวิจัย หลักคั้งกล่าวในกลุ่มควบคุม (กลุ่ม 1) และกลุ่มล้างมือ (กลุ่ม 2) โดยกลุ่ม 1 ได้รับความรู้เรื่องสุขภาพทั่วไป ส่วนกลุ่ม 2 ได้รับความรู้เรื่องโรคไขหวัดใหญ่ ประโยชน์ของการล้างมือ และได้รับการสอนวิธีการล้างมือเป็นรายบุคคล ผู้วิจัยใช้แบบบันทึกประจำวันเพื่อประเมินความถี่ในการล้างมือ ใช้แบบสังเกตขั้นตอนการล้างมือเพื่อประเมินคุณภาพ โดยเปรียบเทียบพฤติกรรมดังกล่าวระหว่างกลุ่มในวันที่ 7 หลังจากให้ความรู้ และใช้แบบสอบถามความรู้ ทักษะ และพฤติกรรมการปฏิบัติเกี่ยวกับโรคไขหวัดใหญ่ เพื่อเปรียบเทียบคะแนนการเปลี่ยนแปลงก่อนและหลังให้ความรู้ในวันที่ 90 ในกลุ่มที่ได้รับความรู้เรื่องการล้างมือ

ผลการศึกษา: พฤติกรรมความถี่และคุณภาพในการล้างมือระหว่างกลุ่มที่ได้รับและกลุ่มที่ไม่ได้รับการสอน ในวันที่ 7 หลังจากให้ความรู้ พบว่า กลุ่ม 2 ล้างมือมากกว่ากลุ่ม 1 โดยกลุ่ม 1 ($n_1=135$) ล้างมือเฉลี่ย 3.9 ครั้งต่อวัน ส่วนกลุ่ม 2 ($n_2=140$) ล้างมือเฉลี่ย 5.7 ครั้งต่อวัน ($P<.001$) พฤติกรรมการล้างมือในเชิงคุณภาพซึ่งวัดเป็นคะแนนจากคะแนนเต็ม 8.5 คะแนน พบว่า กลุ่ม 1 ($n_1=164$) ได้ 3.2 คะแนน ส่วนกลุ่ม 2 ($n_2=166$) ได้ 6.4 คะแนน ($P<.001$) ส่วนการเปรียบเทียบพฤติกรรมความถี่ และคุณภาพในการล้างมือก่อนและหลังให้ความรู้ 90 วัน ของกลุ่มที่ได้รับความรู้ พบว่า กลุ่มนี้ล้างมือเพิ่มขึ้นเฉลี่ย 2 ครั้งต่อวัน และคะแนนของคุณภาพในการล้างมือเพิ่มขึ้น 3 คะแนน พฤติกรรมการใช้สบู่ การถูมือ การใช้ผ้าหรือกระดาษสะอาดเพื่อเช็ดมือดีขึ้น ($P<.001$) เวลาที่ใช้ในการล้างมือเพิ่มขึ้นจาก 26 วินาที เป็น 59 วินาที ($P<.001$) นอกจากนี้พบว่าความรู้เรื่องโรคไขหวัดใหญ่เพิ่มขึ้น ($P<.001$) แต่ทัศนคติเกี่ยวกับความรุนแรงของโรคไขหวัดใหญ่ยังไม่มีการเปลี่ยนแปลง

สรุป: การให้ความรู้แบบเชิงรุกที่บ้านสามารถเพิ่มพฤติกรรมความถี่ คุณภาพในการล้างมือ และความรู้เกี่ยวกับโรคไขหวัดใหญ่ได้ ส่วนการปรับทัศนคติจำเป็นต้องเพิ่มวิธีการให้เข้มข้นและระยะเวลายาวนานขึ้น

สาขาวิชา วิจัยเพื่อการพัฒนาสุขภาพ ลายมือชื่อนิติศ *Suttida Kalem*

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SUCHADA KAEWCHANA: EFFECT OF INTENSIVE EDUCATION ON
FREQUENCY AND QUALITY OF HAND WASHING AMONG HOUSEHOLDS
WITH INFLUENZA POSITIVE CHILD IN URBAN, THAILAND. THESIS

ADVISOR: ASSISTANT PROFESSOR RATANA SUMROMTHONG, Ph.D.

THESIS CO-ADVISOR : ASSOCIATE PROFESSOR SOMRAT

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Background: Limited studies illustrated the effect of intensive education on hand washing behaviors in Thai households. We examined the effect of intensive hand washing education on self-reported frequency (FHW) and measured-quality of hand washing (QHW) as well as determined the change of score on instruments designed to measure knowledge, attitude and practice (KAP) of hand washing relevant to influenza.

Methods: We provided intensive hand washing education in households between April 2007 and July 2009 as a component of a household-randomized control trial of interventions to reduce influenza transmission. We assessed behaviors among members of households (aged ≥ 7 years) with a confirmed influenza infected child enrolled in control (group 1) and hand washing (group 2) arms. Group 1 received routine health education on home visit day 0/1. Group 2 received 30 minutes education on influenza, benefits of hand washing, individual hand washing training and supplies on home visit day 0/1, 3 and 7 and was asked to record frequency of hand washing daily. We compared FHW at 7 days post-education between groups, using self-reported diary and compared QHW between groups by observation. We also compared change of FHW, QHW, KAP and hand washing procedure on 4 practices that include i) use of soap, ii) technique of cleaning area of hands, iii) use of clean towel/paper for drying hands between pre and 90 days post-education in group 2.

Results: On day 7, group 1 ($n_1=135$) reported 3.9 hand washing episodes/day, while group 2 ($n_2=140$) reported 5.7 hand washing episodes/day ($p<.001$), Group 1 ($n_1=164$) obtained a 3.2 quality score, while group 2 ($n_2=166$) obtained a 6.4 quality score ($p<.001$). Pre and 90 days post-education, FHW improved by 2 episodes/day and QHW increased by 3 scores. Hand washing procedure was improved ($p<.001$) in particular duration of washing hands increased from 26 to 59 seconds per episode ($p<.001$). Knowledge of influenza and hand washing following coughing/sneezing showed improvement ($p<.001$) but the attitude towards the severity of influenza remained unchanged.

Conclusions: Intensive home-based education significantly improved the frequency, quality and knowledge of hand washing in preventing respiratory infection during the 90 days. However, the attitude modification may require an intensified approach with a longer intervention.

Field of Study: Research for Health Development
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ศูนย์วิทยุทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

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LIST OF ABBREVIATIONS

WHO: World Health Organization

Thailand-MOPH: Thailand Ministry of Public Health

TUC/IEIP: Thailand MOPH-U.S.CDC Collaboration/ International Emerging Infections Program

AFRIMS: U.S. Armed Forces Research Institute of Medical Science, Bangkok, Thailand

QSNICH: Queen Sirikit National Institute of Child Health (Children Hospital), Bangkok, Thailand

HITS: Household Influenza Transmission Study (3 institute collaborations: TUC/IEIP, AFRIMS and QSNICH)



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CHAPTER I

INTRODUCTION

1.1 BACKGROUND

Hand washing is a primary preventive strategy to prevent the spread of hand pathogens and to prevent at least two types of disease: lower respiratory infections and diarrhea, both have killed millions of children worldwide, as well as to lessen the impact of illness in households. A study in Pakistan demonstrated that hand washing reduced the incidence of pneumonia by 50% and diarrhea by 53% through the facilitation of community based-hand washing education (Carabin et al., 1999; Luby et al., 2005; Monto, 1999; Rabie and Curtis, 2006; Sandora et al., 2005). A 3-year intensive hand hygiene program, including hand washing promotion, in Thai schools also supported the benefits in reducing influenza-like illness by about 60.8 % after the 1st year and a further reduction of 19% after the 2nd year of promotion (Anucha Apisarnthanarak et al., 2009). Additionally, a school-based hand washing promotion in China confirmed the advantage, reducing school absenteeism by 3 days (Bowen, et al., 2007). Consequently, the WHO, U.S. CDC, Thailand Ministry of Public Health and other countries have confidently emphasized directing individuals to wash their hands in order to lessen the impact of an influenza pandemic (Centers for Disease Control and Prevention US CDC, 2009; Thailand Ministry of Public Health, 2009f; WHO/UNICEF, 2006).

The impact on global health and economics due to an influenza pandemic raises the awareness of controlling the transmission of this pandemic. In Thailand, influenza illness significantly affects household economics and individual opportunity costs, including work and school absenteeism. The loss of productivity due to influenza was estimated to range from \$US23.4 - 62.9 million in 2004 (Simmerman et al., 2004). The total individual cost per illness episode was estimated at 663 baht (\$US

15.78) or approximately 20% of an average monthly income. Influenza stricken adult Thais lost an average of 3 working days in 2004, whereas parents of infected children missed an average of 4 working days due to caretaking responsibilities (Clague et al., 2006; Simmerman et al., 2004). The current influenza A (H1N1) 2009 pandemic had an estimated cumulative incidence of 48.5/100,000 in the Thai population and caused 198 deaths between May 1, 2009 and Jan 16, 2010 (Thailand Ministry of Public Health, 2009c). The pandemic situation continues to cause economic as well as physical losses nationwide. While the availability of the pandemic vaccine is challenging, the combination of vaccination and behavioral interventions including hand washing behavior, has been addressed as the most effective method to alleviate the impact (World Health Organization, 2005).

Limited studies illustrate the effect of education on behavior change, in particular frequency and quality of hand washing, before determining the effect of hand washing on illness's rate. A home-based educational intervention, that meets the needs of a household specific to their circumstances, altering perceptions and modifying/sustaining hand washing behavior, has not been carefully studied. A majority of studies suggest that intensified approaches and longer interventions that meet the needs of individuals could establish routine hand washing habits and achieve sustainability (Bowen et al., 2007; Guinan, McGuckin, and Ali, 2002 ; Larson, Bryan, Adler and Blane, 1997; Luby et al., 2005; Luby and Halder, 2008 ; Sandora et al., 2005). Demonstration was suggested as a standard educational approach to visualize the appropriate hand washing procedures. Provision of soap was advised to encourage the improvement of hand washing. Participation using self-monitoring diary was suggested to supplement the educational intervention and to enhance the success in modifying unhealthy behaviors (Boutelle et al., 1999; Levy et al., 2007). Nevertheless, none concludes what the significant length of the educational intervention should be. Accordingly, there is a need to study the effect of hand washing education on behaviors implementing in a particular period as it could increasingly facilitate the success of public hand washing promotion to alleviate the burden of the current influenza 2009 pandemic (Curtis, Cardosi, and Scott, 2000).

In conclusion, influenza illness has a direct impact on Thai households' health and economic wellbeing; however, the effect of home based-hand washing education

on behavior change related to it has not received adequate attention in Thailand. Therefore, this study specifically examined the effect of home-based intensive hand washing education on frequency and quality of hand washing while the secondary objective assessed the change of knowledge, attitude, and practice as well as explored perception and barrier towards hand washing in the households. This data is necessary to build up individual hand washing behavior and assist the development of hand washing promotion in Thai households.

1.2 RESEARCH QUESTIONS

1.2.1 Primary research questions

1. Does intensive education increase frequency and improve quality of hand washing?

1.2.2 Secondary research questions

2. Does intensive education increase knowledge, change attitudes relevant to influenza infection, improve hand washing in preventing respiratory infection?
3. What are the factors that influence over hand washing behavior in the households?

1.3 OBJECTIVES

1.3.1 Primary objectives

1. To determine effect of intensive hand washing education on frequency between pre-intervention and post-intervention at 7 days and 90 days
2. To evaluate the effect of intensive hand washing education on quality of hand washing between pre-intervention and post-intervention at 7 days and 90 days

1.3.2 Secondary objectives

3. To assess effect of intensive education on knowledge, attitude towards influenza infection, hand washing practice and respiratory etiquette between pre-post 90 days intervention

4. To describe the perceptions and barriers toward hand washing in relation to respiratory infection among caregivers responsible for administering full-time care to influenza infected children.

1.4 HYPOTHESIS

The home-based intensive hand washing education improves self-reported frequency and measured quality of hand washing as well as increases knowledge, attitude, and practice (KAP) relevant to influenza by 30% of the baseline.

1.5 CONCEPTUAL FRAMEWORK

The framework was applied from the Health Belief Model (Tones, 1979, 1981) and previous hand washing studies. The intensive hand washing education potentially demonstrates the improvement of the KAP, frequency and quality of hand washing through a combination of educational intervention called intensive hand washing education (Figure 1).

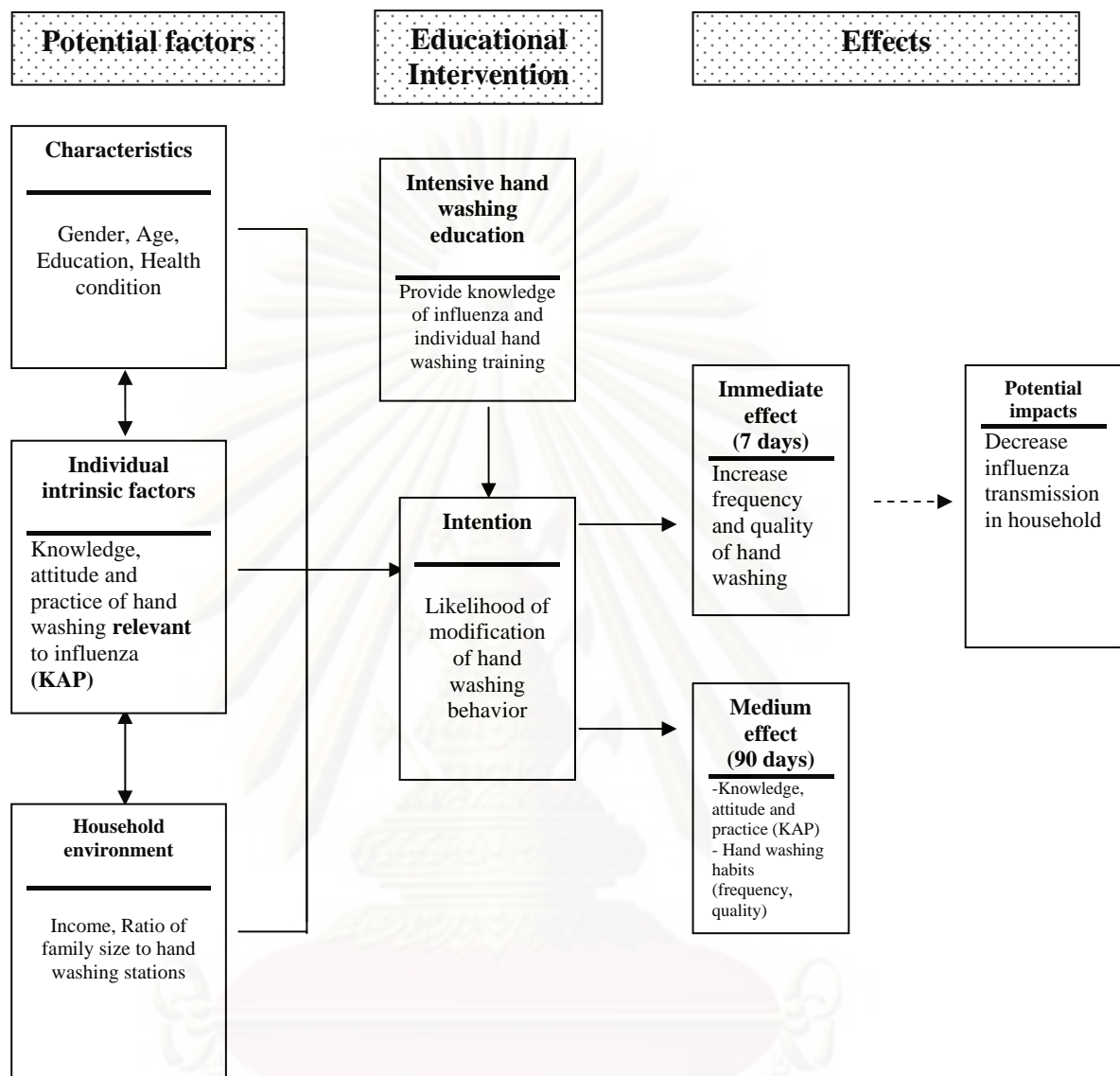


Figure 1.1: Conceptual Framework: The figure shows the potential factors, intensive education and expected effects. The solid arrow illustrates direct results of education and the dotted arrow illustrates the effect of increasing the frequency and quality of hand washing practice.

Potential factors

Characteristics, individual intrinsic factors and household environment strengthen the intention to acquire good hand washing behaviors. Characteristics such as age, gender, education and health conditions are more likely to assist positive behavior change (American Society for Microbiology, 2005; Lydia, 2002; Garbutt et al., 2007) while knowledge creates an awareness (Janz, Champion and Strecher.,

2002) and attitude can influence sustainability (Rosen et al, 2009). Additionally, convenient hand washing facilities and supplies play a role in supporting good hand washing practice. Therefore, it is important to incorporate these factors into the educational approach in order to facilitate a successful hand washing education.

Educational Intervention

In this study, the approach of intensive hand washing education was modified from earlier hand washing studies. The application scheme comprises five approaches: discussion; demonstration; provision of soap and written materials; as well as, self-daily monitoring. Each of individual approaches aims to strengthen the intention to practice. The routine habit of frequency and better quality of practice are the expected outcomes.

Face-to-face discussion has been proven to be one of the more effective strategies for improving health behavior, especially when combined with other educational approaches (Avorn et al., 1983). In addition, written health information materials are a valuable communication tool to reinforce the verbal message that is being presented. (Larson, Wong-McLoughlin and Ferng, 2009).

Individual training with demonstration is the most appropriate and efficient approach to instruct and visualize hand washing techniques. The key concept is to give participants the opportunity to practice these skills and to provide an opportunity for the health educators to explain the reasoning, provide immediate feedback and correctness, as well as reinforcing the benefits of proper hand washing (Chernoff, 1994; Newby et al., 1996).

Environment is a major factor in enabling or hindering the practices of hand washing. Facilitators include the availability and easy access to water and soap. Barriers might include prohibitively expensive or unattractive soap and the total lack of hand washing facilities. Therefore, distribution of soap and water is a way to strengthen the intention to change inappropriate hand washing behavior. Hand washing promotion efforts carried out in communities and schools, which included specific efforts to provide hand washing facilities inside the house, are more likely to

improve hand washing behavior than interventions that ignored this component (Lopez et al., 2008; Luby et al., 2008).

A self-monitoring diary encourages participants to monitoring and controlling their behavior attributed to a particular unhealthy practice. Although, a daily diary has not been applied in previous hand washing interventions, it has been successful in assisting individuals in achieving health behavior modifications, such as weight control, diet, exercise etc, as presented in a study conducted by Boutelle. Boutelle found that the intervention group that regularly self-monitors their exercise and diet were more likely to lose weight than the others (Boutelle et al., 1999). Therefore, this study supplemented the self-monitoring diary in the intervention with an expectation that it would help maintain good hand washing behavior.

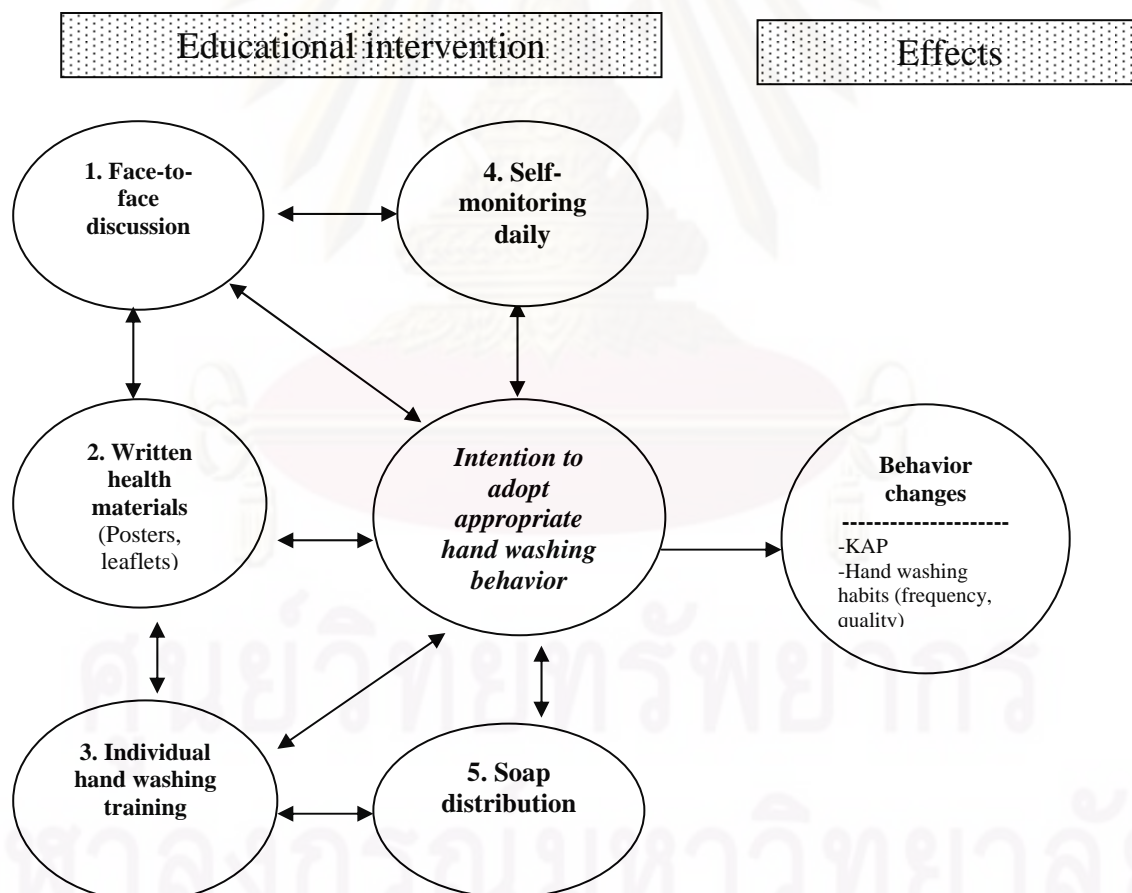


Figure 1.2: Educational Intervention

Effects

The expected effects were divided into 2 periods: i) immediate term effects (first 7 days); and ii) the medium term effects (90 days). The immediate effects aimed to support a research question of the Household Influenza Transmission Study (HITS), which determine if intensified hand washing can reduce household influenza transmission rate or not. The assumption based on the average day of the transmission- 1 day before infected persons are sick and up to 5 days after they become sick (Bridges et al., 2003; Eurico et al., 2006). The medium term effect of this study focused on behavior changes including KAP, frequency and quality.

1.6 OPERATIONAL DEFINITION

1. **Intensive hand washing education:** A 90 days home-based hand washing education comprises of the following 5 approaches (Figure 2).
 - 1.1. Face-to-Face discussion: A 15-20 minute discussion on the benefits of hand washing to prevent disease transmission, particularly influenza infection conducted 3 times during home visits day 1, 3 and day7.
 - 1.2. Written health materials: Leaflets and posters of hand washing procedure and influenza infection prevention
 - 1.3. Individual training: A 10 minutes demonstration and individual training on the hand washing procedure includes 4 practices i) the use of soap, ii) the techniques, iii) the use of clean/paper for drying hand and iv) duration, conducted during home visit at day 1, 3 and day7.
 - 1.4. Self-Monitoring Daily: Daily diary reporting of the frequency of hand washing for 90 days.
 - 1.5. Soap distribution: Dispensing liquid soap in graduate clear plastic container **for 90 days**
2. **Hand washing:** Process of removing dirt and transient microorganism from hands with soap and water for at least 20 seconds.

3. **Quality of hand washing:** The measured scores of demonstration on hand washing procedure by rubbing parts of the hands with soap for at least 20 seconds followed by drying with clean towel or paper.
4. **Frequency of hand washing:** Self-reported frequency of hand washing in a day
5. **Index case:** The first patient infected with influenza in a household.
6. **Household members:** Any person aged ≥ 7 years living in household of a confirmed influenza infected child during study period 90 days.

1.7 OVERVIEW OF STUDY APPROACH

The study of the effect of intensive education was conducted within the context of a larger study, “Household Influenza Transmission Study (HITS)”. The HITS is being conducted jointly by Queen Sirikit National Institute of Child Health (QSNICH), Armed Forces Research Institute of Medical Sciences (AFRIMS), and International Emerging Infections Program/Thailand MOPH-U.S.CDC Collaboration (IEIP/TUC). HITS prospectively identify laboratory-confirmed influenza infected children and their household members by rapid influenza testing and by confirmatory Polymerase Chain Reaction (PCR) testing. Consenting households are enrolled in one of a three groups of this randomized study; control, hand washing, and hand washing plus surgical facemask use. During the home visit on days 0/1, 3, 7 and 21, respiratory swab specimens are collected from all household members and tested for influenza by PCR.

Within the framework of HITS, this study examines the effect of education on hand washing behavior among participants enrolled into the hand washing education and control groups. The study nurse conducts the educational intervention during home visit days 1, 3, and 7 according to the study groups. The behavioral outcomes were assessed on day 1 (pre-education), day 7 and day 90 post-education. This study consists of the three phases.

Phase I (Pre-intervention) - the investigator developed the research methods, standard operational procedures (SOP), education plans, behavioral data collection forms and trained study staff on education plans and hand washing assessments.

Phase II (Intervention and data collection) - the study started at screening, enrollment and follow up that covers days 0/1 to day 90. Trained-study staff conducted the home visits, delivered education and assessed the hand washing behaviors. The investigator controlled the quality of the procedures according to SOP and validated the obtained data.

Phase III (Analytic) - this phase started after the completion of data collection.

1.8 EXPECTED BENEFITS & APPLICATION

Firstly, the results reveal the important role of intensive education in improving hand washing behaviors.

Secondly, the success of using a combination of educational approaches in modifying good hand washing behaviors, as outlined in this study, could help to optimize the success of public hand washing promotions in reducing the burden of the current influenza pandemic.

CHAPTER II

LITERATURE REVIEW

The information included in this paper was written from reviews of relevant articles to improve understanding of current situation of influenza control and to discover the knowledge gap in hand washing education. The articles were researched from Electronic Databases; PubMed, Science Direct and ProQuest, using the key words of “hand hygiene”, “ hand washing”, “influenza”, “households”, “ hand washing intervention” and “ hand washing promotion” that were published prior to 2009. A three-step approach was used to obtain the information that included: i) identify relevant titles/abstracts and scan relevant citations using the key words, ii) search the full articles and iii) finally review 21 hand hygiene, 30 hand washing and 9 influenza studies.

2.1 HAND HYGIENE

Hand hygiene refers to the procedure of removing dirt and pathogens, which are categorized into 3 types; hand washing with plain soap, hand washing with antiseptics and surgical hand washing (Bissett, 2007; Larson et al., 1995). The potential benefits of hand hygiene in reducing influenza transmission in households were demonstrated in studies conducted in Hong Kong and Thailand. The cluster randomized, controlled trial in the Hong Kong study addressed that hand hygiene seemed to prevent household transmission of influenza virus when implemented within 36 hours of the index patient onset of symptoms (Cowling et al., 2009). Likewise, the randomization control trial in Thailand, presented that washing hands on average 5 times a day was likely to reduce the transmission in households (Piyarat Suntarattiwong et al., 2009).

Hand washing with plain soap (non-medicated) is widely recommended for preventing common illness such as diarrhea (Cookson et al., 2009; Luby et al., 2005). The advantage of hand washing in reducing transient hands pathogens are described in studies of Gunter and Jernigan. Gunter et.al concluded that hand washing with plain soap for 1 minute reduced transient hand pathogens by 0.5 to up to 3 log₁₀ units but had no effect on resident hand pathogens (Kampf and Kramer, 2004). Additionally, Jernigan et. al, compared the effect of hand washing on adenovirus removal in 200 controls and 58 cases during the outbreak. The hands were cultured before and after hand washing and found that hands of 3 patients and 3 physicians were positive for adenovirus. They suggested that incomplete hand washing procedure did not remove adenovirus on hands, indicating the techniques of rubbing hands are imperative to eliminating the transient hands pathogens especially during the outbreak (Jernigan et al., 1993).

Hand washing with antiseptics refers to hand washing with antiseptic soaps and hand rubs with antiseptic agents. The antiseptic soaps and antiseptic gels used in the reduction of resident hand pathogens are composed mostly of triclosan, chlorhexidine, isopropanol, n-propoanol and ethanol (Kampf and Kramer, 2004). Kampf et al. described in their study that the efficacy of washing hands with antiseptics in reducing the resident hand pathogens was better than just using plain soap. It was noted that hand washing with 2-4% chlorhexidine liquid soap reduced pathogens by 0.35-1.75 log₁₀ units, while plain soap only reduced it by ≤ 0.4 log₁₀ units. In addition, hand rubs with 60-85% ethanol reduced the resident hand pathogens by 2.4 log₁₀ units compared with plain soap (Kampf and Kramer, 2005). Even though, hand washing with antiseptics works in about 10-15 seconds, certain disadvantages such as skin hydration, irritation, and allergy were noted as barriers to hand washing compliance (Kampf and Kramer, 2005; Pittet, 2001a).

Surgical hand washing is the only effective technique to reduce resident hand pathogens (Tanner, 2008). The process of surgical hand washing is complex and requires specific techniques with a long period of hand scrubbing for at least 120 seconds, and demands special supplies such as antimicrobial solutions and use of a brush (Kramer et al., 2008). Therefore, this technique is applied in hospital settings to

prevent acquired hospitalized infection and to reduce bacteria on the hands of the surgical team in preparation for surgical procedures

2.2 HANDS PATHOGENS

The resident and transient pathogens found on the hands causes infection approximately 71% of the time (Gwaltney, Moskalsi and Hendley, 1978; Rotter, 1999). The resident pathogens, including *Staphylococcus aureus*, *Staphylococcus epidermis*, *Coryneform* bacteria, are consistently present on the skin and are found mostly on the hands (Lee et al., 1994). These bacteria normally will not cause infection on intact skin, but will infect sterile body cavities, eyes and non-intact skin (Lark et al., 2001). These bacteria are usually shed with dead skin cells, are more adherent than transient pathogens, and are not easily removed by hand washing with soap alone (Rotter, 1999).

The transient pathogens include gram-negative bacteria, gram-positive bacteria, fungi and viruses that are attach to dirt particles, skin secretions, and are easily transmitted to other individuals by physical contact. Respiratory syncytial virus, rhinovirus, adenovirus, coronavirus, and influenza virus were found on the hands of approximately 5% of nosocomial viral infections in pediatric wards (Aho et al., 2000). Gwaltney's study reported that rhinoviruses were found in 65% of those individuals infected with the common cold. Bean et al. stated that the influenza virus could effectively be transferred to the hands up to 24 hours following surfaces (steel, plastic etc.) contamination, while tissue shedding could transfer the virus to hands for up to 15 minutes following contamination and survive on hands up to 5 minutes (Bean, 1982). Nonetheless, the transient pathogens including influenza virus can be easily removed by hand washing with soap (Grayson et al., 2009).

2.3 INFLUENZA INFECTION

Influenza infections occur in people of all ages and symptoms are typically more severe than the common cold. In Thailand, influenza was identified in 80 (11%) of 761 hospitalized pneumonia in-patients with projected annual incidence of 18–111/100,000 population with confirmation in 23% of the 1092 outpatients. This data shows an estimated annual incidence of 1420/100,000 population between September 2003 and August 2004. The estimated lost productivity accounts for 56% of all costs between US\$ 23.4 and US\$ 62.9 million in economic losses (Simmerman et al., 2004) with the average adult missing 4-5 days of work taking care of an ill child with influenza (Clague et al., 2006; Simmerman et al., 2004). There are three main types of influenza viruses, influenza A, B, and C, which are comprised of several different subtypes or strains and an influenza infected person will develop antibodies against that strain of virus. The incubation period for influenza virus averages 2 days (range 1–4 days), and the serial interval (the mean interval between onset of illness in 2 successive patients in a chain of transmission) is 2–4 days with viral excretion peaking early in the illness. These factors enables influenza viruses to spread rapidly through communities (World Health Organization., 2006). Approximately 1-3 days after contracting the influenza virus, patients will develop symptoms that include fever (usually high 38-40 degrees Celsius), headache, tiredness, dry cough, sore throat, runny or stuffy nose, and muscle aches. Stomach symptoms, such as nausea, vomiting, and diarrhea can also occur, but are more common in children than in adults. The duration of these symptoms will lessen within 5 days after the onset with full recover within 7-14 days (Eurico, Otavio and Frederick, 2006).

The influenza viruses found in mucus, saliva, and sputum are the predominant mechanism of influenza virus transmission through coughing and sneezing. In influenza outbreak studies conducted, they suggest that virus- large droplets (particles >5 mm in diameter) are generated by coughing and sneezing (Bridge, Kuehnert and Hall, 2003). A person with influenza may be able to pass on the influenza virus to others before they start to show symptoms (1 day before symptoms develop), and during the illness for up to 5 days after becoming sick. Healthy individuals can be infected by touching surfaces contaminated with the influenza virus and transferring

the virus by touching their mouth or nose. Even though transmission of the influenza viruses by contaminated hands, fomites, or surface contact has not been extensively documented, it is believed to occur.

To date, there have been some antiviral medications to shorten the symptoms but most cases receive palliative treatment due to a concern of drug resistance. Initial self-care should include taking anti-fever medicine, tepid sponge baths, drinking plenty of liquids (mainly water), and eating nutritious foods (Eurico et al, 2006). However, hand washing is expected to be a simple hygiene behavior that could interrupt at least one mechanism of transmissions.

2.4 HAND WASHING

2.4.1. Hand washing Procedure

The recommendations of WHO, US-CDC, Thai-MOPH and reviewed hand washing studies suggested that the entire procedure of hand washing is important to reduce hand pathogens (Centers for Disease Control and Prevention US CDC, 2009; Thailand Ministry of Public Health, 2009f; World Health Organization, 2006). A comparative study of five hand hygiene procedures to reduce H1N1 influenza virus among 20 human volunteers concluded that hand washing with plain soap appeared to be highly effective in reducing the virus, but only if the hand washing procedure was completely applied. The study also advised that hand hygiene including hand washing may be an important public health initiative to reduce influenza pandemic (Grayson et al., 2009).

The hand washing procedure requires soap and running water, friction (rubbing) for at least 20 seconds, and drying hands with paper or clean towel. Studies suggested that hand washing with room temperature water and liquid plain soap is efficient to remove transient hands pathogens. Water temperature at $< 43^{\circ}\text{C}$ ($<109.4^{\circ}\text{F}$) was noted as most comfortable and does not scalding the skin (Stone, Ahmed and Evans, 2000). Furthermore, a review of water temperatures summarized that water temperature ranging from 5°C (40°F) to 50°C (120°F) had no effect on reduction of transient and resident hands pathogens (Barry et al., 2002).

Plain soaps containing fatty acids, sodium and potassium hydroxide can remove organic soils (fat, oil, protein etc.) and transient pathogens while the antiseptic soaps composed of triclosan, chlorhexidine aim at maximizing the efficacy in reducing resident pathogens. However, the efficacy in removing transient pathogens between plain soaps and antiseptic soaps were found to be similar in other hand washing studies. Larson conducted a double-blinded randomized control trial of primary caretakers in 238 households to compare the effect of hand washing with plain soap and antiseptic soap containing 0.02% triclosan. Hand cultures were obtained before and after hand washing using modified glove juice techniques. There were no differences in mean log counts of the bacteria on the hands between those using the antiseptic soap or plain soap (Larson et al., 2003). An objective of a study conducted by Luby in Pakistan was to compare the efficacy of hand washing with plain soap and antiseptic soap with 1.2% triclosan on the incidence of respiratory infection, diarrhea and impetigo. They found that the incidence of those diseases did not differ significantly between households given plain soap compared with those given antiseptic soap (Luby et al., 2005). Moreover, Aiello reviewed 27 articles that aimed to compare the efficacy of antiseptic soap containing triclosan compared with plain soap published between 1980 and 2006. The conclusion was that soap containing triclosan within the range of concentrations between 0.01%-0.45% was no more effective than plain soap at preventing infectious illness and reducing bacterial levels on the hands (Aiello et al., 2007). Furthermore, evidence of Gram-negative bacilli were found on the hands of health-care workers who used bar soaps for washing their hands, subsequently leading to a replacement of bar soap with liquid soap as now commonly used in hospital settings (Sartor et al., 2000). Consequently, liquid plain soap is now generally recommended for hand washing to prevent common diseases carried by hands.

The duration of hand washing is essential for providing adequate time to remove pathogens, and for the chemical agent to act. Rotter described that washing the hands with plain soap for 15 seconds reduced bacteria on the hands by 0.6-1.1 log₁₀, whereas for 30 seconds, it was reduced to 1.8-2.8 log₁₀ (Rotter, 1999).

The techniques of rubbing the hands together (friction) has been described as a key element in the procedure of hand washing that aims to remove dirt and transient

pathogens from all areas of the hands (Barry et al., 2002; Larson and Lusk, 2006). Larson advised that the techniques of cleaning all areas of the hand are a reference to a quality of hand washing practice (Larson, 1985). On the other hand, few studies attempt to assess the quality of hand washing due to unavailable reliable measurements.

The areas of hands most frequently missed during hand washing are the fingernails, finger-pad, finger interlaced, thumbs and palm-lines, indicating the technique of rubbing the areas of the hands is imperative as shown in figure 3 (Taylor, 1978).

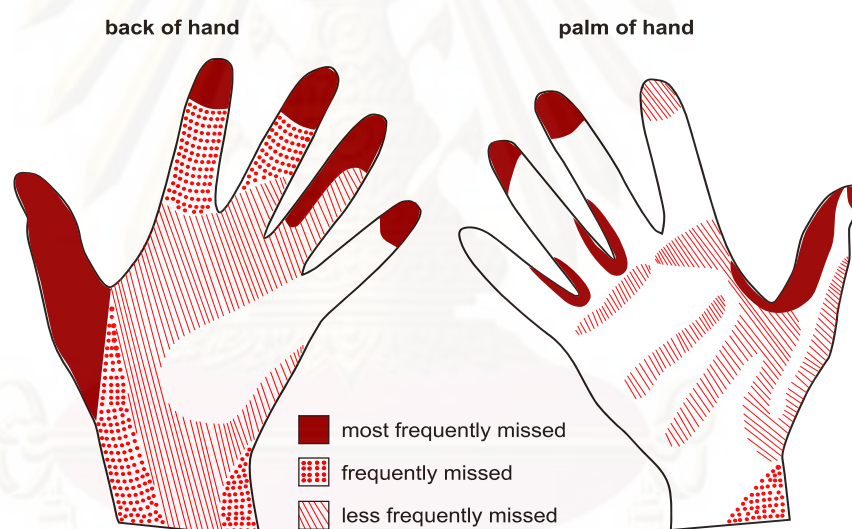


Figure 2.1: Area of hands most frequently missed during hand washing

Source: Adapted from Taylor L, An evaluation of hand washing techniques, Nursing Time Journal, Jan 12, 1978 pp. 54-55

The method of drying hands with paper or clean towel is essential. Two studies suggested that paper towels are more effective than electric hand dryers. Evelyn et al. compared three different methods of hand drying after hand washing i) paper roll ii) towel roll and iii) a hot-air dryer. The findings showed that bacteria was decreased by 24% after drying the hands with paper and by 4% after drying on a towel roll.

However, the bacteria increased by 117% after drying the hands using a hot-air drier (Evelyn, 2005). A further study conducted by the University of Westminster, London, compared the efficacy in reducing hand pathogens among paper, warm air hand dryers and modern jet-air hand dryers after hand washing. The results showed bacteria on the finger pads and palms reduced by 76-77% after using paper. In contrast, the bacteria increased on the finger pads and palms by 194-254% after using the warm air hand dryers and the modern jet-air hand dryers among 20 participants in a study by Keith. This result led to the conclusion that the use of electric hand dryers in public toilets should be carefully considered since it can dramatically increase the number of bacteria on hands after washing them and increase the likelihood of transmission of bacteria via the airflow (Keith and Shameem, 2008).

The Thailand MOPH has recommended techniques of rubbing each part of the hands, which was adapted from the surgical hand washing technique shown in figure 4 (Thailand Ministry of Public Health, 2007) that is generally referred to as the 7 steps-of hand washing. The technique recommended by the World Health Organization (WHO) is shown in figure 5 and which is similar to the Thai-MOPH.

Handwashing Technique with Soap and Water



Figure 2.2: Hand washing techniques recommended by Thai MOPH

Source: Adapted from hand washing recommendation of Health Education Department, Thailand Ministry of Public Health available at <http://www.thaihed.com/html>

Handwashing Technique with Soap and Water

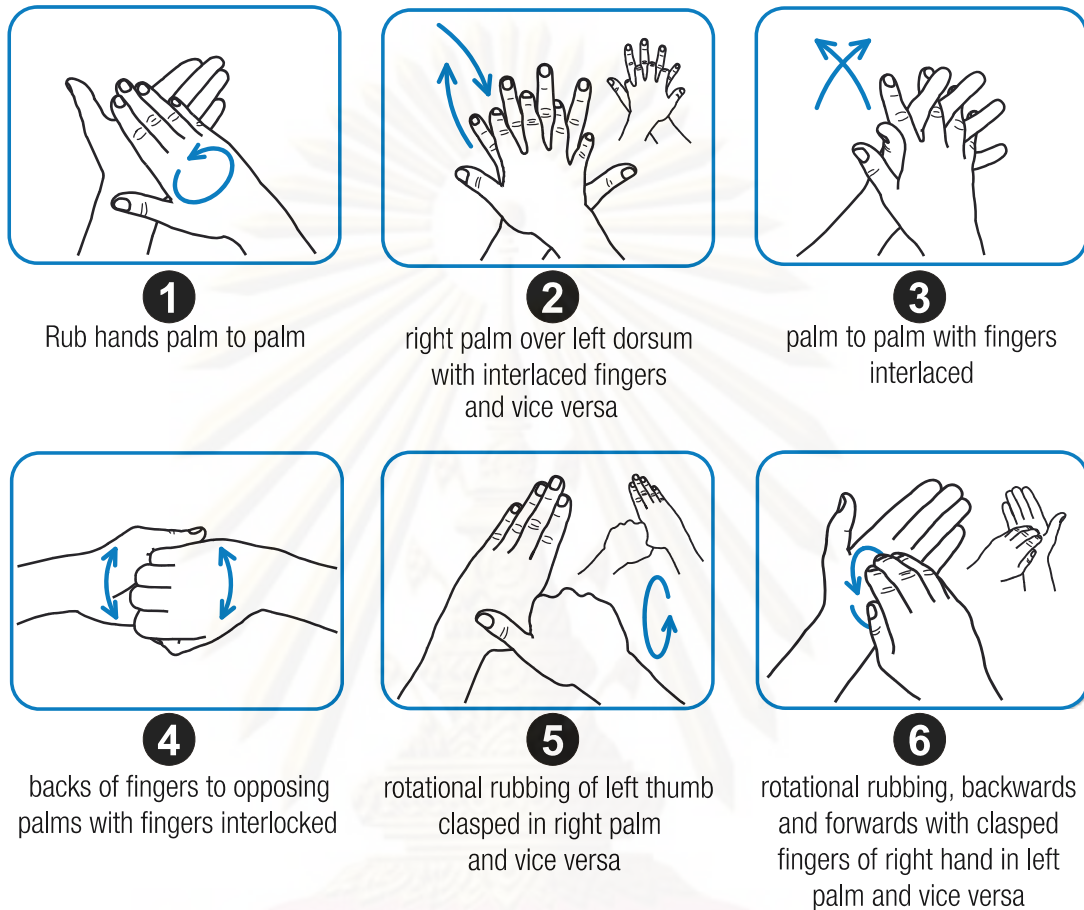


Figure 2.3: Hand washing techniques recommended by WHO

Source: Adapted from WHO guidelines on hand hygiene in health care (advanced draft): Summary p.19

2.4.2. Hand Washing Practice

Hand washing practice at critical moments (after using toilet and before handling food), appropriate hand washing procedures, including the use of soap, and the duration of hand washing appears to be very low as shown in the hand washing surveys carried out in Australia, the U.S., New Zealand, and Thailand. The Food Safety Information Council of Australia observed the hand washing techniques of 200 adults at public toilet facilities. The observation found that only 20% of females and 7% of males practiced the correct procedure for hand washing. In addition, 8% of females and 29% of males failed to wash their hands after visiting the toilet and only 31% of males and 41% of females used soap (Buchtman, 2002).

The American Society for Microbiology, USA conducted a similar survey. They found that 10% of females and 25% of males failed to wash their hands after visiting public toilets (American Society for Microbiology, 2005). New Zealand which conducted the largest hand washing survey, observed the hand washing practices at public toilet facilities of several large shopping malls. The study showed that thirteen percent (13.3%) of those observed failed to wash their hands after visiting the toilets. The frequency of hand washing among females was higher than males though soap was used by 76.5% of females and 66.2% of males. The median recorded hand washing duration was 8 seconds in males and 8.8 seconds in females. Moreover, the survey found that 91.2% of subjects who washed their hands dried their hands with clean paper (Garbutt et al., 2007).

The Thailand-MOPH observed hand washing practice among primary school students in Bangkok before implementing one-week of an intensive hand washing campaign. The observation found that 38% of the students failed to wash their hands after visiting the toilet and 59% of them washed their hands without using soap (Thailand Ministry of Public Health, 2007). However, data on hand washing practices that include the use of soap, duration and techniques of rubbing areas of hands and methods of drying hands among Thais is not available.

2.4.3. Hand Washing Measurements

The development of hand washing measurements to determine quality of hand washing remains an important research priority. Recent studies have tried to establish simple, low cost, and reliable measurement to evaluate the quality. To date, direct observation is regarded as the best measurement despite it often being impractical and introducing potential bias.

Larson et al. validated two measurements; direct observation and self-report by using diaries on hand hygiene episode/hour in the hospital setting. Nursing staff (n = 119) were asked to record their hand hygiene practices on a diary card one shift/month (n = 1,071 diary cards) for 22 months. (n = 206 hours). The same data was collected in

monthly 1-hour direct observation sessions. They concluded no significant difference between the two methods (Larson et al., 2004).

Luby et al. attempted to evaluate a simple low cost method of measuring hand washing practices under the context of a randomized control trial through a hand washing promotion conducted in Pakistan. They found that the three finger direct imprint test, using MacConkey agar for thermotolerant coliforms, was not a useful method to assess regular hand washing practices with soap and addressed that a standardized measurement of hand washing practice is still needed (Luby et al., 2007).

Haas and Larson conducted a review on measurements to assess the compliance of hand hygiene in health care setting. They concluded that the three major methods include direct observation, self-report, and indirect measurements of the product usage are most useful to assess compliance. However, they commented that there is a need to have a standardized measurement of hand hygiene assessment in health care settings (Haas and Larson, 2007).

Biran et al. tried to explore simple indicators to assess hand washing in rural Indian households by comparing the performance of 26 proxy indicators of hand washing practices that were obtained from four tools; *i*) structured observation, *ii*) questionnaire survey, *iii*) hand-wash demonstration, and *iv*) environmental checks. The outcome recognized that only the direct structured observation of hand washing in a sample of 387 households remained the best indicator. They discussed that the direct observation is often not practical, time consuming, expensive, and introduces potential bias as seen from the Hawthorne effect (Biran et al., 2008).

2.4.4 Evidence of Hand Washing in Interruption the Infections

Hand washing is a simple and low cost intervention known to interrupt the two leading causes of childhood mortality. The World Health Organization (WHO) estimated that diarrhea and respiratory infections are responsible for approximately two thirds of childhood mortality in low-and middle-income countries; 35% of the mortality rate is caused by diarrhea and 32% is caused by acute respiratory infection (Bryce et al., 2005; World Health Organization, 2006).

The benefits of hand washing are evident in preventing the spread and reducing the impact of infection as demonstrated in recent studies (Bowen et al., 2007; Luby et al., 2005). A randomized controlled trial showed that hand washing with soap and water can lower the incidence of pneumonia by 50% and diarrhea by 53% (Luby et al., 2005). A clustered randomized controlled trial evaluating the effect of a hand washing program in reducing absenteeism, carried out in a Chinese Primary school, revealed that an intensive hand washing program was associated with a significant reduction of absenteeism among school children. Students at the intervention schools experienced 1.9 days of absences, whereas students at the control schools experienced 2.6 days of absences per 100 student-weeks (Bowen et al., 2007). A quantitative systematic review summarized that hand washing was associated with a lower risk of respiratory tract infection with reductions ranging from 6% to 44%. Similar pooled results of studies implied that hand washing could reduce the risk of respiratory infections by 16% (Rabie and Curtis, 2006). In a review of the interventions in interrupting respiratory viruses, it supported that hand washing was beneficial to disrupt the disease transmission (Jefferson et al., 2007). More recently, the household influenza transmission study in Bangkok presented a preliminary finding of the first 176 households. The analysis showed that hand washing with plain soap was likely to reduce influenza transmission during the first 7 days of a symptomatic infection in the index case compared with the control household but the result was not statistically significant due to insufficient power (Piyarat Suntarattiwong et al., 2009). Therefore, the advantage of simple hand washing with soap in reducing influenza transmission needs further report.

2.4.5 Factors Influencing Hand washing

Knowledge, attitude, perception are pathways of individual factors, while the household hand washing facilities are documented as an environmental factor. A cross-sectional survey among health care workers in nursing homes found that individual factors that include knowledge, perceptions and beliefs influenced self-reported hand hygiene (Aiello et al., 2009). Therefore, understanding individual factors, emphasizing the

importance of hand washing and lowering environmental barriers could facilitate the success of hand washing education (Janz et al., 2002).

Theoretically, knowledge is correlated with health practice (Keith and Jackie, 2004) and is backed up by the conclusion of previous hand washing studies. However, knowledge of hand washing in modifying good hand washing practice is controversial. Alvaran and team found that knowledge of hand washing was not associated with self-reported hand washing while a study of mothers' hygiene behavior in Ghana found a significant association (Alvaran et al., 1994; Pittet et al., 2000; Scott et al., 2007).

Attitude is a strong predictor of hand washing behaviors in hand washing studies. Aiello et al. showed that compliance of hand hygiene among health care workers caring for critical ill neonates was influenced by positive attitude towards hand hygiene (Aiello et al., 2009; Carmem et al., 2005). Rosen et al. suggested that the combination of knowledge and positive attitudes toward hand washing helped to create a sustained good hand washing behavior (Rosen et al., 2009).

The Health Belief Model Theory states that, individuals are more likely to follow appropriate hand washing procedures if they perceive that the benefits outweigh the disadvantages (Janz et al., 2002). Aiello et al. applied the concept of perception in their study and found that positive perceptions on effectiveness of infection control in nursing homes were associated with reported glove use (Aiello et al., 2009).

The environment is an important factor in the enhancement of hand washing with soap and water (Luby and Halder, 2008). The lack of facilities and availability of basic supplies such as soap and water were extensively documented as a barrier to hand washing (Pittet, 2001; Thailand Ministry of Public Health, 2007). Providing soap and ensuring a source of water is a way to encourage hand washing practice. The hand washing promotions that included specific efforts to provide hand washing supplies were more likely to be successful than the promotion that ignored this component (Lopez, Freeman and Neumark, 2008; Luby and Halder, 2008).

2.5 HAND WASHING PROMOTIONS

Hand washing promotion that combined various educational approaches and conducted for a period between 3 and 12 months, could facilitate the improvement of hand washing practices and reduce the impact of infection (Bowen et al., 2007; Guinan et al., 2002; Larson et al., 1997; Sandora et al., 2005). Successful hand washing promotions are mostly implemented at hospitals, schools and villages using face-to-face discussions, regular meetings, written materials (leaflet, posters etc.), demonstration and provision of soap or cleansing agents. However, there has been little attempt to conduct hand washing education/promotion at the individual household level.

School-based promotion

School based-hand washing promotions were mostly successful in reducing the impact of illness. However, sustaining proper hand washing procedures remains an important issue. Guinan et al conducted school-based hand hygiene promotion (education program and hand sanitizer) on absenteeism and cost-effectiveness among 290 students from 5 independent schools, with a follow up 3 months post-intervention. The result strongly suggested that the hand hygiene program that combined education and use of a hand sanitizer in the classroom lowered absenteeism by 50.6% (Guinan et al, 2002). A 3-year school-based intensive hand hygiene promotion in Thai kindergarten schools was successful in improving hand washing behaviors and the result supported the benefits in reducing influenza-like illness by about 60.8 % after the 1st year and a further reduction of 19% after the 2nd year of the promotion (Anucha Apisarntharak et al., 2009). Additionally, one year of school-based hand washing promotion in China improved the behaviors and confirmed the advantage of a school absenteeism reduction by 3 days (Bowen et al., 2007). One-week intensive hand washing promotion in Bangkok-primary schools found that the practice improved immediately following the campaign and declined after 6-week post-intervention. The study explained that one week of promotion may not be sufficient to sustain hand washing behavior and suggested that the provision of a favorite type

of soap and dispenser would encourage the sustainable behavior among children (Thailand Ministry of Public Health, 2007).

Hospital- based promotion

The success of intensified hand washing in reducing nasocromial infections is well documented. On the other hand, the compliance and sustainable behaviors are documented as the major challenge of the hospital-based promotion. Larson et al conducted a one-year quasi-experimental study on hand washing among health care workers in hospital setting which included focus group sessions, installation of automated sinks, and feedback to staff on hand washing frequency. The study concluded that the intervention only improved the frequency of hand washing 2 month post-intervention and had minimal long-term effect at 1 year (Larson et al., 1997).

Chen and team conducted quasi-experimental hand washing intervention using a developed video teaching program to demonstrate hand washing procedures among family members who visited pediatric intensive care units. A comparison was made between families who viewed the video and families who were taught the same techniques with the aid of an illustrated poster of hand washing procedure. They found that the compliance of hand washing procedure was improved in both groups but the video-based teaching program was more effective than the others (Chen and Chiang, 2007).

Field community-based promotion

Field community-based hand washing promotion was worthwhile in reaching widespread communities. Luby and team conducted the field community-based hand washing promotion in Karachi, Pakistan to determine the effects of a one-year hand washing promotion on the incidence of acute respiratory infection, impetigo, and diarrhea. The intervention included weekly meetings, demonstrations and providing bar soap for 1 year. Twenty neighborhoods (300 households) randomly received hand washing promotion, while 11 neighborhoods (306 households) were randomly selected as controls and were followed up at 1 year. One year following the study, results indicated that hand washing promotion successfully promoted good hand washing practice to reduce diarrhea and respiratory tract infection, but that the cost-

effectiveness needed further investigation (Luby, Agboatwalla, Billhimer, & Hoekstra, 2007).

Household-based promotion

Household-based promotions that included the entire household in the promotion were more likely to achieve good practices in controlling disease transmission. Sandora et al. conducted a cluster randomized controlled trial of a 5 month hand hygiene education in 292 families with children enrolled to 26 childcare centers. The intervention households received a supply of hand sanitizer and biweekly written hand-hygiene educational materials for 5 months, while the control households received only materials promoting good nutrition. Primary caregivers received biweekly phone calls to report any respiratory and gastrointestinal tract illnesses in family members. Findings concluded that a 5 month multifaceted intervention, emphasizing alcohol-based hand sanitizer, was useful in the reduced transmission of gastrointestinal tract infections within the household (Sandora et al., 2005).

Public hand washing promotion

Public health guidance in controlling influenza transmission suggests that good hand washing practice would be simplest and most economical preventative behavior to lessen the morbidity and mortality of influenza pandemic (WHO/UNICEF, 2006). Through concerns of influenza pandemic, the WHO/UNICEF and Thailand Ministry of Public Health (MOPH) held informal discussions in December 2006 in response to requests for guidance in developing a national influenza pandemic planning document. The meeting concluded that Flu-WISE and Flu-CARE could aid in the reduction of the risk of transmission, mortality from incoming pandemic influenza. The Flu-WISE aim is to reduce influenza transmission and persuade preventative behaviors, which include frequent hand washing with soap and, informing people that if they get sick they should stay home and maintain good cough etiquette. While Flu-CARE expects to reduce mortality by providing better care of an influenza-infected person at home during the pandemic.

Following the declaration of the 2009 influenza (H1N1) pandemic by WHO on June 11, 2009, hand washing was publicized through the mass media as a method to minimize the transmission of the virus, in addition to other preventative behaviors. The US-CDC delivered three key messages in their efforts against the influenza 2009 for public guidance called “Take 3 Steps to Fight the Flu”, which included frequent hand washing (Centers for Disease Control and Prevention US CDC, 2009). Likewise, Thailand Ministry of Public Health urges people to wash their hands frequently in addition to the use of masks and a vaccine campaign, in dealing with the current influenza pandemic (Thailand Ministry of Public Health, 2009f).

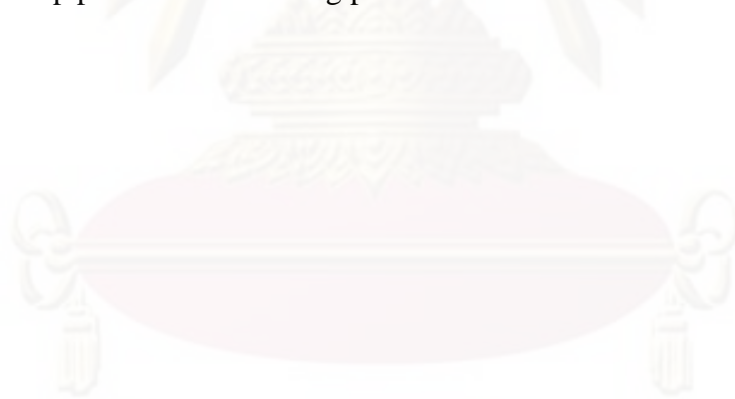
2.6 SUMMARY

From the literature review, hand washing is the simplest preventive behavior to lessen the burden of common diseases such as diarrhea, skin diseases and respiratory infection including pneumonia and influenza. The potential benefit of hand washing combined with other measures such as mask use and hand-antiseptic gel in reducing influenza transmission in the households was demonstrated.

The recommendations of WHO/UNICEF, US-CDC, Thai-MOPH and hand washing studies suggested that the entire hand washing procedure is important to reduce hands pathogens. The H1N1 influenza could be reduced when the entire hand washing procedure is completely applied. Consequently, the entire hand washing procedure that includes i) the use of soap, ii) the technique of cleaning areas of hands, iii) the use of clean towel/paper for drying hands, and iv) duration of washing hands of more than 20 seconds was recommended. However, hand washing practiced at critical moments (after using toilet and before handling food) and proper hand washing procedure appears to be very low. Lastly, the sustained good hand washing practice still presents a special challenge of education promotion. On the other hand, the lack of low cost and reliable hand washing measurement to determine the quality of hand washing remains an important research priority.

Type and length of educational approaches to promote good hand washing depend on individual and environmental contexts. A majority of the studies suggested that a combination of approaches that meet the needs of individuals and environment could establish routine hand washing habits. Hand washing studies that include demonstration and provision of soap conducting 3-12 months or longer were recommended as they could encourage the improvement. On the other hand, studies have yet to be concluded that suggest an appropriate length to achieve sustainability.

A majority of successful hand washing promotion programs in reducing the impact of illness were a result of the community promotion basis such as hospital and school. Studies addressed that field community-based hand washing promotion including household based-promotion was worthwhile in reaching widespread communities. However, there has been no study attempted to promote hand washing at the individual household level in Thailand. Therefore, there is a need to emphasize to households and individuals the benefits of the practices and evaluate their practices as it could help public hand washing promotion to be successful.



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CHAPTER III

METHODOLOGY

This chapter describes research methods of the study conducted under the context of the Household Influenza Transmission Study (HITS). Within the framework of the HITS, this study examined the effect of education among household members enrolled into two study groups: control (group 1) hand washing education (group2).

3.1 STUDY CONTEXT

The Household Influenza Transmission Study (HITS) is a CDC IRB approved household randomized controlled trial (RCT) of non-pharmaceutical interventions (NPI) to reduce influenza transmission. The HITS study prospectively identifies pediatric patients who seek care for influenza like illness (ILI) at the outpatient department of the Queen Sirikit National Institute of Child Health. Eligible patients are 1 month through 15 years of age, a resident of the Bangkok Metropolitan Area and have an onset of illness less than 48 hours before testing positive with the QuickVue Influenza A+B rapid test. The household of the eligible patient (index case) must have at least 2 household members that are ≥ 1 month of age that plan to sleep inside the house for a period of at least 21 days from the time of enrollment. Households with any member reporting an ILI that precedes the index case by 7 days or less and households where any member has received influenza vaccination during the preceding 12 months were excluded.

HITS uses block randomization to randomly assign participants to one of the three study groups, using control group = 1 (group 1), hand washing group = 2 (group 2), and hand washing plus mask = 3 (group 3). Enrolled families are randomized to one of these study groups at 1:1:1. The control group receives nutrition, physical

activity and smoking cessation education; Intervention group 1 receives hand washing education and materials and Intervention group 2 receives hand washing education and paper surgical face masks.

Following randomization, a study nurse collects baseline data and schedules a home visit to be completed within 24 hours (Day 0/1), and again on days 3 and 7 following enrollment. Family members were asked to maintain symptom diaries and hand washing diaries. Liquid hand soap and face mask use is recorded. Nasal and oral swab specimens were obtained at days 0/1, 3 and 7 from the index case and all household members. Blood is collected from each consenting, participating household member at day 0/1 and again on day 21.

3.2 DESIGN

A comparative design between study population with and without intensive hand washing education conducted under the context of household-randomized controlled non-pharmaceutical intervention trial.

3.3 SETTING

Pediatric Outpatient Departments, Queen Sirikit National Institute of Child Health (QSNICH) or Children Hospital conducted the study. The QSNICH is the largest pediatric referral hospital (age < 15 years), has full research facilities and experiences in clinical research.

3.4 POPULATION

The study populations are household members randomly assigned to either hand washing education or control groups in HITS. The study population resides in Bangkok and the greater Bangkok area which includes 5 provinces, Samut Prakarn, Samut Sakhon, Nonthaburi, Nakhorn Pathom and Pathum Thani. The population in the city is over 5.8 million (Thailand Ministry of Public Health, 2009d). The estimated number of members in a household ranges between 2.1 to 5.1 persons (Thailand

Ministry of Public Health, 2009e). In Bangkok, monthly household income averages 36,000 baht and expenditure averages 25,000 baht. The percentage of expenditures is approximately 70% of the income (Thailand Ministry of Public Health, 2009a).

3.4.1 Inclusion/exclusion criteria

Inclusion criteria

1. Household members aged ≥ 7 years
2. Resident in a household that has a confirmed influenza infected child in Bangkok and metropolitan area
3. Enrolled into either control (group 1) and hand washing (group 2) groups of the HITS

Exclusion criteria

1. A history of influenza-like illness that precedes the index case by 7 days or less
2. Recipient of influenza vaccine during the preceding 12 months
3. Prior participation in HITS

3.4.3 Sample size

The appropriate sample size is expected to detect the difference of primary outcomes between intervention and control group with a minimal error. The sample size formulation for comparing the mean of two independent groups is shown below (Geoffrey and David, 2000).

$$n = 2 \left[\frac{(z_{\alpha} + z_{\beta})\sigma}{\Delta} \right]^2$$

The notation for formulation

n = sample size in each group

z_{α} = 1.96 (α error 0.05 (two-tails Z value) for 95% confidence interval)

z_{β} = 0.84 (β error 0.20 for 80% power)

σ = standard deviation

Δ = detectable difference

We decided to use 80% power to detect the difference between intervention and control households with 5% type I error. We hypothesized that the intervention would increase frequency of hand washing practice in the intervention group by 30%. The expected difference was based on the preliminary result of HITS (Piyarat Suntarattiwong et al, 2009). The average of reported frequency of hand washing from the survey was 3.34 and standard deviation was 2.76 (Appendix IV). We also allowed a 10% dropout rate following randomization. Thus, we estimated that we needed 133 individual members in the control group and 133 individual members in hand washing group.

3.5 INTERVENTIONS AND ASESESSMENTS

3.5.1 Educational interventions

The control household members received 30 minute-educational intervention on influenza infection, nutrition, physical activity, smoking cessation and received written educational materials on the first home visit (day 0/1) after randomization. The study team reinforced the education component on subsequent home visits on day 3 and 7 (figure 5).

The intervention household members received education on influenza infection, benefits of hand washing and hand washing procedure by discussion and sharing experiences for 30 minutes. An additional 5-10 minutes of demonstration and individual training on hand washing procedure was provided and repeated on day 3 and 7 to all members. Written materials that included pamphlets and posters about hand washing procedures were provided and were attached near the sink/running water taps in the households. Liquid plain soaps with containers were provided for use during the study period (90 days). Additionally, the intervention participants were asked to record their number of episodes of hand washing /day for 90 days (figure 5).

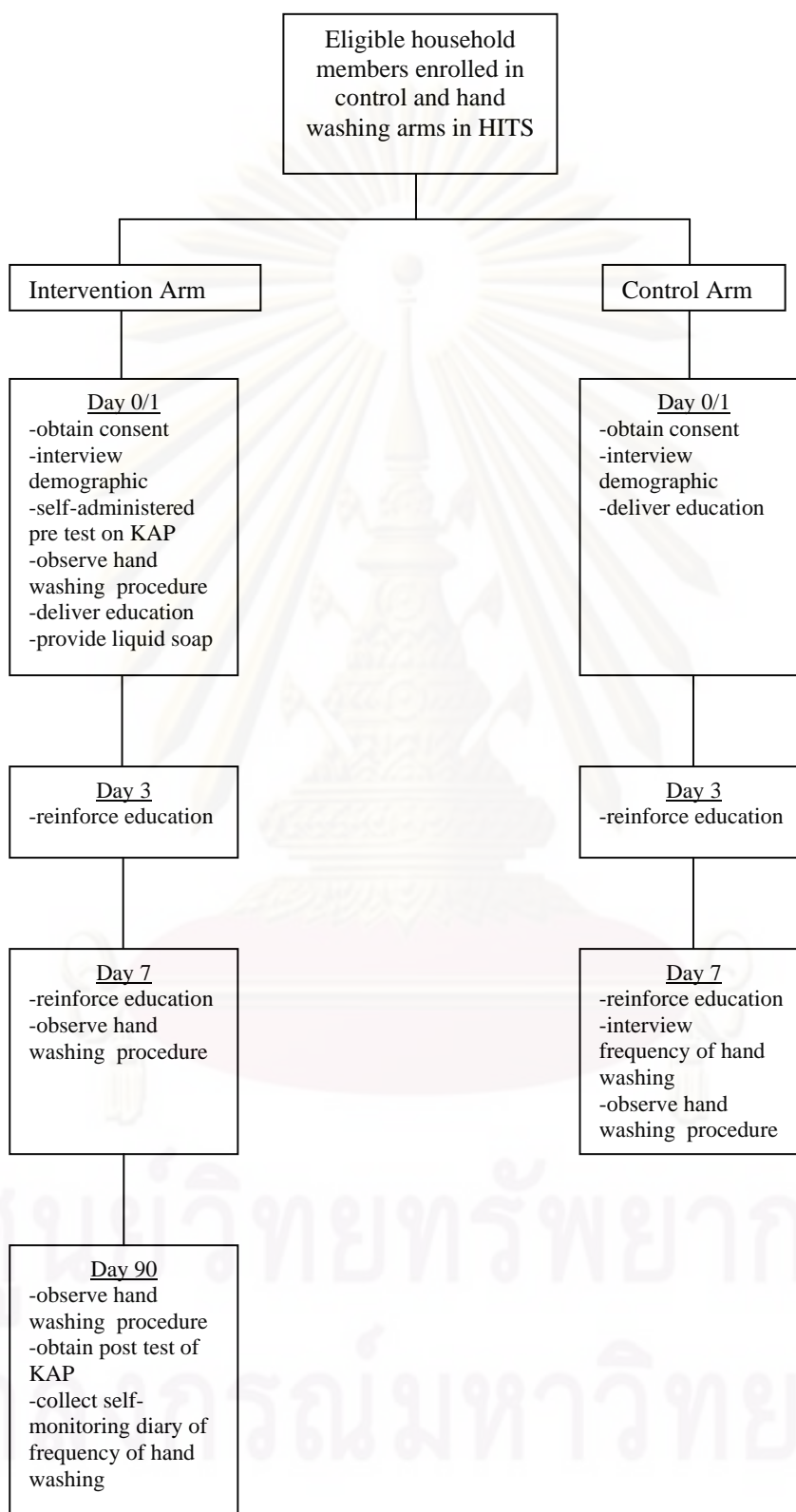


Figure 3.1: Intervention schedule and activities

3.5.2 Assessments of hand washing behaviors

Frequency of hand washing assessment was based on self-reporting. The control participants were interviewed on their average episode of hand washing with soap that lasted at least 20 seconds/day during the study week (day1-day7). Whereas the intervention participants were asked to record their number of episodes of hand washing with soap that lasted at least 20 seconds/day during the same period (figure 6).

Quality of hand washing was measured by observation using a check list that includes 4 practices: i) the use of soap, ii) the techniques of rubbing areas of hands, iii) the duration and iv) the methods of drying hands. The study staff asked the control household members to demonstrate their hand washing procedure on day 7 while asking the intervention household members to demonstrate hand washing procedure three times on day 1(pre-education) and day 7 and day 90 (post-education) (figure 6). A total score for perfect technique is 8.5 points. The use of soap was given one point. The hand was divided into 7 parts: palms, back of hands, fingers, finger interlaced, finger tips, thumbs and wrists. If the seven areas were rubbed, then a total 5.5 points were given. The duration of rubbing hands > 20 seconds was given one point and the use of a clean towel or paper was also given one point (appendix VI).

The pre-post test of knowledge, attitude and practice using a 15- question Likert scale were obtained in the intervention household members on day 1 (pre-education), and again on day 90 (post-education).

An in-depth interview to elicit perceptions towards hand washing was conducted at participants' homes for approximately 20-25 minutes. The study interviewed twenty-five caregivers who provided care to an influenza infected child and were available.

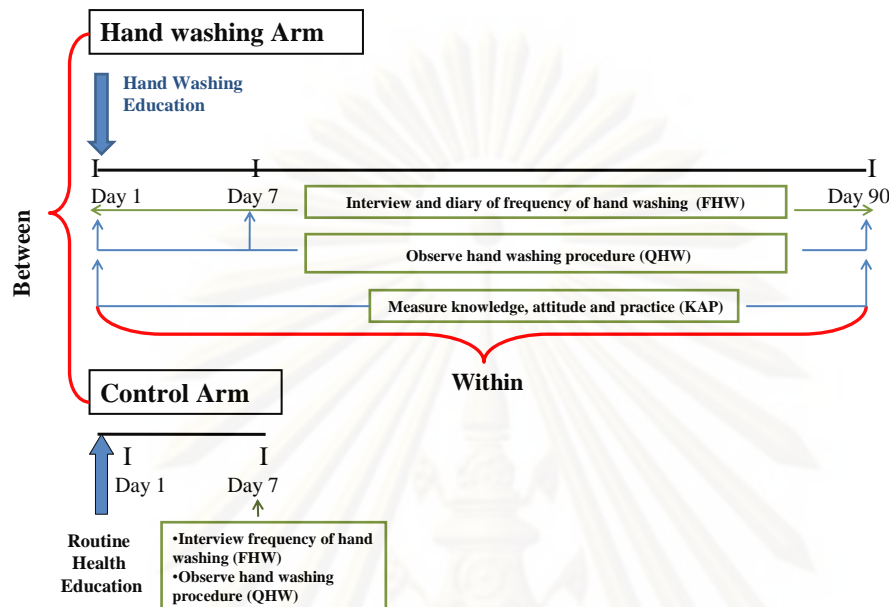


Figure 3.2: Hand washing behaviors assessments

3.6 INSTRUMENTS

Data was collected during home visits using the following instruments. All data entry was maintained at QSNICH, omitting entry of personal identifying information.

1. The interview of demographics was collected by study staff using handheld computers (PDA) on day 1 Appendix II).
2. The interview of frequency of hand washing in the control household members was collected by study staff using handheld computers (PDA) on day 7 (Appendix II).
3. The diary of frequency of hand washing was recorded by participants on day 1 through day 90 (Appendix II). The study staff checked the form twice on day 7 and 21 and collected it on day 90.
4. The hand washing observation was completed by study staff during home visits day 1, 3, 7 and 90 (Appendix II).

5. The questionnaire on knowledge, attitude and practice of hand washing relevant to influenza was completed by participants on day 1 (pre-intervention) and day 90 (Appendix II).
6. The in-depth interview guide elicited details of perception on the benefits and barriers of hand washing as well as the idea of approaches to promote hand washing in the households (Appendix II). The interview took place at participants' home before receiving the hand washing education on day 1 in the intervention households and day 7 in the control households.

The investigator developed the interview, diary, observation and in-depth interview guide. Public health experts validated the content. The pre-test was done with 10 participants and 5 study staff. The language of the questions was adjusted based on comments.

The knowledge, attitude and practice using a Likert scale was tested with 31 participants. The content validity in regards to item-objective congruence index (IOC) was high. The results of internal consistency reliability coefficients (Conbrach's Alpha) of attitude and practice questions were satisfied. The result of reliability coefficient of knowledge questions obtained from Kuder- Richardson (K-R 20) was just low.

Validity: The degree of agreement was obtained from 3 experts on health education, infection control and influenza. Item-objective congruence index (IOC) was used to calculate the degree of agreement (StatSoft, 2010). The IOC of knowledge was 0.93, attitude was 0.86 and practice was 0.93.

$$IOC = \frac{\sum R}{N}$$

IOC = Item-objective congruence index

N = Number of experts

R = Degree of agreement of each item (0 = not sure, 1 = relate, -1 = not relate)

Reliability: The internal consistency reliability coefficients (Conbrach's Alpha) of attitude questionnaire was 0.46 and practice questionnaire was 0.53 from the following formulation (StatSoft, 2010).

$$\alpha = \left[\frac{n}{n-1} \right] \left[1 - \frac{\sum S_i^2}{S_t^2} \right]$$

α = Conbrach's alpha coefficient

S_i^2 = variation of item

S_t^2 = variation of total score among respondents

n = number of items

The reliability coefficient of knowledge questionnaire obtained from Kuder-Richardson (K-R 20), which is used for binomial answers (yes and no) as shown in the following formulation was 0.28 (StatSoft, 2010).

$$r = \left[\frac{n}{n-1} \right] \left[1 - \frac{\sum pq}{S_t^2} \right]$$

r = reliability coefficient

n = number of items

p = proportion of respondents gave corrected responses

q = proportion of respondents gave wrong responses

S_t^2 = variation of total score among respondents

3.7 DATA ANALYSIS

3.7.1 Analysis on frequency and quality of hand washing

The analysis used SPSS version 17. Analysis of variance (ANOVA) and t-test was used to compare continuous variables. ANOVA compared individual

characteristics (age, gender, education and health condition) between two groups. Paired t-test and unpaired t-test compared mean (average) of self-reported frequency, measured quality of hand washing and mean score of KAP. Chi-square compared the mean of frequency and the mean score of quality on individual characteristics. McNemar tests compared ordinal scale of the KAP and compared each technique of hand washing procedure. The level of significance for any statistical test was established at alpha 0.05. The statistics and data summary were shown in table 3.1.

Table 3.1: Statistics of frequency and quality

Objectives	Data summary	Statistics
To determine individual factors influencing frequency of hand washing	age, gender, education, underlying chronic condition	ANOVA
To compare frequency of hand washing on day 1 (pre-intervention), 7 and 90 days post intervention	The average reported frequency in a day	Unpaired t-test (between control and intervention households)
		Paired t-test (within the intervention households)
To compare quality of hand washing on day 1 (pre-intervention), 7 and 90 days post intervention	The average measured score of quality	Unpaired t-test (between control and intervention households)
		Paired t-test (within the intervention households)
To compare hand washing procedure between pre and 90 days-post intervention	The percentage of the use of soap, technique of cleaning areas of hands, duration and the use of clean towel/paper	McNemar (binomial outcomes: yes/no)
To compare frequency, quality and hand washing procedure prior to and during influenza 2009 (H1N1)	The average frequency	Unpaired t-test (different period)
	The average measured quality score	Unpaired t-test (different period)
	The percentage of the use of soap, technique of cleaning areas of hands, duration and the use of clean towel/paper	Chi-Square

3.7.2 Analysis on knowledge, attitude and practice

The pre and post mean test scores on knowledge, attitude and practice were evaluated using the paired t-test. Pre-post test of knowledge of each items were compared by McNemar test while attitude and practices (ordinal scale variables) were compared by Wilcoxon signed ranks test. The p value $<.05$ was considered as statistical significant.

The knowledge questionnaire contained five questions designed to assess knowledge of influenza and its prevention. One point was given for each correct response. Responses of “no” and “don’t know” were classified as a wrong response and were given “0” points. The total score of the questionnaire was summarized and ranked from 0 to 5. The higher total score of knowledge (≥ 3 points) indicates that participants had a higher knowledge of influenza and its prevention.

The attitude questionnaire comprised five questions. Responses are measured on rating scales ranging from 1 to 4 with 1= strongly disagree, 2= disagree, 3= agree and 4= strongly agree. Negative statements were reversed code and scale scores. The total score of the questionnaire was summed and the score ranked from 1 to 20. The higher score on these scales (≥ 10 points) indicates a greater positive attitude.

The practice questionnaire contains five questions including one question on social distancing, one on respiratory etiquette and three on hand washing. The responses were measured on rating scales ranging from 1 to 5 with 1= none of the time, 2= 25% of the action, 3=50% of the action, 4= most of the time and 5=always. Score of respiratory etiquette was ranked from 1-5 and the score of social distancing was ranked from 1-5, while hand washing practice was summarized from the score of 3 questions (question no.3 to question no. 5) and was ranked from 1 to 15. The higher practice score ($> 50\%$ of total score) indicates that participants were more likely to practice with reference to those practices.

3.7.3 Analysis on perception towards hand washing

The investigator analyzed data using a computerized (Microsoft Excel) program. Three steps applied content analysis. First, the responses were transcribed from a tape recorder. Second, the key words were coded and categorized. Last, the

findings were summarized according to the following sub-topics. Significant findings were also presented in quotation marks.

1. Benefits and barriers of hand washing
2. Members' perception towards benefits of hand washing
3. Opinion on approaches to promote hand washing in the household
4. Availability of hand washing

3.8 ETHICAL CONSIDERATIONS

The study protocol and informed consent have been approved from three institutes: i) US-CDC, ii) QSNICH, and iii) AFRIMS. The study nurses conducted the informed consent process. Permission was obtained from all participants. For children aged < 18 years, consent was obtained from their parents or caregivers. The children age 7-17 were also asked for assent. A brief description of informed consents are shown in Appendix V.

CHAPTER IV

RESULTS

This chapter presents results according to the research questions and hypotheses. The primary objectives examined the effect of intensive hand washing education on frequency and quality of hand washing while the secondary objective aimed to assess the change of knowledge, attitude, and practice and to explore the perception towards benefits of hand washing. The study conducted home based-intensive hand washing education in Bangkok between April 2008 and July 2009 under the context of a household-randomized control trial (RCT) of 3 study groups at 1:1:1 with recruited participants from Queen Sirikit National Institute of Child Health (QSNICH). Group 1 received knowledge on routine health education and influenza on day 0/1 and 3. Group 2 received 30 minutes education on influenza, benefits of hand washing and individual hand washing training on home visits on days 0/1, 3 and 7 and was asked to record frequency of hand washing daily as well as received liquid soap for 90 days. The study assessed the behaviors on day 0/1(pre-education), day 7 and day 90 post-education. The results were presented as follows.

4.1 HOUSEHOLD CHARACTERISTICS

During April 9, 2008 to July 31, 2009, 446 households were enrolled. A total of 14 households, 5 control households and 9 intervention households, were excluded from the study because: i) of not receiving the education component after randomization, and ii) they did not complete the education component on day 7.

Among enrolled households, the mean number of household members was 4.4 (SD 1.7), (Median 4; Quartiles 3, 5). Of 226 households, 96 (42.4 %) households earned income of 10,001-20,000 baht/month. A sink with a running water tap and available soap/detergent was defined as a hand washing station in the household. The

number of stations was found to range from 1-6, with an average of 3 stations per household (table 4.1).

Table 4.1: Household characteristics

Characteristics	n	Mean (SD)	Median (Q1,Q3)
Members in household	435		
<i>Mean (SD)</i>		4.4 (1.7)	
<i>Median (Q1,Q3)</i>		4 (3,5)	
Monthly household income n (%)	226		
< 10000 baht	39 (17.2 %)		
10001-20000 baht	96 (42.4 %)		
20001-30000 baht	46 (20.3 %)		
>30001 baht	45 (19.9 %)		
Median of hand washing stations (Q1,Q3)	226		3 (2,3)

4.2 HOUSEHOLD MEMBERS' CHARACTERISTICS

Hand washing frequency at day 7 was evaluated with 275 household members, 140 members enrolled in the hand washing education group and 135 members enrolled in the control group. Among these participants, the mean age was 34.2 (SD 13.3), had an average of 11 years of education (SD 6.7), 91 (32.3%) of them reported having at least one chronic health condition, and 160 (57.3 %) were female. Age, gender, education, and underlying chronic health condition between control and intervention groups were not statistically different ($p > .05$) (table 4.2).

Hand washing quality was assessed in 330 household members, 164 members were in the hand washing group and 166 members in the control group. The mean age of these members was 35.3 (SD14.3), 193 (58.5%) were female, had 10.3 years of education (SD 6.4) and 73(22.2%) of them reported having chronic health condition. Age, gender, education and underlying chronic health condition between these 2 groups were not statistically different ($p > .05$) (table 4.2).

Table 4.2: Household members' characteristics

Characteristics	Frequency assessment (n=275)				Quality assessment (n=330)			
	Control (n=135)	Hand washing (n=140)	Total	P- value	Control (n=166)	Hand washing (n=164)	Total	P- value
Age (years)				.56 ^a				.17 ^a
Mean	34.7	33.8	34.2		34.8	35.7	35.3	
(SD)	(13.6)	(13.1)	(13.3)		(14.9)	(13.5)	(14.3)	
Education (years)				.10 ^a				.62 ^a
Mean	10.3	62	11		10.4	10.1	10.3	
(SD)	(6.4)	(52.1)	(6.7)		(7.0)	(5.6)	(6.4)	
Gender n (%)				.80 ^b				.99 ^b
<i>Male</i>	57 (42.2)	60 (42.8)	117 (42.5)		69 (41.6)	68 (41.5)	137 (41.5)	
<i>Female</i>	78 (57.7)	80 (57.1)	158 (57.4)		97 (58.4)	96 (58.5)	193 (58.5)	
Chronic health condition n (%)				.21 ^b				.71 ^b
<i>Having at least one underlying health condition</i>	39 (28.8)	49 (35)	88 (32)		38 (23)	35 (21.3)	73 (22.2)	
<i>No</i>	96 (71.1)	91 (65)	187 (68)		127 (77)	129 (78.7)	256 (77.8)	

NOTE: ^a independent t-test; ^b Chi-Square test

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4.3 EFFECT OF INTENSIVE HAND WASHING EDUCATION ON SELF-REPORTED FREQUENCY AT 7 DAY AND 90 DAYS POST-INTERVENTION

During April-October 2008, the frequency of hand washing at day 7 post-intervention was determined with 275 household members. One hundred and forty members received the education and 135 members did not. Household members who received intensive hand washing education reported washing their hands 5.7 times/day (SD 3.4) and household members without the education reported 3.9 times/day (SD 2.4) ($p < .001$).

One hundred and thirty-three of 140 household members (95%) completed follow up at day 90. They reported hand washing 4.1 times/day (SD 2.7) before receiving the education and 5.6 times/day (SD 3.5) at 90 day-post education ($p < .001$) (table 4.3).

Table 4.3: Effect of intensive hand washing education on self-reported frequency at 7 day-post intervention and 90 day-post intervention (pre- novel H1N1 2009 pandemic)

	<i>Self-reported frequency at 7 day-post intervention (n=275)</i>					<i>Self-reported frequency at 90 day-post intervention (n=133)</i>				
	n	Min-Max	Mean (SD)	Mean Diff (95% CI)	P- value	Min-Max	Mean (SD)	Mean Diff (95% CI)	P-value	
Control	135	0-12	3.9 (2.4)	-	-	-	-	-	-	
Intervention	140	2-19	5.7 (3.4)	-	-	Pre-intervention 0-20	4.1 (2.7)	-	-	
						90 day post-intervention 1-22	5.6 (3.5)	-	-	
Total	275	-	-	-1.7 (-2.4,-1.0)	<.001 ^a	Total	-	-	-1.5 (-2.2,-0.9) <.001 ^b	

NOTE: ^a independent t-test, ^b paired t-test

Individual characteristics that were associated with self-reported frequency of hand washing were age ($p = .03$) and gender ($p < .001$). Household members aged ≥ 16 years reported episodes of hand washing averaging 5 times/day (SD 3), while children aged 7-15 years reported washing 3.3 times/day (SD 1.7). Females washed their hands 5.4 times/day (SD 3.9), while males practiced washing 4 times/day (SD 2.2). Educational levels ($p = .37$) and the presence of an underlying chronic health condition ($p = .10$) did not influence this practice ($p = .13$) (table 4.4).

Table 4.4: Self-reported frequency of hand washing by characteristics (n=275)

Individual characteristics	n	Self-reported frequency at 7 day-post intervention		
		Min-Max	Mean (SD)	P-value ^a
Age				.03
7-15 years*	28	1-9	3.3 (1.7)	
16-60 years*	234	0-19	5.0 (3.2)	
≥ 61 years	13	2-11	5.0 (3.1)	
Gender				<.001
Male	117	0-11	4.0 (2.2)	
Female	158	0-19	5.4 (3.5)	
Education				.37
Primary school (6 years)	106	0-19	4.5 (2.9)	
Secondary school (6-12 years)	63	0-15	5.0 (3.4)	
College/ University (> 12 years)	106	0-17	5.0 (3.0)	
Underlying chronic health condition				.13
Yes	88	1-19	5.2 (3.2)	
No	187	0-17	4.6 (3.0)	

NOTE:^a ANOVA: * Statistical significant different between 2 groups

4.4 EFFECT OF INTENSIVE HAND WASHING EDUCATION ON QUALITY AT 7 DAY AND 90 DAY-POST INTERVENTION

During Jan-July 31, 2009, 330 household members were assessed for the quality of their hand washing practice, 164 participants were in the intervention group while 166 participants were in the control group. The mean measured quality scores at day 7 among household members who received the intervention was 6.4 (SD 1.7) and 3.2 (SD 1.2) among the control group members ($p < .001$). As of July 31, 158 (96%) of the intervention group were completely followed up at 90 days. They received the mean measured quality score 3.2 (SD 1.3) before receiving the intervention and achieved 6.5 scores (SD 1.8) at 90 day post-intervention ($p < .001$) (table 4.5).

Table 4.5 : Effect of intensive hand washing education on measured quality of hand washing at 7 day-post intervention and 90 day-post intervention (pre- novel H1N1 2009 pandemic)

	Measured quality score at 7 day-post intervention (n=330)					Measured quality score at 90 day-post intervention (n=158)			
	n	Min- Max	Mean (SD)	Mean Diff (95% CI)	P-value	Min- Max	Mean (SD)	Mean Diff (95% CI)	P-value
Control	166	1.5-8	3.2 (1.2)	-	-	-	-	-	-
Intervention	164	2.5-8.5	6.4 (1.7)	-	-	Pre- intervention	1.5-8 3.2 (1.3)	-	-
						90 day post- intervention	2-8.5 6.5 (1.8)	-	-
Total	84	-	-	-3.1 (-3.4,-2.8)	<.001 ^a	Total	-	-	-3.3 (-3.7,-2.9) <.001 ^b

NOTE: ^a independent t-test, ^b paired t-test

Hand washing procedure on 4 practices: i) the use of soap, ii) the techniques of cleaning areas of hands, iii) the use of clean towel/paper for drying hands and iv) duration of hand washing between pre and 90 days post-intervention were compared.

The findings found that the four practices were significantly improved. The percentage of participants using soap increased from 33.5 to 88 ($p < .001$); the percentage of participants using clean towel/paper for drying hands increased from 69 to 94.3 ($p < .001$); the percentage of participants that cleaned all areas of their hands increased from 0.9 to 39.4 ($p < .001$). The duration of washing hands increased from 25.9 to 59.2 seconds ($p < .001$) (table 4.6).

Table 4.6: Effect of hand washing education on observed hand washing procedure (n= 158)

Hand washing practices	Pre-intervention n (%)	90 day-post- intervention n (%)	p-value
Used soap	53 (33.5)	139 (88)	.001 ^a
Used clean towel or paper	109 (69)	149 (94.3)	.001 ^a
Cleaned all areas of hands	3 (0.9)	130 (39.4)	.001 ^a
Duration of hand washing in seconds <i>Mean (SD)</i>	25.9 (15.5)	59.2 (25.0)	<.001 ^b

^a McNemar test (binomial distribution used) : ^b paired t-test

4.5 ADDITIONAL ANALYSIS ON SELF-REPORTED FREQUENCY AND MEASURED QUALITY SCORE OF HAND WASHING PRIOR TO AND DURING THE 2009 INFLUENZA PANDEMIC

A total of 367 members enrolled before the pandemic and 250 members enrolled during pandemic (after June 11, 2009) were compared for the frequency of hand washing at 7 day post-intervention. Two hundred members in the control group enrolled prior to the pandemic reported that they washed their hands 3.7 times/day (SD 2.3) whereas the 131 members in the control group enrolled during the pandemic reported 4.3 times/day (SD 2.5) ($p=.04$). One hundred and sixty-seven members in the intervention group enrolled before pandemic reported hand washing 6.5 times/day (SD 4.2) while 119 members in the intervention group enrolled during pandemic reported 7.2 times/day (SD 3.6) ($p=.11$).

Eighty-one members enrolled before the pandemic and 149 members enrolled during the pandemic were assessed for the quality of hand washing. The mean measured quality score of hand washing of 35 members in the control group enrolled before pandemic was 3.6 (SD 0.9) while the score of 131 members enrolled during pandemic was 3.1 (SD 1.2) ($p=.02$). In the intervention group, the mean measured quality score of 46 members enrolled before pandemic was a 5.1 score (SD 2.2) and 118 members enrolled during pandemic was a 6.8 score (SD 1.2) ($p < .001$) (table 4.7).

Table 4.7: Reported frequency and measured quality of hand washing prior to and novel H1N1 2009 pandemic at 7 day-post intervention

	Reported frequency (n= 617)					Measured quality (n=230)						
	Pre-pandemic		Pandemic		Mean Diff (95%CI)	P-value	Pre-pandemic		Pandemic		Mean Diff (95%CI)	P-value
	n	Mean (SD)	n	Mean (SD)			n	Mean (SD)	n	Mean (SD)		
Control	200	3.7 (2.3)	131	4.3 (2.5)	-0.5 (-1.0,-0.0)	.04 ^a	35	3.6 (0.9)	131	3.1 (1.2)	0.5 (0.08,1)	<.02 ^a
Intervention	167	6.5 (4.2)	119	7.2 (3.6)	-0.7 (-1.7,0.1)	.11 ^a	46	5.1 (2.2)	118	6.8 (1.2)	0.3 (-2.3,-0.9)	<.001 ^a
Total	367	-	250	-	-	-	81	-	149	-	-	-

Note: ^a independent t-test,

Comparison of hand washing procedures at 7 day post-intervention of study participants enrolled prior to and during the pandemic were analyzed. The analysis indicated that public health education during the 2009 influenza pandemic had a moderate affect on the techniques of cleaning all areas of the hands among the control group. None of the participants in the control group cleaned all areas of the hands prior to the pandemic, 4 (4.3%) did during the pandemic ($p < .010$). The practice of using soap ($p > .05$), using clean towel/paper for drying hands ($p = .35$) between the 2 periods did not differ. Also, the percentage of participants who washed hand for ≥ 20 seconds decreased from 71.4 to 47.3 percent ($p < .019$) during the pandemic.

In the intervention group, the analysis confirmed that the public health education for 2009 influenza pandemic did not affect 3 practices: the use of soap ($p = .16$), the use of clean towel/paper for drying hands ($p = .37$) and the duration of washing hands ($p > .05$). Nevertheless, it influenced the technique of cleaning all area of the hands ($p < .001$) (table 4.8). However, the technique of cleaning all areas of the hands of the members in the intervention group was greater than in the members of the control group (18.3% vs. 0%; 79.8 vs. 4.3%).

This finding concludes that public health education for 2009 influenza pandemic affects only the techniques of cleaning all areas of the hands, whereas the intensive hand washing education done during the study affects all 4 hand washing practices.

Table 4.8: Observed hand washing practice between prior to and during the pandemic at 7 day post-intervention

Hand washing practices	Control Group			Intervention Group		
	Pre-pandemic (n=35)	Pandemic (n=131)	P-value ^a	Pre-pandemic (n=46)	Pandemic (n=118)	P-value ^a
Used soap (%)	12 (34.3)	46(35.1)	1.0	39(84.8)	110(93.2)	.16
Used clean towel or paper (%)	27(77.1)	88(67.2)	.35	44(95.7)	106(89.8)	.37
Cleaned all area of hands (%)	0	6(4.3)	.010	39(18.3)	95(79.8)	<.001
Washed hands ≥ 20 seconds (%)	25(71.4)	62(47.3)	.019	45(97.8)	117(99.2)	1.0

Note: ^a Chi-square test: Continuity correction (computed only for a 2x2 table)

4.6 EFFECT OF INTENSIVE HAND WASHING EDUCATION ON KNOWLEDGE, ATTITUDE AND PRACTICE BETWEEN PRE AND 90 DAYS POST-INTERVENTION

During April-October 2008, 127 of 140 (91%) household members completed pre-post KAP questionnaires. Seventy (55%) of 127 participants were female. The mean age of participants was 33.8 years (SD 13.5) and ranging from 7-72 years of age. Majority (85%) of participants were adult aged 16-60 years. The mean years of education was 9.7 (SD 4.3) and 44 (34.6%) completed primary school and college/university. Thirty-three (26%) reported having chronic health conditions (table 4.9).

Table 4.9: Household characteristics (n=127)

Characteristics	n (%)	Mean (SD)
Age (years)		33.8 (13.5)
<i>Children 7-15 years</i>	14 (11)	
<i>Adult 16-60 years</i>	108 (85)	
<i>Elderly >60 years</i>	5 (3.9)	
Gender		
<i>Male</i>	57 (44.9)	
<i>Female</i>	70 (55.1)	
Education		9.7 (4.3)
<i>Primary School level (<7 years of education)</i>	44 (34.6)	
<i>Secondary Scholl level (7-12 years of education)</i>	36 (28.3)	
<i>College/University level (≥ 12 years of education)</i>	44 (34.6)	
<i>Missing</i>	3 (2.4)	
Underlying health condition (Self-reported)		
<i>Having at least one underlying condition</i>	33 (25.9)	
<i>Asthma and upper reactive airways</i>	18 (54.5)	
<i>Hemoglobinopathy including Thalassemia</i>	3 (9)	
<i>Metabolic disease including Diabetes Mellitus</i>	3 (9)	
<i>Kidney disease</i>	3 (9)	
<i>Others e.g. liver disease, muscular disease</i>	6 (12)	
<i>No</i>	78 (61.4)	

The pre and post mean score of knowledge on influenza ($p < .001$) and hand washing practices ($p < .001$) were statistically significantly different; however, the mean score of attitude towards severity and prevention of influenza was not statistically different ($p = .79$) (table 4.10).

Table 4.10: Knowledge, attitude and hand washing questionnaires between pre- 90 days post-intervention (n =127)

	Pre-intervention Mean (SD)	90 days post-intervention Mean (SD)	Mean diff (95% CI)	P-value
Knowledge about influenza	2.7 (1.1)	3.7 (0.8)	-0.9 (-1.2-0.7)	< .001 ^a
Attitudes towards severity and prevention of influenza	15.5 (1.8)	15.6 (2.6)	-.06 (-0.6-0.4)	.79 ^a
Hand washing practices	9.5 (2.6)	11 (2.5)	-1.5 (-1.9-1.0)	<.001 ^a

Note: ^a paired t-test

The pre and post mean score of each knowledge question were statistically significant difference (table 4.11).

Table 4.11: Number of participant who gave the corrected responses between pre and 90 days post-intervention (n=127)

Knowledge questions	No. of correct response		P-value*
	Pre-intervention	90 days post-intervention	
Cause of Influenza			
<i>Influenza infection is caused by a change in the weather</i>	3	17	<.001 ^a
Transmission			
<i>I am more likely to catch influenza when I am very near (1 meter or less) to a person with influenza</i>	70	108	<.001 ^a
Prevention			
<i>The best way to reduce influenza transmission in my household is to cover my mouth and nose when I sneeze or cough , to wash my hands and to clean surfaces such as door knobs, books</i>	100	120	<.001 ^a
Hand washing			
<i>Washing my hands several times each day helps protect my family from infection</i>	104	123	<.001 ^a
<i>Washing my hands for 20 second or longer with soap and running water can remove the influenza virus from my hands</i>	73	110	<.001 ^a

Note:^a McNemar test : * Each item was binomial distribution

The pre and post median scores of positive attitude towards hand washing in preventing influenza was different ($p=.004$) and the rest of the items were not statistically different (table 4.12).

Table 4.12: Attitude towards severity, prevention of influenza and hand washing between pre-90 post intervention (n=127)

	Pre-intervention Median (Q1,Q3)	90 days post- intervention (Median Q1,Q3)	P-value
Severity			
<i>Influenza can cause me to miss school or work</i>	3 (3,4)	3 (3,4)	.31 ^a
<i>Influenza infection can cause young children and elderly to be admitted to hospital</i>	3 (2,3)	3 (2,3)	.35 ^a
<i>Influenza infection is serious enough that I should take steps to prevent it</i>	3 (3,4)	3 (3,4)	.10 ^a
Prevention			
<i>Taking vitamins, sleeping at least 8 hours each night and getting daily exercise will help protect me from getting the influenza</i>	3 (3,3)	3 (3,4)	.18 ^a
Benefit of hand washing			
<i>Hand washing is a good way to protect my family from influenza infection</i>	3 (3,4)	3 (3,4)	.004 ^a

Note: ^a Wilcoxon signed ranks test

The pre-post median scores of social distancing ($p = .82$) and respiratory etiquette ($p = .17$) indicated that these practices were not different (table 4.13). The pre and post median scores of hand washing in relation to preventing respiratory infection had a statistically significant difference. Participants reported washing their hands more frequently after using their hands to cover their mouth and nose when coughing, sneezing, or blowing their nose ($p < .001$) and after touching or handling presumably secretion-contaminated surfaces such as books, door knobs, and telephones ($p < .001$). They also reported that they washed their hands with soap more often ($p = .005$) (table 4.13).

Table 4.13: Social distancing, respiratory etiquettes and hand washing practices between pre-90 days post-intervention (n=127)

	Pre-intervention Median (Q1,Q3)	90 days post-intervention Median (Q1,Q3)	P-value
Social distancing			
<i>When I get influenza , I stay home from school , work and social gatherings to protect others from catching my influenza</i>	3 (2,4)	3 (2,4)	.82 ^a
Respiratory etiquettes			
<i>I cover my mouth and nose with a tissue when I cough or sneeze</i>	3 (3,5)	4 (3,4)	.17 ^a
Hand washing			
<i>I wash my hands after covering my mouth and nose when I cough or sneeze or blow my nose</i>	3 (3,4)	4 (3,5)	.001 ^a
<i>I wash my hands after I touch any object that I know has been touched by a person in my household who has a cough or runny nose</i>	3(2,3)	4(3,4)	<.001 ^a
<i>I wash my hands with soap and water</i>	3.5 (3,5)	4(3,5)	.005 ^a

Note: ^a Wilcoxon signed ranks test

4.7 PERCEPTION TOWARDS HAND WASHING AMONG CAREGIVERS: IN-DEPTH INTERVIEW

Of the 25 caregivers, 24 were female with an average age of 34 years (SD 7.3) and ranging from 22-47 years of age. The mean years of education were 9.9 (SD 3.5) and the median number of members in a household was 3 (range 3-13). Half of the caregivers (13/25) worked outside the home and contributed toward the household's income. The children in their household age ranged from 6 months to 15 years old. Those participants who had children under < 6 years of age worked at home in occupations such as laundering and tailoring. The household income was ranged 6,000-40,000 baht/month. A majority (24/25) of the participants lived in a single family unit consisting of 3 members.

Benefits and barrier of hand washing

All participants perceived that hand washing is essential in reducing germs and minimizing diseases transmission. Seven of twenty-five of participants knew that hand washing could prevent colds and influenza. In addition, they stated that the most frequent barriers to hand washing among their family members were forgetfulness, unawareness, being busy, in a hurry and inconvenience (table 4.14).

Table 4.14: Perception toward hand washing (n=25)

Perception	n (%)
Positive perception toward hand washing in preventing diseases	
<i>Diarrhea</i>	25 (100)
<i>Cold and influenza</i>	7 (28)
<i>Other diseases such as eye infection, skin infection</i>	7 (28)
Perceived that hand washing facilities in household are convenient	24 (96)
Member's perception toward benefits of hand washing	
<i>Adult in household were aware of benefits in preventing diarrhea</i>	25 (100)
<i>Children aged 7-15 were unaware of benefits</i>	14 (56)
Barriers to hand washing among their members	
<i>Unawareness</i>	8 (32)
<i>Being busy/in a hurry</i>	4 (16)
<i>Inconvenient</i>	1 (4)

Not all participants responded to each response

All participants admitted to hand washing before eating and after visiting the toilet in an effort to prevent diarrhea, and they reported they washed their hands with soap about 3-10 episodes/day. Participants who work as food vendors or were employed in garment factories said they wash their hand approximately 6-10 times a day. A majority of participants admitted to being unaware of the proper techniques and duration of hand washing. They washed all areas of the hands until they were visibly clean and this process took 30-60 seconds (table 4.15).

A caregiver aged 24 years spoke, “Hand washing is important. It removes dirt and reduces germs and I strongly believe that if we wash our hands frequently, we avoid diarrhea and colds.”

Table 4.15 Reported hand washing practice among caregivers (n=25)

Hand washing practice	
Average frequency of hand washing with soap in a day (median, min-max)	4 (3-10)
Duration of hand washing with soap (ranging in seconds)	30-60
Occasions for hand washing (No. of participants)	
<i>Before and after eating/food preparation</i>	25
<i>After visiting the toilet</i>	25
<i>Others such as obviously dirty hands/ hands moist with sweat etc.</i>	10
No. of participants aware of proper technique of rubbing hands	3
<i>Not all participants responded to each response</i>	

Member’s perception toward benefits of hand washing

More than a half of participants who had children aged between 7-15 years in the household, disclosed that their children were unaware of the benefits of hand washing because they noticed that their children failed to wash their hands before eating or after visiting the toilet. However, they perceived that adults in their household recognized the positive benefits of hand washing in preventing diarrheal diseases and that adults washed their hands before eating and after visiting the toilet (table 4.16).

Hand washing promotion in the household

Caregivers believed that intensive hand washing promotion can increase the awareness of benefits among children. The examples of the responses to an educational approach to their family members are shown in Table 4.16.

Table 4.16: Responses with regard to educational approach to family member

Approaches	Example of Responses
Practice	“My child is 3 years old. I need to get her to wash her hands”
Face-to-Face Demonstration	“My kids are stubborn; they need to be told. I think that if they have been repeatedly educated and trained, they would probably wash their hands more often”
Verbal Reminder	“My sons ignore hand washing. I always have to tell them before sitting down to eat”
Poster Reminder	“I would like to have a poster of hand washing and post it in the kitchen to remind my sons about hand washing ”
Positive Reinforcement	“I promised my kid a favorite toy if she would regularly wash her hands before eating”

Not all participants responded to each response

Availability of hand washing facilities

Most of participants perceived that hand washing facilities should include a sink, running water, soap/detergent and a clean towel which should be convenient and in adequate supply-for each household. They stated that hand washing supplies such as soap and a clean towel were always available in their households. The study found that a majority of households had at least 2-3 hand washing stations. These hand washing stations were located in the bathroom, kitchen and foyer (front door) of the

house. Hand washing stations in the kitchen were identified as the most convenient and most often used (table 4.14).

A caregiver aged 40 years explained, “My family has 5 members and there are 3 hand washing stations in my household including two sinks in the bathroom located on the 2nd floor and one sink in the kitchen. I always provide soap and a change of towels every week and I think this is enough and appropriate for my family.”



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CHAPTER V

SUMMARY, DISCUSSION AND CONCLUSION

This chapter discussed study findings in relation to research questions, conceptual framework and hypotheses. The discussion is based on theories and relevant hand washing studies. A conclusion is drawn based on the findings. Implication regarding the hand washing and education are described for a better hand washing promotion. In addition, the limitations are provided for further study.

5.1 SUMMARY

Effect of intensive hand washing education on self- reported frequency at 7 day and 90 day post-intervention

The intensive hand washing education improved self-reported frequency of hand washing at 7 and 90 day-post intervention. Household members who received the intensive hand washing washed their hands averaged 6 times/day and members who did not get benefit of the education washed their hands averaged 4 times/day. Similarly, the members who received the education reported that they washed their hands more often than the baseline, which was 4 times/day before receiving education and 6 times/day at 90 day post-intervention. Additionally, the study found that age and gender influence self-reported frequency of hand washing. Females washed their hands averaged 5 times/day while males washed hands 4 times/day. Household members aged ≥ 16 years reported episodes of hand washing 5.02 times/day, while children aged 7-15 years reported 3 times/day.

Effect of intensive hand washing education on quality of hand washing at 7 day and 90 day post-intervention

The intensive hand washing education improved measured quality of hand washing practice at 7 and 90 days-post intervention. Household members who received the intervention obtained an average 6 score while the control obtained 3 score. Likewise, the quality score of hand washing between pre and 90 days-post intervention was also improved from 3 to 6 score.

Also, hand washing procedure on four practices: the use of soap, the technique of cleaning area of hands, the use of clean towel/paper for drying hands and duration, were all improved. The participants use of soap increased from 34 % to 88 %, use of clean towel/paper for drying hands increased from 69% to 94%, and cleaning all areas of the hands increased from 1 to 39%. Similarly, the duration of hand washing practice was improved from 26 to 59 seconds for each episode.

Self-reported frequency and measured quality score of hand washing prior to and during the 2009 influenza H1N1 pandemic

The 2009 influenza H1N1 pandemic had a minor effect on hand washing behaviors on frequency among the study population. First, the analysis found that the household members in the control group enrolled during the pandemic were more likely to wash their hands more often than members enrolled before the pandemic. They reported that they washed their hands 3.7 times/day before the pandemic and 4.3 times/day during the pandemic.

Second, the intensive hand washing education significantly improved hand washing procedure in the intervention group between pre-90 day post-education. Findings found that the practice of using soap, using clean towel/paper for drying hands and duration of washing hands ≥ 20 seconds before and during the pandemic were not different.

Third, a comparison of the techniques of cleaning areas of hands between the intervention and control groups prior to the pandemic; the intervention group completely cleaned areas of the hand about 18% while the control group did not

complete this practice at all. During the pandemic, the intervention household members had completely cleaned all areas of the hands more than the control household members (80 % vs. 4 %). This data indicates that our intensive hand washing education was more likely to influence the techniques of cleaning areas of hands than the public education on H1N1 pandemic.

Lastly, the MOPH pandemic health education was likely to influence only the technique of cleaning areas of hands. In the control group, findings indicated that the practices of using soap, using clean towel/paper for drying hands between the 2 periods did not differ. Also, percentage of participants who washed hands for ≥ 20 seconds decreased from 71 to 47 percent. However, the percentage of participants who completely cleaned all area of hands was significantly increased from 0 to 4 percent during the pandemic.

In summary, this data indicated that the intensive hand washing education had a significant influence on frequency, quality of hand washing and hand washing procedure on four practices while the public H1N1 pandemic education campaign had only a slight influence on frequency and hand washing procedure on one practice, which is the technique of cleaning areas of hands.

Effect of intensive hand washing education on knowledge, attitude and practice between pre and 90 days post-intervention

The intensive hand washing education significantly increased knowledge of influenza and improved self-reported hand washing practices in relation to preventing respiratory infection. On the other hand, the intensive hand washing education did not change attitude towards severity and influenza prevention.

Perception towards hand washing among caregivers: a qualitative method

The caregivers play a role in promoting good hand washing behavior especially with children in their households. They are aware of the benefits of good hand washing practices but only as it applies to preventing gastrointestinal tract infections.

5.2 DISCUSSION

Characteristic of households and household's members

Household and individual characteristics are described as factors influencing hand washing (Keith and Jackie, 2004). Findings indicated that the household factors including the number of members, hand washing stations and monthly household income were not barriers to hand washing. Individual age, gender, education and underlying at least one chronic health condition are described; however, age and gender significantly influence hand washing.

The ratio 4:3 of the household members to hand washing stations demonstrated that hand washing stations were adequate for the households. This finding was supported by qualitative methods conducted simultaneously with this study. We observed that a majority of hand washing stations with soap/detergent were located in the bathroom, kitchen and foyer (front door) of the house. The hand washing station in the kitchen was identified as the most convenient and most often used.

Monthly household income for 42.4% of these households ranged 10,000-20,000 baht/month and 40.2 % ranged 20,001-30,000 baht/month. The monthly income is likely sufficient for providing soap/detergent and for living in the Bangkok. The assumption was based on data from the Thai- household Socio-economic Survey in 2007, which stated that an average household in Thailand earned an income and expenditure averaging 18,660 and 14,500 baht per month, respectively (Thailand Ministry of Public Health, 2009b).

Our findings found that gender and age influenced hand washing behavior, which is consistent with previous hand washing surveys. Females are more likely to practice hand washing than males. We found that females washed their hands an average 5 times/day, while males washed their hands 4 times/day. The American Society for Microbiology survey found 90 % of females and 75% of males washed their hands after using public restroom (American Society for Microbiology 2005). In addition, women tend to practice hand washing procedures more correctly than males. Australia observed that 31% of females and 27% of males used soap and rubbed it all

over their hands after using the restroom (Buchtman, 2002). New Zealand reported that males washed hands an average 8 seconds while females washed hands 8.8 seconds (Garbutt et al., 2007). The different practice between males and females may relate to awareness and responsible duties in the households. Women tend to be the caregivers and responsible for administering full-time care for ill children, meals, school, clothes and housework in the household. These routine responsibilities raise the awareness of the benefits of good hand washing practices in association to illness (Buchtman, 2002).

Participants aged ≥ 16 years reported an average of 5 hand washing episodes, while children aged 7-15 years reported 3 episodes/day. The explanation of the differences is linked to the knowledge and belief of the benefits. Adults have greater awareness of the consequence of acquiring influenza illness due to parental/caregiver role; therefore, they tend to comply with good hand washing practices more than younger adults and children do (Becker, 1974, Glanz et al., 2002). Buchtman and team discussed in their study that persons age 35 to 49 years old had the best hand washing knowledge and better practice than other age groups. The result is linked to the fact that this age group is more likely to have children at home and tend to practice a good hygiene more than the persons who do not have children (Buchtman, 2002).

On the other hand, frequent hand washing was not influenced by years of education or chronic health conditions. As found, a majority of the household members received an average of 11 years of schooling, which is equivalent to secondary level. This data suggested that all participants learned the basics of personal hygiene including hand washing, while in primary school based on the curriculum of health education for primary school students. However, the role of knowledge in modifying hand washing behavior is controversial as contrasted by Scott's study and by the studies of Alvaren and Pittet. Scott et al summarized that knowledge is an important factor to change hand washing behavior (Scott, Lawson, & Curtis, 2007) while Alvaren and Pittet concluded that hand washing knowledge is unlikely to change the hand washing behavior (Alvaran et al., 1994; Pittet et al., 2000).

Lastly, the finding also demonstrated that there was no difference of frequency in hand washing between those with chronic health conditions and the otherwise healthy. The result is consistent with a theory of determinants of health behavior, which states that

a pathway of individual intrinsic factors to manipulate a good health habit are knowledge, attitude, perception, belief, self-efficacy, etc (Keith and Jackie, 2004). So far, there has not been any conclusion about the effects underlying chronic health conditions have as a factor that influences hand washing behavior.

Effect of intensive hand washing education on self- reported frequency at 7 day and 90 day post-intervention

The findings supported the hypothesis that the intensive hand washing education improved the frequency of hand washing by 2 episodes/day. Household members who received the intensive hand washing education reported that they washed their hands an average 6 episodes/day, while those participants who did not receive the education reported that they washed their hands an average of 4 episodes/day. The improvement of an additional 2 episodes of washing hands was also confirmed at 90 days post-intervention.

Success was facilitated by the strengths of the intensive hand washing education, which combined several educational approaches to provide information and to encourage good hand washing practices. Memorizing messages about “why to wash,” “when to wash,” “how to wash,” and “how hand washing is linked to influenza transmission” were repeatedly conveyed by study staff during the 3 home visits in the first 7 days of a symptomatic infected child. This information helped create an awareness of susceptibility of getting influenza and the benefits of hand washing in preventing influenza transmission in the household (Rosentock, 1974). Additionally, providing hand washing supplies to the household helped to minimize environmental barrier and strengthened the intention to routinely wash the hands (Luby et al., 2008; Thailand MOPH, 2007; Val et al., 2000).

Furthermore, sustainable frequent hand washing presents special challenges for educational interventions as found in other hand washing studies (Larson et al., 1997; Thailand MOPH, 2007). Larson commented that frequent hand washing among health care workers was sustained only 2 months post-intervention. Likewise, Thailand MOPH highlighted that hand washing with soap after using the toilet among students declined 1.5 months post-intervention. Based on this finding, we introduced self-

monitoring that has been proven to successfully modify unhealthy eating habits in other studies (Boutelle et al., 1999; Levy et al., 2007) by asking participants to record their episodes of hand washing with soap every day for a 90-day period. The incorporation of self-monitoring diary into the educational intervention offered the household members an opportunity to participate in the process of self-reminder. Collectively, all these components may have played a role in increasing the frequency of hand washing among the study participants.

However, the improvement was based exclusively on self-reporting. Similar studies, where diaries were used, showed a tendency for participants to over-report (Hass et al., 2007; Manun et al., 1997; Morat et al., 2004). However, due to limited resources under the context of the ongoing project, it was not possible to include more intensive observation methods.

Effect of intensive hand washing education on quality of hand washing at 7 day and 90 day post-intervention

The intensive hand washing education improved measured quality of hand washing. The quality score among household members who received intensive hand washing was about 6 scores while household members who did not receive the hand washing education was about 3 scores. The improvement of 3 scores was confirmed by the assessment between pre and 90 day post intervention. In comparison to hand washing techniques of pre and 90 days post-intervention, the percentage of participants using soap, using clean towel/paper, and cleaning all areas of the hands increased. Additionally, the duration of washing hands improved from 26 to 59 seconds.

The increased quality score and the improvement of hand washing procedures were as a result of the strengths of the education program, particularly demonstration and individual training on hand washing procedure. Demonstration is acknowledged as the most efficient approach to visualize hand washing procedure and individual training provides an opportunity for the health educators to explain the reasoning, offer immediate feedback and correction, as well as reinforcing the benefits of proper hand washing procedure (Newby et al., 1996). However, the quality of hand washing for this study might be considerably lower than the actual practices because the

participants were aware of being observed (Pittet, 2000; Pittet et al., 1999). Still, this finding is able to show the positive effect of educational intervention on the quality of practice.

Self-reported frequency and hand washing procedure before and during the 2009 influenza pandemic

We hypothesized that the MOPH influenza pandemic education after the WHO declared the 2009 influenza pandemic on June 11, 2009 might influence hand washing practices, especially the practice among control household members. We found that the control household members enrolled before the pandemic washed their hands on average 3.7 times/day, whereas the control members enrolled during the pandemic washed their hands about 4.3 times/day. The slight difference was caused by publicized messages of the MOPH, which focused on several other preventive behaviors, while our intensive education focused only on hand washing with soap (Centers for Disease Control and Prevention US. CDC, 2009; Thailand Ministry of Public Health, 2009f). Even though the analysis showed a statistical significant difference of the techniques on cleaning areas of the hands in the control groups enrolled in the different periods, we were unable to conclude whether the MOPH influenza pandemic education had any influence on this technique. We found 0 of 35 (0%) of the control household members enrolled before the pandemic completely cleaned all areas of their hands, while we found 6/131 (4.3%) of the control household members enrolled after the pandemic completely cleaned all areas of the hands. Based on these small numbers, the MOPH influenza pandemic education may have helped but not sufficiently to improve the technique of cleaning all areas of the hands. The intensive hand washing education was found to be useful in modifying the entire hand washing procedure. The intensified information of our intensive education created awareness and encouraged good hand washing procedures that included 4 practices; the use of soap, the use of clean towel/paper for drying hands, the techniques of cleaning all areas of the hands and the duration of hand washing. While the MOPH pandemic health education influenced only the technique of cleaning all areas of the hands.

In conclusion, intensive hand washing education shows a positive effect on increasing the frequency, quality and the entire process of hand washing procedure during the pandemic, while the MOPH influenza pandemic education helped to persuade the techniques of rubbing areas of the hands among the study participants.

Effect of intensive hand washing education on knowledge, attitude and practice between pre and 90 days post-intervention

The intensive hand washing education program increased the mean scores of knowledge and hand washing in relation to preventing respiratory infection. This result was a consequence of the intensive education that aimed to provide information on the risks and consequences of influenza illness on households e.g. school and work absenteeism, as well as income loss while caring for an ill child (Simmerman et al., 2006). This finding is supported by the theory of the Health Belief Model (Tone et al., 2004), which describes individuals as being more likely to engage in good practices if they understand the risk of getting the illness and believe in the benefits of preventive practices. As a result, the household members were made aware of the risks and were prepared to actively participate in this intensive hand washing education and follow recommendations given by study staff.

In addition, the provision of soap was presented to meet the needs of the Thai households (Thailand MOPH, 2007). The self-monitoring diary was given to encourage active participation in maintaining good hand washing practice, which was previously effective in changing other health-related behaviors e.g. eating and exercise. These two educational components likely contributed to sustainable hand washing behavior during the study period.

However, we found no significant changes in attitudes towards severity and influenza prevention. In contrast with the Health Belief Model, which suggests that, hand washing behavior can be predicted from attitude (Tone et al., 2004). A positive attitude gave support to improved compliance of hand hygiene among health care workers that was presented in other studies (Aiello et al., 2009; Carmann et al., 2005). One explanation would be that there was insufficient time allocated to this within the

educational program. In theory, an educational program would require appropriate strategy and duration of implementation of more than one year to achieve positive attitude changes (Ajzen, 1991; Galnz et al., 2002; Strecher et al., 1986).

An in-depth interview on perception towards hand washing

Findings indicated that family caregivers responsible for administering full-time care to influenza infected children are aware of the benefits of good hand washing practices but only as it applies to preventing gastrointestinal tract infections. This finding correlates with public health communications publicizing that diarrhea is a major cause of deaths in young children (World Health Organization, 2006). This might have created more of an awareness and motivation for hand washing in diarrhea prevention (Keren et al., 2002; Kretzer et al., 1998). The caregivers perceived that lack of knowledge, being busy/in a hurry and lack of convenience were found to be common barriers to hand washing, which are comparable to findings in prior studies (Kretzer et al., 1998; Pittet, 2001; Sporat et al., 1994). They perceived that hand washing facilities are always available in their households. Additionally, they perceived that adults in their households believed in benefits of hand washing unlike their children. Based on caregivers' experiences in learning hygiene practices, they perceived that effective educational approaches such as practice, face-to-face demonstration, verbal reminder, poster aide and positive reinforcement were effective in promoting hand washing to their family members. Furthermore, a combination of these instructive methods and an enhanced active participation in hand washing promotion at the individual level could aid in an increased awareness of the benefits and promote frequent hand washing among children age 7-15. This finding was consistent with studies that applied a combination approach in the programs and were successful in promoting hand hygiene to reduce illness transmission in the home and decrease absenteeism in school (Guinan et al., 2002; Sandora et al., 2005).

5.3 CONCLUSIONS

A home-based intensive hand washing education that repeatedly conveys a consistent message on hand washing and individual training on hand washing procedure, together with 90 days of self-monitoring using a diary, improved hand washing behaviors on knowledge, frequency, quality and to motivate individuals to hand washing practices in relation to preventing respiratory infection. On the other hand, the attitude towards severity and influenza prevention did not change. The findings reaffirm that females and younger adults aged ≥ 16 years were more likely to wash their hands more often than the others were. Therefore, males and children less than 15 years old should be given priority for hand washing promotion. In fact, the program should be extended and aimed at modifying attitudes in relation to respiratory infections and the severity of influenza.

Additionally, during the 2009 influenza (H1N1) pandemic, our intensive hand washing education showed positive effects on increasing frequency and modifying good hand washing procedure on 4 practices: the use of soap, duration, appropriate method of drying hands and the techniques of rubbing areas of hands. However, the sustainable behavior on those four practices needs to be evaluated in a long-term follow up (>1 years) since this behavior might be caused by the response to the current influenza pandemic.

5.4 IMPLICATIONS

A home based intensive hand washing education that utilizes visuals and hands on demonstration needs to be regarded as an important tool to promote quality of hand washing in preventing respiratory tract infections. This action can be achieved through an intensive hand washing training program that includes all household members. Furthermore, having caregivers promote hand washing behaviors in the households is key to assisting the success of the community-based hand washing promotion. However, caregivers should be motivated to practice in relation to preventing respiratory infection. In addition, the advantages of hand washing practices can only

be applicable if hand washing facilities, including adequate supplies for the households are readily available. Lastly, the finding of this study points out that good hand washing practices such as frequency, quality and appropriate procedure may be sustained if the promotion can introduce a component of active participation and continually follow up the practice in the long term. However, the cost of field home visits and follow up might be expensive; thus, the program should be considered combining with other health-related home visits.

5.5 LIMITATIONS AND RECOMMENDATIONS

This study had several limitations. First, we concluded that household factors were not a barrier to hand washing behaviors based on the qualitative method. The data regarding hand washing facilities and household income were not collected at the beginning of the study causing insufficient sampling, which affected the statistical power. For this reason, we decided to use the qualitative methods such as in-depth interview and observation to describe the household factors. Second, the increased frequency of hand washing was based exclusively on self-reporting and similar studies have showed a tendency for participants to over report (Haas and Larson, 2007; Moret et al., 2004). Additional evaluation methods such as a designated household member to monitor hand washing behavior, measuring individual hand washing soap use and spot checking of the hand washing facilities could reduce bias and increase accuracy of the data. Third, the observed quality of hand washing practices of this study was based on an instrument that was developed for this study and has not been externally validated. The observation by researchers may have introduced bias from the Hawthorne Effect that could affect the generalizability of our findings (Jones, 1992; Parsons, 1978). The quality of hand washing measurements needs further investigation. Fourth, the association of frequent hand washing and influenza infection rate can reaffirm the knowledge and practice and it needs further study/report. Finally, the questionnaire on knowledge, attitude and practice of individuals was developed to assess the effect of hand washing education using specific approaches that meet the needs of Thai -households with an influenza-infected child and was conducted under

the context of the on-going influenza study. Even though, the content validity was as good, the internal consistency reliability coefficients (Cronbach's Alpha) were only satisfactory. This reflects on the sensitivity of the questionnaires. Therefore, the application of these questionnaires needs adjustment. The standardized questionnaires that were developed, refined, validated and tested for its reliability and item analysis is suggested to enhance the sensitivity of the questionnaires.



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APPENDICES

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

APPENDIX I

INTRUMENTS

INTERVIEW: HOUSEHOLD MEMBERS CHARACTERISTICS

1. Date of birth: ____/____/____ [day/month/year]
2. Age: ____ months or years
3. Sex [circle]: Male Female
4. What is the highest level of education you have completed? [circle one]

Primary school:	1	2	3	4	5	6			
Secondary school:	1	2	3	4	5	6			
Vocational school:	1	2	3	4	5	6			
University:	1	2	3	4	5	6	7	8	≥9

 Don't know Not applicable – too young to attend school
5. Have you been under the care of a health care provider or seen one for routine care anytime over the last 12 months? Yes No
 - a) If **YES**, please list any medical conditions that have been treated with or without medication over the last 12 months. Check all that apply.
 - Asthma (including reactive airway disease, ≥2 event)
 - Other chronic lung disease
 - Abnormality of the upper airway
 - Heart and circulatory disease (excluding hypertension)
 - Kidney disease
 - Liver disease
 - Neurologic/Neuromuscular disorder (including muscular dystrophy, cerebral palsy)
 - Hemoglobinopathy (including thalassemia)
 - Metabolic disease (including Diabetes)
 - Premature birth (gestational age <37 weeks at birth for patients <2 yrs of age)
 - Developmental delay (e.g., Downs syndrome)
 - Immunosuppressive condition
 - Cancer diagnosed in the last 12 months
 - Other

HOUSEHOLDS CHARACTERISTICS

1. What is the average monthly income of your household?----added in Form B day
 < 5000 baht \geq 5001-10000 >10001- 15000 > 15001-20000
 >20001-30000 >30001-40000 >40001
2. How many sinks are in your house where your family members usually wash their hands?
 1 2 3 4 5
3. Number of family member in household including index case ____

SELF-REPORTED FREQUENCY OF HAND WASHING (CONTROL GROUP)

1. What is the **average** number of times in a day that you wash your hands with soap and water?
2. How long does it take you to wash your hands **approximately**? _____ (seconds)
3. What is the average number of times in a day that you wash your hands with soap and water for at least 20 seconds)? _____ (times)


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KNOWLEDEG, ATTITUDE AND PRACTICE

Self-administered questionnaires

Instruction: To be completed by persons aged ≥ 10 years and verbally asked for children aged 7-9 years Date completed: ____/____/____ [day/month/year]

Part I: Knowledge

Please select the best answer by placing a ✓ in the column answer for each the following questions.

Statement	Yes	No	Don't know
1. Influenza infection is caused by a change in the weather			
2. I am more likely to catch influenza when I am very near (1 meter or less) to a person with influenza			
3. The best way to reduce influenza transmission in my household is to cover my mouth and nose when I sneeze or cough, to wash my hands and to clean surfaces such as door knobs, books			
4. Washing my hands several times each day helps protect my family from infection			
5. Washing my hands for 20 second or longer with soap and running water can remove influenza virus from my hands			

Part II: Attitude

Please state your opinion about the statement. There are no rights or wrong answers to these questions so please give your answer that best represents your opinion. Please select the best answer by placing a ✓ in the column answer for each the following questions.

In your opinion	Strongly disagree	Disagree	Agree	Strongly agree
1. Influenza can cause me to miss school or work				
2. Influenza infection can cause young children and elderly to be admitted to hospital				
3. Influenza infection is serious enough that I should take steps to prevent it				
4. Taking vitamins, sleeping at least 8 hours each night and getting daily exercise will help protect me from getting the influenza				
5. Hand washing is a good way to protect my family from influenza infection				

Part III: Influenza infection and hand washing practice

Please state whether you do each of the following practices in the past year.

1= None of the time (none)

2= Little of the time (25% of the action)

3= Some of time (50 % of the action)

4= Most of the time (75 % of the action)

5= Always

Please select the best answer by placing a ✓ in the column answer for each the following statements.

	1 None	2 Little of the time	3 Some of time	4 Most of the time	5 Always
1. When I get influenza , I stay home from school , work and social gatherings to protect others from catching my influenza					
2. I cover my mouth and nose with a tissue when I cough or					
3. I wash my hands after covering my mouth and nose when I cough or sneeze or blow my nose					
4. I wash my hands after I touch any object that I know has been touched by a person in my household who has a cough or runny nose					
5. I wash my hands with soap and water					

ศูนย์วิทยุทรัพยากร

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ความรู้, ทักษะ และ พฤติกรรมการล้างมือเกี่ยวกับการติดเชื้อไข้หวัดใหญ่
(สำหรับผู้ที่มียุ 10 ปีขึ้นไป และทำการถามปากเปล่าสำหรับเด็กที่มีอายุ 7-9 ปี)

ส่วนที่ 1: ความรู้ (กรุณาทำเครื่องหมาย ✓ ในช่องที่ถูกต้องที่สุดสำหรับแต่ละข้อความ)

ข้อความ	ใช่	ไม่ใช่	ไม่ทราบ
1. โรคไข้หวัดใหญ่มีสาเหตุมาจากอากาศเปลี่ยนแปลง			
2. ฉันอาจติดโรคไข้หวัดใหญ่ได้ ถ้าอยู่ใกล้ชิดผู้ป่วยในระยะน้อยกว่า 1 เมตร			
3. การป้องกันโรคไข้หวัดใหญ่ที่ดีที่สุดในการครอบครั คือปิดปาก/จุมกเมื่อไอหรือ จาม ล้างมือ และทำความสะอาดสิ่งของที่สมาชิกทุกคนในบ้านใช้ร่วมกัน เช่น ลูกบิดประตู หนังสือ โทรศัพท์ เป็นต้น			
4. ล้างมือบ่อยๆ ช่วยป้องกันคนในบ้านไม่ให้เป็นโรคติดต่อ			
5. ล้างมือด้วยสบู่ นานมากกว่า 20 วินาที ช่วยทำลายเชื้อไข้หวัดใหญ่ออกจากมือของฉัน			

ส่วนที่ 2: ทักษะ (กรุณาทำเครื่องหมาย ✓ ในช่องที่ตรงกับความเห็นของท่านมากที่สุด)

ในความเห็นของท่าน	ไม่เห็นด้วยอย่างยิ่ง	ไม่เห็นด้วย	เห็นด้วย	เห็นด้วยอย่างยิ่ง
1. โรคไข้หวัดใหญ่ทำให้ฉันต้องขาดเรียน หรือขาดงาน				
2. โรคไข้หวัดใหญ่ทำให้เด็กเล็กและผู้สูงอายุต้องนอนโรงพยาบาล				
3. โรคไข้หวัดใหญ่เป็นโรคที่มีความรุนแรง ฉันควรต้องหาทางป้องกัน				
4. ฉันสามารถป้องกันโรคไข้หวัดใหญ่ได้ โดยรับประทานวิตามินนอนหลับอย่างน้อยวันละ 8 ชั่วโมง และออกกำลังกายทุกวัน				
5. การล้างมือเป็นวิธีที่ดีในการป้องกันคนในครอบครัวฉันไม่ให้ติดโรคไข้หวัดใหญ่				

ส่วนที่ 3: การติดเชื้อใช้หัตถ์ใหญ่และการล้างมือ

กรุณาระบุข้อมูลตามที่ท่านได้ปฏิบัติในแต่ละข้อในระยะเวลา 1 ปีที่ผ่านมา

1=ไม่เคย (ไม่เคยแม้แต่ครั้งเดียว)

2=นานๆครั้ง (ปฏิบัติร้อยละ25 ของการปฏิบัติทั้งหมด)

3=บางครั้ง (ปฏิบัติร้อยละ50 (ครึ่งหนึ่ง) ของการปฏิบัติทั้งหมด)

4=บ่อยครั้ง (ปฏิบัติร้อยละ75 ของการปฏิบัติทั้งหมด)

5=ทุกครั้ง

กรุณาทำเครื่องหมาย ✓ ในช่องที่ตรงความเป็นจริงมากที่สุดในแต่ละข้อ

	1 ไม่เคย	2 นานๆ ครั้ง	3 บางครั้ง	4 บ่อยครั้ง	5 ทุกครั้ง
1. เมื่อฉันป่วยเป็นโรคใช้หัตถ์ใหญ่ ฉันจะหยุดเรียน หรือ หยุดงาน หรือ และหลีกเลี่ยงเข้าไปร่วมกับกลุ่มคน เพื่อป้องกันผู้อื่นติดเชื้อใช้หัตถ์ใหญ่จากฉัน					
2. ฉันปิดปากและจมูก เวลาไอ หรือจาม ด้วยกระดาษทิชชู					
3. ฉันล้างมือหลังจากใช้มือปิดปากและจมูก เวลาไอ จาม หรือสูดน้ำมูก					
4. ฉันล้างมือหลังจากสัมผัสหรือจับ สิ่งของเครื่องใช้ของผู้ที่มีอาการ ไอ หรือ มีน้ำมูก เช่น หนังสือ ลูกบิดประตูบ้าน โทรศัพท์					
5. ฉันล้างมือด้วยสบู่					

IN-DEPTH INTERVIEW QUESTIONS

Perception of benefits of hand washing

1. Why is hand washing necessary? What are the benefits of hand washing ?
2. What diseases could be prevented by hand washing ?
3. How would you value hand washing in preventing disease transmission compare with other preventive behaviors?
4. When do you wash your hands? What occasions? How often?

Perception on availability of hand washing facilities

1. What equipment or supplies are necessary for hand washing in your household?
2. Do you think soap, water, paper or towel is enough for your members? Why?
3. Is it convenient and easy to walk to a hand washing station in your household? Why?
4. What is the most convenient area (hand washing station) where you and your household members prefer to wash their hands? Why?

Member's perception toward benefits and barrier to hand washing

1. Do you think that your household members perceive the benefits of hand washing ? Why?
2. What are the barriers that cause you and your household's member not being able to wash hands?

Effective approach to promote good hand washing practice in household

1. How would you encourage your household's member to wash their hands?
2. What approaches do you usually apply? Why? Are those effective in promoting hand washing in your households?
3. If you have learnt the proper hand washing techniques, will you teach your household's member? How will you teach them? How will you monitor their practice?

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APPENDIX II

HAND WASHING SURVEY

Background: There has been no data of hand washing behaviors on frequency and hand washing practices among Thai households. This survey aimed to explore frequency and procedure of hand washing in order to develop home-based intensive hand washing education.

Methods: The interview was carried out at Queen Sirikit National Institute of Child Health (Children hospital) in May 2008. Participants aged 5 years and older living in households of influenza-infected child. The 11-item questions obtained information related to previous hand washing education, frequency, hand washing procedure including the use of soap, duration, techniques of rubbing the area of hands and obstacles as well as priority of occasions for hand washing. Regarding to occasions for hand washing, participants were asked to weigh the priority of five occasions by scoring one for the highest priority and five for the lowest priority.

Results:

Characteristics: A total of 32 household members were interviewed. Age of participants ranged between 5-72 years (mean= 32 years). Majority of them completed primary school (43.5 %), followed by secondary school (25%). Additionally, most of participants were not educated about hand washing techniques (75%). Among participants who received hand washing education were taught the hand washing procedure from school (16%).

Frequency of hand washing with soap: The reported frequency of hand washing with soap ranged between 1-15 times/day (mean= 3.34, SD= 2.76).

Frequency of hand washing without soap: The reported frequency of hand washing without soap ranged between 0-10 (mean= 3.50, SD=1.98).

The use of soap: Five of twenty-seven (84%) of participants did not use soap when they wash their hands at home.

Duration: A half of participant (50%) washed hands less than 20 seconds.

Friction: Two of thirty-two (6%) of participants rubbed all areas of hands. Area of hands that were rubbed ranged from the most to the least were palms (100%), followed by back of hands (66%), fingers and finger interlaced (44%), wrists (28%) and finger tips (25%), back of fingers(22%) and thumbs (19%) respectively.

Obstacles: The barriers to hand washing included i) being busy (37%), ii) forget (37%), iii) inconvenient (17%), and iv) unnecessary/unaware (10%).

Priority of occasions for hand washing : The highest priority of occasions for hand washing was before eating and handling food (Mean=1.63, SD=.87), followed by after having been toilet (Mean=1.88 SD=.79), after handling animals (Mean= 3.63, SD=1.18), after handling coughing or sneezing (Mean=3.91, SD=.81) and after handling public objects (Mean=3.97,SD=1.17) respectively.

Conclusion: The average frequency of hand washing with soap was found to be 3 episodes/day. Hand washing procedure needs improvement. The procedure includes the use of soap, duration, friction and the methods of drying hands were found < 50% of the practices. Additionally, hand washing after handling coughing /sneezing was rated as the last priority.

Suggestion: Intensive hand washing education including demonstration and individual training is necessary to promote appropriate hand washing procedure. The education need to motivate the benefits of hand washing in relation to preventing respiratory tract infection in addition to preventing gastrointestinal tract infections. A hand washing education that can increase awareness and motivate hand washing practice in preventing respiratory infection is needed.

QUESTIONNAIRES OF HAND WASHING SURVEY

- 1) Sex 1.Male 2.Female
- 2) Age(years)_____
- 3) Education: 1. Primary school 2. Secondary school
3. High School 4. Vocational school 5. Bachelor degree
6. Master degree 7. Professional degree 8. Others

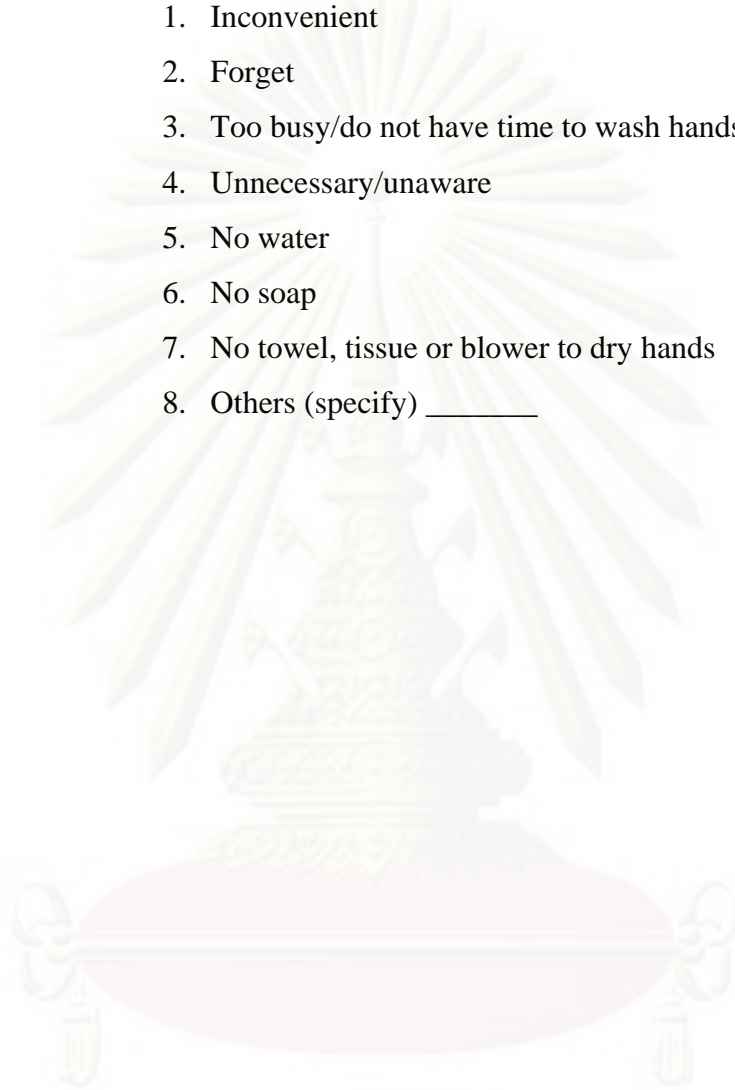
Hand washing behavior

- 4) Have you ever been taught “how to wash your hands”?
1. Yes 2. No
If yes, who taught you?
1. Parents or care takers 2. School 3. Works
4. Hospital/ health care center etc. 5. Others (specify) _____
- 5) What is the average number of times in a day that you wash your hands **with soap**? _____
- 6) What is the average number of times in a day that you wash your hands **without soap**? _____
- 7) Do you use soap when you wash your hands at home? **1. Yes 2. No**
- 8) How long does it take you to wash your hands **with soap** approximately? _____
- 9) How long does it take you to wash your hands **without soap** approximately? _____
- 10) What parts of hands that you usually rub when you wash your hands?

	Interview	
	Yes (1)	No (2)
13.1 Palms		
13.2 Back of hands		
13.3 Fingers interlaced		
13.4 Back of fingers		
13.5 Thumbs		
13.6 Finger tips		
13.7 Wrists		

11) When you do **NOT** wash your hands, please choose the **single best answer** that explains why you do not wash

1. Inconvenient
2. Forget
3. Too busy/do not have time to wash hands
4. Unnecessary/unaware
5. No water
6. No soap
7. No towel, tissue or blower to dry hands
8. Others (specify) _____



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APPENDIX III

ASSESSMENT OF HAND WASHING QUALITY

A tool to assess the quality of hand washing was developed based on expert consensus. Five experts concluded that hand washing procedure includes 4 practices; the use of soap, the technique of rubbing areas of hand, duration and method of drying. Moreover, hands divided into 7 parts; palms, back of hands, finger, and finger interlaces, back of fingers, thumbs, fingertips (nail) and wrists.

Experts were asked to weight the importance of hand washing components. The consensus was that each part of the hands was not of equal importance with respect to acquiring respiratory infections. Subsequently, the experts ranked each part of the hand from potentially the most contaminated to the least contaminated areas (were mostly missed during the hand washing) then assigned them a score.

A total score of quality is 8.5 scores. The use of soap was given 1 scores. A total score of 5.5 was given if seven areas of hands were rubbed. The duration of rubbing hands > 20 seconds was given 1 score and the use of clean towel or paper was also given 1 score.

The study staff asked the control household members to demonstrate their hand washing procedure on day 7 while asked the intervention household members to demonstrate hand washing procedure three times on day 1(pre-education) and day 7 and day 90 (post-education).

Assessment of quality tool

Hand washing procedure	Scores
1. Technique of rubbing areas of hands	
1.1 Palms	1
1.2 Back of hands	0.5
1.3 Fingers and Fingers interlaced	1
1.4 Back of fingers	0.5
1.5 Thumbs	1
1.6 Finger tips	1
1.7 Wrists	0.5
2. Use soap	
2.1 no soap used	0.5
2.2 use any type of soap or detergent	1
3. Spend appropriate time in rubbing hands	
3.1 Rub hands < 20 second	0.5
3.2 Rub hand > 20 second	1
4. Dry hands	
4.1 Do not dry hands or dry hand with clothes	0.5
4.2 Dry hands with clean towel or paper or blower	1
Total score	8.5

APPENDIX IV

EDUCATIONAL PLANS

CONTROL GROUP

Participants: All family members

Learning objectives: 1. Participants understand effect of the potential influenza pandemic

2. Participants can apply the knowledge of healthy diet, exercise and smoking cessation in daily life

Time: 25-30 minutes

Outcome	Contents	Teaching methods	Materials	Measurements
1. Participants will verbalize understanding of the potential influenza pandemic	Impact of influenza pandemic	Provide information regarding impact of previous influenza pandemics and the burden of seasonal influenza transmission.	Pamphlet	Self administered questionnaires
2. Participants will be able to explain and discuss the advantage of healthy diet, exercise and smoking cessations	1. Healthy diet 2. Exercise: Advantage of exercise 3. Smoking cessations: disadvantage of smoking, advantage of smoking cessation	1. Share experience in health problems in household 2. Discuss the appropriate resolution in solving health problems 3. Provide information regarding to healthy diet, exercise and smoking cessations 4. Questions & Answers	Pamphlets	Diary

INTERVENTION GROUP

Participants: All family members

Learning objectives:

1. Participants frequently wash hands in reducing influenza transmission in household contacts
2. Participants apply/adapt appropriate hand washing habits to prevent the influenza and other disease transmission in households

Time: 25-30

Outcome	Contents	Teaching methods	Materials	Measurements
1. Participants will be able to discuss the causes and mechanism of influenza transmission	Diseases and germs that are carried by hands	Share experience in health problems resulting from contaminated hands	1. Influenza Pamphlet 2. Flip chart	Self administered questionnaires
2. Participants will verbalize understanding of the potential for an influenza pandemic and the potential role of hand washing in reducing influenza transmission.	1. Impact of influenza pandemic 2. The effectiveness of hand washing in reducing respiratory infection	1. Provide information regarding impact of previous influenza pandemics and the burden of seasonal influenza transmission. 2. Discuss the effectiveness of hand washing in preventing influenza transmission in household.	Pamphlet	Self administered questionnaires
3. Participants will be able to demonstrate proper hand washing technique.	Seven hand washing techniques according to the Thai MOPH	1. Demonstrate hand washing techniques 2. Provide graduated clear liquid soap dispenser and soap for each household. 3. Questions & Answers 4. Demonstration by household members, if incorrect, repeat the teaching process.	1. Poster of hand washing techniques 2. Demonstration kits	1. Self administered questionnaires 2. Observations 3. Diary

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EDUCATIONAL MATERIALS (CONTROL GROUP)

สื่อการสอน

กลุ่มควบคุม (กลุ่ม 1)

PAMPHLET

แผ่นพับ

โรคติดเชื้อไข้หวัดใหญ่

ส่วนใหญ่ติดต่อโดยการไอ จามรดกันหรือสัมผัสกับสิ่งปนเปื้อนน้ำมูก น้ำลาย เสมหะของผู้ป่วยเช่น ของเล่น แก้วน้ำ ช้อนอาหาร โทรศัพท์ ลูกบิดประตู ราวบันได เป็นต้น



การป้องกัน

การแพร่กระจายเชื้อจากผู้ป่วยไปสู่ผู้อื่นเป็นสิ่งสำคัญที่สุด ซึ่งทำได้ง่าย ๆ โดยการใส่หน้ากากอนามัยในชีวิตประจำวันซึ่งเป็นวิธีหนึ่งที่สามารถลดการแพร่กระจายของโรคไข้หวัดใหญ่ และโรคระบบทางเดินหายใจอื่นๆ ได้



ทำไม? จึงควรใส่หน้ากากอนามัย



เชื้อโรคที่เกิดจากการไอ จามของผู้ป่วยสามารถกระจายไปได้ไกลถึง 3 ฟุต ทำให้ผู้ที่อยู่ใกล้ชิดมีโอกาสรับเชื้อได้ ซึ่งจากงานวิจัยขององค์การอนามัยโลกค้นพบว่า การใส่หน้ากากอนามัยสามารถลดการแพร่กระจายของอนุเล็ๆ ที่มีเชื้อโรคปนเปื้อนได้ถึงร้อยละ 80 การใส่หน้ากากอนามัยจึงช่วยป้องกันการติดต่อ และป้องกันการแพร่เชื้อโรคไข้หวัดใหญ่ไปสู่ผู้อื่นได้

ควรใส่หน้ากากอนามัย

เมื่อป่วยด้วยโรคติดเชื้อไข้หวัดใหญ่ มีอาการไอ จาม มีน้ำมูก และเมื่อต้องอยู่ร่วมกับผู้อื่นในที่สาธารณะ เช่น ในห้องเรียน ห้องทำงาน ศูนย์การค้า รถประจำทาง โรงพยาบาล โดยเฉพาะในห้องปรับอากาศ



“ไม่จำเป็นต้องใส่หน้ากากอนามัยเมื่ออยู่ลำพังคนเดียว เช่นเวลานอน”

จุฬาลงกรณ์มหาวิทยาลัย

กินอย่างไรให้สุขภาพดี

**กินอาหารสุกสะอาด
ปราศจากสารอันตราย และ
หลีกเลี่ยงอาหารรสจัด สีจัดฉูด**

อาหารที่คนเรากินเข้าไปเป็นปัจจัยหนึ่งที่สำคัญในการกำหนดสภาวะสุขภาพของคนนั้นๆ การกินอาหารที่ดีมีประโยชน์อย่างพอเพียงและเหมาะสมทำให้สุขภาพร่างกายแข็งแรง ในขณะที่พฤติกรรมการกินอาหารที่ไม่ดีมีสารปนเปื้อนไม่ถูกหลักโภชนาการ และมากเกินไปจนกลายเป็นของว่างจะก่อให้เกิดโรคต่างๆ ตามมานมากมาย

อาหาร 5 หมู่ คืออะไร?


กินอาหารให้ครบ 5 หมู่ ถูกหลักโภชนาการ โดยกินในปริมาณที่เหมาะสมกับอายุ เพศ และกิจกรรมประจำวัน มารู้อีกกันอาหาร 5 หมู่กันเถอะ

หมู่ที่	อาหาร	คุณค่า
หมู่ที่ 1 โปรตีน		ช่วยเสริมสร้างร่างกายให้เจริญเติบโตและซ่อมแซมเนื้อเยื่อที่

		เสริมให้ปกติ
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หมู่ที่	อาหาร	คุณค่า
หมู่ที่ 2 คาร์โบไฮเดรต	ข้าว แป้ง น้ำตาล เตือกมัน 	เป็นแหล่งพลังงานแต่ไม่ควรกินมากเกินไป เพราะจะถูกเปลี่ยนและสะสมในรูปของไขมันตามส่วนต่างๆ ของร่างกายทำให้เป็นโรคอ้วนได้
หมู่ที่ 3,4 เกลือแร่ และ วิตามิน	ผัก และผลไม้ต่างๆ 	มีวิตามิน แร่ธาตุและใยอาหาร ช่วยให้ง่ายต่อการดูดซึมอย่างปกติ ช่วยในการขับถ่าย และกำจัดสารพิษที่เรื้อรังต่างๆ
หมู่ที่ 5 ไขมัน	น้ำมันและไขมันจากพืชและสัตว์ 	ให้พลังงานและความอบอุ่นแก่ร่างกาย

หลักการรับประทานอาหารให้มีสุขภาพที่ดี

1. รับประทานอาหารให้ครบ 5 หมู่ แต่ละหมู่ให้หลากหลายเหมาะสมกับน้ำหนักตัว
 2. รับประทานอาหารเป็นอาหารหลัก สลับกับอาหารจำพวกแป้งเป็นบางมื้อ
 3. รับประทานอาหารให้ได้ตามฤดูกาลเป็นประจำ
 4. รับประทานอาหารโปรตีนจากเนื้อปลา
 5. สดชื่นให้เหมาะสมตามวัย ซึ่งในวัยทำงานควรดื่มน้ำได้วันละ 1-2 แก้ว 
 6. กินอาหารที่มีไขมันแต่พอดี เพราะถ้าได้รับไขมันที่มากเกินไป จะทำให้เกิดปัญหาไขมันในเส้นเลือดสูง และเป็นปัญหาโรคอ้วน
 7. ปรุงอาหารให้สุกด้วยความร้อนทั่วถึง
 8. งดหรือลดเครื่องดื่มแอลกอฮอล์ เพราะถ้าดื่มจนติดแล้วจะทำให้ร่างกายขาดวิตามิน และแร่ธาตุต่างๆ
- หลักการกินอาหารทั้ง 8 ข้อนี้ สามารถปฏิบัติได้ควบคู่กันการออกกำลังกายอย่างสม่ำเสมอจะทำให้ร่างกายแข็งแรงปราศจากโรคภัยไข้เจ็บและยังทำงานได้อย่างมีประสิทธิภาพอีกด้วย



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

"สูบบุหรี่... ไม่ก่อผลดีต่อร่างกาย"

คุณรู้อย่างไรว่าในบุหรี่มีสารประกอบต่าง ๆ ที่มีพิษไม่ต่ำกว่า 4,000 ชนิด เช่น นิโคติน และทาร์ ฯลฯ จึงถือว่า "ควันบุหรี่มีพิษร้าย...ก่อนอันตรายมากมายแก่ภวชน"



สำหรับตัวผู้สูบเอง การสูบบุหรี่อาจทำให้เกิดโรคต่าง ๆ เช่น โรคถุงเรื้อรัง ที่พบบ่อยคือมะเร็งปอด **"ผู้สูบบุหรี่มีโอกาสเป็นมะเร็งปอดมากกว่าผู้ไม่สูบบุหรี่ถึง 20 เท่า"**
ยังพบมะเร็งของปาก มะเร็งกล่องเสียง หลอดอาหาร กระเพาะอาหาร กระเพาะปัสสาวะ ไต

ระบบหัวใจและหลอดเลือด การสูบบุหรี่ทำให้ปริมาณกรดไขมันอิสระในพลาสมามากขึ้นกระตุ้นการเกิดหลอดเลือดง่ายขึ้น เป็นผลทำให้ผู้สูบบุหรี่ป่วยเป็น **"โรคระบบหัวใจ/หลอดเลือดสูง กว่าผู้ไม่สูบบุหรี่ถึง 2 เท่า"**

ระบบทางเดินหายใจ ควันบุหรี่ทำให้เกิดการระคายเคืองต่อเยื่อเมือกของโพรงจมูกและกล่องเสียง ทำให้เกิดการไอ หอบหืด หลอดลมอักเสบ และ **"โรคถุงลมโป่งพองถึงร้อยละ 70"**

นอกจากนี้ ควันบุหรี่ยังมีผลร้ายต่อผู้ที่อยู่ใกล้เคียง คือได้รับควันบุหรี่จากผู้สูบและต้องอยู่ในบริเวณเดียวกัน เช่น อยู่ในบ้านเดียวกัน ห้องทำงานด้วยกัน ก็ก่อให้เกิดอาการแพ้ได้เช่นเดียวกับผู้สูบ

"ผลดีเมื่อคุณเลิกสูบบุหรี่"

1. คุณจะเหลือเงินไว้ใช้จ่ายถึงสัปดาห์ละ 200-350 บาท
2. ลมหายใจของคุณจะสดชื่นขึ้น คลื่นเหินมาจากลมหายใจและกลิ่นปากจะค่อย ๆ หายไป ความมั่นใจของคุณจะกลับคืนมา
3. รับประทานอาหารได้ดีขึ้น
4. คุณจะมีความสุขมากขึ้น

สำหรับคนในครอบครัวของคนที่ไม่ได้สูบบุหรี่อีก ๆ จะได้รับประโยชน์ คือ

1. คนอื่น ๆ จะได้รับอากาศบริสุทธิ์มากขึ้น
2. ลดอัตราการเสียชีวิตจากการเป็นโรคร้ายจากบุหรี่
3. ลดความรุนแรงของโรคภูมิแพ้ เช่น หอบหืด , ภูมิแพ้, หลอดลมอักเสบ
4. เด็ก ๆ ได้มีแบบอย่างที่ดีในการปฏิบัติ

"ถ้าคุณมีจิตใจที่แน่วแน่และมั่นคงที่จะเลิกบุหรี่ ตัวคุณเองและผู้ใกล้ชิดจะได้รับประโยชน์ อย่างมหาศาล โดยไม่ต้องลงทุนอะไรมากมาย"

วิธีเลิกบุหรี่แบบง่าย ๆ

1. เตรียมตัวให้พร้อมที่จะเลิกสูบบุหรี่
2. กำหนดวันที่แน่นอนอย่าลืมนอกซองเชิรี่ที่ใกล้ชิด เช่น ในครอบครัว
3. หาเหตุจูงใจที่จะเลิกบุหรี่ เช่น เพื่อมอบเงินของขั้วบุหรี่ ให้แก่ พ่อ แม่ ตนเองหรือ ภรรยา
4. ลมมือ...หยุดเลย ในวันที่แรกอาจเริ่มด้วยการสูดดมเข้ากว่าปกติอาจทำให้สบาย นานๆ เพื่อให้ร่างกายชินกับความชุ่มฉ่ำของน้ำ
5. เนื่องแบบความสนใจจากครอบครัวไปทำกิจกรรมอื่น ๆ เช่น การออกกำลังกาย, การฝึกสมาธิ ฯลฯ

6. ยืนยันการเลิกบุหรี่ต่อไป เมื่อเลิกบุหรี่ได้แล้ว ไม่คิดลองสูบบุหรี่อีก เดือนตัวเองว่าสุขภาพดีขึ้นแล้วไม่เป็นทั้งโรคภัยของคนรอบข้าง

7. ถ้าคุณต้องการรับคำปรึกษาวิธีการเลิกสูบบุหรี่ที่ถูกต้องสามารถโทรขอรับคำปรึกษาได้ที่

"มูลนิธิรณรงค์เพื่อการไม่สูบบุหรี่"
เบอร์โทรศัพท์: 0-2278-1828-9 หรือ สายด่วน 1600
ที่อยู่ : 36/2 ซ.ประดิพัทธ์ 10 ถ.ประดิพัทธ์ สามเสนใน พญาไท กทม.



ศูนย์วิทยุโทรพยาบาล
จุฬาลงกรณ์มหาวิทยาลัย

หลักการออกกำลังกาย เพื่อสุขภาพ

สาระสำคัญของการออกกำลังกายเพื่อสุขภาพ มีดังนี้

การออกกำลังกายเพื่อสุขภาพเป็นยุทธวิธีอย่างหนึ่งที่จะส่งเสริมสุขภาพป้องกัน รักษาและฟื้นฟูสภาพร่างกายที่ประหยัด และมีประสิทธิภาพ สามารถปฏิบัติได้ทุกคนและทุกสภาพร่างกาย ถ้าปฏิบัติไม่ถูกต้องและไม่เหมาะสมกับสภาพร่างกาย ก็อาจเป็นอันตรายต่อสุขภาพและร่างกายได้เช่นกัน ฉะนั้นจึงควรคำนึงและเรียนรู้ว่าการออกกำลังกายนั้นและหนักเท่าไร จึงจะพอเพียงที่จะให้ผลดีต่อสุขภาพ

การออกกำลังกายเพื่อสุขภาพนั้น

พระบาทสมเด็จพระเจ้าอยู่หัวทรงดำรัสว่า "การออกกำลังกายนั้น หนักน้อยเกินไปร่างกายจะเฉื่อยช้ำและฟุ้งมากเกินไปร่างกายจะชืดโรยก็จะจำ"

ดังนั้นการออกกำลังกายควรทำให้พอดี โดยหลัก 3 ประการคือ

1. ความบ่อย ควรออกกำลังกายอย่างน้อยสัปดาห์ละ 3 วันๆ ละครั้ง
2. ความหนัก ควรออกกำลังกายให้มีอาการเหนื่อย หอบ แต่สามารถพูดคุยได้ ถือว่าหนักพอเหมาะพอดี
3. ความนาน เพียงครั้งละอย่างน้อย 20-30 นาที ทั้งนี้ขึ้นอยู่กับรูปแบบของการออกกำลังกาย เช่น เดินเร็ว ต้องใช้เวลานานกว่าวิ่งเหยาะ และวิ่งเหยาะใช้เวลานานกว่ากระโดดเชือก และออกกำลังกายที่หนักกว่า มีความแข็งแรงที่จะออกกำลังกายได้นานเพียงใด



12. ช่วยควบคุมน้ำหนักให้อยู่ในเกณฑ์ปกติ
13. ออกซิเจนไปเลี้ยงทุกส่วนของร่างกายและจิตใจ
14. ทำให้หลับสบายและหลับนาน

"ออกกำลังกายมีหลายวิธี"

ประโยชน์และสาระสำคัญของการออกกำลังกายเพื่อสุขภาพ มีดังนี้

ประโยชน์ที่ได้รับจากการออกกำลังกายอย่างสม่ำเสมอและเหมาะสม จะทำให้ร่างกายมีสุขภาพแข็งแรง สามารถป้องกัน รักษา และ ฟื้นฟูสภาพร่างกายได้ โดยทั่วไปแล้วจะทำให้เกิดการเปลี่ยนแปลงทางร่างกายคือ

1. สุขภาพทั่วไปแข็งแรง
2. การเรียวตัวไปในวัยเด็กจะช่วยให้สูงขึ้น
3. เสียดไปเลี้ยงสมองมากขึ้น ความคิดแจ่มใส
4. หัวใจและปอดแข็งแรงขึ้น
5. ความดันโลหิตลดลง
6. เส้นเลือดมีขนาดใหญ่ขึ้น โอกาสจะอุดตันน้อยลง
7. ลดระดับไขมันในเส้นเลือด
8. ป้องกันโรคเบาหวานได้
9. สมรรถภาพทางเพศดีขึ้น
10. ลดและช่วยแก้โรคน้ำหนักเกิน, ความเครียด
11. ระบบย่อยอาหารและระบบขับถ่ายดีขึ้น



EDUCATIONAL MATERIALS (INTERVENTION GROUP)

สื่อการสอน

กลุ่มทดลอง (กลุ่ม 2)

PAMPHLET

แผ่นพับ

โรคติดเชื้อไข้หวัดใหญ่

ส่วนใหญ่ติดคือโดยการไอ จามรดกันหรือสัมผัสกับสิ่งปนเปื้อนน้ำมูก น้ำลาย เสมหะของผู้ป่วยเช่น ของเล่น แก้วน้ำ ช้อนอาหาร โทรศัพท์ ลูกบิดประตู ราวบันได เป็นต้น



การป้องกัน

การแพร่กระจายเชื้อจากผู้ป่วยไปสู่ผู้อื่นเป็นสิ่งสำคัญที่สุด ซึ่งทำได้ง่าย โดยการใส่หน้ากากอนามัยในชีวิตประจำวันซึ่งเป็นวิธีหนึ่งที่สามารถลดการแพร่กระจายของโรคไข้หวัดใหญ่ และโรคระบบทางเดินหายใจอื่นๆ ได้



ทำไม? จึงควรใส่หน้ากากอนามัย



เชื้อโรคที่เกิดจากการไอ จามของผู้ป่วยสามารถกระจายไปได้ไกลถึง 3 ฟุต ทำให้ผู้ที่อยู่ใกล้ซึ่งมีโอกาสรับเชื้อได้ ซึ่งจากงานวิจัยขององค์การอนามัยโลกค้นพบว่า การใส่หน้ากากอนามัยสามารถลดการแพร่กระจายของอนุเล็ทกๆ ที่มีเชื้อโรคปนเปื้อนได้ถึงร้อยละ 80 การใส่หน้ากากอนามัยจึงช่วยป้องกันการติดต่อ และป้องกันการแพร่เชื้อโรคไข้หวัดใหญ่ไปสู่ผู้อื่นได้

ควรใส่หน้ากากอนามัย

เมื่อป่วยด้วยโรคติดเชื้อไข้หวัดใหญ่ มีอาการไอ จาม มีน้ำมูก และเมื่อต้องอยู่ร่วมกับผู้อื่นในที่สาธารณะ เช่น ในห้องเรียน ห้องทำงาน ศูนย์การค้า รถประจำทาง โรงพยาบาล โดยเฉพาะในห้องปรับอากาศ



“ไม่จำเป็นต้องใส่หน้ากากอนามัยเมื่ออยู่ลำพังคนเดียว เช่นเวลานอน”

จุฬาลงกรณ์มหาวิทยาลัย

POSTER

“ล้างมืออย่างไร ให้สะอาด”

ล้างมือด้วยน้ำและสบู่ 7 ขั้นตอน
ทุกขั้นตอนทำ 5 ครั้ง สลับกันทั้ง 2 ข้าง

1. ฝ่ามือถูกัน
2. ฝ่ามือถูหลังมือ และนิ้วถูข้อมือ
3. ฝ่ามือถูฝ่ามือ และนิ้วถูข้อมือ
4. หลังนิ้วมือถูฝ่ามือ
5. ถูนิ้วหัวแม่มือ โดยรอบฝ่ามือ
6. ปลายนิ้วถูข้อมือ
7. ถูข้อมือ

ล้างมือบ่อยครั้ง หยุดยั้งเชื้อโรค

- หลังไอ จาม หรือสิ่งน้ำมูก
- หลังการขับถ่าย
- ก่อนและหลังการเตรียมหรือปรุงอาหาร
- ก่อนรับประทานอาหาร
- ก่อนและหลังการสัมผัสผู้ป่วย
- หลังการสัมผัสสัตว์ทุกชนิด

กรมควบคุมโรค ปรารภรอนาให้คนไทย ปลอดภัยจากโรค

จุฬาลงกรณ์มหาวิทยาลัย

FLIPCHART

ภาพพลิกการล้างมือ



ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

APPENDIX V
CONSENT FORMS

HOUSEHOLD INFLUENZA TRANSMISSION STUDY (HITS)
WRITTEN ADULT HOUSEHOLD MEMBER CONSENT
PERSON AGED \geq 18 YEARS

The United States Centers for Disease Control and Prevention is working with Thailand's Queen Sirikit National Institute of Child Health Children's Hospital (QSNICH) to study influenza or flu among family members. We want to know who gets the flu, how it spreads, and what people can do to stop it. Your family member was diagnosed with flu at the hospital. We would like you to also be part of our research study called HITS.

We are studying how influenza is transmitted within households to find the best ways to reduce the spread of influenza. To do this, we will compare three different groups who will use different ways to reduce transmission. The group you would be in is chosen randomly. This would be like flipping a coin to see what group you would be in. This way, you will have an equal chance of being in one of the three groups. Only the study staff and you will know which group you are in.

If you are part of this research study, we will visit you 3 times over the next 7 days, once three weeks later and possibly as long as 6 months later. We will either come to your home or you and your family can come to the hospital. During our visits we will ask you questions, test you for flu, and teach you about some health choices. At each visit, we will rub the inside of your nose and the back of your throat with a cotton swab to test for flu. The swabbing will feel odd, but it will only take a few seconds. It may be a little sore and there could be a little blood. We would also like to take about 5cc of blood from you on two different days. It may hurt while we take the blood. It may bruise afterward and the skin that is covered by a bandage may get red. In between visits, we would like you to answer a few questions each day for 7 days in a diary. The first visit will take about 1 hour. Each later visit will take about 15-20 minutes.

If the later tests show that your family member does not have the flu, we will then stop visiting you and your participation in the study will end. If the other tests also show that your family member has the flu, you can stay in the study. If you are part of this study, your family will be put into one of three groups. Differences in these groups will help us know how people get influenza and how we can help people keep from getting influenza. You are free to join the study or not. If you do not join, your medical care will not change in the future. Also, during the study you can leave at any time and it won't change your future medical care.

All the information collected as part of this study is confidential. All of the study information will be kept under lock. To keep your identity secret, we will use a code instead of your name. No one but study staff can look at your information. Two years after the study result are made public, all records will be destroyed.

If your family joins the study, we can give you money to help pay for your time and any money your family spends for being in this study. At the end of each visit, the study nurse will give your family a partial payment that will add to as much as 2000 Baht if all visits are completed.

There may be leftover sample after we complete all the planned tests. Instead of throwing it away, we want to store any leftover samples and use it for future flu testing. No genetic testing will ever be done of the samples. If you do not want us to keep the leftover samples you can tell us and we will throw them away.

We do not expect any risks to you but there also are no real benefits to you in being part of this study. You would help us learn how flu infects people and how we may be able to stop it.

If you have any questions later about this study you can call the HITS study or you may call the HITS study director Dr. Piyarat Suntarattiwong at 085-910-1840. If you have questions about your rights as a study participant, please call Ms. Sasichol Kumprau at Tel 02-644-8943.

If you have questions about your rights or feel that you have been harmed in this study, contact the CDC Human Research Protection Office by calling <<add country code>> 1-800-584-8814 or emailing huma@cdc.gov and refer to the study HITS (study #####).

I have been informed of the study plan and my rights as a part of the study. My questions have been answered. I have received a copy of the consent information. I agree to be part of this study.

Check one:

- I give consent for approximately 5cc (one teaspoon) of my blood to be taken and stored at QSNICH as outlined in this consent form.
- I do **NOT** give consent for my blood to be taken and stored at QSNICH.

Check one:

- I give consent for my leftover specimens to be stored at QSNICH as outlined in this consent form.
- I do **NOT** give consent for my leftover specimens to be stored at QSNICH.

_____/_____/_____

day / month / year

Household member's printed name

Household member's signature

Study staff obtaining consent

Witnessed by: _____

Household ID: _____

Flesch-Kincaid 7.1

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

HOUSEHOLD INFLUENZA TRANSMISSION STUDY (HITS)
WRITTEN CHILD HOUSEHOLD ASSENT TO BE IN RESEARCH STUDY
PERSON AGED 7-17 YEARS

The United States Centers for Disease Control and Prevention is working with Thailand's Queen Sirikit National Institute of Child Health Children's Hospital to study influenza or flu. We want to know who gets the flu, how it spreads, and what people can do to stop it. At the hospital one of your family members was told they have the flu and so we want you to be part of our study, HITS. Please ask questions if you don't understand.

We are studying how influenza is transmitted within households to find the best ways to reduce the spread of influenza. To do this, we will compare three different groups who will use different ways to reduce transmission. The group you would be in is chosen randomly. This would be like flipping a coin to see what group you would be in. This way, you will have an equal chance of being in one of the three groups. Only the study staff and you will know which group you are in.

If you are part of this study, we will see you 3 times over the next 7 days, once three weeks later and possibly as long as 6 months later. We will either come to your house or your family will come to the hospital. During our visits we will ask questions, test for flu, and teach you about some health choices. At each visit, we will rub the inside of your nose and the back of your throat with a cotton swab to test for flu. It may feel odd and there may be a little bleeding from rubbing. We would also like to take about 5cc of blood from you on two different days. It may hurt while we take the blood. It may bruise afterward and the skin that is covered by a bandage may get red. In between visits, we would like you to answer a few questions for each of the 7 days in a diary. The first visit will take about 1 hour. Each later visit will take about 15-20 minutes.

If the later tests show that your family member does not have the flu, we will then stop visiting you and your participation in the study will end. If the other tests also show your family member has the flu, you may stay in the study. Everything you tell us as part of the study remains private. We keep all the study information under

lock. To keep your identity secret, we use a code instead of your name. No one but study staff can look at your information. Two years after the study result are made public, all records will be destroyed.

We will give your family money if everyone joins the study. The money will help pay for your time and any money your family spends for being in this study. At the end of each visit, the study nurse will give your family some money.

There may be leftover specimen after we do all of the testing. If there is any, we would like to keep it. We will only use the leftover to test for flu. No genetic testing will ever be done of the samples. If you do not want us to keep the leftover samples you can tell us and we will throw them away.

You are free to join or not join the study. If you do not join, your medical care will not change. If you do join, you can still leave the study at any time and your medical care will not change. There is no benefit to you from being part of this study. We also do not expect you to get hurt from being part of this study. By joining the study, you will help us learn how flu infects people and maybe how to stop it.

Your parents or guardian has said that it is okay for you to join this study, but you do not have to join the study if you don't want to.

If you have any questions about this study you can call the HITS study or you may call the HITS study director Dr. Piyarat Suntarattiwong at 085-910-1840. If you have questions about your rights as a study participant, please call Ms. Sasichol Kumprau at Tel 02-644-8943.

If you have questions about your rights or feel that you have been harmed in this study, contact the CDC Human Research Protection Office by calling <<add country code>> 1-800-584-8814 or emailing huma@cdc.gov and refer to the study HITS (study #####).

I was told or read about the study. I asked questions and had my questions answered. I want to be part of this study.

Check one:

- I give consent for approximately 5cc (one teaspoon) of my blood to be taken and stored at QSNICH as outlined in this consent form.
- I do **NOT** give consent for my blood to be taken and stored at QSNICH.

Check one:

- I give consent for my leftover specimens to be stored at QSNICH as outlined in this consent form.
- I do **NOT** give consent for my leftover specimens to be stored at QSNICH.

Print child's name

_____/_____/_____
Day / month / year

Child's signature

For children 7-17 years old, parental consent must also be obtained.

Study staff obtaining consent

Witnessed by: _____

Household ID: _____

Flesch-Kincaid 6.7

ศูนย์วิทยทรัพยากร
จุฬาลงกรณ์มหาวิทยาลัย

โครงการศึกษาวิจัยเรื่องการติดต่อของเชื้อไข้หวัดใหญ่ภายในครัวเรือน (HITS) สมาชิกผู้ใหญ่ในครัวเรือนอายุ 18 ปีขึ้นไปให้ความยินยอมด้วยความสมัครใจเป็นลายลักษณ์ อักษรที่จะเข้าร่วมโครงการศึกษาวิจัย

ผู้วิจัยหลัก: ดร. มาร์ค ซิมเมอร์แมน แพทย์โรคไข้หวัดใหญ่ ศูนย์ควบคุมและป้องกันโรคแห่งชาติ ประเทศสหรัฐอเมริกา
รศ. (พิเศษ) นพ. ทวี โชติพิทยสุนนท์ สถาบันสุขภาพเด็กแห่งชาติมหาราชินี ประเทศไทย
นพ. โรเบิร์ต กิบบอน สถาบันศึกษาวิชาวิทยาศาสตร์การแพทย์ทหาร ประเทศไทย

สถาบันสุขภาพเด็กแห่งชาติมหาราชินี ได้ประสานความร่วมมือกับศูนย์ควบคุมและป้องกันโรคแห่งชาติ ประเทศสหรัฐอเมริกา เพื่อที่จะทำการศึกษาวิจัยเกี่ยวกับโรคไข้หวัดใหญ่ในสมาชิกในครัวเรือน โครงการศึกษาวิจัยนี้ต้องการทราบว่า มีใครบ้างที่จะติดเชื้อหวัดใหญ่ เชื้อไวรัสไข้หวัดใหญ่ติดต่ออย่างไร และเราจะหยุดยั้งการติดต่อได้อย่างไร เนื่องจากมีสมาชิกในครัวเรือนของท่านได้รับการวินิจฉัยจากโรงพยาบาลว่าเป็นไข้หวัดใหญ่ เราจึงมีความประสงค์ที่จะขอให้ท่านให้เข้าร่วมโครงการศึกษาวิจัยเรื่องการติดต่อของเชื้อไข้หวัดใหญ่ภายในครัวเรือน หรือ เรียกย่อๆเป็นภาษาอังกฤษว่า "โครงการ HITS"

เรากำลังทำการศึกษาว่าเชื้อไข้หวัดใหญ่สามารถติดต่อสู่คนภายในครอบครัวได้อย่างไร และจะมีวิธีใดที่ดีที่สุดที่จะลดการแพร่กระจายของเชื้อไข้หวัดใหญ่ได้ ฉะนั้นเราจึงอยากจะเปรียบเทียบกับกลุ่มประชากรต่างๆที่ใช้วิธีการติดต่อของเชื้อไข้หวัดใหญ่แบบต่างๆ เราจะใช้วิธีง่ายๆเช่น โยนเหรียญว่าออกหัวหรือก้อย เพื่อสุ่มเลือกกลุ่มให้ท่านร่วม ด้วยวิธีนี้ท่านจะมีโอกาสเท่าๆกันว่าจะได้เข้าไปอยู่ในกลุ่มใดกลุ่มหนึ่งใน 3 กลุ่มการศึกษา เฉพาะท่านและพยาบาลวิจัยเท่านั้นที่จะทราบว่าท่านอยู่ในกลุ่มใด

มีการทำอะไรบ้างหากท่านเข้าร่วมโครงการวิจัยนี้ ?

หากท่านเข้าร่วมโครงการนี้ ท่านและครอบครัวจะได้รับการสุ่มเลือกเข้ากลุ่มการศึกษาวิจัยกลุ่มใดกลุ่มหนึ่ง ในขณะที่อยู่ภายในบ้านท่านและครอบครัวจะต้องสวมหน้ากากอนามัยและ/หรือ ล้างมือบ่อยๆ เราจะจัดหาอุปกรณ์ และแนะนำวิธีการใช้ให้แก่ท่าน

พยาบาลวิจัยจะทำการนัดพบ 3 ครั้งใน 7 วันข้างหน้า อีกครั้งหนึ่งใน 3 สัปดาห์ถัดไป และอาจจะมีการนัดอีกครั้งใน 6 เดือนถัดไปได้ พยาบาลวิจัยอาจจะไปที่บ้าน หรือท่านและครอบครัวของท่านอาจจะมาพบพยาบาลวิจัยที่โรงพยาบาล พยาบาลวิจัยจะถามคำถามท่าน ทำการทดสอบหาเชื้อไข้หวัดใหญ่ และจะแนะนำครอบครัวของท่านในเรื่องทางเลือกของการดูแลสุขภาพอนามัย ในการนัดพบ 3 ครั้งแรก พยาบาลวิจัยจะทำการป้ายน้ำมูกในจมูกและป้ายในคอของท่านด้วยไม้พันสำลีเพื่อทำการทดสอบหาเชื้อไข้หวัดใหญ่ ด้วยไม้พันสำลี เพื่อทำการทดสอบหาเชื้อไข้หวัดใหญ่ ซึ่งอาจก่อให้เกิดความอึดอัดรำคาญ แต่จะใช้เวลาเพียง 2-3 วินาทีเท่านั้น และอาจทำให้เจ็บหรือมีเลือดออกเล็กน้อยจากการป้าย

นอกจากนั้นพยาบาลวิจัยจะขออนุญาตเจาะเลือดท่านประมาณครั้งละ 5 cc (ไม่เกินหนึ่งช้อนชา) ในการนัด 2 ครั้ง ท่านอาจรู้สึกเจ็บขณะมีการเจาะเลือด อาจมีจ้ำบริเวณที่เจาะในเวลาต่อมา และผิวหนังส่วนที่ปิดด้วยผ้าปิดแผลอาจจะแดงขึ้น ในระหว่างการนัดแต่ละครั้งโครงการจะขอให้ท่านตอบคำถามและบันทึกลงในบันทึก

ประจำวัน การนัดครั้งแรกจะใช้เวลาประมาณ 1 ชั่วโมง และการนัดครั้งต่อไปจะใช้เวลาประมาณครั้งละ 15-20 นาที

หากผลการทดสอบหาเชื้อใช้หัดใหญ่อีกวิธีหนึ่งเพื่อยืนยัน พบว่าผู้ป่วยที่เป็นสมาชิกในครอบครัวของท่านไม่ได้เป็นไข้หัดใหญ่จริง โครงการจะแจ้งให้ทราบ และหยุดการศึกษาวิจัยต่อท่านและครอบครัว หากผลการทดสอบอีกวิธียืนยันว่าผู้ป่วยที่เป็นสมาชิกในครอบครัวของท่านเป็นไข้หัดใหญ่จริง ท่านและครอบครัวจะคงอยู่ในการศึกษาวิจัยนี้ต่อไป

หากท่านเข้าร่วมโครงการนี้ ครอบครัวของท่านจะได้รับการสุ่มเลือกเข้ากลุ่มการศึกษาวิจัยกลุ่มใดกลุ่มหนึ่งในทั้งหมด 3 กลุ่ม ความแตกต่างระหว่างกลุ่มเหล่านี้ จะช่วยเพิ่มความรู้เรื่องวิธีที่เชื้อไวรัสไข้หัดใหญ่ติดต่อสู่คน และจะช่วยในการหาวิธีป้องกันไม่ให้ผู้คนเป็นโรคไข้หัดใหญ่

สิทธิในการเข้าร่วมและการถอนตัวอาสาสมัครในโครงการ

ท่านมีอิสระที่จะเลือกเข้าร่วมโครงการนี้หรือไม่ก็ได้ การที่ท่านจะเข้าร่วมหรือไม่เข้าร่วมโครงการนี้จะไม่ส่งผลกระทบต่อการรักษาพยาบาลของท่านในอนาคต นอกจากนี้ท่านยังสามารถถอนตัวออกจากโครงการได้ทุกเมื่อ และการตัดสินใจถอนตัวจะไม่มีผลต่อการรักษาพยาบาลของท่านเช่นกัน

การปกป้องสิทธิส่วนบุคคลและการรักษาข้อมูลส่วนบุคคล

ข้อมูลที่ท่านให้แก่พยาบาลวิจัย ซึ่งเป็นส่วนหนึ่งของการศึกษาวิจัยนี้ จะถูกเก็บเป็นความลับในที่ที่มีกุญแจปิดอย่างปลอดภัย ชื่อของท่านจะถูกเก็บเป็นความลับ โดยจะมีการใช้รหัสแทนชื่อ และพยาบาลวิจัยท่านนั้นที่ดูแลข้อมูลนี้ได้ 2 ปีนับจากการตีพิมพ์เผยแพร่ผลการศึกษาวิจัยต่อสาธารณชนแล้ว ข้อมูลทั้งหมดจะถูกลบหรือทำลายทิ้งไป

ค่าตอบแทนแก่อาสาสมัครในการเข้าร่วมโครงการ

หากครอบครัวของท่านได้รับเลือกให้เข้าร่วมโครงการนี้ ทางโครงการจะจ่ายค่าตอบแทนเป็นค่าชดเชยเวลาและค่าใช้จ่ายต่างๆที่เกิดขึ้นเนื่องจากการเข้าร่วมโครงการ หลังการนัดพบแต่ละครั้ง พยาบาลวิจัยจะจ่ายค่าตอบแทนแก่ครัวเรือนของท่าน 100-800 บาทต่อครั้งต่อครัวเรือน หากเข้าร่วมตลอดโครงการรวมเป็นจำนวนเงิน 1,200-2,000 บาทต่อครัวเรือน

ท่านมีความเสี่ยงอะไรจากการเข้าร่วมในโครงการศึกษาวิจัยนี้

โครงการศึกษาวิจัยนี้จะไม่ก่อให้เกิดอันตราย ต่อสุขภาพของท่าน การปัสสาวะในจุกและในคอเพื่อเก็บตัวอย่างมาทดสอบหาเชื้อใช้หัดใหญ่ อาจทำให้ท่านรู้สึกอึดอัดและรำคาญได้ การปัสสาวะในจุกอาจมีโอกาสนำให้มีเลือดออกได้บ้างเล็กน้อย การเจาะเลือดอาจทำให้ท่านรู้สึกเจ็บ อาจมีจำเป็นบริเวณที่เจาะในเวลาต่อมาและผิวหนังส่วนที่ปิดด้วยผ้าปิดแผลอาจจะแดงขึ้น

ท่านจะได้รับประโยชน์อะไรจากการเข้าร่วมในโครงการศึกษาวิจัยนี้

การที่ท่านเข้าร่วมโครงการนี้จะไม่มีผลประโยชน์โดยตรงต่อท่าน แต่การที่ท่านเข้าร่วมโครงการจะทำให้เราทราบว่าความคิดเห็นของใช้หัวใจใหญ่เป็นอย่างไร และเราอาจช่วยหยุดยั้งการติดต่อนั้นได้อย่างไร

การซักถามข้อสงสัยจากโครงการ

หากท่านมีข้อสงสัยใดๆเกี่ยวกับโครงการศึกษาวิจัยนี้ หรือท่านคิดว่าอาจได้รับอันตรายจากการศึกษาวิจัย ท่านสามารถสอบถามข้อมูลได้จากเจ้าหน้าที่ของโครงการหรือโทรศัพท์สอบถามโดยตรงจาก พญ. ปิยรัชต์ สันตะรัตติวงศ์ แพทย์ประจำโครงการได้ ที่หมายเลข 085-910-1840 หากท่านมีข้อสงสัย เกี่ยวกับสิทธิของท่านในฐานะอาสาสมัครผู้เข้าร่วมโครงการ กรุณาสอบถามจาก คุณศศิชล คำเพราะ เลขานุการ คณะกรรมการพิจารณาการศึกษาวิจัยในมนุษย์ ของสถาบันสุขภาพเด็กแห่งชาติมหาราชินี ศูนย์วิจัยและพัฒนา อาคารสถาบันสุขภาพเด็กแห่งชาติมหาราชินี ชั้น12 โทรศัพท์/โทรสาร 02-644-8943 หรือโทร 02-354-8333 ถึง 43 ต่อ 5210, 5211

ข้าพเจ้าได้รับการชี้แจงเกี่ยวกับการศึกษาวิจัย HITS ได้อ่านใบคำยินยอมด้วยความสมัครใจนี้แล้ว ข้าพเจ้าได้สอบถามและได้รับคำตอบในข้อสงสัยทุกประการแล้ว ข้าพเจ้าได้รับสำเนาใบยินยอมจำนวน 1 ฉบับเก็บไว้ ข้าพเจ้ายินยอมด้วยความสมัครใจที่จะเข้าร่วม โครงการ HITS

กรุณาทำเครื่องหมายหนึ่งข้อ:

- ข้าพเจ้านุญาตให้พยาบาลของโครงการศึกษาวิจัยจะเลือดข้าพเจ้าประมาณ 5 cc (เท่ากับ 1 ช้อนชา) ตามที่ได้ระบุไว้ในใบยินยอมด้วยความสมัครใจฉบับนี้
- ข้าพเจ้าไม่อนุญาตให้พยาบาลของโครงการศึกษาวิจัยจะเลือดของข้าพเจ้า

ชื่อผู้ให้ความยินยอม (ตัวบรรจง)

ลายมือชื่อ

วันที่ / เดือน / พ.ศ.

หลังจากนำตัวอย่างตรวจไปตรวจหาเชื้อใช้หัวใจใหญ่ตามที่ได้อ้างไว้ในโครงการแล้ว อาจยังมีตัวอย่างตรวจเหลืออยู่แทนที่จะทำลายทิ้งไป โครงการมีความประสงค์ที่จะเก็บรักษาไว้ เพื่อใช้ในการตรวจเชื้อใช้หัวใจใหญ่เพิ่มเติมในอนาคต ตัวอย่างตรวจนี้จะไม่ใช่เพื่อการตรวจทางพันธุกรรม ขาย หรือใช้เพื่อการพาณิชย์ หากท่านไม่ประสงค์ที่จะให้มีการเก็บตัวอย่างตรวจที่เหลือนี้ไว้ ท่านสามารถแจ้งความประสงค์ให้พยาบาลวิจัยทราบและจะได้ทำลายตัวอย่างดังกล่าวทิ้งไป

กรุณาทำเครื่องหมายหนึ่งข้อ:

- ข้าพเจ้านุญาตให้สถาบันสุขภาพเด็กแห่งชาติมหาราชินีเก็บตัวอย่างตรวจที่เหลือของข้าพเจ้าไว้ตามที่ได้ระบุไว้ในหนังสือแสดงความยินยอมฉบับนี้
- ข้าพเจ้าไม่อนุญาตให้สถาบันสุขภาพเด็กแห่งชาติมหาราชินีเก็บตัวอย่างตรวจที่เหลือของข้าพเจ้า

ชื่อผู้ให้ความยินยอม (ตัวบรรจง)

ลายมือชื่อ

วันที่ / เดือน / พ.ศ.

ลายมือชื่อ และชื่อตัวบรรจงของพยาบาลวิจัยที่รับความยินยอม

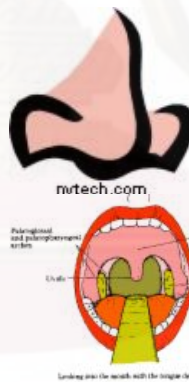
ลายมือชื่อ และชื่อตัวบรรจงของพยาน

เลขประจำตัวครัวเรือน: _____

โครงการศึกษาวิจัยเรื่องการติดต่อของเชื้อไข้หวัดใหญ่ภายในครัวเรือน (HITS) สมาชิกเด็กในครัวเรือนอายุ 7-17 ปีให้ความตกลงยินยอมด้วยความสมัครใจ เป็นลายลักษณ์อักษรที่จะเข้าร่วมโครงการศึกษาวิจัย

หมายเหตุ: เนื่องจากบุคคลอายุ 7-17 ปี ยังไม่บรรลุนิติภาวะตามกฎหมายไทย ดังนั้นก่อนที่จะเข้าร่วมโครงการศึกษาวิจัย จะต้องได้รับความยินยอมด้วยความสมัครใจจากบิดา มารดาหรือผู้ปกครองด้วย (ตรวจสอบใบยินยอมของบิดามารดาหรือผู้ปกครองด้วยความสมัครใจ A 6 หรือ A 7)

ศูนย์ควบคุมและป้องกันโรคแห่งชาติ ประเทศสหรัฐอเมริกา ได้ทำงานร่วมกันกับสถาบันสุขภาพเด็กแห่งชาติมหาราชินี ประเทศไทย เพื่อศึกษาวิจัยเกี่ยวกับโรคไข้หวัดใหญ่ ทางโครงการต้องการทราบว่าใครติดเชื้อไข้หวัดใหญ่ได้บ้าง ไข้หวัดใหญ่ติดต่อได้อย่างไร และผู้คนจะหยุดยั้งการติดต่อของไข้หวัดใหญ่ได้อย่างไร เนื่องจากเด็กคนหนึ่งในบ้านเดียวกันกับท่าน/หนู น่าจะป่วยเป็นไข้หวัดใหญ่ เราจึงอยากขอให้ท่าน/หนู เข้าร่วมในโครงการศึกษาวิจัยนี้ ซึ่งเรียกย่อๆเป็นภาษาอังกฤษว่า “โครงการ HITS” ให้ถามคำถามถ้าท่าน/หนูมีข้อสงสัย



เรากำลังทำการศึกษาว่าเชื้อไข้หวัดใหญ่สามารถติดต่อสู่คนภายในครอบครัวได้อย่างไร และจะมีวิธีที่ดีที่สุดที่จะลดการแพร่กระจายของเชื้อไข้หวัดใหญ่ได้ ฉะนั้นเราจึงอยากที่จะเปรียบเทียบกลุ่มประชากรต่างๆที่ใช้วิธีการติดต่อของเชื้อไข้หวัดใหญ่แบบต่างๆ เราจะใช้วิธีง่ายๆเช่น โยนเหรียญว่าออกหัวหรือก้อย เพื่อสุ่มเลือกกลุ่มให้ท่าน/หนูเข้าร่วม ด้วยวิธีนี้ท่าน/หนูจะมีโอกาสเท่าๆกันว่าจะได้เข้าไปอยู่ในกลุ่มใดกลุ่มหนึ่งใน 3 กลุ่มการศึกษา เฉพาะท่าน/หนูและพยาบาลวิจัยเท่านั้นที่จะทราบว่าท่าน/หนูอยู่ในกลุ่มใด

หากท่าน/หนู เข้าร่วมการศึกษาวิจัยครั้งนี้ พยาบาลของโครงการจะนัดเจอท่าน/หนู 3 ครั้งภายในเวลา 7 วันนับจากวันนี้ อีกครั้งหนึ่งใน 3 สัปดาห์ถัดไป และอาจจะมีการนัดอีกครั้งใน 6 เดือนถัดไปได้ พยาบาลอาจจะไปพบท่าน/หนูที่บ้าน หรือท่าน/หนูและครอบครัวอาจจะมาพบพยาบาลที่โรงพยาบาล ในแต่ละครั้งพยาบาลจะถามคำถาม ให้คำแนะนำเป็นทางเลือกในการดูแลสุขภาพอนามัย และตรวจหาเชื้อไข้หวัดใหญ่ โดย 3 ครั้งแรก จะ

ทำการป้ายน้ำมูกจากในจมูกและป้ายในคอของท่าน/หนูด้วยไม้พันสำลี ท่าน/หนูอาจรู้สึกอึดอัดรำคาญ และ อาจมีเลือดออกเล็กน้อยจากการป้ายในจมูก ใน 2 ครั้งของการนัดพยาบาลจะขอเจาะเลือดจำนวนไม่เกิน 5 ซีซี หรือไม่เกิน 1 ซีซี การเจาะเลือดอาจจะทำให้เจ็บบริเวณที่เจาะ อาจมีรอยจ้ำ และผิวหนังที่ติดพลาสติกไว้อาจจะแดงได้ ในระหว่างการนัดแต่ละครั้งจะขอให้ท่าน/หนูตอบคำถามลงในบันทึกประจำวันด้วย การนัดครั้งแรกจะใช้เวลาประมาณ 1 ชั่วโมง และการนัดครั้งต่อไปจะใช้เวลาประมาณครั้งละ 15-20 นาที

ถ้าผลการตรวจหาใช้หัดใหญ่อีกริธีหนึ่งต่อมา พบว่าเด็กที่น่าจะเป็นไข้หัดใหญ่ที่อยู่บ้านเดียวกับท่าน/หนูไม่ได้เป็นไข้หัดใหญ่จริง พยาบาลจะแจ้งให้ทราบและหยุดเยี่ยมบ้านท่าน/หนู และการศึกษาวิจัยกับครอบครัวท่าน/หนูจะสิ้นสุดลง แต่ถ้าผลการตรวจหาใช้หัดใหญ่อีกริธีหนึ่งยืนยันว่าเด็กคนดังกล่าวเป็นไข้หัดใหญ่จริงๆ ท่าน/หนูจะอยู่ร่วมในโครงการต่อไป

ข้อมูลที่ท่าน/หนูบอกหรือให้กับพยาบาล จะถูกเก็บเป็นความลับในที่มีกฎหมายปิดอย่างปลอดภัย ชื่อของท่าน/หนูจะถูกเก็บเป็นความลับ โดยใช้รหัสแทนชื่อของท่าน/หนู และพยาบาลของโครงการวิจัยเท่านั้นที่จะดูข้อมูลนี้ได้ หลังจากผลการศึกษาวิจัยได้ตีพิมพ์ออกเผยแพร่ต่อประชาชนทั่วไปแล้ว 2 ปี ข้อมูลนี้จะถูกลบหรือทำลายทิ้ง

ท่าน/หนูมีอิสระที่จะเลือกเข้าร่วมหรือไม่เข้าร่วมโครงการก็ได้ หากท่าน/หนูจะไม่เข้าร่วม การดูแลรักษาพยาบาลท่าน/หนูจะไม่เปลี่ยนแปลง หากท่าน/หนูเข้าร่วมโครงการนี้แล้วและอยากถอนตัวออกจากโครงการก็สามารถทำได้ โดยการดูแลรักษาพยาบาลท่าน/หนูก็จะไม่เปลี่ยนแปลงเช่นกัน โครงการศึกษาวิจัยนี้จะไม่เป็นอันตรายต่อท่าน/หนู และไม่มีผลประโยชน์โดยตรงสำหรับท่าน/หนู แต่การร่วมโครงการของท่าน/หนูจะทำให้เรารู้ว่าไข้หัดใหญ่คิดต่อสู่คนได้อย่างไร และจะหยุดยั้งการติดต่อได้อย่างไร

พ่อ/แม่ หรือผู้ปกครองของท่าน/หนูได้ให้ความยินยอมด้วยความสมัครใจ ให้ท่าน/หนูเข้าร่วมการศึกษาวิจัยครั้งนี้ได้ แต่ท่าน/หนูก็ไม่จำเป็นต้องเข้าร่วมโครงการ ถ้าท่าน/หนูไม่ต้องการ

หากมีข้อสงสัยใดๆเกี่ยวกับโครงการศึกษาวิจัยนี้ ท่าน/หนูสามารถถามข้อมูลได้โดยตรงจากเจ้าหน้าที่ของโครงการ หรือโทรศัพท์ถาม จาก พญ. ปิยรัชต์ สันตะรัตติวงศ์ แพทย์ประจำโครงการ ได้ที่หมายเลข 085-910-1840 หากท่าน/หนู มีข้อสงสัยเกี่ยวกับสิทธิของท่าน/หนูในฐานะผู้เข้าร่วมโครงการ ให้สอบถามจาก คุณศศิชล คำเพราะ ที่หมายเลข 02-644-8943

ข้าพเจ้า/หนูได้รับการชี้แจงและได้อ่านเกี่ยวกับโครงการศึกษาวิจัยนี้จนเข้าใจแล้ว ได้ซักถามและได้รับคำตอบในข้อสงสัยทุกอย่าง ข้าพเจ้า/หนูต้องการที่จะเข้าร่วมโครงการนี้ด้วยความสมัครใจ

ชื่อเด็ก (ตัวบรรจง)

_____/_____/_____
วัน / เดือน / พ.ศ.

ลายมือชื่อเด็ก

กรุณาวางกลมหนึ่งข้อ:

- (1) ข้าพเจ้า/หนูอนุญาตให้เจาะและเก็บตัวอย่างเลือดของข้าพเจ้า/หนูตามที่ได้ระบุไว้ในใบยินยอมฉบับนี้
- (2) ข้าพเจ้า/หนูไม่อนุญาตให้เจาะและเก็บตัวอย่างเลือดของข้าพเจ้า/หนู

ลายมือชื่อเด็ก

หลังจากนำตัวอย่างตรวจจากการป้ายน้ำมูกในจมูกและป้ายในคอ และจากเลือดไปตรวจครบตามที่ได้วางแผนการวิจัยไว้แล้ว โครงการต้องการเก็บตัวอย่างตรวจที่เหลือไว้ที่โรงพยาบาล และจะตรวจเชื้อไขหวัดใหญ่เท่านั้น ถ้าท่าน/หนูไม่ต้องการให้เราเก็บตัวอย่างตรวจไว้ ท่าน/หนู สามารถแจ้งแก่พยาบาลได้ และทางโครงการจะทำลายตัวอย่างตรวจนั้นทิ้งไป

กรณาวางกลมหนึ่งข้อ:

- (1) ข้าพเจ้า/หนู อนุญาตให้สถาบันสุขภาพเด็กแห่งชาติมหาราชินีเก็บรักษาตัวอย่างตรวจที่เหลือของข้าพเจ้า/หนูไว้
- (2) ข้าพเจ้า/หนู ไม่อนุญาตให้สถาบันสุขภาพเด็กแห่งชาติมหาราชินีเก็บรักษาตัวอย่างที่เหลือของข้าพเจ้า/หนูไว้

ลายมือชื่อเด็ก

หมายเหตุ: สำหรับเด็กอายุ 7-17 ปี ต้องได้รับความยินยอมด้วยความสมัครใจจากบิดามารดา หรือผู้ปกครองก่อน (ตรวจสอบใบยินยอมด้วยความสมัครใจ A 6 หรือ A 7)

ลายมือชื่อ และชื่อตัวบรรจงของพยาบาลวิจัยที่รับความยินยอม

ลายมือชื่อ และชื่อตัวบรรจงของพยาน

เลขประจำตัวสมาชิกครัวเรือน: _____

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1992–1996 Bachelor Degree of Communication Arts, Sukhothaithammathirat University, Nonthaburi, Thailand

1994 -1996 Master Degree of Health Education from Chulalongkorn University, Bangkok, Thailand

Professional experiences

1991-1994 Pediatric nurse, Department of Nursing, Chulalongkorn Hospital

1996-1998 Research nurse, Institute of Health Research, Chulalongkorn University

1999- 2000 Research nurse, HIV-NAT AIDS research center, Thai Red Cross

2001- 2002 Research coordinator, Bristol Myers Squibb (Thailand) Ltd.

2002- 2004 Research coordinator, Pediatric AIDS Clinical Trial Group, Thailand

Jan 2005- present-Research coordinator, Influenza section, International Emerging Infections Program/ Thailand MOPH-US.CDC Collaboration

จุฬาลงกรณ์มหาวิทยาลัย