

**KNOWLEDGE, ATTITUDE AND PRACTICE
OF KINDERGARTEN TEACHERS TOWARD HAND FOOT AND
MOUTH DISEASE IN KINDERGARTEN SCHOOLS UNDER
CONTROL OF BANGKOK PRIMARY EDUCATION OFFICE**

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**A THEMATIC PAPER SUBMITTED IN PARTIAL
FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF SCIENCE
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2015**

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I am also thankful to School director as well as school teachers from all invited schools, for giving me the opportunity to conduct this research project with 60 kindergarten teachers in 10 kindergarten schools under the control of Bangkok Primary Education Office, Bangkok, Thailand. I am deeply thankful to all the respondents who actively participated in this study. In addition, I am extremely thankful for their great contributions at the time of data collection using face to face interview, in- depth interview as well as checklists for school environmental and hygiene observation for this study.

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ABSTRACT

Hand Foot and Mouth Disease (HFMD) mainly affects young children, causing outbreaks in pre and primary schools. Kindergartens are considered as the most vulnerable spreading places and kindergarten teachers' knowledge, attitude and practice (KAP) potentially impact on the disease prevention.

This cross sectional study used a face to face interview open-ended questionnaire to collect data on KAP on disease prevention policy adaptation. The sample population was 60 kindergarten teachers drawn from 10 schools under control of Bangkok Primary Education Office. The school observation for school environment, sanitation and hygiene was done using a check list adapted from the Ministry of Education (MOE) and Ministry of Public Health (MOPH) for school. The in-depth interview was also conducted with 10 randomly selected kindergarten teachers, one from each school.

Among the 60 teachers, 43 (71.7%) showed moderate level of knowledge, 10 (16.7%) were poor and only 7 (11.7%) were high. Almost all 54 (90.0%) of the kindergarten teachers showed high level of attitude on HFMD. As for the practice, 46 (76.7%) exhibited high level, 12 (20.0%) were moderate and only 2 (3.33%) were poor. There was no significant association of teachers' age, working experience and experience on HFMD with their KAP

The results of school observations using >80% of full score as the indicator for good hygiene and sanitary school, showed that all met good sanitation and hygiene criteria. All had a high number of children in one class (>30/ class) and only half 5 (50%) schools provided soap at hand washing facilities for the pupils.

Conclusion, the overall KAP level of the kindergarten teachers was moderately high. The school sanitation and hygiene was high. Schools should provide training courses related to health and diseases to teachers. Teachers should pay more attention to the disease guidelines and the MOE and MOPH's school policy. It is important for schools to focus on hygiene and provide soap at hand washing basins in schools. Further study should explore the finding in other school contexts.

**KEY WORDS: HAND FOOT AND MOUTH/ HFMD/ KINDERGATEN/ TEACHER/
KNOWLEDGE/ ATTITUDE/ PRACTICE/ KAP**

103 pages

ความรู้ ทักษะคติ และการปฏิบัติ ของครูผู้สอนนักเรียนอนุบาล ต่อโรคมือเท้าปาก ในโรงเรียนอนุบาล
สังกัดสำนักงานการประถมศึกษา กรุงเทพมหานคร

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บทคัดย่อ

โรคมือเท้าปากส่งผลกระทบต่อเด็กเล็ก ก่อให้เกิดการระบาดในโรงเรียนอนุบาล และโรงเรียนประถม โรงเรียน
อนุบาลถูกถือว่าเป็นแหล่งแพร่กระจายของโรคที่สำคัญ ความรู้ ทักษะคติ และการปฏิบัติ ของครูผู้สอนนักเรียนอนุบาลส่งผลต่อ
การป้องกันโรคนี้นี้ในเด็กนักเรียน

การวิจัยนี้ ใช้การสัมภาษณ์แบบตัวต่อตัว ที่ใช้คำถามปลายเปิด เพื่อสอบถามเกี่ยวกับ ความรู้ ทักษะคติ และการ
ปฏิบัติ และนโยบายต่อการป้องกันโรคในครูผู้สอนนักเรียนอนุบาล จำนวน 60 ท่าน จากโรงเรียนอนุบาลจำนวน 10 แห่ง ใน
สังกัดสำนักงานการประถมศึกษา กรุงเทพมหานคร และยังทำการศึกษาเพิ่มเติมโดยการสำรวจและสังเกตสิ่งแวดล้อม และ
สุขอนามัยโรงเรียนโดยใช้รายการตรวจสอบที่ดัดแปลงจากคู่มือโรงเรียน จากกระทรวงศึกษาธิการและกระทรวงสาธารณสุข
และการสัมภาษณ์แบบเชิงลึกในครูผู้สอนนักเรียนอนุบาลจำนวน 10 ท่าน หนึ่งท่านจากหนึ่งโรงเรียน

ในจำนวนครูทั้ง 60 ท่าน มี 43 (71.7%) ท่าน ที่มีความรู้ ในระดับปานกลาง ในขณะที่ 10 (16.7%) ท่าน อยู่ใน
ระดับต่ำ และมีเพียง 7 (11.7%) ท่าน, เกือบทั้งหมด ที่ 54 (90.0%) ของ ครูผู้สอนอนุบาลมีทัศนคติ เกี่ยวกับ โรคมือเท้าปาก สูง
อยู่ในระดับสูง สำหรับการปฏิบัติ มีครู 46 (76.7%) ท่าน อยู่ในระดับสูง ในขณะที่ 12 (20.0%) ท่านอยู่ในระดับปานกลาง และมี
เพียง 2 (3.33%) ท่าน อยู่ในระดับต่ำ ทั้งนี้อายุ ประสบการณ์การทำงาน และประสบการณ์การเจอโรคมือเท้าปากบ่อย ไม่ส่งผล
เกี่ยวข้องหรือกระทบกับความรู้ ทักษะคติ และการปฏิบัติ ของครูผู้สอนนักเรียนอนุบาล ต่อ โรคมือเท้าปากบ่อยเลย

ผลของการสังเกตสิ่งแวดล้อมและสุขอนามัยโรงเรียนโดยใช้รายการตรวจสอบแสดงว่าโรงเรียนที่มีคะแนน
>80% ของคะแนนทั้งหมดเป็นโรงเรียนที่อยู่ในเกณฑ์มาตรฐานสิ่งแวดล้อมและสุขอนามัย และโรงเรียนทั้ง 10 โรงเรียนที่เข้า
ร่วมการศึกษานี้เป็นโรงเรียนที่อยู่ในเกณฑ์มาตรฐาน แต่ทุกโรงเรียนมีนักเรียนมากกว่า 30 คนต่อชั้นเรียน และมีเพียง 5 โรงเรียน
ที่มีสปูให้นักเรียนใช้ที่อ่างล้างมือ

ความรู้ ทักษะคติ และการปฏิบัติโดยรวม ของครูผู้สอนนักเรียนอนุบาลในการวิจัยนี้อยู่ในระดับค่อนข้างสูง
สุขอนามัยโรงเรียนอยู่ในเกณฑ์ดีมาก ผลการศึกษาพบว่าครูขาดการฝึกอบรมเพิ่มเติมเรื่องสุขภาพและการป้องกันโรค ทาง
โรงเรียนที่อยู่ในการศึกษาในครั้งนี้ควรจัดให้มีหลักสูตรการฝึกอบรมที่เกี่ยวกับ สุขภาพ และโรคต่างๆ ให้กับครู, ครูควรจะ
ตื่นตัวเกี่ยวกับแนวทางการเกิดโรค และ นโยบายของโรงเรียน จากกระทรวงสาธารณสุข และ กระทรวงศึกษาธิการ มากกว่านี้,
มันเป็นสิ่งสำคัญสำหรับโรงเรียนที่จะ มุ่งเน้น เกี่ยวกับสุขอนามัย และมีสปูให้นักเรียนใช้ที่บริเวณอ่างล้างมือในโรงเรียน
การศึกษาต่อไปควรทำการศึกษาโรงเรียนในบริบทอื่น

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LIST OF ABBREVIATIONS

HFMD	Hand Foot and Mouth Disease
WHO	World Health Organization
CNS	Central Nervous System
EV71	Enterovirus71
CA16	CoxsackievirusA16
OBEC	The Office of Basic Education Commission
BPEO	Bangkok Primary Education Office
BSEO	Bangkok Secondary Education office
KAP	Knowledge, Attitude and Practice
MOPH	Ministry Of Public Health
SAR	Special Administrative Region
BoE	Bureau of Epidemiology
CVA	Coxsackievirus type A
CVB	Coxsackievirus type B
IV	Intravenous
IDI	In-depth interview

CHAPTER I

INTRODUCTION

1.1 Background and Justification

Hand Foot Mouth and Disease (HFMD) is an emerging epidemiology worldwide. HFMD is an infectious disease caused by Enterovirus genus including Coxsackieviruses A (CA), Coxsackieviruses B (CB), Echoviruses, Polioviruses and Enterovirus which are transmitted through direct contact with the mucus, saliva, or feces of an infected person. The disease affects mainly infants and young children; causing a range of symptoms from self-limited febrile illness, high fever with skin eruptions over the hands and feet and vesicles in the mouth to severe CNS infection. Infection with Enterovirus 71 (EV71) is of particular concern as it can cause severe complications in young children and sometime resulting in death. Many small and large outbreaks associated with EV71 infection have been reported throughout the world since the early 1970s [1].

Outbreaks of HFMD occur worldwide. Asian countries have recently been burdened with more frequent and extensive outbreaks of HFMD and countries with recent large increases in the number of reported cases are China, Japan, Hong Kong, Republic of Korea, Malaysia, Singapore, Thailand, Taiwan and Viet Nam [1].

HFMD typically as epidemics mainly in young children, causing outbreaks in nurseries or kindergartens and primary schools. There are some variations of genotypic diversity of the enterovirus, particularly of EV71 and coxsackievirus A16 (CA16) with different disease prevalence and severity in different regions. This could contribute to the difference in public health responses among Asian countries. The failure of HFMD control is also partly attributable to lack of an evidence-based consensus of a standard operating procedure. Recently, most Asian countries have had increases of HFMD with variable public health responses. Despite the WHO guidelines for HFMD control, an effective containment is yet to be established. World organization has disseminated “A Guide to Clinical Management and Public Health

Response for HFMD” since 2010, but the disease containment method is generally not effective in many Asian countries. It is not known how many countries have adopted, adapted or ignored the guidelines all together.

HFMD has potentially becoming Thai public health problem in the near future, since HFMD outbreaks occurred in many of Thailand neighboring countries such as Malaysia in 1997, 2000, 2003, 2006, and Vietnam in 2008, 2011 [2]. In Thailand, HFMD prevalence is increasing every year; moreover, National Institute of Health of Thailand (Thailand NIH), also reported increasing trend of the severe serotype EV71 infection [3]. In the 2012 HFMD outbreak, the number of HFMD cases, is higher than ever. Even though, the fatality rate of HFMD is very low, the 2012 outbreak in Thailand and Cambodia caused panic in Thai society.

In term of economic impact, the median duration of illness for HFMD was 7 days and median number of missed days from school was 1 days. Direct medical costs varied from \$69 to \$771 per case and indirect costs varied from \$63 per case for HFMD to \$422 per case for other severe complications [4].

From the factors mentioned above, the prevention and control of the HFMD should not be overlooked. Since there is no effective HFMD vaccine so far, the HFMD prevention and control in young children rely on good knowledge, attitude and practice of kindergarten teachers towards HFMD which is one of the effective method to control the disease [5].

According to the report from ministry of public health (MOPH), Thailand the as in figure 1.1 shows the geographic distribution of the study population during the HFMD outbreak in 2012 in Thailand. Closed circles on the map indicate the locations and numbers of patients collected during the outbreak period. Data of the estimated numbers of cases per 100,000 people per year in different regions were obtained from the Thai Ministry of Public Health of Thailand and are indicated under the geographic region (black) [6] (Figure 1.1).

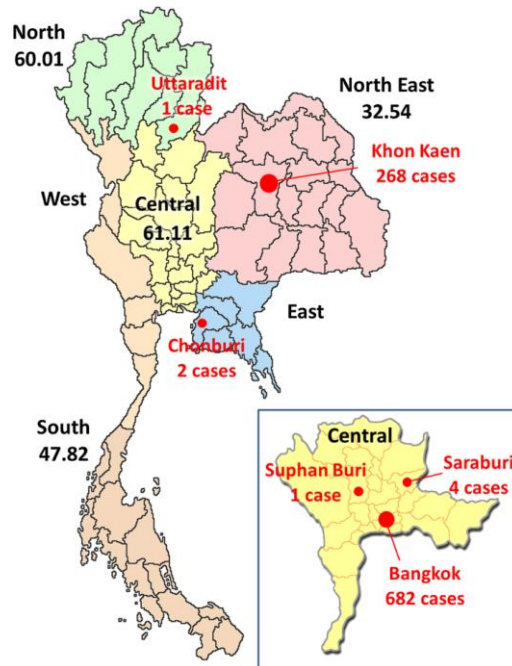


Figure 1.1 Geographic distribution of the study population during the HFMD outbreak in 2012 in Thailand.

http://www.researchgate.net/figure/260252660_fig1_Geographic-distribution-of-the-study-population-during-the-HFMD-outbreak-in-2012-in

This research aims to conduct a survey in kindergarten schools under control of Bangkok primary education office (BPEO), (สพป. กทม.), which is under the Office of Basic Education Commissions (OBEC), (สพฐ.) in Bangkok, Thailand and to initiate the qualitative and quantitative evaluation of current control measures and guidelines in Thailand. The kindergarten survey will comprise of related components i.e. (1) Knowledge, attitude and practice of kindergarten teachers in kindergarten schools under control of BPEO (สพป. กทม.), Bangkok Thailand. (2) The sanitation and hygiene of kindergarten schools under control of BPOE (สพป. กทม.), Bangkok Thailand.

1.2 Research Questions

1. How are the knowledge, attitude and practice of kindergarten teachers in kindergarten schools under control of BPEO (สพป. กทม.), Bangkok Thailand?
2. How are the sanitation and hygiene of kindergarten schools under control of BPEO (สพป. กทม.), Bangkok Thailand?

1.3 Objectives of the study

1. To explore the knowledge, attitude and practice of kindergarten teachers towards hand foot and mouth disease in kindergarten schools under control of BPOE (สพป. กทม.), Bangkok Thailand.
2. To explore the sanitation and hygiene of kindergarten schools under control of BPEO (สพป. กทม.), Bangkok Thailand.

1.4 Hypothesis

The knowledge, attitude and practice of the HFMD disease among the kindergarten teachers in kindergarten schools under control of BPOE (สพป. กทม.) are high. The school sanitation and hygiene are high compare to the national standard guideline.

1.5 Scope of the study

Kindergarten schools under control of BPOE (สพป. กทม.), Bangkok Thailand; the exploration for the knowledge, attitude and practice of kindergarten personnel towards Hand Foot and Mouth Disease will be conducted using the qualitative and quantitative research tools; structural questionnaires and in-depth interview as well as a series of checklists for the observation on the school's sanitation and hygiene.

1.6 Significant of the study

The study will be the first data base of HFMD in prevalence and level of knowledge, attitude and practice among kindergarten teachers towards hand foot and mouth disease. The study results may contribute to the HFMD prevention measure.

1.7 Conceptual framework

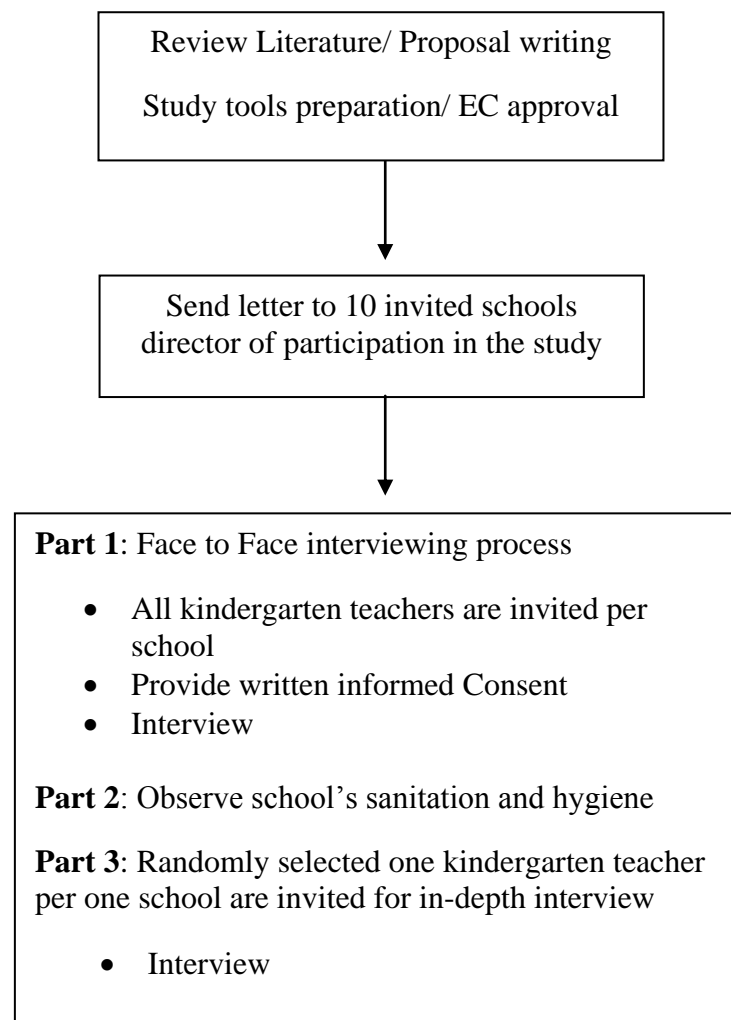


Figure 1.2 Conceptual framework

CHAPTER II

LITERATURE REVIEW

In chapter 2, literature related to Hand Foot and Mouth Disease (HFMD) research, general knowledge about HFMD, guidelines for HFMD preventions and controls are reviewed. The teachers and kindergarten context about KAP impact on the infectious diseases including HFMD is also reviewed. Importantly, the standard survey study and the study tools development knowledge are include and presented in this chapter.

2.1 General fact about Hand Foot Mouth Disease

Hand, foot mouth disease (HFMD) is a viral illness caused by Enterovirus genus including Coxsackieviruses A (CA), Coxsackieviruses B (CB), Echoviruses, Polioviruses and Enterovirus that usually affects infants and children at the age younger than 5 years old. However, it can sometimes occur in adults. Symptoms of HFMD are characterized by brief febrile illness, rashes on the palms, soles and or buttocks and vesicles or ulcers in the oral cavity.

Individual cases and outbreaks of HFMD occur worldwide. In countries with temperate climates, cases occur more often in the spring to fall. In tropical, the disease distribution pattern is a whole year round but the peaks of the disease are varied in difference geographical areas. Generally, every country in Asia has at least one outbreak of HFMD every year, while the outbreak time happens mostly in spring and summer, and the outbreak peak is regular in every country except Thailand [7].

In China the peak season of the disease is heterogeneous for and also demonstrates the correlated of the diseases outbreak with the level of socioeconomic status [8]. The study from Thailand demonstrates by modeling that the pattern of HFMD case in Thailand is any time of the year, but appears to peak in the rainy and cold seasons. The distribution of outbreaks exhibited a clustered pattern [9]. Since

1997, large outbreaks of HFMD caused by Enterovirus 71 (EV71) have been reported mostly in children in east and Southeast Asia. In these outbreaks, most children have typical symptoms of HFMD and recover without health complications [10]. Although HFMD is commonly a self-limiting illness, outbreaks associated with EV71 as the primary causal agent have been particularly alarming because of its association with serious and fatal disease resulting from neurological and cardiopulmonary complications [11]. However, a small number of people with this disease develop severe complications requiring hospitalization or even causing death, it is causing panic to the community as well as the economic lost.

2.1.1 Epidemiology

HFMD is an endemic disease with global distribution and it is estimated that more than 50% of children under the age of 5 years are at risk. In a study in Singapore when comparing seropositivity with age, it was found that only 1 of the 124 (0.8%) samples from children ages 1–23 months had EV71 antibodies. Seropositive rate increase of 12% per year in the age of 2-5 years, EV71 antibody prevalence reached 50% after 5 years of age. These suggesting that most infections occur in preschool-aged children [12]. Epidemics have been detected throughout the Asia-Pacific regions since the late 1990s, including in Taiwan, eastern China, Australia, Singapore, Malaysia, Vietnam and Thailand [13]. Outbreaks of HFMD occur every few years in different parts of the world, but in recent years these have occurred more in Asia. Countries with recent large increases in the number of reported cases in Asia include: China, Japan, Hong Kong (China), Republic of Korea, Malaysia, Singapore, Thailand, Taiwan (China) and Viet Nam [14]. Over the last year, the region has experienced a widespread occurrence of HFMD due to EV71 with outbreaks reported in China, Hong Kong SAR, Macao SAR, Taiwan, Mongolia, Vietnam, Malaysia and Singapore [13].

In Thailand, HFMD usually occurs during the rainy season (June–August); average incidence during 2007–2011 was 20.2 cases per 100,000 populations. In 2011, there were a total of 18,196 cases and 6 deaths reported. In 2012, an extensive outbreak of HFMD occurred; the incidence rate was 3-fold higher than the average incidence rate of 58.15 cases per 100,000 population or more than 36,000 cases; a

higher than usual number of cases has been reported corresponded with higher reported number from some other countries in the region. The total case reported was 16,860 cases included 2 fatal cases of EV71 encephalitis [15]. The outbreak has continued throughout the country in later years. The reported cases in 2013-2014 have been somewhat higher than in prior years.

In 2013, 46,053 HFMD cases were reported with morbidity rate was 72.50 per 100,000 populations. A proportion of female and male was 1:1.32. HFMD was mostly found among infants and young children group of 0-4 years old (1,058 per 100,000 populations). Most outbreaks were occurred in child care centers and kindergartens. The Northern, especially in Chiang Rai province were highest morbidity rate (120.84 per 100,000 populations in Northern and 255.41 per 100,000 populations in Chiang Rai). There were 72 events reported in the event base surveillance. A pattern of the disease was categorized into two groups. One was patients who infected to Enterovirus showed skin lesion and most of them were mild symptoms including fever, blisters and ulcers in mouth/hands/feet/bottom. The other group was patients who infected to Enterovirus without skin lesion and most of them were severe case. The severe complications such as high fever, frequent vomit and diarrhea, dehydration, fatigue, dozily, seizures, pulmonary edema, shock and unconscious, cardiomyositis, cardio-circulatory failure caused fatal case. A range of period from date of onset to date of death was 2-11 days (median was 6 days). The infected classmates and infected family members were important host in transmission of the disease. Eight of 12 death cases (67%) had positive results of EV-71 among cases or close contacts. Without a definitely sign of HFMD or Herpangina symptom, physicians should also consider other factors of close contact with neighbor or family members who had signs of HFMD [16].

In 2014, The Disease Control Department revealed that 34,834 children had suffered hand, foot and mouth disease between January 1 and July 20 but there was no serious outbreak or deaths. The provinces with the highest HFMD prevalence per 100,000 people are Trat (179.54), Rayong (165.33), Chiang Rai (120.51), Prachuap Khiri Khan (101.38) and Chanthaburi (99.95) [17].

Both types of Enteroviruses which cause HFMD, Coxsackie virus A16 (CA16) and EV71 have been previously known to circulate in Thailand. While several genotypes of EV71 circulate in Asia; to date, there is no demonstrated difference in virulence between genotypes [18].

2.1.2 Cause

Hand, Foot and Mouth Disease (HFMD) is a common illness of young children caused by a group of Enteroviruses, Enterovirus genus, belongs to Picornaviridae family, have more than 60 serotypes. The most common are poliovirus (3 serotypes), Coxsackievirus A (23 serotypes) and B (6 serotypes), Echovirus (30 serotypes), and Enterovirus 68-71. Enteroviruses classified by genetic sequences can be divided into four species, A, B, C and D. EV71 is classified in species A, which could be further divided into eleven subgenotypes, A, B (B1~B5) and C (C1~C5). Enteroviruses can cause numerous kinds of diseases, most are asymptomatic or only mild flu-like symptoms. Sometimes these viruses induce some specific clinical symptoms, including HFMD, herpangina, aseptic meningitis, viral meningitis, myocarditis, flaccid paralytic syndromes and acute hemorrhagic conjunctivitis. In all serotypes of Enterovirus, besides poliovirus, EV71 possess the high potential to induce central neural system complications. Some cases develop non-life-threatening complications such as meningitis, mild encephalitis, acute flaccid paralysis, while serious complications have potentially lethal consequences. The epidemics caused by enteroviruses have given rise to great attention in Asia [19].

Serotypes EV71 and CA16 are the most frequent causes of HFMD in Asia-pacific region [20]. HFMD illness is usually self-limiting. Severe complications of HFMD including neurological, pulmonary and cardiovascular complication rarely occur. Since the late 1990s the Asia Pacific region has experienced several large epidemics of HFMD in children that have been accompanied by higher rates of severe neurologic and cardio-pulmonary manifestations. These severe cases of HFMD are associated with EV71 infection, which appears to be increasing in the region and its emergence has prompted concern that it will continue to spread in the region and globally.

2.1.3 Transmission

Enteroviruses are transmitted predominantly via the fecal-oral route. However, there are some exceptions, including Coxsackievirus A21, which is spread mainly by respiratory secretions and Enterovirus 70, which is shed in tears and spread via fingers and fomites. Upon entry into the oropharynx, the virus replicates in submucosal tissues of the distal pharynx and alimentary tract. Viral particles are shed in the feces and in upper respiratory tract secretions for days prior to symptom onset. The average incubation period is 3-10 days, during which the virus migrates to regional lymphoid tissue and replicates. A minor viremia result, which is associated with the onset of symptoms, viral spreads to the reticuloendothelial system (spleen, liver and bone marrow).

Dissemination to target organs follows, and viral replication in target organs produces the major viremia with possible secondary seeding of the CNS. Potential target organs include the skin and CNS. Infectious virus is shed from the upper respiratory tract for 1-3 weeks and from the feces for 3-8 weeks. Enteroviruses undergoes a high rate of mutation during replication in the gastrointestinal tract, where single-site mutations can occur in the 5' noncoding region of the attenuated polioviruses; this can lead to prolonged excretion and neurovirulence.

The neuropathy of paralytic diseases caused by Enteroviruses is due to direct cellular destruction. Neuronal lesions occur mainly in anterior horn cells of the spinal cord. The 3 serotypes of poliovirus all bind to the cell surface receptor CD155 [21].

HFMD's transmission through vesicles and upper respiratory secretions is highly efficient. The primary site of Enterovirus replication is within the gastrointestinal tract. Patients with enteroviral illness excrete viruses in throat, nasal secretions or faeces before onset of symptoms and continue to excrete the virus for several weeks thereafter. Around 50-80% of HFMD enteroviral infections are asymptomatic. Chag LY and colleagues measured seroprevalence of neutralizing antibodies to EV71 before and after an epidemic , it was estimated that up to 71% of children with EV71 were asymptomatic and may have served as reservoirs for EV71 [22]. The source of infection could be both an asymptomatic or sick case. [23].

Young children are in the most susceptible age group Young children are in the most susceptible age group because they are less likely than adults to have antibodies and be immune from previous exposures to the disease, moreover, children also likely act as the primary reservoir for Enteroviruses. Propagation of HFMD disease by the oral fecal route is very efficient in situations where children congregate such as in childcare centers and schools as well as within households. Although children are the most contagious during the first week of the illness, the virus can remain in his or her body for weeks after the signs and symptoms subside. Adults can also pass the virus without showing any signs or symptoms of the disease.

Recently, Li J *et al*, reported the correlation that the severe HFMD case correlated with the longer viral shedding duration both in throat swab and fecal sample. This study also found that virus can be detected in throat swab sample 2-3 days prior to the clinical manifestations [24].

In the preschool such as kindergarten or child-care setting where there may be asymptomatic cases in addition to symptomatic cases not being detected and isolated are the most susceptible place for spreading. Moreover, children below 5 years of age who may not have acquired the same immunity are the most susceptible. In addition, other factors such as overcrowded of kindergarten and care centers, poor standard of hygiene, sick children being sent to school and not properly isolated may all contribute to facilitate rapid spread of the virus [25].

2.1.4 Clinical signs/ symptoms

HFMD patient are present with fever, sore mouth or throat, and characteristic rash on palms, soles and oral cavity. The rash is typically papulovesicular lesions but may also be maculopapular. Young toddlers may present with a rash on their buttocks, elbows, knees and trunk. Oropharyngeal (buccal mucosa, tongue, gums and palate) lesions consist of vesicles which are rapidly ulcerating. In some cases, inflammation of the conjunctiva has been reported.

The majorities of the cases are self-limiting and resolve spontaneously. However, rarely severe complications following EV71 infection such as central nervous system, cardiovascular and pulmonary edema may occur. The most common central nervous system manifestations are aseptic meningitis, acute flaccid paralysis

and brainstem encephalitis. Other less common manifestations include cerebellar ataxia, Guillain-Barre syndrome, transverse myelitis, opsomyoclonus syndrome and benign intracranial hypertension. Ishimaru Y and colleagues reported the severe neurological manifestations in 81 (24%) out of 692 pediatric proven and around 30 % of these neurological manifestations caused by EV71 HFMD [26].

The overall mortality rate of HFMD is less than 0.05% but the most devastating neurological and cardiopulmonary syndrome due to brainstem encephalitis had a case fatality rate ranging from 40-90% [27, 28]. The neuropathology may leads to the second devastating component of severe complications, cardiopulmonary failure resulting from neurogenic pulmonary edema, hemorrhage, circulatory failure and death. Those who recover may face long-term neurological disability.

2.1.5 Treatment

There is no specific treatment for HFMD. In most cases, this infection will clear up with supportive/symptomatic treatment or without treatment in one or two a weeks. Fever and pain can be managed with antipyretic. Antipyretic medication can ease other symptoms such as headaches and sore throats; Acetaminophen is usually recommended. Prescription or topical ointments may soothe blisters and rashes. Medicated syrups, lozenges, or salt water rinses may also relieve painful sore throats. Sore mouth can also be managed by using mouthwashes or sprays that numb mouth pain. It is important for infected children to drink enough fluids to prevent dehydration. Severely dehydrated patients may require hospitalization and intravenous (IV) fluids. In rare cases, EV71 may cause serious conditions such as meningitis and encephalitis and cardiopulmonary complications which require the intensive symptomatic managements.

2.1.6 Prevention and Control

There are no specific antiviral drugs or vaccines available against this group of non-polio Enteroviruses causing HFMD. The risk of infection can be lowered by good, hygiene practices and prompt medical attention for children presenting severe signs and symptoms. HFMD is spread from person to person through nose and throat secretions (such as saliva, sputum, or nasal mucus), blister fluid, or stool of infected persons.

Preventive measures include:

A good standard of personal hygiene should be maintained and care when handling articles contaminated with respiratory secretions or feces, i.e. handkerchiefs, tissues and diapers should be encouraged.

Frequent hand washing with soap and water especially after touching any blister or sore, before preparing food and eating, before feeding young infants, after using the toilet and after changing diapers; cleaning contaminated surfaces and soiled items (including toys) first with soap and water, and then disinfecting them using a dilute solution of chlorine-containing bleach. There are evidences that the Enterovirus high stability in the human environment including the gastric acid and also can survive at room temperature for several days [29].

Moreover, Enterovirus are resistant to organic solvents (such as ether and chloroform), alcohol as well as freezing, but can be inactivated while temperatures higher than 56 C, Chlorination, formaldehyde and ultraviolet radiation [30].

Avoiding close contact (kissing, hugging, sharing utensils, etc.) with children with HFMD may also help to reduce the risk of infection.

Keeping infants and sick children away from kindergarten, nursery, school or gatherings until they recover; monitoring the sick child's condition closely and seeking prompt medical attention if persistent high fever, decrease in alertness or deterioration in general condition occurs; covering mouth and nose when sneezing and coughing; disposing properly of used tissues and diapers into waste bins that close properly; maintaining cleanliness of home, child care centre, kindergartens or schools. Feng Ruan MM and colleagues has demonstrated that the strong HFMD protective effect from better hand washing during EV71 outbreak [23]. Parents can also protect their children from HFMD by teaching them good hygiene practices and observe the

child health status daily basis. If the child is diagnosed with HFMD, keep him/her at home until fully recovered.

These are measures which should be encouraged at all times to also prevent this and many other infections.

Even the overall disease mortality rate is very low (less than 0.05%) but the responsible pathogen is highly contagious, highly infectivity so it can be spread easily then causes the rapid and large outbreak, the diagnosis and the diseases staging for the HFMD is still also not sensitive enough for severe case detection, countries currently affected typically have frail health infrastructures, can easily be overburdened by outbreaks. The HFMD disease is one of the important disease require upscale the preventive measures.

All childcare centers must maintain high standards of personal and environmental hygiene to minimize the risk of HFMD transmission.

1. The overall health of the children should be checked daily upon arrival at the childcare centre. Children with any unusual symptoms or behavior should be removed from the child care centre for further assessment. This is an important measure in preventing the mode of spread of infectious diseases to other children.

2. Children with HFMD should stay at home, away from school, child care, playgroup, kindergarten and crowded public places until the fluid in the blisters has dried. During this period, contact with other children should be avoided until the child recovers.

3. Both staff and children must wash their hands frequent enough to maintain their hands in a clean state.

3.1 Hand washing

➤ Staff and children should follow the following recommended hand washing procedures to reduce the risk of disease mode of spread in the childcare centers

- Use liquid soap and running water;
- Run hands vigorously as they are washed for at least 10 seconds;
- Wash all surfaces, including back of hands, wrists, between fingers and under fingernails;

- Rinse hands well after washing;
- Dry hands with single-use towel
- Staff should wash their hands:
 - When they come to the centre in the morning;
 - Before they prepare or serve food;
 - After they change diapers, clean up or wipe the nose of a child;
 - After contact with blood or body fluids such as fluids from the nose, mouth and chest as well as from inside the blisters;
 - After they have been to the toilet, either with a child or by themselves;
 - After handling pets, pet cages, or other pet objects;
 - After outdoor activities (e.g. playing with children in the playground);
 - Before giving or applying medication or ointment to a child or self;
 - Before going home
- Children should wash their hands:
 - When they arrive at the centre;
 - Before they eat or drink;
 - After they use the toilet;
 - After they come into contact with a child who may be sick;
 - After having their diapers changed;
 - After playing on the playground;
 - After handling pets, pet cages, or other pet objects;
 - Before going home

4. Do not share food, utensils, drinking cups, toothbrushes or towels with other children.

5. Proper disinfection of articles such as toys, eating utensils and towels contaminated by droplet, saliva, vesicular fluid or feces of infected cases.

6. Communal toys.

- Toys or appliances that are contaminated by nasal or oral secretions should be cleaned before they are used again.

- Only washable toys should be used with diapered children. Separate toys should be provided for each child group so that no sharing should occur between groups. This will limit the exposure of the infectious agents to only a single group during disease outbreaks.

- Hard surfaced toys should be washed and disinfect with household bleach regularly.

- Stuffed toys should be discouraged, i.e. toys that cannot be sanitized should not be allowed.

- A toy that is mouthed by a child should be washed and disinfected before other children handle it [31].

2.2 Review guidelines for Hand Foot and Mouth disease

Monitoring of HFMD is the main focus in surveillance aspect, and giving publicity to good personal hygiene is the main point in prevention and control strategy.

In 2011, WHO published guidelines for clinical diagnosis and management of HFMD, in summarize WHO the prevention and control measures guideline into 7 items: 1) establishing and strengthening surveillance, 2) conducting and education campaigns on good personal hygiene, 3) providing assistance to childcare organizations during outbreaks, 4) enhancing infection-control measures in both health care facilities and the community, 5) upgrading the equipment of severe disease's medication and care, 6) regional preparedness and response information exchange during outbreaks and 7) establishing administrative framework beneficial to promoting prevention and control measures, evaluation and monitoring [1].

Individual countries that have experienced large outbreaks have developed their own guidelines. All guidelines are based primarily on expert opinion with little evidence base because Enterovirus has different impacts on each country, related strategy for prevention and control makes a difference. Countries like Singapore, Thailand and Hong Kong, monitoring and adopting prevention and control strategy earlier has fewer death cases; Taiwan has established complete prevention and control measures, and the case fatality rate of Enterovirus related HFMD patients significantly decreased. [32]

Enterovirus is likely to infect children under 9 years old, every country put childcare organizations as the main target to disseminate on the propaganda of personal hygiene. Each country's prevention and control strategies of Enterovirus are mostly enhancing the hands sanitation and closure of class in epidemic stage, and no concrete result of class closure is evidenced so far. However, because it could lower or postpone the spread of outbreak to the community and reduce the impact of epidemic peak, though it may not lower the entire infected people, it is still adopted by several countries. Class closure is by far the most adopted measure when entering to the Enterovirus epidemic stage. However, the closure time in each country differs, all at least seven days [32].

In Singapore, the outbreak of HFMD divided into three levels, either the incidence rate reaches to the threshold, the appearance of severe disease or death cases. In addition, the prevention and control measures on educational and childcare organizations gradually upgraded from enhancing the propaganda to mandatory class closures, closing education and childcare organizations and places where children gathered [32] (Table2.1).

Table 2.1 The primary and secondary preventions of each country

Country	Primary prevention	Secondary prevention
China	1. Enhancing monitoring: Active search for and report HFMD cases every day, conduct epidemiological survey on every severe disease case to achieve the monitoring of clinical cases, expecting to achieve the goal of early monitoring and preventing severe disease. 2. Enhancing national health activities, and strengthen the health campaign of HFMD. 3. Check if children got fever or rash every day, enhance environmental cleanness of school by sterilizing toys and table wares 4. Accelerate the development of rapid testing reagents and vaccine	1. Public health level: (1) Implement closing of class(es) (2) Enhance communication of risk, spontaneously announce outbreak status 2. Medical level: (1) Enhance the classifying system of patients, improve the classification of HFMD cases (2) Assign responsible hospital to offer treatment, increase the investment of prevention/control and medication to ensure that HFMD patients receive immediate medical care. (3) Gather experts to collect experience of curing severe disease and set treatment guide line and distributed to hospital.
Japan	Monitor epidemic situation and control the trend	No special arrangement

Table 2.1 The primary and secondary preventions of each country (cont.)

Country	Primary prevention	Secondary prevention
Taiwan	<p>1. Monitor strictly, control the epidemic situation:</p> <ul style="list-style-type: none"> (1) Set warning threshold and the epidemic threshold. (2) Set the standard of class closures <p>2. Health education campaign:</p> <ul style="list-style-type: none"> (1) Target subjects: Child caretakers for children < 5 years old, educators, nurse in school and epidemic prevention staff (2) In the primary epidemic stage, cultivate correct concept and behavior of washing hands (3) Check hand washing equipments and sanitation education <p>3. Development of EV71 vaccine and rapid testing reagents.</p>	<p>1. Public health level:</p> <ul style="list-style-type: none"> (1) The focal point of propaganda during epidemic stage e.g. Early clinical manifestations guideline of severe disease complicated by Enterovirus infection, Do not go to school when sick rule. (2) Enhance communication of risk: <ul style="list-style-type: none"> A. General population communication: news announcement, usage of media. B. Minor communication: Using enterprise resources to enhance propaganda on target groups. C. Personal communication: To parents who have severe disease children (3) Measures of class closures and shut-down of playground. <p>2. Medical level:</p> <ul style="list-style-type: none"> (1) Set outlines of treatment management of severe disease (2) Conduct professional training along with medical societies, raising the professional capability of medical staff in clinical diagnosis (3) Assign responsible hospitals

Table 2.1 The primary and secondary preventions of each country (cont.)

Country	Primary prevention	Secondary prevention
Singapore	<p>1. Set warning threshold and epidemic threshold.</p> <p>2. Set Enterovirus outbreak levels in childcare organizations</p>	<p>Divide the outbreak scale into three levels , enhancing the health education campaigns initially and gradually upgrading to forcing the class closing according to the rise of the level:</p> <p>(1) First level Issue alert and inspect the prevention/control measures of educational and childcare organizations when the HFMD incidence rate higher than previous epidemic threshold.</p> <p>(2) Second level If the outbreak is not weaken and severe cases appear, besides conducting the first level prevention and control measures, require related educational and childcare organizations reported severe case(s) to close classes.</p> <p>(3) Third level Besides continuing on the prevention/control measures of the second level, shut down all educational and childcare organizations and places crowded with children if death cases caused by HFMD appear and if the death case is related to those organizations.</p>

Table 2.1 The primary and secondary preventions of each country (cont.)

Country	Primary prevention	Secondary prevention
Malaysia	<p>1. Monitor outbreak status. Set warning threshold and epidemic threshold.</p> <p>2. Health education: instruct target groups to wash hands by the media and face-to-face visit</p>	<p>1. Public medical level: (1) Implement class closures. (2) Enhance reporting of Enterovirus and outbreak investigation. Enhance the cognition of educational and childcare organizations' on HFMD by closing classes, extend school holidays and strengthen campaign of hygienic habit.</p> <p>2. Medical level: Set the criteria of hospitalization, clinical treatment guideline</p>
Vietnam	Monitor the outbreak and control trend	No special arrangement
Cambodia [33]	Health centres will report cases of HFMD to the MOH on a weekly basis. The Ministry of Health, with technical support from WHO and other partners is developing risk communication messages for health centers nationwide and preventive messages for the general population. Information, Education and Communication materials will also be developed and distributed to all health centers in the country.	MoH with support from its partners, is following up laboratory testing to identify which subgenotype of EV71. The government is also developing guidelines and training courses for management of patients with mild and severe forms of HFMD. The MoH is also working on campaigns to raise awareness on prevention, identification and care of children with HFMD.

Table 2.1 The primary and secondary preventions of each country (cont.)

Country	Primary prevention	Secondary prevention
Thailand	Conduct health education. Announce and warn people when outbreak occurs. Adopt the measure of monitoring outbreak during the end stage and in normal times.	1. Public medical level: (1) Prevention measure like enhancing health education, isolating patients from healthy children, closing classes, investigating the outbreak, sterilizing the environment and articles, and cleaning. (2) Set the investigation standard of cases: Hospitalized cases, death cases and when cluster appears in childcare organizations. 2. Medical level: Set the HFMD clinical medication guide line.

2.3 Teachers and kindergarten context

School faces multiple types of demand. They are places where society's main concerns all converge. "School settles between multiple functions: teaching mastery, introducing new technologies, transmitting traditional knowledge and enabling understanding of contemporary situations allowing for differences and ensuring a common educational base, helping students to succeed in education and teaching how to live in society such as providing training in environmental awareness providing health education"

According to public health point of view, even if the core task of schools is focusing on educational outcomes, rather than the reduction of health problems, schools have a mission in relation to health and many other issues related besides. The school system lies at the intersection of all these approaches, and therefore would seem to be obviously a key actor of public health strategy because school is unique environment place in which all individuals of the same age come together so they are

places in which specific preventive and protective themes may be easily implemented along with the educational theme. It is call “**mobilization of the educational system**” This is particularly true since schools are one of the tools that the state can use for health promotion.

The Health Promoting Schools (HPS) framework encourages a whole school approach to health promotion by developing a coordinated and integrated approach to the health and wellbeing of all school community members. A health promoting school is one that constantly strengthens its capacity as a healthy setting for living, learning and working. World-wide, education and health are inextricably linked. In simplest terms: healthy young people are more likely to learn more effectively, health promotion can assist schools to meet their targets in educational attainment and meet their social aims; young people that attend school have a better chance of good health, young people that feel good about their school who are connected to significant adults are less likely to damage their health with high risk behaviors and are likely to have better learning outcomes (Figure 2.1).

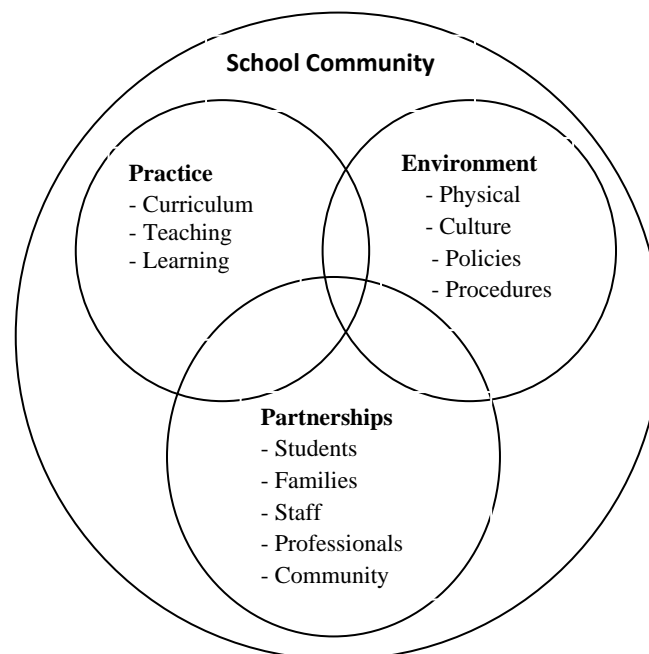


Figure 2.1 School community

<http://www.each.com.au/health-promotion/-2015/school/>

Priority areas for programs in schools that are part of the Health Promotion Schools network in Thailand [34]

On various levels, schools have approached the following aspects:

- Social well-being: community, communication, working together, participation, the school's culture, internal regulations, conflict management, prevention of violence;
- Physical well-being: diet, physical activity, relaxation, posture; prevention of addiction: on legal or illegal drugs, eating disorders;
- School structures: mission statement, training for person responsible for the project, social work in schools;
- Health of teachers;
- Psychological well-being: improving protective factors, self-esteem, stress management, suicide prevention;
- Planning of school facilities: playground, rest rooms, infrastructure;
- Working together with parents, authorities, specialized centers, school openness, working together with the local community;
- Sex education and AIDS prevention;
- Environment, nature;
- Risk and safety.

Preschool or kindergarten is an early childhood program in which children combine learning with play in a program run by professionally trained adults. Children are most commonly enrolled in preschool between the ages of three and five. This unique age group has fewer tasks for daily education and considered as easily the health promotion and prevention to be implemented.

There are also many factors conditioning teacher's practice health education and behaviors e. g. Institutional factor, individual factors and factor linked to the public (Figure 2.2).

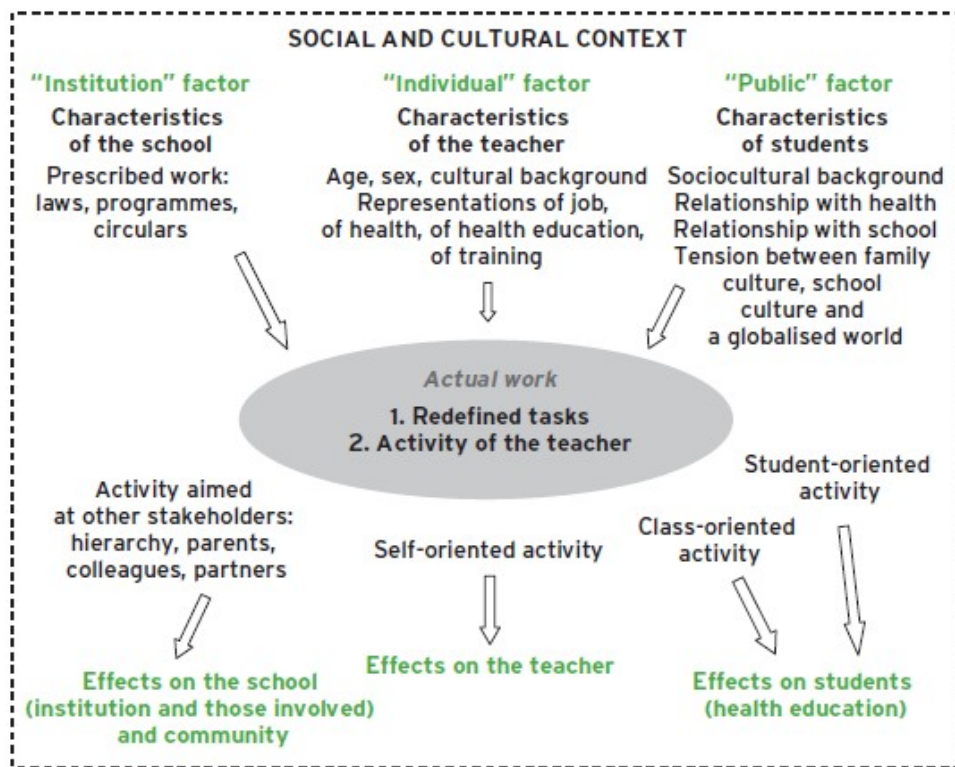


Figure 2.2 Factor determine activities of teacher in health promoting and education

For the personal or individual factor, factors that are connected to the role perception as the health promotion personnel, the knowledge, attitudes, behavior towards to prevention are considered as the important factors. Some studies conducted in schools reveal the positive results of improving health as well as improving the succeed in education especially the nutrition and life style studies, risk behavior and drug studies and others chronic diseases, while some studies failed to demonstrate the impact of this setting unless there is the very well implemented [35, 36, 37, 38, 39, 40].

Many studies have revealed that the majority of the teachers' responses regarding knowledge about communicable disease were very poor and deteriorating, the majority of the teacher's needs continuing education programs about common communicable disease and ways of prevention them [35, 36, 37, 38, 39, 40].

Apparently, there is no study according to the KAP of the teacher specifically about HFMD. Some studies about the teacher KAP effected on the other diseases such as general infectious diseases, hyperactive attention deficit (ADHD), autism, HIV, epilepsy and life style and non-communicable diseases [35, 36, 37, 38, 39, 40].

2.4 Impact of school environment and hygiene on child's health

School environment and hygiene, safe water and sanitation facilities in school are the first step towards a healthy physical learning environment benefiting both learning and health. Good school environment and hygiene, good facilities of water and sanitation can prevent many infectious diseases. Thus, it is important to look at the aspect of school environment and hygiene related with hand foot and mouth disease [41].

Schools, those in developing country, often lack drinking-water and sanitation and hand washing facilities. School where such facilities do exist they are often inadequate in both quality and quantity. Schools with poor water, sanitation and hygiene conditions, and intense levels of person-to-person contact, are high-risk environments for children and staff, and exacerbate children's particular susceptibility environmental health problems [42].

WHO school hygiene and sanitary guideline for poor setting was as the standard guideline for the school in developing and under developing country [43].

Thailand also implements the standard guideline for school hygiene and sanitary, the study will use this guideline as the standard checking list to evaluate each school selected to the study.

Health behaviors are strongly determined by difference factors. School is essential in helping students to achieve health literacy. Moreover, there was the evidence showing that the school has become an important setting to build up the skills and capacity for students, parents and the wider community to combat the challenges of outbreak of communicable diseases. The school hygiene program has been shown to be effective means to disease prevention [44].

2.5 School environment, sanitation and hygiene in Thailand

In Thailand, there is the national guideline and standards on school environment and hygiene regarding the school location, building, classroom, library, canteen, first aid room, water supply, latrines and waste disposal as well as activities for health promotion. [45, 46]

2.6 Review of a survey study and Questionnaires

The strength of the survey depends on good quality data that stems comes;

1) Good design of the data collection instrument which is questionnaires and 2) the collection procedures.

Good survey study should ask these questions at the beginning

1) What type of information is needed to be captured and evaluated?

(Define research aims, questions)

2) What type of question(s) and response(s) will the best to be captured would enough (complete questionnaire response rate and response rate)? (Define population or sample including technique to survey)

3) What format should the questionnaire be designed to make it user-friendly and to also capture the breadth of information needed to be evaluated? (Define the survey format)

Literally, survey study, like many studies in human subject that require the well planned in advance including the data coding and data analysis. It is also require the ethic approval since this information the researcher required are also considered as related to human right and human protection issues.

Questionnaires

Questionnaires are the most commonly used method for collecting information from the survey study. Designing a questionnaire, it is important to keep key points in order to best meet the true outcomes/ responses require.

There are many different types of question used to get the information required. In the main, these fall into open and closed questions. An open question allows the respondent to use their own words to answer, such as “what do you think are the main causes of common cold?”

A closed question gives them pre-defined options, such as., “which of the following do you think are the main causes of backache: multiple responses a, b, c, d”. Other examples of closed end are yes/ no response, ranked responses e. g. Likert scale. The pros and cons of each are given in the table below:

Open ended	Close ended
<ul style="list-style-type: none"> Rich qualitative data 	Elicit quantitative data
<ul style="list-style-type: none"> Encourage thought and freedom of expression 	Can encourage mindless to reply
<ul style="list-style-type: none"> May discourage response from less literate or mindless respondent 	Easy for all literacy level to responds
<ul style="list-style-type: none"> Take longer duration to answer 	Quick to answer and may improve the response rate
<ul style="list-style-type: none"> More difficult to analyses--- miss coding/ misinterpreted are most common 	Easy to coded and analyses
<ul style="list-style-type: none"> Interviewers confounding 	-

General rules for questionnaires construction are

- Concise and unambiguous
- Avoid double questions
- Avoid questions involving negatives
- Ask for precise answers
- Avoid leading questions

Survey type

Decide whether the survey is to be completed by

1. Self- administered *e.g.* conventional post/ letter, by e-mail
2. Interviewer-administered *e.g.* face to face interview, telephone based, other interactive application based *e.g.* SKYPE or MSN).

Computerization is playing an increasingly important role in standardizing interviews, decreasing the time spent on individual interviews. Internet-based surveys already are practical for use in selected groups and show great potential for use as widely access to and familiarity with computers, e-mail, and the Internet increase. The advantages of disadvantages of these methods are in the table below:

	Interviewer-Administered Questionnaire	Self-Administered Questionnaire
• Response	Generally higher	Generally lower
• Ability to Monitor Data Collection	Easy to limited	Limited to impossible
• Interviewer Error	Present	None
• Relative Cost	Higher cost	Lower cost
• Time in Field	Longer data collection period	Shorter data collection period
• Maximum Length	60–90 minutes	30 minutes
• Complexity of Questions	Higher complexity	Lower complexity
• Use of Visual Aids	Easy	Difficult
• Sensitive Topics	Decreased respondent comfort	Increased respondent comfort

Face-to-face interview surveys have several key strengths. These surveys are clearly structured, flexible and adaptable. They are based on personal interaction and can be controlled within the survey environment. Physical stimuli can be used and respondents are able to be observed. On the other hand, there are also some disadvantages, such as interviewer bias, high cost per respondent, geographical limitations and time pressure on respondents.

<u>Advantages and disadvantages of survey methods</u>		
Survey type	Advantages	Disadvantages
Mail	<ul style="list-style-type: none"> • Easy and cost efficient • No interviewer, respondents may be more willing to share information 	<ul style="list-style-type: none"> • Response rates are typically low • Not appropriate for low literacy audiences • No interviewer, respondents cannot be probed
Phone	<ul style="list-style-type: none"> • Large scale accessibility in many countries • Rapid data collection, particularly with the integration of CATI (computer assisted telephone interviewing) systems • Quality control • Anonymity • Flexibility 	<ul style="list-style-type: none"> • Lack of visual materials • Call screening is common • Limited open-end questions or time constraints due to more limited survey length • Wariness • Inattentiveness
Online	<ul style="list-style-type: none"> • Low costs • Automation and real-time access • Less time needed • Convenience for respondents • Design flexibility, surveys can be programmed even if they are very complex. • No interviewer, respondents may be more willing to share information 	<ul style="list-style-type: none"> • Limited sampling and respondent availability. • Possible cooperation problems • No interviewer, respondents cannot be probed
Face to Face	<ul style="list-style-type: none"> • Good response rates • Longer interviews more likely to be tolerated • Attitude can be observed 	<ul style="list-style-type: none"> • Expensive • Time-consuming • May produce a non-representative sample

Figure 2.3: Advantages and disadvantages of survey method

<http://www.fao.org/ag/humannutrition/33251-0a0b0928c3532ed36c3b6624d54d73f86.pdf>

Run a Pilot study

Test the questionnaire on a small sample, similar subjects is recommended, if this is not possible, at least test it on some colleagues or friends. The aim of running pilot study is to detect any flaws in questioning and correct these prior to the main survey. The piloting may enable researcher to convert an open-ended question in to a closed question by determining the range of possible answers. Researcher may also be able to perform a trial analysis on the pilot sample and hence test out the coding and analysis procedures. Having done good pilot survey, researcher can make amendments that will help to maximize response rate and minimize error rate on answers. [54]

Qualitative study; in-depth interview

In- depth interview, one of the strengths of the in-depth interview is that deeper level of information that can be acquired through conversations. Items that normally might not get the deeper answer through other fixed questions and fix multiple choices may come to the issues that the interviewer bring up. Comparing with other types of questionnaires, face to face interview and in-depth interview have more potential to get accurate data or information. There is the recommendation for combining the IDI (qualitative) in the cross-sectional survey (quantitative) to give fuller and wider information especially in the navigated study [51].

School hygiene check list instruments

In this study, School checklists based on general information of school, classroom parameter and hygiene, water supply, canteen and food preparation and latrine and waste disposal. The school checklists was modified from water, sanitation and hygiene standard for school in low cost settings [43]

CHAPTER III

MATERIALS AND METHODS

3.1 Research design

This study design was a cross-sectional study to identify the knowledge, attitude and practice of kindergarten teachers in kindergarten schools under control of Bangkok Primary Education Office (BPEO) in Bangkok, Thailand towards Hand Foot and Mouth Disease and to explore the sanitation and hygiene of the invited kindergarten schools under control of BPEO in Bangkok, Thailand.

3.2 Site of the study

Bangkok is the capital city of Thailand. It is known in Thai as Krung Thep Maha Nakhon or simply Krung Thep. The city occupies 1,568.7 square kilometers (605.7 sq mi) in the Chao Phraya River delta in Central Thailand, and has a population of over 8 million, or 12.6 percent of the country's population. Over 14 million people (22.2 percent) live within the surrounding Bangkok Metropolitan Region, making Bangkok an extreme primate city, dwarfing Thailand's other urban centers in terms of importance.

The city of Bangkok is locally governed by the Bangkok Metropolitan Administration (BMA). Although its boundaries are at the provincial level, unlike the other 76 provinces Bangkok is a special administrative area whose governor is directly elected to serve a four-year term. The governor together with four appointed deputies, form the executive body, who implement policies through the BMA civil service headed by the Permanent Secretary for the BMA. In separate elections, each district elects one or more city councilors, who form the Bangkok Metropolitan Council. The council is the BMA's legislative body, and has power over municipal ordinances and the city's budget.

Bangkok is subdivided into fifty districts which are further subdivided into 169 sub districts. Each district is managed by a district director appointed by the governor. District councils, elected to four-year terms, serve as advisory bodies to their respective district directors (Figure 3.1).

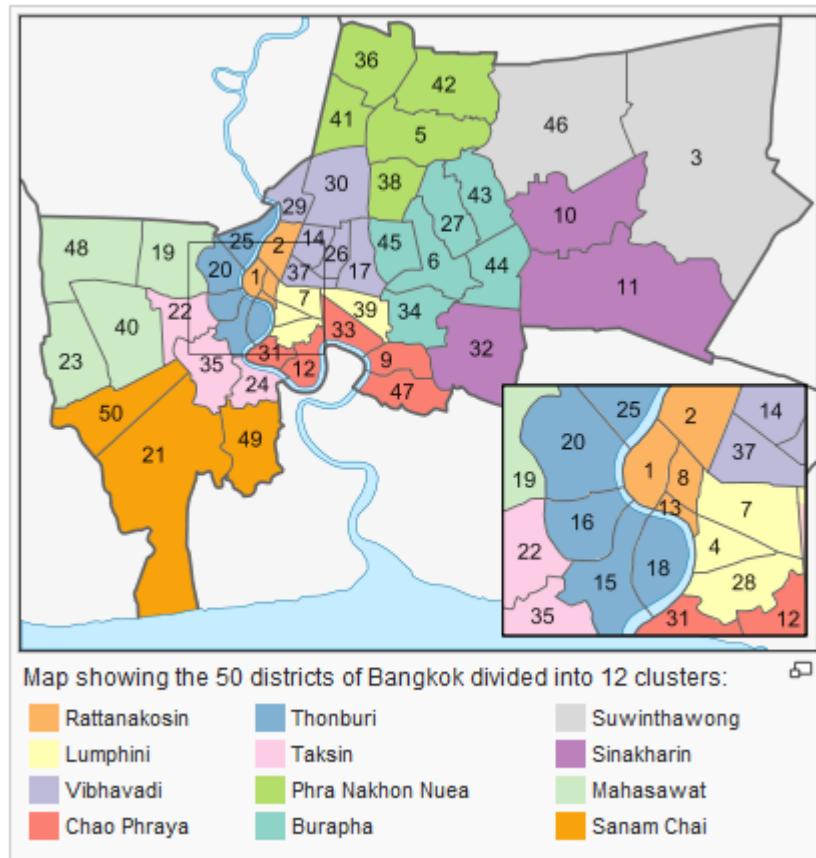


Figure 3.1 Bangkok map

Education in Thailand is provided mainly by the Thai government through the Ministry of Education from pre-school or kindergarten to senior high school. A free basic education of twelve years is guaranteed by the constitution, and a minimum of nine years' school attendance is mandatory. There around 560 Primary schools in Bangkok including governmental schools under control of the Office of Basic Education Commission (OBEC), (สพฐ.) (37), Bangkok authority schools (431), private schools (56) as well as special schools such as the school under university or college authorization (8) and international schools (28).

In this study we focus on the primary schools under control of OBEC (สพฐ.); the schools under Bangkok Primary Education Office (BEPO), (สพป. กทม.), there are totally 37 schools (in totally 24 districts). This study randomly selected 10 out of 37 schools.

3.3 Population, sample and sample size

Sample and sample size

The sample and sample size of this study are 60 kindergarten teachers in 10 randomly selected **schools under OBEC (สพฐ.); schools under control of Bangkok Primary education office (BPEO), (สพป. กทม.)** in Bangkok, Thailand.

This study was a navigated study in order to probe the direction of the study results, so the study sample size was estimated under the presumptive idea after has the school geographic data by statistician as 60 participants will provide enough data.

Choosing school type

The technique to select the represented sample was multiple steps randomization. First, simple random to select schools (OBEC schools, Bangkok authority schools, private schools, under university or college authorization schools or international schools); **the schools under OBEC (สพฐ.); schools under control of Bangkok Primary education office (BPEO), (สพป. กทม.) were selected randomly.**

Choosing the study areas

Random schools under OBEC (สพฐ.); schools under control of Bangkok Primary education office (BPEO), (สพป. กทม.), 10 out of 37 schools from 6 out of 24 districts and all 60 kindergarten teachers from these 10 schools are invited.

(Figure 3.2)

- Ratchathewi District: school 01
- Dusit District: school 02
- Pha nakhon District: school 03, 04
- Pom Prap Sattru Phai District: school 05, 06
- Chom Tong District: school 07, 08
- Bangkoknoy District: school 09, 10

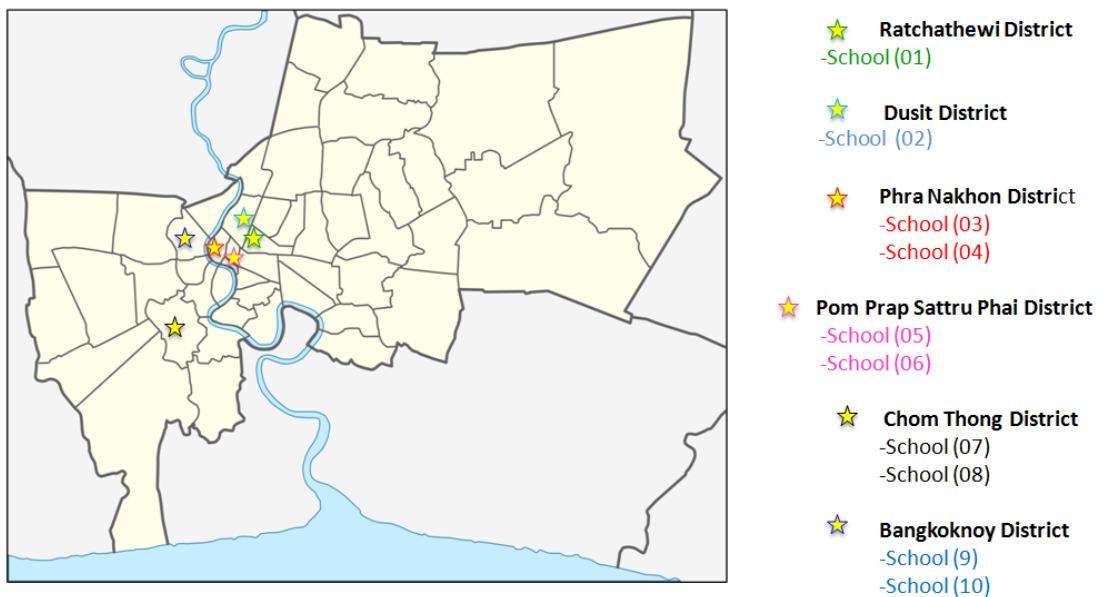


Figure 3.2 Selected school map

3.4 Research instrument

The study composed of 3 parts.

Part1: Face to face interview: using open-ended Questionnaires, composes of 3 sections; disease knowledge (11 items), prevention and hygiene precaution (10 items) and attitude towards disease and policy (6 items) (Appendix A).

Part2: Observation based on checklists on school's sanitation and hygiene, composed of 5 sections; general information of the schools (2 items), classroom parameters and hygiene (7 items), water supply (5 items), canteen parameters (6 items) and latrine and waste disposal (9 items) (Appendix B).

Part3: In-depth Interview: using open-ended Questionnaires, composes of 4 section; common health issue (3 items), knowledge on HFMD (8 items), attitude on HFMD (4 items) and practice on HMFMD (5 items) (Appendix C).

3.4.1 Instrument building and Quality instrument

The questionnaire was developed under the questionnaire development guideline [49, 50], since this HFMD disease does not have questionnaire used in the previous literature. Questionnaire Content validity of questionnaires was examined by advisors and experts. Pre-test or pilot testing of the questionnaires was carried out in 3 school teachers in a school located nearby faculty of Tropical Medicine. The purpose of the testing is to evaluate the clarity of the questionnaires. The researcher modifies the questionnaires according to the advisor suggestions and the problem found during the pilot testing;

The in-depth interview opened questions were prepared based on the standard guideline for in-depth interview [51, 52]. These questions were also examined by advisors and pilot testing in these 3 selected school teachers. In-depth interview is an important instrument to encourage the teacher to deeply express the opinions on the disease issues.

3.5 Ethical considerations

The study was conducted after receiving the approval from Ethics Committee of the Faculty of Tropical Medicine, Mahidol University.

(MUTM 2015-040-01)

The school director was informed by the official letter from Faculty of Tropical Medicine. The informed consents were obtained from each teacher before starting of the study. If the teacher was selected to participation the in-depth interview the separate inform consent was also performed. The participation was voluntarily and the teacher could stop or withdraw the consent at any time without starting the reason of withdrawal. The questionnaires were coded as number for school and teacher code. The study results were presented as the anonymous and all the study results were used for academic purpose only (Appendix E).

3.6 Data collection

Before the research was carried out, researcher asked permission from authorize person of each kindergarten to conduct an interview with kindergarten personnel. The formal letters from School Health Department, Faculty of Tropical Medicine were sent to director or authorize person of each school.

(i) The data were collected by face-to-face interviewing. The informed consent was asked to each interviewee with signature in the consent form. The case by case interviewing was performed. **The questions were asked without showing the answering choices to the interviewee.**

(ii) The in-depth interview was recorded by hand writing and by audio files, the audio files were transcribed into word carefully.

(iii) All notes and audio files were kept and link under code and number by PI and were discarded after thematic paper was passed after the manuscript was published.

(iv) The school sanitation and hygiene observation was performed by the researcher using checklists prepared following the school hygiene and environment guideline.

(v) The patient questionnaire and school hygiene form were filled by hand by the interviewer. The data were entered into an SPSS, EXCEL program and analyzed.

(vi) The in-depth interview was described in the results to elaborate the qualitative result in detail.

3.7 Data analysis

Statistical analysis: The data were verified carefully and analyzed statistically with the SPSS program version 15.0.

Descriptive statistics:

The results of the study were summarized by using descriptive statistics which are number, mean, frequency, percentage, standard deviation.

Inferential statistics:

Chi-square test and t-test were used to determine the significant different of the result

In- depth interview responded to opened ended questions was recorded by the recorder and written note. This information was transcribed and analyzed by content and group according to how it related to the diseases issues such as disease knowledge, prevention attitude or others. The answer from the opened ended questions in-depth interview were useful for understanding how the concept of HFMD disease among kindergarten teachers.

3.8 Timelines for research project

No.	Planning	Months 2015																			
		May				June				July				August				September			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1.	Methodology design																				
2.	Protocol development																				
3.	EC approval																				
4.	Visit the site of study																				
5.	Testing of questionnaires																				
6.	Questionnaire and sample collection																				
7.	Data analysis																				
8.	Conclusion and report																				

Figure 3.3 Timeline for research project

CHAPTER IV

RESULTS

This chapter shows the findings of the study; general demographic of schools and teachers are presented in first part. Hand Food and Mouth Disease (HFMD) experience and health related training experience are also added as the part of base line characteristic of teachers. Second part is about knowledge, attitude and practice (KAP) descriptions and the third part is the associations of those variables and the percentage of KAP on HFMD. Third part is the school hygiene and environment study. The results of in-depth interview will be presented as the quoted texts/ sentences to support each interesting issue and to expand the outcome discussion in the discussion part.

4.1 Demographic

4.1.1 Demographic of schools

All ten kindergarten schools under control of Bangkok Primary Education office in this study was randomly selected seven out of twenty-four districts; one school from Ratchathewi districts, one school from Dusit districts, two schools from Pha Nakhon district, two school from Pom Prap Sattru Phai district, two schools from Chom Thong district and two schools from Bangkoknoy district. All schools are in the health promotion school program. All schools are attached with the Primary schools but they have their own section separately far from the primary school section at least 500 meters. The school facilities of kindergarten schools are clearly separate from those of primary school section and of primary school students (Appendix F).

4.1.2 Demographic of 60 kindergarten teachers

Sixty teachers from 10 selected schools completed all parts of the questionnaires. All were female. The mean age was 35.75 years range from 21 to 68 years. Most of the kindergarten teachers in this study are new graduated showing the half of them are in the youngest age group at 20-30 year-old which also related to the mean working experience. The mean working experience was 11.2 years range from 1 to 40 years. 41 (68.0%) has been working as the kindergarten teacher less than 10 years (Table 4.1).

Table 4.1 Demographic data

Descriptions		Number (%)
Gender		
• Female		60 (100.0)
Age (years)	Mean (SD)	35.75± 12.205
• 21–30		30 (50.0)
• 31–40		12 (20.0)
• 41–50		8 (13.3)
• 51–60		9 (15.0)
• 60 up		1 (1.7)
Work-experience (years)	Mean (SD)	11.02±12.186
• 1-10		41 (68.3)
• 11-20		8 (13.3)
• 21-30		3 (5.0)
• 31-40		8 (13.3)

4.1.3 Teachers who have experience on HFMD at least once

Thirty-three (51.7%) had experience on HFMD at least once (Table 4.2).

Table 4.2 Teachers who have experience on HFMD at least once

Disease Experience	Number (%)
• Yes	31 (51.7)
• No	29 (48.3)

4.1.4 Teachers who have heard or aware about HFMD

Regarding the awareness on HFMD, 33 (55.0%) of the teachers have heard or aware about HFMD on medias such as television, newspaper or other sources (Table 4.3).

Table 4.3 Teachers who have heard or aware about HFMD

Disease Experience	Number (%)
• Yes	33 (55.0)
• No	27 (45.0)

4.1.5 Teachers who have experience on HFMD or health related training

None of the teachers have experience on HFMD or health related disease training at least even once (Table 4.4).

Table 4.4 Teachers who have experience on HFMD or health related training

Experience on Health related Disease Training	Number (%)
• Yes	0 (0.0)
• No	60 (100.0)

4.2 Knowledge towards HFMD

In knowledge domain, there are 11 questions about knowledge on HFMD regarding season, susceptible population, cause, route of transmission, sign and symptom, treatment, prevention, cleaning and sanitizing of toys and school supplies, national guidelines for HFMD, and national prevention measure for HFMD.

Twenty-nine (48.4%) of teachers answered correctly that HFMD occurs commonly in Thailand during rainy season, while the rest of the teacher answered that HFMD occur in every season and between seasons. All of the teachers know that HFMD is a transmitted disease. Forty-nine (81.6%) teachers know that HFMD mostly occurs in children age 0-12 years. Twenty-five (41.7%) teachers answered correctly that virus is the cause of HFMD, while 17 (30%) answered bacteria and hesitate that it should be mixed of bacteria and virus. Among these 11 (18.3%) teacher answered poor hygiene was the cause of HFMD. 4 (6.7%) teacher answered completely have no idea. Most of the teachers know how HFMD transmits, 58 (96.7%). Almost all, 56 (93.2%) teachers know about sign and symptom of HFMD. Only 5 (8.3%) teachers know that HFMD is treated with symptomatic treatments.

While asking about national guidelines for HFMD, and national prevention measure for HFMD, almost all of the teachers, 59 (96.6%) teachers answered correctly for how HFMD can be decrease by difference means including good hygiene and hand washing practice, health education, an early case detection and separate the index case as well as vaccine. 1 teacher do not know how. None of them answered Wear the face mask while people get sick or cleaning toy and school supply, But there were 48(76.7%) of teachers who know how to clean toys and school supply. All of the teacher who know how to clean the toys, none of them use chlorine bleach solution. Forty-five (75.0%) teachers can answer correctly to what included in national guideline. Mainly about hand washing, school closure, providing the fact to the people. Out of 60 teachers, 18 (30%) teachers answered that hand washing/ eating recently cooked food/ use personal belonging is the national prevention measure for HFMD, this is the Thai MOPH slogan for preventing the communicable diseases. Even the majority of the teachers aware of the national GL but still 15 (25.0%) of the teachers did not aware of Thai national guideline for HFMD (Table 4.5).

Table 4.5 Knowledge towards Hand Foot and Mouth Disease

No.	Statements	Number (%)
1	Which season does HFMD occur?	
	• Rainy season	29 (48.4)
	• Every season	12 (20.0)
	• Between season (summer-rainy-winter)	12 (20.0)
	• Winter	6 (10.0)
	• Do not know	1 (1.6)
	• Others	0 (0.0)
2	Is HFMD transmitted disease?	
	• Yes, it is transmitted disease	60 (100.0)
	• No	0 (0.0)
	• Do not know	0 (0.0)
	• Others	0 (0.0)
3	Who are susceptible for HFMD?	
	• Mostly occurs in children age 0-12 years	49 (81.6)
	• All ages	7 (11.7)
	• Adults	4 (6.7)
	• Do not know	0 (0.0)
	• Others	0 (0.0)
4	What is the cause of HFMD?	
	• Virus	25 (41.7)
	• Bacteria	13 (21.7)
	• Poor hygiene	11 (18.3)
	• Virus and bacteria	5 (8.3)
	• Weather	2 (3.3)
	• Dirty water	0 (0.0)
	• Do not know	4 (6.7)
	• Others	0 (0.0)
5	How is HFMD transmitted?	
	• By close contact + mucus	46 (76.6)
	• By mucus	7 (11.7)
	• By air	2 (3.3)
	• By poor hygiene	1 (1.7)
	• By coughing and droplets	3 (5.0)
	• By feces	1 (1.7)
	• By food contamination	0 (0.0)
	• Do not know	0 (0.0)
	• Others	0 (0.0)

Table 4.5 Knowledge towards Hand Foot and Mouth Disease (cont.)

No.	Statements	Number (%)
6	What are the sign and symptom of HFMD?	
	• Fever or low grade fever and blister on/in the hand foot and mouth	29 (48.2)
	• blister on/in the hand foot and mouth	27 (45.0)
	• Infected wound	1 (1.7)
	• Skin itching	1 (1.7)
	• Red rashes	1 (1.7)
	• Shortness of breath	0 (0.0)
	• Brain effect, Brain symptom	0 (0.0)
	• Do not know	1 (1.7)
	• Others	0 (0.0)
7	How is HFMD treated?	
	• Symptomatic treatment, self limited	5 (8.3)
	• Meet doctor	11 (18.3)
	• Eat medicine	9 (15.0)
	• Antibiotics (drug for killing the bug)	0 (0.0)
	• Resting	1 (1.7)
	• Hydration	2 (3.3)
	• Local cream application	4 (6.7)
	• Focus on good hygiene	24 (40.0)
	• Use vaccine	1 (1.7)
	• Do not know	3 (5.0)
	• Others	0 (0.0)
8	How can HFMD be decreased?	
	• Good hygiene and hand washing	46 (76.5)
	• Educate children	6 (10.0)
	• Separate sick child	3 (5.0)
	• Basic health check up every week	1 (1.7)
	• Early detection	1 (1.7)
	• Use only personal belonging	1 (1.7)
	• Vaccine	1 (1.7)
	• Educate parents and teachers	0 (0.0)
	• Treat water and food well	0 (0.0)
	• Wear the face mask while people get sick	0 (0.0)
	• Cleaning hand/ toys/ school supply	0 (0.0)
	• Media response	0 (0.0)
	• Don't know	1
	• Others	0 (0.0)

Table 4.5 Knowledge towards Hand Foot and Mouth Disease (cont.)

No.	Statements	Number (%)
9	Do you know about cleaning toy and school supply according to guideline?	
	<ul style="list-style-type: none"> • Yes, separate/Wash with soap in running water/ bask • Clean with detergent • Just wiping • Don't know • Others 	<p>33 (55.0) 12 (20.0) 12 (20.0) 3 (5.0) 0 (0.0)</p>
10	Do you know about national guideline for HFMD?	
	<ul style="list-style-type: none"> • Yes, when have HFMD cases, close the school for cleaning • Yes, hand washing • Yes, provide fact sheet for disease prevention • Yes, policy on eating hot food/ use personal belonging and hand washing • Media communication (Public communication) • Upscale/ promote the personal hand hygiene • Reduce class size • Regular cleaning toys and school supplies • Educate the school teacher and responsible personnel • School closure if there is number of children with HFMD • No, don't know • Others 	<p>17 (28.4) 5 (8.3) 5 (8.3) 18 (30.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 0 (0.0) 15 (25.0) 0 (0.0)</p>
11	Do you know about the national prevention measure of HFMD?	
	<ul style="list-style-type: none"> • Yes, hand washing/ eat recently cooked food/ use personal belonging • No • Do not know • Others 	<p>43 (71.7) 17 (28.3) 0 (0.0) 0 (0.0)</p>

Bold is considered as correct answers

4.3 Attitude towards HFMD and School policy and national policy

In attitude domain, there are 6 questions about hygiene precaution and prevention and control on HFMD regarding HFMD epidemic, socioeconomic impact, importance of hand washing facilities, importance of cleaning toys and school supplies, school closure and teacher as a part on preventing or controlling HFMD.

Forty-eight (80.0%) teachers agreed that HFMD could possibly cause the epidemic. Words epidemic had been explained to all of them as “the chance to spread in the area widely”, but still with that explanation 9 (15.0 %) teacher still not sure about this possibility. Among 60 teachers, 43 (71.7%) teachers answered that they think HFMD has socioeconomic impact (Interviewer also explained the meaning as “causing the community social and economic well-being as a whole”).

Majority of the teachers 53 (88.3%) teachers thought that the access/ number of the washing basins are important for disease prevention. The rest 7 (11.6%) has negative answer as NO; not important and have washing basins but not use is no benefit while 1 (1.7%) of them answered don't know. Fifty-eight (96.7%) teachers answered that they think cleaning and sanitizing toys and school supplies is important while 2 (3.3%) accepted that don't know.

For the school guideline that they aware of, 46 (76.7%) teachers accepted that the guideline for school closure is clear to follow while 14 (23.3%) teachers complaint about the time constraint about their usual tasks was there already too time consuming to deal with other issue or other guideline else. All of the teachers, 60 (100%) teachers answered that they can be a part of the team to help preventing or controlling HFMD disease (Table 4.6).

Table 4.6 Attitude towards Hand Foot and Mouth Disease

No.	Statements	Number (%)
1	Do you think the disease can cause the epidemic? (Explain: spreading and affecting the community in the wide scale)	
	• Yes, because of close contact	37 (61.6)
	• Yes, lack of knowledge and poor hygiene	10 (16.7)
	• Not sure	9 (15.0)
	• Yes, by air	3 (5.0)
	• Yes, had experience on student got HFMD from community	1 (1.7)
	• Do not know	0 (0.0)
	• Others	0 (0.0)
2	Do you think HFMD has the impact on socioeconomic? (Explain: causing the community social and economic well-being as a whole)	
	• Yes, lost of time/ budget/ effect people in wider scale	43 (71.7)
	• No	15 (25.0)
	• Do not know	2 (3.3)
	• Others	
3	Do you think the access/ number of the washing basin is importance for the disease prevention?	
	• Yes, enough number/ convenient	53 (88.3)
	• No, have washing basins but not use; no benefit	4 (6.7)
	• No, not important	2 (3.3)
	• Do not know	1 (1.7)
	• Others	0 (0.0)
4	Do you think cleaning the toys and school supply is importance for the disease prevention?	
	• yes, very important way to prevent any disease	58 (96.7)
	• No	0 (0.0)
	• Do not know	2 (3.3)
	• Others	0 (0.0)
5	Do you think the guideline for school closure guide line is clear to follow?	
	• Yes	46 (76.7)
	• No, not apply to school policy/ parent have no time/	0 (0.0)
	• teacher do not have enough time to finish the curriculum	14 (23.3)
	• Do not know	0 (0.0)
	• Others	0 (0.0)

Table 4.6 Attitude towards Hand Foot and Mouth Disease (cont.)

No.	Statements	Number (%)
6	What can you and your team can do to help controlling HFMD disease?	
	<ul style="list-style-type: none"> • Yes, meeting/ consult/ educate the children and promote the practice • Maintain the personal hygiene policy among your team and your children • Frequent cleaning toy and school supplies properly • Concern and early detect the suspected case and report case to health authority • sent sick student away • update the situation of disease • Class or school closure while appropriate • Do not know • Others 	<p>60 (100.0)</p> <p>0 (0.0)</p> <p>0 (0.0)</p> <p>0 (0.0)</p> <p>0 (0.0)</p> <p>0 (0.0)</p> <p>0 (0.0)</p> <p>0 (0.0)</p> <p>0 (0.0)</p>

Bold is considered as correct answers

4.4 Hygiene precaution and prevention (Practice domain)

In hygiene precaution and prevention and control domain, there are 10 questions about hygiene precaution and prevention and control on HFMD regarding school policy, guidelines for HFMD in school, school closure, class size policy, class size, homeroom education, cleaning policy, chemical used for cleaning, washing basins and hand washing facilities.

Fifty-eight (96.7%) of the teachers answered that there is the school policy to decrease HFMD in their school while Two (3.3%) did not know. The number of the teachers who awared that there is a school guideline on HFMD following MOPH and nearby health service recommendation was 57 (95%). Forty-one (68.3%) answered correctly about school closure related to HFMD. While the rest of the answers were considered as not correct such as send sick kids back home even it is correct but not for this question. 5 (8.8%) teachers did not know about the school closure related to HFMD of their own working school.

Almost all, 57 (95%) teachers knew that not more than 30 students per class is the class size policy but still, 20 (33.3%) teachers accepted that they have to handle more than 30 students in their responsible class. Almost all teachers answered that they performed homeroom activity in the morning for general advice and personal hygiene, 57 (95.0%). Among them, 35 (58.3%) teachers had done homeroom activity everyday, 22 (36.7%) teachers answered weekly. Three (5.0%) teachers never perform home room before starting class. None of the teachers answered that they clean and sanitize the toys and school supplies every day after class. The best answer was from around half of them 29 (48.8%) who answered that they clean the toys and school supply once a week. 31 (51.2%) teachers answers were even longer duration, 15 (25.0%) teachers answered once a month, 14 (23.3%) teachers answered once in every four months or in one semester, 29 (3.3%) answer not often. For the question about the chemical used for cleaning and sanitizing, 29 (48.3%) teachers answered that the use general purposed detergent for cleaning. 17 (28.3%) used disinfection liquid. None of them know or answer about using chlorinate solution diluted by water

All 60 (100%) teachers answer that the school provide hand washing basin for students. Fifty-four (90.0% teachers answered that they provide liquid and bar soap for students at hand washing facilities (While for the school check list part; just only half of the school had soap at hand washing basin) (Table 4.7).

Table 4.7 Hygiene Precaution and Prevention

No.	Statements	Number (%)
1	Does your school have policy for decreasing HFMD?	
	• Yes, hand washing	19 (31.7)
	• Yes, focus on good hygiene	19 (31.7)
	• Yes, give education to parents and students	12 (20.0)
	• Yes, et sick students stay at home/ close the class	5 (8.3)
	• Yes, basic health check up before class	3 (5.0)
	• No	0 (0.0)
	• Don't know	2 (3.3)
	• Others	0 (0.0)

Table 4.7 Hygiene Precaution and Prevention (cont.)

No.	Statements	Number (%)
2	Do you have Guideline for HFMD in your school?	
	• Yes, from ministry of public health and nearby hospital	57 (95.0)
	• Do not have	3 (5.0)
	• Do not know	0 (0.0)
	• Others	0 (0.0)
3	Does your school close when there are HFMD cases?	
	• Yes, if there are 3-5 cases; close only the class with present cases	20 (33.3)
	• Yes, if there are 5-10 cases; close the school for one week	21 (35.0)
	• No, send sick kids back home	14 (23.4)
	• Don't know	5 (8.3)
	• Others	0 (0.0)
4	Does your school have the class size policy?	
	• Yes, Not more than 30 students per class	57 (95.0)
	• No, Do not have	0 (0.0)
	• Do not know	0 (0.0)
	• Others: Unlimited	3 (5.0)
5	Does your present class size less than 30?	
	• Yes, 20 - 30 students in class	45 (66.7)
	• No, 30 -35 students in class	20 (33.3)
	• Do not know	0 (0.0)
	• Others	0 (0.0)
6	Is there any homeroom education about hygiene and hand washing for the students?	
	• Yes, everyday	35 (58.3)
	• Yes, once a week	22 (36.7)
	• No, Do not have	3 (5.0)
	• Others	0 (0.0)
7	The regular cleaning policy; How often to clean the toy and school supply?	
	• Once a week	29 (48.4)
	• Once a month	15 (25.0)
	• Once/ four months or one semester	14 (23.3)
	• Not often	2 (3.3)
	• Do not know	0 (0.0)
	• Others	0 (0.0)

Table 4.7 Hygiene Precaution and Prevention (cont.)

No.	Statements	Number (%)
8	What are the chemical used for cleaning as for HFMD and other diseases prevention?	
	• General purposed detergent	29 (48.3)
	• Disinfection liquid	17 (28.3)
	• Dish washing	4 (6.7)
	• Alcohol	3 (5.0)
	• Gel	2 (3.3)
	• Soap	2 (3.3)
	• Just wiping	1 (1.7)
	• Washing powder	1 (1.7)
	• Attenuate floor cleaning liquid	1 (1.7)
	• Baby shampoo	0 (0.0)
	• Chlorinate solution diluted by water	0 (0.0)
	• alcohols	0 (0.0)
	• Do not use anything but just water	0 (0.0)
	• Do not know	0 (0.0)
	• Others	0 (0.0)
9	Does your school provide washing basins for students to use?	
	• Yes	60 (100.)
	• No	0 (0.0)
	• Do not know	0 (0.0)
	• Others	0 (0.0)
10	What Kind of soap used or provided for the students?	
	• Liquid	43 (71.7)
	• Bar	11 (18.3)
	• Gel	5 (8.3)
	• No soap	1 (1.7)
	• Do not know	0 (0.0)
	• Others	0 (0.0)

Bold is consider as correct answers

4.5 Result of knowledge, attitude and practice of kindergarten teachers

The distribution of knowledge score range from 5 to 11 scores out of 11 scores, mean score was 7.90 ± 1.50 (Figure 4.1).

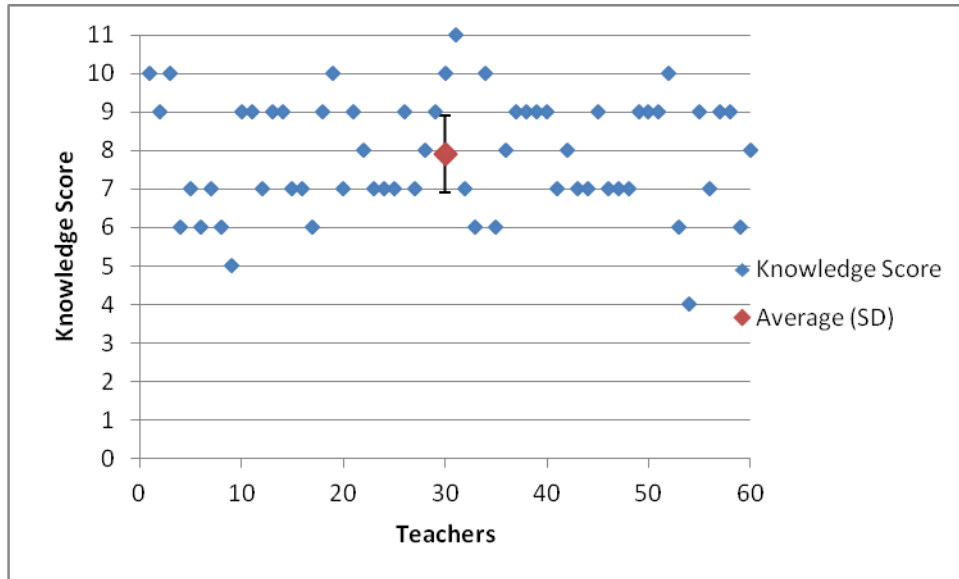


Figure 4.1: Distribution of knowledge score and $\bar{x} \pm SD$

The distribution of attitude score range from 3 to 6 scores out of 6 scores, mean score was 5.52 ± 0.77 (Figure 4.2).

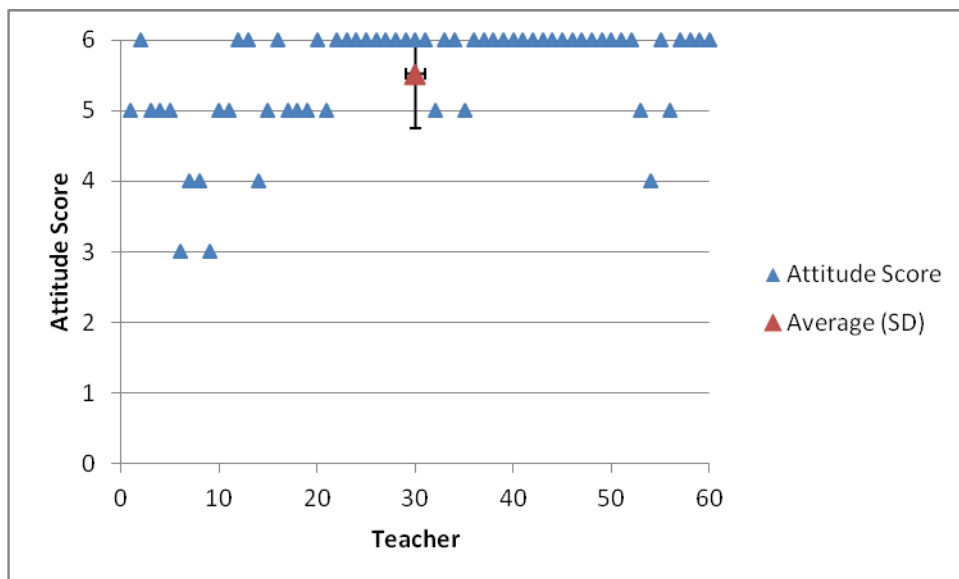


Figure 4.2: Distribution of attitude score and $\bar{x} \pm SD$

The distribution of practice score range from 5 to 10 scores out of 10 scores, mean score was 8.98 ± 1.10 (Figure 4.3).

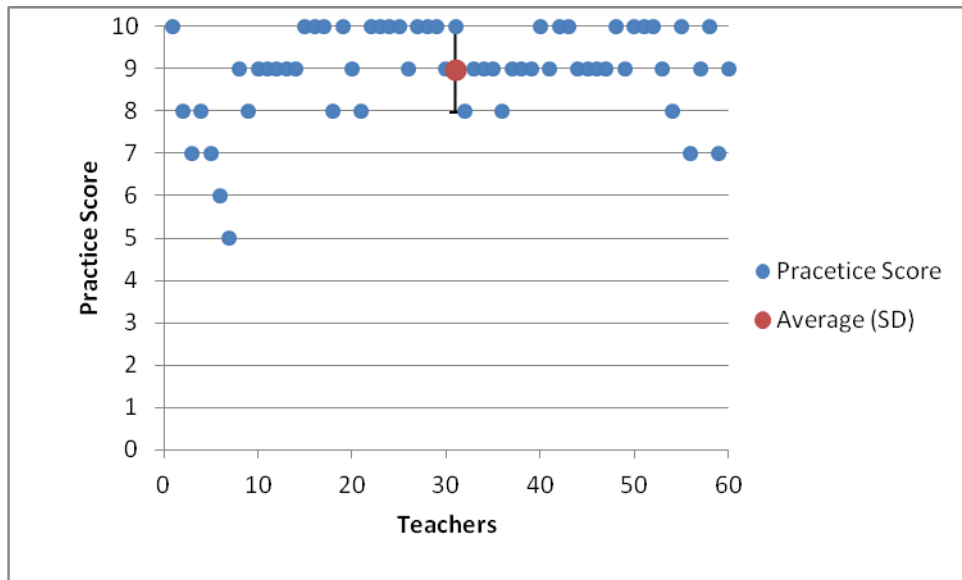


Figure 4.3: Distribution of practice score and $\bar{x} \pm SD$

The questionnaires grouping based on distribution of number of correct answer based on distribution and mean score of each domain (score) (Table 4.8).

Table 4.8 Grading of KAP

Domains (items)	Level (Score)		
	Poor	Moderate	High
Knowledge (11)	≤ 6	7-9	≥ 10
Attitude(6)	≤ 4	-	≥ 5
Practice(10)	≤ 6	7-8	≥ 9

The overall knowledge, attitude and practice (KAP) of kindergarten teachers in this study is moderate to high. (Table 4.9)

Table 4.9 Result of KAP

Domains (items)	Level (Score)		
	Poor	Moderate	High
Knowledge	10 (16.7)	43 (71.7)	7 (11.7)
Attitude	6 (10.0)	-	54 (90.0)
Practice	2 (3.3)	12 (20.0)	46 (76.7)

4.6 Association of teachers' actual age and their knowledge, attitude and practice towards HFMD

From the number of 60 of enrolled kindergarten teachers, based on the distribution and mean value of ages their actual age was grouped into 2 groups with the cutoff point of less than or equal to 30 years and of more than or equal to 31 years to find out the association of their actual age to their knowledge, attitude, and practice towards HFMD.

The results of the association of their actual age to their knowledge, attitude and practice towards HFMD showed no significant association, in other words there was no different in knowledge, attitude and practice of the teachers who their actual age is less or more than 30 years old. (Table 4.10)

Table 4.10 Association of KAP level and actual age (year)

KAP Level/ Actual Age (year)(N=60)	Knowledge			Attitude		Practice		
	Poor	Moderate	High	Poor	High	Poor	Moderate	High
≤30	7	20	3	2	28	2	5	23
≥31	3	23	4	4	26	0	7	23
P value	0.377			0.389		0.311		

P value is calculated using chi-square: P value <0.05 is statistical significant

4.7 Association of teachers' work experience and their knowledge, attitude and practice towards HFMD

From the number of 60 of enrolled kindergarten teachers, their work experience was grouped into 2 groups based on the distribution and mean of work experience (year), so the cutoff point of less than or equal to 10 years and more than or equal to 11 years to find out the association of their actual age to their knowledge, attitude, and practice towards HFMD.

The results of the association of their actual age to their knowledge, attitude and practice towards HFMD showed no significant association, in other words there was no different in knowledge, attitude and practice of the teachers who have been working as kindergarten teacher for more or less than 10 years. (Table 4.11)

Table 4.11 Association of KAP level and work experience (year)

KAP Level/ Work Experience (year) (N=60)	Knowledge			Attitude			Practice	
	Poor	Moderate	High	Poor	High	Poor	Moderate	High
≤10	9	37	6	5	47	2	9	41
≥11	1	6	1	1	7	0	3	5
P value	0.944			0.800			0.375	

P value is calculated using chi-square: P value <0.05 is statistical significant

4.8 Association of teachers who have experience on HFMD and their knowledge, attitude and practice towards HFMD

From the number of 60 of enrolled kindergarten teachers, based on their experience on HFMD, they were grouped into 2 groups; a group of teachers who had experience on HFMD at least once before and a group of teachers who have never had experience on HFMD at all to find out the association between the teachers who experience on HFMD at least once before and the teachers who have never had experience on HFMD at all to their knowledge, attitude, and practice towards HFMD.

The results revealed no significant association, means there was no different in knowledge, attitude and practice between the teachers who experience on HFMD at least once before and the teachers who have never had experience on HFMD at all to their knowledge, attitude, and practice towards HFMD (Table 4.12).

Table 4.12 Association of KAP level and experience on HFMD

KAP Level/ Experience on HFMD(N=60)	Knowledge			Attitude		Practice		
	Poor	Moderate	High	Poor	High	Poor	Moderate	High
Yes	3	23	5	2	29	0	4	27
No	7	20	2	4	25	2	8	19
P value	0.220			0.344		0.097		

P value is calculated using chi-square: P value <0.05 is statistical significant

4.9 Association of teachers who have heard or aware about HFMD and their knowledge, attitude and practice towards HFMD

From the number of 60 of enrolled kindergarten teachers, based on their hearing about HFMD, they were grouped into 2 groups; a group of teachers who have HFMD and a group of teachers who have never heard about HFMD to find out the association between the teachers who have heard about HFMD and the teachers who have never heard about HFMD to their knowledge, attitude, and practice towards HFMD.

The results of the association between the teachers who have heard or aware about HFMD and one who have never heard or aware about HFMD to their knowledge, attitude, and practice towards HFMD showed no significant association, in other words there was no different in knowledge, attitude and practice between the teachers who have heard about HFMD and the teachers who have never heard about HFMD. (Table 4.13)

Table 4.13 Association of KAP level and heard about HFMD

KAP Level/ Heard about HFMD (N=60)	Knowledge			Attitude		Practice		
	Poor	Moderate	High	Poor	High	Poor	Moderate	High
Yes	5	26	2	3	30	2	6	25
No	5	17	5	3	24	0	6	21
P value	0.273			0.795		0.414		

P value is calculated using chi-square: P value <0.05 is statistical significant

4.10 School observation on sanitation and hygiene

Apart from identifying knowledge, attitude and practice of kindergarten teachers toward hand foot and mouth disease in kindergarten schools under control of Bangkok Primary Education office, Thailand this study also explore the sanitation and hygiene of kindergarten schools under control of Bangkok Primary Education office, Thailand by using checklist.

All the schools (100%) in this study are preschool or kindergarten schools. All schools (100%) have a first aid room but only one school 1 (1.7%) had school nurse for the first aid room (Table 4.14).

Table 4.14 General information of the school

No.	Statements	Number (%)
1	Is there a first aid room?	
	<ul style="list-style-type: none"> • Yes • No 	10 (100.0) 0 (0.0)
2	Is there a nurse for the first aid room?	
	<ul style="list-style-type: none"> • Yes • No 	1 (10.0) 9 (90.0)

All the schools (100%) met the classroom parameter standard for classroom height, shape, size, ventilation and illumination but only 40% are the classroom with air condition (Table 4.15).

Table 4.15 Classroom parameter and hygiene

No.	Statements	Number (%)
1	Is classroom high at 3.50 meters?	
	• Yes	10 (100.0)
	• No	0 (0.0)
2	Is the classroom in rectangular shape 6×8 or 7×9 meters?	
	• Yes	10 (100.0)
	• No	0 (0.0)
3	Are there more than 30 students per classroom?	
	• Yes	10 (100.0)
	• No	0 (0.0)
4	Is space in the classroom lesser than 2 square meters per one student?	
	• Yes	10 (100.0)
	• No	0 (0.0)
5	Is the classroom has appropriate ventilation?	
	• Yes	10 (100.0)
	• No	0 (0.0)
6	Is the classroom has appropriate illumination?	
	• Yes	10 (100.0)
	• No	0 (0.0)
7	Is there air conditioner in the classroom?	
	• Yes	4 (40.0)
	• No	6 (60.0)

Almost all of the schools met the water supply standard for schools but surprisingly only 50% of the schools had provided soaps at hand washing basins (Table 4.16)

Table 4.16 Water supply

No.	Statements	Number (%)
1	Is tap water used in school?	
	• Yes	10 (100.0)
	• No	0 (0.0)
2	Is cleaned drinking water provided?	
	• Yes	10 (100.0)
	• No	0 (0.0)
3	Is cleaned cleaning water provided?	
	• Yes	10 (100.0)
	• No	0 (0.0)
4	Are washing basins sufficient for the number of the students?	
	• Yes	10 (100.0)
	• No	0 (0.0)
5	Are soap provided near the washing basins?	
	• Yes	5 (50.0)
	• No	5 (50.0)

Almost all of the schools met the canteen parameter standard for schools but only 30% of the schools had provided soaps at hand washing basins (Table 4.17).

Table 4.17 Canteen parameter

No.	Statements	Number (%)
1	Does the school have school canteen with appropriate space for number of student?	
	• Yes	10 (100.0)
	• No	0 (0.0)
2	Is there drinking water provided?	
	• Yes	10 (100.0)
	• No	0 (0.0)
3	Is there hand washing basins provided?	
	• Yes	10 (100.0)
	• No	0 (0.0)
4	Is there dish washing basin provided?	
	• Yes	10 (100.0)
	• No	0 (0.0)
5	Are soap provided near the basins?	
	• Yes	3 (30.0)
	• No	7 (70.0)
6	Is there a place for wasted?	
	• Yes	10 (100.0)
	• No	0 (0.0)

Almost all of the schools met the latrine and waste disposal standard for schools but only 40% of the schools had provided soaps at hands washing basins and only 60% of the school have clean toilets with no strain and no bad smell or stink (Table 4.18).

Table 4.18 Latrine and waste disposal

No.	Statements	Number (%)
1	The school provide accessible toilet (flush toilet)?	
	• Yes	10 (100.0)
	• No	0 (0.0)
2	Are the toilets sufficient for number of students? (1 Toilet for 30 girls, 1 toilet for 60 boys and 1 chamber pot for 50 boys)	
	• Yes	10 (100.0)
	• No	0 (0.0)
3	Are toilets at least 30 meters far from any drinking water source and canteen?	
	• Yes	10 (100.0)
	• No	0 (0.0)
4	Are toilets separate for kindergarten and older students?	
	• Yes	10 (100.0)
	• No	0 (0.0)
5	Are there separate toilets for male and female students and teachers	
	• Yes	10 (100.0)
	• No	0 (0.0)
6	Is there sufficient water in the toilets?	
	• Yes	10 (100.0)
	• No	0 (0.0)
7	Are hands washing facilities with soap available?	
	• Yes	4 (40.0)
	• No	6 (60.0)
8	Are toilets cleaned? (no strain and no bad smell or stink)	
	• Yes	6 (60.0)
	• No	4 (40.0)
9	Rubbishes or trashes are taken off school site?	
	• Yes	10 (100.0)
	• No	0 (0.0)

The overall of school observation on sanitation and hygiene based on checklist comprised of five domains; general knowledge of the school (2 items), classroom parameter and hygiene (7 items), water supply (5 items), canteen parameter (6 items) and latrine and waste disposal (9 items). The total numbers of checklist items are 29 items. All 10 schools are having more than 80%, are standard schools (Table 4.19).

Table 4.19 The overall of school observation on sanitation and hygiene

School No.	N	%
1	27	93.1
2	26	89.7
3	25	86.2
4	24	82.8
5	25	86.2
6	24	82.8
7	25	86.2
8	26	89.7
9	26	89.7
10	25	86.2

The distribution of school standard percentage range from 86.2% to 93.1%, mean score was 87.260 ± 3.2701 (Figure 4.4).

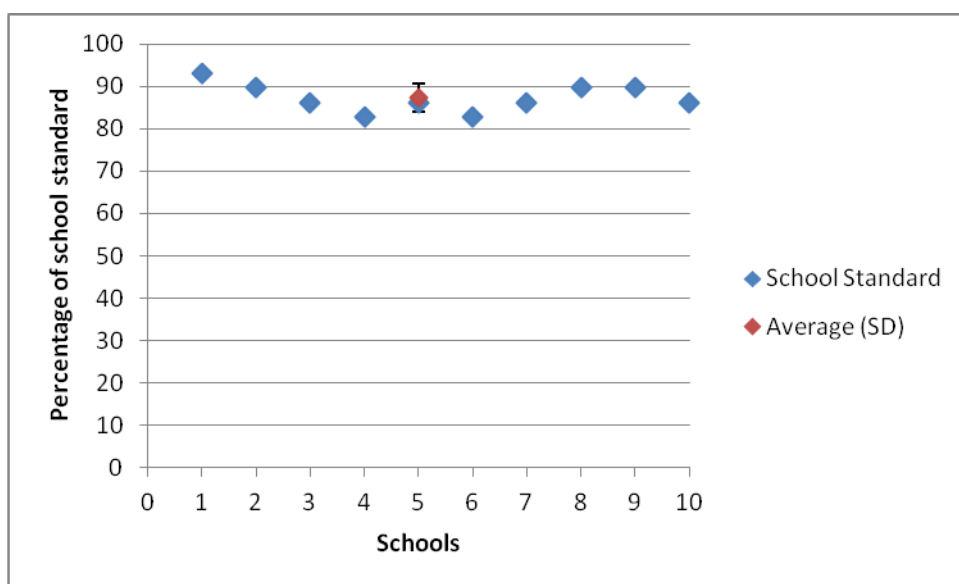


Figure 4.4: Distribution of school standard and $\bar{x} \pm SD$

4.11 In-depth Interview (IDI)

All 10 teachers are female, mean age was ± 41.30 years range from 24 -60 years, 8 (80.0%) had experienced on HFMD. None of them were nurse. None of them were involved in administrative team of each school.

In-depth interview was conducted in 10 kindergarten teachers using open-ended questionnaires composed of 4 sections; common health issue in school, knowledge on HFMD, attitude on HFMD and practice on HFMD. The interview took place in the private room by giving all participants enough time (about half of hour for each participant) to answered and discussed following the prepared topics sequentially. The voice recording was done and the dialogs were translated to texts. The results of IDI will help the researcher to see the other dimension of the survey study in qualitative perspective. This results present here as the highlight of the number (%) of the correspond answers from each sections, but the related texts or sentences that related to other main results are quoted in each issue related.

1. Common health issue in school: Cold, fever, coughing headache, stomachache and conjunctivitis are the health issues that commonly occur in the schools.

2. Knowledge on HFMD: All (100.0%) of teachers knew that HFMD is a transmitted disease and all know that it is transmitted by respiratory discharge from blister, mucus, saliva and feces, 9(90%) answered that it is the disease of young children. 6 (60.0%) knew that HFMD occur in rainy season, only 4 (40%) know that virus cause HFMD (one can say name that EV 71), only 5 (50%) thought or have heard that this disease could turn severe or life threatening. While asking about treatments only 1(%) said it was symptomatic but the rest were not really known about treatments. Most of the teacher who had participated IDI gain the disease knowledge due to their direct experience by themselves, 8/10 (80%) experienced HFMD during previous years. Around half of them learnt about infectious disease or HFMD form media such as TV, newspapers, website more than receiving the information from responsible authority. All mentioned about the detail of the disease they know are not good enough to transfer to others people such as students, student's family, community or even the teachers' family member themselves. All of them did not

know that Thailand set standard of the kindergarten requirement as the teacher requires at least once a year school health related training. While the interviewer stated about Thailand kindergarten guideline that it is compulsory that kindergarten school administrative is to perform health related training to the students' care giver (parents, care givers) at least once a year. All of them did not realize and not comfortable to perform such that activity.

3. Attitude on HFMD: All of them (100%) agreed that giving knowledge on HFMD to teachers. Parents and children is important because it can help prevent the disease and they felt with that regular training, it should have positive outcome on the disease as the whole. Ten teacher accepted that everyone; teachers, assistance teachers parents and children have significant role to prevent the disease. All teachers agreed with school closure policy. All teacher said that hand washing and toys cleaning are the way to prevent HFMD. All 10 (100%) teachers said that they used to participated in activities related to HFMD such as distribute HFMD fact sheet to parents, teaching or giving knowledge to children on HFMD prevention, means even they did not have activity provided by authority, they still seek for participating the related event by themselves. This shows the good attitude on the diseases learning, attitude and further more to action.

4. Practice on HFMD: 8(80%) teachers experienced HFMD in school before and all of them experience school closure which they agreed. Most of them said it is effective methods. All of them agreed that regular prevention method should have been done regularly. Early detection and case separation , 9 (90.0%) teachers said that, they have done the observation every children sickness including clinical of HFMD such as fever with rash in moth palm and sole almost every day, but most of the cases that they could pick up were from parents informing for school absence. All 10 (100.0%) teachers said that the active daily health checkup, active classroom cleaning and the school closure were the school policy which will be strongly activated when HFMD already occurred only. All of them mentioned that the toy and classroom cleaning are what they would take as serious actions only when there is a case of HFMD. The guideline for toys and school cleaning/ sanitizing is not clear from authority, the correct chemical required for each cleaning tasks were not enough supply and were not identified properly. 8 (80.0%) teachers said that their schools

have personnel, time and activities for HFMD prevention but don't really have budget. 8(80%) added up about the teacher responsibilities which were too overloaded to handle more tasks. All of them would like to participate training/ workshop and believe that KAP of the teachers would help decreasing the disease

CHAPTER V

DISCUSSION

Many infectious diseases as well as HFMD commonly affect young children. School is the suitable place facilitating disease transmissions. The primary prevention and control measures for infectious disease such as personal hygiene practice, healthy behavior practice MUST be initiated during early year of school life. [55] Students spend one third of their time with teachers and there is always true that training the youth by the teacher is usually fruitful, so the KAP of the teacher can be the key factors affecting the outcome of knowledge teaching/ training as well as health related teaching/ training such as health promotion & life style, disease prevention and control. There was such a study showed the sustainability of health-related intervention program in the elementary school compare to higher school level. [55] Students who have adequate regular health training at school are more able to integrate hygiene education into their daily lives and can be effective messengers and agents for change in their families and the wider community. [43]

This study is the very first and importance study to explore the KAP among teachers, school environments and hygiene in kindergartens in Bangkok.

5.1 Demographic characteristics

The demographic characteristic (such as female gender and average age) of the teachers in this study was corresponding to the demographic distributions of the teachers in Thailand. The percentage of male teachers of elementary school in Bangkok was only 6.82% compared to female teachers. Even though, there was no obvious gender policy for kindergarten teacher but regarding Thai culture and norms, the duty of taking care of elementary children is to be for female. There were member of studies on an opinion analysis of parents and early childhood teachers concerning

gender specific teacher in early childhood education revealed that there are both positive and negative opinions of parents towards male teachers. [56]

Around half of kindergarten teachers in Bangkok aware or experienced of HFMD before, this not surprising since the teacher might have high probability to experience real HFMD outbreak situation since HFMD has been the epidemic disease affecting the children during a whole year round in Thailand for number of years. Additional factor may according to young age; mean age 35 year-old with the short mean work experience (11 year), that means majority of them were young and this probably relate to the active learning, using multimedia and internet access manner of new generation who live in the city.

In this study, none of the teacher has experienced health related training before even Thai School Health monitoring guideline addresses that the teacher training for health related and disease prevention should be performed at least once a year [57]. There is evidence that teachers who have experienced health promotion training tend to be involved more frequently in health promotion practice and have a more comprehensive approach to health education [58]. All of teacher participated in IDI would like to participate the health promotion and prevention training and would like to be part of team to prevent and control HFMD and other infectious disease in school. Four teachers mentioned about the hand full responsibility of the teachers

“Administrative often overlook the heavy workload of the teachers and the amount of additional work involved” (32 year-old, school 03).

The 47 year-old from school 08 said “Training, not only health related are lack, we have too many regular jobs”

There were 2 similar interesting thoughts form two difference schools in IDI study

“School generally lack unity and coordination in the planning and practice for troubles such as emergency accidents and diseases, and do not have enough staff and facilities for students during disease widely spread. (37 year old, school 03 and 29 year-old, school 08)

5.2 Knowledge, Attitude and Practice (KAP)

The study was face-to face interviewing method using the questionnaires without reading the choices to the interviewee which was suitable design for the study that requires small sample size and the study that has done at the beginning in order to probe or explore the possible related results/trend of the issue to be elaborated to the future study. The answering of this type of performing could be boarded and needed to clean up properly before data coding and analyzing, it is one of the pitfalls of the open-ended design which may lead to the coding error and finally the study error. In term of the navigative study, it is useful.

Overall score of knowledge, attitude and practice results; the overall results of KAP score were moderate to high. This KAP levels were also in agreement with some studies about the KAP among the teachers incommunicable as well as on-communicable disease elsewhere. [35, 36]

Even though, the kindergarten teachers demonstrated moderate to high overall knowledge score level regarding HFMD, there were some issues that they still had insufficient knowledge. Especially for the cause of HFMD, less than half of the teachers knew that virus is the cause of HFMD. Similarly regarding to how can HFMD be decrease, indeed, the teacher answered that HFMD could be decreased by difference means including good hygiene and hand washing practice as well as providing health education but none of the teacher answered the very practical methods that usually came together with school personal hygiene campaigns or school health promotion policy such as toys and school supplies cleaning or wearing face mask while getting respiratory illness.

Regarding knowledge on how HFMD could be treated, only 5 (8.3%) teachers know that HFMD was treated by symptomatic treatments because none of the teacher had experience on health related training before. The answers about the cause of disease and treatment of disease were not highly expected from teacher level, but they reflected the lack of training. Health related training was important for school teachers in order to give develop understanding and having confident enough to involve in children and their community health [59]

There is the noticeable point of discrepancy of knowledge about that there was the national guideline for HFMD was already in place, around 45 (75.0%) teachers can answered correctly to what were included in the national guideline. There were a high number of teachers, 15 (25.0%) teacher who did not have any idea for the national guideline for HFMD. Theoretically, his part of knowledge is less possible for the general people to know from other medias, it should have come from the health related policy training, but in the climate of 100 % teachers insisted in the questionnaire part that there was no training before, the question came to the researchers mind about the possibility of these source of knowledge should come from.

In the IDI part, the part of “policy domain” 10 teacher still answered that there was no health related training experience at all, but 7 (70%) teachers mentioned about the school regular meetings where the teacher responsible or administrative person who joined the policy meeting outside actually come back to report the message to the members. This can be assumed as the major sources of indirect knowledge gain for teacher within school. This results of the study showed the deeper dimensions of data gained from IDI study, that is why Central for Disease Control and prevention epidemiological program supported in-depth interview as the additional tool for quantitative survey. [60]

The score from in attitude and practice domains are quite high in our study population. These could only assume that they have moderate to high KAP for HFMD but the study design did not test relationship among these parameters. Literally, knowledge may affect the attitude, and attitude probably had impact on practice, but there were still an issue for debate. [61]

In our study, if we have a look at the detail of each critical responses carefully to try to identify the discrepancy among data.

1. About toys and school supply cleaning and sanitizing, 75 % of them **they knew** about Thai policy, but **none** of them answer every day, and **none** of them used the correct chemical for cleaning and sanitizing recommended.

2. Knowing about benefit of the hand washing, 46 (75%) knew that hand washing is part of the good practice to reduce the spreading of HFMD while on attitude domain 53(88%) have good attitude on having enough number of hand

washing basin, this number is acceptable high as whole score. Interestingly, 4 teacher answered that hand washing basin was **not important** and was **not useful** and one teacher answer “**do not know**”, this could considered as very critical attitude, even it was the small portion of subjects, but it hold strong negative effect especially in the school setting like Bangkok, the capital city of the country . This study did not design for the testing the real practice of hand washing among teachers and children, for real practice, this should be recommended for the future survey.

KAP relationship is complex, picking up some significant portion of discrepancies or negative impacted answers on each items possibly showed something which is not only related to pure knowledge of the teacher and the conclusion of these findings could not be assume that the teacher require health training. School health promotion was not equal to teacher training. Health promotion and prevention in school depends on many factors and contexts including institutions factors, individual factors and public factors. The positive impact of improving school health policy and training were shown in many studies but again many study also failed to demonstrate the impact unless there is the very well implemented. [62]

5.3 School environment, sanitation and hygiene

All 10 schools participated in the study exhibited the high score for school hygiene and environment in the school hygiene check list study.

From 29 (100%) items in the check lists, the percentage of mean score was 87%. This study has been performed in the good standard setting as in school are under BPEO under OBEC and as under the school health promotion program for all of them.

Only one school in this study has school nurse. The policy for school nurse is not well demonstrated in Thailand. The school nurse is the health care representative on site. They are essential to ensure coordinated care among people involved in health trouble. Allen G, has shown the relationship between health and learning, as there is between school nurse availability and student well-being and educational success [63].

There are trouble related to class sized policy which should be than 30 children/ class, but all of them could not implement it since they all had more than 30 students in class. This may due to the over populated effect of Bangkok.

The questionnaires part study, prevention-control measure domain, 54 (90.0%) teachers answered that they provide liquid and bar soap for students at hand washing facilities while in the school check list part; only half of the school 5(50%)had soap at the washing basins.

5.4 In-depth interview equate

“The students always play with soap and finish the bottle quick, that was why we could not have soap in palace” (36 year-old, school 08)

“No regular soap provided and we have to always ask for” (30 year-old, school 2)

“We use the alcohol base gel, but can no let the student reach by themselves, they will eat all” ((26 year-old, school 01)

Theoretically, health-risk behaviors of students are focusing in unsupervised places or unowned spaces at the school such a toilet, washing and refreshing place, a corridor or unused room. Several studies suggested that the large number of ‘unowned’ spaces in schools was the result of teachers focusing on classroom-based instruction and not the supervision of the wider school environment, which was considered beyond their professional responsibility [64]. To solve such the trouble of this washing area school, administrative must consider these area as the hotspot area to determine by everyone and organize the well plan of using, supplying and frequent evaluation.

5.5 Pitfall of the study

This is the cross-sectional survey study which studies only the description of school teachers in kindergarten in Bangkok which may not represent the population of school or teacher elsewhere.

There are pitfalls of the school observations which is the limit of study time, that the researcher could not have done the real time practice such as asking children to clean hand, the high score can also come from the knowing that the observation was taking place as the Hawthorn's effect. It should be better if the cohort study with training or intervention are also applied and are followed up for a period of time.

CHAPTER VI

CONCLUSION AND RECOMMENDATION

The study was aimed to explore the knowledge, attitude and practice of kindergarten teachers as well as to observe the school sanitation and hygiene in kindergarten schools under control of Bangkok Primary Education Office, Bangkok, Thailand.

6.1 Conclusion

There were a total number of 60 kindergarten teachers, all were female. The mean age was at 35.75 years. The mean number of working experience was at 11.02 years. 31(51.7%) of teachers had experience with HFMD at least once before. 33(55.0%) of teachers have heard about HFMD from TV or news paper. None of the teacher 0(0.0%) have experience on HFMD or health related training. All of the teachers are kindergarten teachers in kindergarten schools under control of Bangkok Primary Education Office, Bangkok, Thailand.

The results of knowledge, attitude and practice domains of 60 kindergarten teachers was graded as high, moderate and poor based on the number of the sample size (60 kindergarten teachers) and distribution of number of the correct answers in score. For knowledge out of 11 scores; we graded ≤ 6 , 7-9 and ≥ 10 for poor, moderate and high. For attitude out of 6 scores; we graded ≤ 4 and ≥ 5 for poor and high. For practice out of 10 scores; we graded ≤ 6 , 7-8 and ≥ 9 for poor, moderate and high.

Knowledge among 60 teachers enrolled, 43 (71.7%) showed moderate knowledge while 10 (16.6%) was poor and only 7 (11.7%) was high.

Attitude among 60 teachers enrolled, 54 (90.0%) showed high attitude level while 6 (10.0%) was poor.

Practice among 60 teachers enrolled, 46 (76.7%) showed high practice level while 12 (20.0%) was moderate and only 2(3.3%) was poor.

In general characteristics, we have analyzed for the correlation of demographic data: the cutoff point based on the age distribution of the teachers enrolled in this study, actual age <30 and >30 years, work experience <10 and >10 years as well as the group of teachers who have experience on HFMD at least once and the group of teachers who have not heard about HFMD dead cases with the grading of their knowledge, attitude and practice domains and there was no association apparent between them, all teacher have moderate to high level of knowledge, attitude and practice domains unrelated to their age, work experience, experience on HFMD and whether they have heard about HFMD dead cases or not.

The results of school observations following the school checklist using >80% of full score for high standard as the indicator for good hygiene and sanitary school, all of them met good hygiene and sanitary criteria. The only weak point are that all have the high number of children in one class (>30/ class) and only half 5 (50%) schools provided soap at hand washing facilities for students.

6.2 Recommendation

Based on the findings discussed in this study, the following issues would be considered as recommendation of the participated schools, teachers as well as any further study.

Even though, the overall knowledge, attitude and practice (KAP) among kindergarten teachers in this study is moderate to high, some important knowledge, attitude and practice point are still not very clear to the teachers. Regarding HFMD or health related training, none of the teachers in all kindergarten schools under control of Bangkok Primary Education office have ever had any training on HFMD or any other diseases as well as any health related training course. Unexpectedly, the percentages of teachers who have experience about HFMD cases are more than half 31 (51.7%). It is important to provide supportive knowledge on disease, prevention and control measure of the disease as well as good attitude towards the disease for teachers through HFMD or health related training course. The percentage of teachers who have heard of HFMD death cases are 25 (41.7%), less than half of the teachers are aware for

information and news on HFMD, less than half of the teachers know that HFMD can be a deadly disease. It is necessary that the teachers be more aware for information and news about the diseases that occur in children and the information of such diseases should provide and be easy to accessed like that information and news related to epidemic of disease and school policy towards disease from ministry of public health and ministry of education.

For school sanitation and hygiene, it should be considered that the density of the class size for all classes should strictly follows the policy from ministry of education and it very necessary that soaps are provided thoroughly for students to use at hand washing facilities.

6.3 Recommendation for further study

This study setting is in the capital city which may not represent the school elsewhere or not represent the school under other authorities in Bangkok since, these schools participated are under very well management under control of Bangkok Primary Education Office. The finding about the big class size is corresponding to the trouble of high density of Bangkok population. Further study should explore the finding in schools under other authorities.

6.4 Limitation of study

There were several limitations of this study. At first, the results from the study may not be generalized in other schools of other authorities because every school under different authorities has different management and different corporation between school with governmental and private organization. In addition, the knowledge, attitude and practice of the teachers who participated in this study may be different from the rest of the teachers in other schools under other authorities.

Moreover, in the questionnaire, regarding hand washing facilities 98.3% of the teachers responded that they provide soap for students but in contrast to school sanitary and hygiene observation only 50% of 10 schools provided soap for students at hand washing facilities. Therefore it was not sure that there was reliability about the respondent to this issue.

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APPENDICES

APPENDIX A

Disease surveillance for Hand Foot and Mouth Disease barriers in kindergarten schools under Bangkok affiliated in Thailand

Questionnaire for kindergarten teacher.

Version 1.0

Participant/ respondent code: |_|_|

Participant/respondent study number: |_|_|_|-|_|_|_|

Date of questionnaire completion:

|_|_|-|_|_|-|_|_|_|_| (dd/mm/yyyy)

Date of data supervision of data collection:

|_|_|-|_|_|-|_|_|_|_| (dd/mm/yyyy)

<p>Instructions</p> <ul style="list-style-type: none"> • Introduce yourself, your work; explain about the background, objective and questionnaire to the respondent. • Explain that you want to ask some questions about their experience, knowledge and attitude of HFMD and also want to have the permission to observe their school environments. • Explain that the answers to their questions are confidential and will not have any influence on the medical care/ the child care they receive. • Remind them that they are free to choose whether or not they want to participate and that they can withdraw at any point and there will be no negative consequence • Ask the question and listen to the response. Then, classify the response to one/multiple of the numbered options under the question. <u>Do not read the options to the respondent.</u> • Circle the correct answer(s), do not read out, multiple response allowed. 			
<p>W1.1 Today's date (dd/mm/yyyy) [__][__]-[__][__]-[__][__][__][__]</p>		<p>W1.2 Time of interview start (24 hour clock e.g. 15:25) [__][__]:[__][__]</p>	<p>W1.3 Interviewer code [__][__]</p>
<p>W1.4 Working experience [__][__]years</p>	<p>W1.5 Gender 1. Male 2. Female</p> <hr/> <p>W1.6 Age [__][__] years</p>	<p>W1.7 Role of respondent 1. School teacher (if primary school) 2. Teacher assistance/ Day care assistance (if kindergarten) 3. Other (specify)_____</p>	
<p>W1.8 Interview result (<i>fill in at the end of interview</i>) 1. Interview completed 2. Interview interrupted and not complete 3. Proposed respondent refused to participate (why?)_____</p> <p>4. Respondent withdrew participation from questionnaire (why?)_____</p>			
<p>W1.9 Time of interview end [__][__]:[__][__]</p>			

Section A disease knowledge	
A.1	<p>Do you know in which season does HFMD occur?</p> <ol style="list-style-type: none"> 1. Summer 2. Rainy 3. Winter 4. All season 5. Don't know 6. Other(specify)_____
A.2	<p>Do you know does HFMD a transmitted disease?</p> <ol style="list-style-type: none"> 1. Yes 2. No 3. Don't know 4. Other(specify)_____
A.3	<p>Who are susceptible for HFMD?</p> <ol style="list-style-type: none"> 1. Elderly (>50 yrs.) 2. Adults (>18 yrs.) 3. Teenagers (12- 18 yrs.) 4. Young children (0- <12 yrs.) 5. Don't know 6. Other(specify)_____
A.4	<p>What is the cause of HFMD?</p> <ol style="list-style-type: none"> 1. Dirty water 2. Dirty air 3. Bacteria 4. Spirit 5. Virus 6. Don't know 7. Other (specify)_____
A.5	<p>How is HFMD transmitted?</p> <ol style="list-style-type: none"> 1. By mosquito bite 2. By sexual transmission 3. By air pollution 4. By droplet of saliva and nasal secretion 5. By droplet of farces 6. By food contamination 7. Don't know 8. Other (specify)_____

Section A disease knowledge	
A.6	<p>What is the clinical sign and symptoms of HFMD?</p> <ol style="list-style-type: none"> 1. Fever 2. Rashes in mouth, palm, sole and buttock 3. Shortness of breath 4. Brain affected, brain symptom 5. Don't know 6. Other(specify)_____
A.7	<p>How is HFMD treated?</p> <ol style="list-style-type: none"> 1. Antibiotics (drug for killing the bug) 2. Resting 3. Hydration 4. Symptomatic treatment (treatment as clinical shown) 5. Local cream application 6. Don't know 7. Other(specify)_____
A.8	<p>How can HFMD be decreased?</p> <ol style="list-style-type: none"> 1. Treat water and food well 2. Wear the face mask while people gets sick 3. Cleaning hand/ toys/ school supplies 4. School closure if there is number of children with HFMD 5. Giving vaccination 6. Educate parents/ or(and)/ teacher/ children 7. Media response 8. Don't know 9. Other (specify)_____
A.9	<p>Do you know about cleaning toy and school supply according to guideline (explain how)?</p> <ol style="list-style-type: none"> 1. Yes 2. No 3. Other(specify)_____ <p>if Yes, write the explanation of what he/she knows about how to toys and school supply guideline_____</p> <p>_____</p>

Section A disease knowledge	
A.1 0	<p>Do you know about national guideline for HFMD?</p> <ol style="list-style-type: none"> 1. Media communication (public communication) 2. Upscale/ promote the personal hand hygiene 3. Reduce class size 4. Regular cleaning toys and supplier 5. Educate the school teacher and responsible personnel 6. School closure if there is number of children with HFMD 7. Other (specify)_____ 8. Don't know
A.1 1	<p>Do you know about the national prevention measure of HFMD?</p> <ol style="list-style-type: none"> 1. Yes 2. No 3. Don't know 4. Doesn't have 5. Other (specify)_____
Section B Attitude towards HFMD	
B.1	<p>Do you think the disease can cause the epidemic (Explain: spreading and affecting the community in the wide scale)?</p> <ol style="list-style-type: none"> 1. Yes 2. No 3. Don't know 4. other(specify)_____ <p>if Yes, write the explanation of what he/she knows about the spreading of disease in the wide scale problem</p> <p>_____</p> <p>_____</p>
B.2	<p>Do you think HFMD has the impact on socioeconomic? (Explain: Causing the community social and economic well-being as a whole)</p> <ol style="list-style-type: none"> 1. Yes 2. No 3. Don't now 4. Other (specify)_____ <p>If Yes, How_____</p> <p>If No, Why_____</p>
B.3	<p>Do you think the access the washing basin/ number of washing is importance for the disease prevention or not?</p> <ol style="list-style-type: none"> 1. Yes 2. No 3. Don't know 4. Other (specify)_____ <p>If Yes, How_____</p> <p>If No, Why_____</p>
B.4	<p>Do you think cleaning the toys and school supply properly is importance for the disease prevention?</p> <ol style="list-style-type: none"> 1. Yes 2. No 3. Don't know 4. Other (specify)_____ <p>If Yes, How_____</p> <p>If No, Why_____</p>

Section B Attitude towards HFMD	
B.5	<p>Do you think the guideline for school closure guide line is clear to follow?</p> <p>1. Yes 2. No 3. Don't know 4. Doesn't have 5. Other (specify)_____</p> <p>If Yes , How _____</p> <p>If No , Why _____</p>
B.6	<p>What can you and your team can do to help controlling the HFMD disease?</p> <ol style="list-style-type: none"> 1. Maintain/ enforce the personal hygienic policy among your team and your children 2. Frequent cleaning toy and supply properly 3. Concern and early detect the suspected case and report case to health authority 4. Sent sick student away 5. Update the situation of disease 6. Class or school closure while appropriate 7. Don't know 8. Other (specify)_____
Section C: Hygiene precaution and Prevention (Practice domain)	
C.1	<p>Does your school have policy for decreasing HFMD?</p> <p>1. Yes 2. No 3. Other(specify) _____</p> <p>if Yes, write his/her the explanation</p> <p>_____</p> <p>_____</p> <p>_____</p>
C.2	<p>Do you have Guideline for HFMD in your school?</p> <p>1. Yes 2. No 3. Don't know 3. Other(specify)_____</p> <p>if Yes, write the explanation of what she/he knows about school guideline/ recommendation</p> <p>_____</p> <p>_____</p>
C.3	<p>Does your school close when there are HFMD cases?</p> <p>1. Yes 2. No 3. Don't know 4. Other(specify)_____</p> <p>if Yes, specify (number of official day)_____ Days</p>
C.4	<p>Dose the school has/ implement the class size policy?</p> <p>1. Yes 2. No 3. Don't know 4. Other (specify)_____</p> <p>if Yes, write the explanation of what he/she knows about the class size guideline _____</p>

Section C: Hygiene precaution and Prevention (Practice domain)	
C.5	What is your present class size? 1. < 20 2. 20- 30 3. > 30 4. Other(specify)_____
C.6	Is there any homeroom education about hygiene and hand washing for the students? 1. Yes 2. No
C.7	The regular cleaning policy; How often to clean the toy and school supply? 1. Once a week 2. Once in two weeks 3. Once a month 4. Other (specify)_____
C.8	The chemical used for cleaning as for HFMD and other diseases prevention? 1. General purposed detergent 2. Baby shampoo/ baby detergent 3. Chlorinated solution diluted by water 4. Alcohols
C.9	Does your school provide washing basins for students to use? 1. Yes 2. No 3. Don't know 4. Other (specify)_____
C.10	What Kind of soap used? 1. Bar soap 2. Liquid soap 3. Other(specify)_____

Thank the participant/ respondent for his/her time and return to page 2 to fill in the result and time of the interview

Note

APPENDIX B

Topic guide for HFMD study - In-depth Interviews Version 1.0

IDI Code _ _ _ _ _ _	IDI interviewer _____	
IDI assistant _____	IDI other _____	
Date _____	Start Time _____	End Time _____
Name of school(if school personnel) _____ (
position _____)		

Introduction

- ✓ Consent
- ✓ Welcome
 - Introduce yourselves, where you are from and what you are trying to achieve
- ✓ Review Purposes of the study **including confidentiality** Logistics
 - Expected duration (1/2-1 hour)
 - Location, breaking time
 - Refreshments for participants
 - Discussion environment
- ✓ What will happen with the collected information and how the participant/target will benefit
- ✓ **Topics of discussion included**

- To explore the common health problem related to school setting both communicable and non- communicable diseases/ sickness
 - To explore people's **experience** of HFMD in children
 - To explore if the people **understand the cause, prevention and treatment of HFMD.**
 - To explore their **ideas** about **HFMD and other communicable diseases in school based**
 - To explore **policy implementation for school through every channel and of how they prevent and treat HFMD differently of similarly to other communicable diseases.**
 - To explore their real **experience of HFMD control interventions**
 - To explore their **idea about the school health policy lacking or requirement.**
- ✓ Logistics
 - Expected duration (1/2-1 hour)
 - Location, breaking time
 - Refreshments for participants
 - Discussion environment
 - ✓ What will happen with the collected information and how the participant/target will benefit
 - ✓ **Confidentiality is assured again here**
 - ✓ Any questions?
 - ✓ Tape recorder with assistance on and off will be notified every time

Domain	Topics and probe
Common health problems of the school setting?	<p>- Please tell me about the most common health problems in this school (all sickness including - communicable and non-communicable)? [<i>Probe: What? Has there been change over time? Who is at risk of these illnesses? How often? How serious?</i>]</p> <p>- What is the most serious communicable sickness you have experience? (5-10 minutes)</p>

Domain	Topics and probe
General communicable diseases among school children	<p>-Tell me about the different types of communicable sickness in these school children? [<i>Probe: How do they know what kind of communicable diseases esp. mode of infections? What symptoms? What are the causes? Who is at risk?</i>] (10- 15 minutes)</p>
“HFMD” and all Modes	<p>- Please tell me a bit more about your experience of HFMD or what you have heard about HFMD? [Probe: specific HFMD experience and perception] Leading questions can be – transmission, virus or bacteria, age at risk, clinical signs and symptoms, severity, treatments</p> <p>- Example: What kind of age group, transmission, severity (and more.....) are you aware of?</p> <p>- How can you prevent HFMD? [Probe: environment, hygiene...?] (10-15 minutes) Have heard about the death report?</p>
Perceptions and knowledge about HFMD control/ implementation related activities	<p>- Where have you heard information about HFMD, when? [Probe: tv, radio, friends, health workers, and policy related stuff?]</p> <p>-What kind of information have you heard about HFMD? [Probe: diagnosis? Treatment? Severity/ threaten to children life?]</p> <p>-Compared to other illnesses in this school setting – do you think HFMD is a big or small problem?</p> <p>-Have you taken part in any activities related to HFMD prevention, treatment or information [Probe: e.g. School survey? Any kind of meeting related to HFMD or school hygiene or school health? Describe the activity; What was the purpose?] The perception about the school policy, national policy, WHO or other standard GL for communicable diseases including HFMD? What is lacking in term of HFMD including school communicable disease in your school setting? (15- 20 minutes)</p>

Thank participants

Give refreshments and transport refund

Be open for further discussion or feedback **‘off-the-record’**

APPENDIX C

Checklists for kindergarten schools' sanitation and hygiene School code.....

Part 1: General information of school

1. What kind of school? (Multiple response allowed/ tick what school has e.g. if school has all levels then tick all boxes)

- Preschool/ kindergarten, specify number of children _____ teacher _____
- Primary (junior high school), specify number of children _____ teacher _____
- Secondary (high school), specify number of children _____ teacher _____

2. Have the school medical room for first aid room? ___ Yes ___ No

3. Have nurse or teacher for the first aids room? ___ Yes ___ No

Note.....
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Part 2: classroom parameter and hygiene

1. Classroom high not less than 3.50 meters. ___ Yes ___ No

2. Is the classroom in rectangular shape 6×8 or 7×9 meters? ___ Yes ___ No

3. Are there more than 30 students per classroom? ___ Yes ___ No

4. Is space in the classroom lesser than 2 square meters per one student?
___ Yes ___ No

5. Is the classroom has appropriate ventilation? ___ Yes ___ No

6. Is the classroom has appropriate illumination? ___ Yes ___ No

7. Is the classroom air conditioner? ___ Yes ___ No

Note.....
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Part 3: water supply

1. The school use tap water / ground water / rain water ___ Yes ___ No

2. Is cleaned drinking water provided? ___ Yes ___ No

3. Is cleaned cleaning water provided? ___ Yes ___ No

4. Are washing basins sufficient for the number of the students? ___ Yes ___ No

5. Are soap provided near the washing basins? ___ Yes ___ No

Note.....
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Part 4: Canteen and food preparation

- 1. Have school canteen? Yes No
(If has) Has the canteen appropriate space? (1 Square meter per 1 student)
 Yes No
- 2. Is there drinking water provided in the canteen? Yes No
- 3. Is there hand washing basin provided? Yes No
- 4. Is there dish washing basin? Yes No
- 5. Are soaps provided near the basins? Yes No
- 7. Is there a place for wasted? Yes No
- 8. Is there food cover for barrier for insect? Yes No

Note.....
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Part 5: latrine and waste disposal

- 1. The school provide accessible toilet / flush toilet / squat toilet Yes No
- 2. Are the toilets sufficient for the number students?
(1 Toilet for 30 girls, 1 toilet for 60 boys and 1 chamber pot for 50 boys)
 Yes No
- 3. Are toilets at least 30 meters from any drinking water source and canteen?
 Yes No
- 4. Are toilets separate for kindergarten and older students? Yes No
- 5. Are there separate toilets for male and female students and teachers?
 Yes No
- 6. Is the water sufficient in the toilets? Yes No
- 7. Are hand-washing facilities with soap available? Yes No
- 8. Are toilets clean? (No bad smell and no stink) Yes No
- 9. Rubbishes or trashes are: burned / buried / take off school site Yes No

Note.....
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This check lists for kindergarten schools' sanitation and hygiene is modified from Water, Sanitation and Hygiene Standards for Schools in Low-cost Settings (WHO)

APPENDIX D

Submission No. TMEC

FTM-ECF-021-04

หนังสือแสดงเจตนายินยอมเข้าร่วมการวิจัย (Informed Consent Form)

แบบฟอร์มนี้ใช้สำหรับ ผู้เข้าร่วมโครงการวิจัยที่มีอายุ 18 ปี ขึ้นไป

วันที่.....เดือน.....พ.ศ.

ข้าพเจ้า (นาย /นาง /นางสาว).....นามสกุล.....อายุ.....ปี
 อยู่บ้านเลขที่.....หมู่.....ตำบล.....อำเภอ.....จังหวัด.....
 ขอแสดงเจตนายินยอมเข้าร่วมการวิจัย ในโครงการวิจัยเรื่อง.....

โดยข้าพเจ้าได้อ่านเอกสารคำอธิบายโครงการวิจัยเรื่อง ความรู้ ทักษะคิด และการปฏิบัติ ของครูอนุบาลต่อ โรคมือเท้าปากเปื่อย
 ในโรงเรียนสังกัดสำนักงานการศึกษา กรุงเทพมหานคร และ /หรือได้รับฟังคำอธิบายจาก นางสาวมยุรา อุปจักร์ ผู้ทำ
 โครงการวิจัย และได้รับทราบถึงรายละเอียดของโครงการวิจัยเกี่ยวกับ วัตถุประสงค์และระยะเวลาที่ทำการวิจัย ขั้นตอนและ
 วิธีการปฏิบัติตัวที่ข้าพเจ้าต้องปฏิบัติ ผลประโยชน์ที่ข้าพเจ้าจะได้รับ ผลข้างเคียงหรืออันตรายที่อาจเกิดขึ้นจากการเข้าร่วม
 โครงการ ตลอดจนค่าตอบแทนที่จะได้รับ

และข้าพเจ้ายินยอมให้ผู้วิจัยใช้ข้อมูลส่วนตัวของข้าพเจ้าที่ได้รับจากการวิจัย โดยให้นำเสนอเป็นข้อมูลโดยรวมจาก
 การวิจัยนั้นแต่จะไม่เผยแพร่ ต่อสาธารณะเป็นรายบุคคล ทั้งนี้ข้าพเจ้า สามารถถอนตัวหรืองดเข้าร่วมการวิจัยได้ทุกเมื่อ

หากข้าพเจ้า มีข้อข้องใจเกี่ยวกับขั้นตอนของการวิจัย หรือหากเกิดผลข้างเคียงที่ไม่พึงประสงค์จากการวิจัยขึ้นกับ
 ข้าพเจ้า ข้าพเจ้าสามารถติดต่อกับ นางสาว มยุรา อุปจักร์ เบอร์โทรศัพท์ 086-005-46-49

หากข้าพเจ้าได้รับการปฏิบัติไม่ตรงตามที่ระบุไว้ในเอกสารชี้แจงผู้เข้าร่วมการวิจัย ข้าพเจ้าสามารถแจ้งให้
 คณะกรรมการจริยธรรมฯ ทราบได้ที่ ฝ่ายเลขานุการคณะกรรมการจริยธรรมการวิจัยในคน สำนักงานบริการการวิจัย ชั้น 4
 อาคารเฉลิมพระเกียรติฉลองสิริราชสมบัติครบ 60 ปี คณะเวชศาสตร์เขตร้อน มหาวิทยาลัยมหิดล โทร. 0 2354 9100-4 ต่อ
 1349, 1525 ต่อ 16-17

ข้าพเจ้า เข้าใจข้อความในเอกสารชี้แจงผู้เข้าร่วมการวิจัย และหนังสือแสดงเจตนายินยอมนี้โดยตลอดแล้ว จึงได้ลง
 นามยินยอมเข้าร่วมโครงการ

ลายมือชื่อผู้เข้าร่วมโครงการวิจัย

.....
 (.....)

วันที่.....เดือน.....พ.ศ.....

วันที่.....เดือน.....พ.ศ.....

ลายมือชื่อผู้ให้ข้อมูล/ ผู้ขอความยินยอม

.....
 (.....)

วันที่.....เดือน.....พ.ศ.....

เอกสารฉบับนี้จะสมบูรณ์เมื่อมีตราประทับของคณะกรรมการจริยธรรมการวิจัยในคน

APPENDIX E



CERTIFICATE OF ETHICAL APPROVAL
Ethics Committee of the Faculty of Tropical Medicine, Mahidol University
420/6 Ratchawithi Rd., Ratchathewi, Bangkok 10400, Thailand

This Certificate of Ethical Approval (MUTM 2015-040-01) applies to the

Project entitled: Knowledge, attitude and practice of kindergarten teachers toward hand foot and mouth disease in kindergarten schools under control of Bangkok primary education office

EC Submission No.: TMEC 15-040

with the following relevant documents:

- | | |
|--|---------------------------------------|
| 1. Research Proposal (FTM ECF-019-04): | English version 2.0 date 24 June 2015 |
| 2. Participant Information Sheet (FTM ECF-020-02): | Thai version (date not affixed) |
| 3. Informed Consent Form (FTM ECF-021-04): | Thai version (date not affixed) |
| 4. Questionnaire: | Thai version 1.0 date 26 June 2015 |
| 5. In-depth Interview Form: | Thai version 1.0 date 26 June 2015 |
| 6. School Checklist: | English version 1.0 date 26 June 2015 |


Principal Investigator: Ms. Mayura Upajak

Advisor: Podjane Jittamala

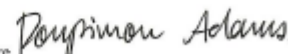
Affiliation: Department of Tropical Hygiene,
 Faculty of Tropical Medicine, Mahidol University

This project has been approved for the period
from 19 August 2015 to 18 August 2016

The Ethics Committee of Faculty of Tropical Medicine certify that we are in compliance with Declaration of Helsinki, ICH Guidelines for Good Clinical Practice and other International Guidelines for Human Research Protection.

Signature 
 (Prof. Dr. Srisin Khusmith)

Chairperson (Panel 2)
 Ethics Committee of the
 Faculty of Tropical Medicine
 Date ..2.6.AUG.2015.

Signature 
 (Mrs. Pornpimon Adams)

Member and Secretary
 Ethics Committee of the
 Faculty of Tropical Medicine
 Date ..2.6.AUG.2015.

APPENDIX F



All schools are attached with the Primary schools but they have their own section separately far from the primary school section at least 500 meters. The school facilities of kindergarten schools are clearly separate from those of primary school section and of primary school students.

BIOGRAPHY

NAME	Mayura Upajak
DATE OF BIRTH	05 September 1991
PLACE OF BIRTH	Nan, Thailand
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