UNIVERSITI PUTRA MALAYSIA

KNOWLEDGE, ATTITUDE AND PRACTICE TOWARDS HAND, FOOT, AND MOUTH DISEASE (HFMD) AMONG NURSERY GOVERNESSES OF NURSERIES AT PUBLIC UNIVERSITIES AND RESIDENTIAL AREAS IN KLANG VALLEY

SITI AIDA SYAQIRAH MAHADZAR

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BY

SITI AIDA SYAQIRAH BINTI MAHADZAR

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ABSTRACT

KNOWLEDGE, ATTITUDE AND PRACTICE ON HAND, FOOT, AND MOUTH DISEASE (HFMD) AMONG NURSERY GOVERNESSES OF NURSERIES AT PUBLIC UNIVERSITIES AND RESIDENTIAL AREAS IN KLANG VALLEY

SITI AIDA SYAQIRAH BINTI MAHADZAR

Introduction: Hand, foot and mouth disease (HFMD) is reported as endemic and rank in the third place among other communicable diseases in Malaysia. According to Ministry of Health Malaysia (2016), in 2016, highest number of cases reported is from Selangor with 7,471 cases. Majority cases in Malaysia involve infection from Coxsackie virus (A16) which followed by Enterovirus 71 (EV 71). This virus transmits through human contact with faeces and blister of infected individuals. In other words, HFMD can be prevented by applying good hygienic practice. HFMD outbreak is often found in nurseries and playgroups where children have lots of close contacts with other children. Therefore, nursery governess was included in this study as they involved in observing and nurturing children in nursery. **Objective:** To study the knowledge, attitude and practice of HFMD among nursery governesses of nurseries at public universities and residential areas. **Methodology:** A comparative cross sectional study was carried out among nursery governesses at public universities and residential areas in Klang Valley. A total of 102 nursery governesses were selected as respondents which include 83 respondents from public university while 26 respondents from residential areas. Questionnaires were administered to determine socio – demographic, knowledge, attitude and practice on HFMD among the study population. The level of knowledge, attitude and practice on HFMD was evaluated using scoring method. **Result:** The level of knowledge for nursery governesses in public universities and residential areas was moderate which was 44.2 % and 64 % respectively. For attitude, both groups were moderate which was 75.3 % and 76 % respectively. Level of practice for public universities showed better practice which scored 58.4% than residential areas 41.6 %. The result indicated that no significance different between knowledge, attitude and practice between two groups ($Z = -0.321$, $p > 0.005$; $Z = -1.196$, $p > 0.005$; $Z = -1.155$, $p > 0.005$) respectively. On the other hands, there is an association between age factor with attitude among nursery governess in public universities ($p = 0.015$, $p < 0.005$). In addition, there was no association between knowledge with practice ($p = 0.581$, $p > 0.005$) and attitude with practice ($p = 0.298$, $p > 0.005$). **Conclusion:** Nursery governesses in both public universities and residential areas perceived moderate knowledge and attitude level. However for practice, public universities showed better application of practice if compared to residential areas. It is recommended for the nursery governesses to attend program such as health talk on HFMD occasionally, as it can be efficiently induce positive outcome.

Keywords: Knowledge, attitude, practice, hand, foot and mouth disease (HFMD), nursery governess

ABSTRAK

PENGETAHUAN, SIKAP DAN AMALAN PENYAKIT TANGAN, KAKI DAN MULUT (HFMD) DI KALANGAN PENGASUH TASKA DI UNIVERSITI AWAM DAN KAWASAN PERUMAHAN DI LEMBAH KLANG.

SITI AIDA BINTI SYAQIRAH MAHADZAR

Pengenalan: Penyakit tangan, kaki dan mulut (HFMD) dilaporkan sebagai endemik di Malaysia. Menurut Kementerian Kesihatan Malaysia, jumlah tertinggi kes yang dicatatkan pada 2016 adalah di Selangor dengan 7, 471 kes. Majoriti kes di Malaysia melibatkan jangkitan daripada *Coxsackie Virus* (A16) yang diikuti oleh *Enterovirus* 71 (EV 71). Virus ini tersebar melalui sentuhan kepada najis dan lepuh individu yang dijangkiti. Wabak HFMD sering tersebar di pusat asuhan kanak – kanak, taman permainan dan sekolah di mana kanak-kanak akan berinteraksi dengan kanak-kanak lain. HFMD boleh dicegah dengan mengamalkan amalan kebersihan yang baik. Pengasuh akan memerhati dan menjaga kanak-kanak di pusat asuhan. **Objektif**: Untuk mengkaji pengetahuan, sikap dan amalan terhadap HFMD dalam kalangan pengasuh taska di universiti awam dan kawasan perumahan. **Metodologi**: Kajian telah dijalankan dalam kalangan pengasuh di pusat jagaan di universiti awam dan kawasan perumahan di Lembah Klang. Sebanyak 102 pengasuh telah dipilih sebagai responden di mana 83 responden dari universiti awam manakala dari kawasan perumahan adalah 26 responden. Borang soal selidik telah diberikan untuk menentukan sosio - demografi, pengetahuan, sikap dan amalan mengenai HFMD di kalangan mereka. Tahap pengetahuan, sikap dan amalan mengenai HFMD telah dinilai menggunakan kaedah pemarkahan. **Keputusan**: Tahap pengetahuan untuk pengasuh di universiti awam dan kawasan perumahan adalah sederhana iaitu 44.2% dan 64% masing-masing. Kedua-dua kumpulan adalah sederhana tahap sikap iaitu 75.3% dan 76% masing-masing. Tahap amalan untuk universiti awam menunjukkan amalan yang lebih baik 58.4% daripada kawasan perumahan 41.6%. Hasilnya menunjukkan bahawa tiada perbezaan yang signifikan antara pengetahuan, sikap dan amalan di antara kedua - dua kumpulan ($Z = -0{,}321$, $p > 0.005$; $Z = -1{,}196$, $p > 0.005$; $Z = -1{,}155$, $p > 0.005$). Terdapat kaitan antara faktor umur dengan sikap di kalangan pengasuh di universiti awam ($p = 0.015$, $p < 0.005$). Di samping itu, tidak ada kaitan antara pengetahuan dengan amalan ($p = 0{,}581$, $p > 0.005$) dan sikap dengan amalan ($p = 0{,}298$, $p > 0.005$). **Kesimpulan**: Pengasuh di universiti awam dan kawasan perumahan mempunyai pengetahuan dan sikap tahap sederhana. Walau bagaimanapun, bagi amalan, universiti awam mengamalkan amalan yang lebih baik jika dibandingkan dengan kawasan perumahan. Pengasuh digalakkan untuk menghadiri ceramah kesihatan atau promosi kesihatan mengenai HFMD kerana ia boleh mendorong keputusan positif selain mencari maklumat melalui media cetak atau media masa secare kendiri.

Kata kunci: Pengetahuan, sikap, amalan, penyakit tangan, kaki dan mulut (HFMD), pengasuh

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LIST OF ABBREVIATIONS

CAV 16	Coxsackie A virus 16
EV 71	Enterovirus 71
HFMD	Hand, Foot and Mouth Disease
IIUM	International Islamic University Malaysia
KAP	Knowledge, Attitude and Practice
MOT	Mode of transmission
SPM	Sijil Pelajaran Malaysia
SPSS	Social Sciences Statistical Programme
TCN	Temperature change on neighbouring days
UM	Universiti Malaya
UNITEN	Universiti Tenaga Nasional
UPM	Universiti Putra Malaysia
WHO	World Health Organization

CHAPTER 1

INTRODUCTION

1.1 Background

Hand, foot, mouth and disease (HFMD) is a typical viral disorder that usually suffers by newborn or children that the age ranging up until 5 years old. Outbreaks of HFMD commonly surge to Asian countries such as China, Vietnam and Malaysia (CDC, 2015). Thus, HFMD is one of the diseases that need to take into serious concern and should not be neglected by all parties. According to World Health Organization (WHO), as of 31st July 2016, there were a total of 1,620,670 cases of HFMD including 151 deaths were reported in China while in Vietnam there were 20,438 cases of HFMD and no deaths reported. In Malaysia, a total of 23,454 cases of HFMD were reported from January, 3 to August, 6 for all states which with an average of 757 cases per week (Shahar, 2016).

HFMD is caused by a group of enteroviruses which mostly are Coxsackie A virus 16 (CAV 16) and Enterovirus 71 (EV 71) (Xu et al. 2016). In most cases, HFMD follows a benign and self – limiting course. However, some individuals rapidly develop neurological and cardiopulmonary complications that can be fatal which these cases mostly associated with EV 71 infection (Reed & Cardosa, 2016). Enteroviruses usually are transmitted from person to person through direct contact, air, and also through the faecal-oral route (Ang et al. 2009).

HFMD mostly will present its clinical manifestation through skin. The disease will start with mild fever then by appearance of papulovesicular rashes (Ashok, 2013). Children that are diagnosed to have HFMD usually will suffer the following signs and symptoms: rash, Herpangina and Onychomadesis (Ashok, 2013). Rashes will commonly appear on palms, hands, soles, knee, feet, and buttocks. Herpangina is the production of multiple oral ulcers affecting posterior part of the oral cavity (Park et al. 2012). For onychomadesis, it is the complete shedding of a fingernail or toenail from the proximal nail bed which then will result of nail bed matrix growth arrest (Steven et al. 2015).

Mode of transmission (MOT) for HFMD is through fecal – oral route which virus-causing disease is transmitted from fecal of the host to another host through oral cavity. Besides, the viruses can be spread by nasal and throat secretions such as saliva, sputum, or nasal mucus (Aswatgyraj et al. 2016). Then, the viruses can also transmit through respiratory droplets and contacting with blister fluid or having close contact with the infected individuals (Chew et al. 2015). Several days before the onset of the illness, the virus can be detected from the stool and pharynx and it will continue to shed through the stool for several weeks (Wang et al. 2011).

1.2 Problem Statement

Malaysia is one of the countries that also confronted with HFMD. First HFMD cases that were reported in Malaysia were in the middle of year 1997 which a few children were died during epidemic of Enterovirus – 71 (EV – 71) in Sarawak (Cardosa et al. 1999). According to the Health Facts by Ministry of Health (2015 & 2016) as shown in **Table 1.1** and **Table 1.2**, although the incidence rate of HFMD in Malaysia has been decrease from 104.07 per 100,000 populations in year 2014 to 74.09 per 100,000 populations in year 2015, but HFMD still be among the diseases that has the highest incidence rate. HFMD with the incidence rate 74.09 per 100,000 populations came in third after dengue with 357.49 and tuberculosis with 74.95 per 100,000 populations in year 2015 (MOH, 2016).

In 2016, Selangor has the highest number of cases with 7 471, followed by Sarawak 3 007, Johor 2 294, Kuala Lumpur 2 084, and Sabah 1 535. (The Star Online, 2016). According to statement made by Health Director General Noor Hisham Abdullah in International Business Times (2016), HFMD cases has 6.4 % increase from 1,296 cases reported. Thus the Health Ministry has placed Malaysia under the "alert level" following 1379 cases for that week. He did mentioned that three districts in Selangor had the most cases, namely Petaling (2,699), Hulu Langat (1,801) and 1,023 in Klang.Therefore, this study is conducted as HFMD is one of the diseases that the number of new cases keep increasing from time to time and focusing to vulnerable group which is children.

Table 1.1 Incidence rate and mortality rate of communicable diseases (per 100,000 population)

Year	Incidence rate	Mortality rate
2013	78.52	0.00
2014	104.07	0.00
2015	74.09	0.00

1.3 Study Justification

HFMD is one of the communicable diseases that can spread through fecal – oral route. If the community keep neglecting on how the disease is transmitted, the incidence rate will be increasing from time to time. According to previous study, HFMD remains common disease among Asian countries which include Malaysia.

Therefore, this study is conducted in Selangor which focussing in Klang Valley due to Selangor is recorded having the highest number of HFMD cases in Malaysia with 7 471 cases and Kuala Lumpur placed in fourth with 2 084 cases in 2016. Three districts in Selangor had the most cases were Petaling (2,699), Hulu Langat (1,801) and Klang (1,023).

Nursery is chosen due to the children send there would be in the range of age below than five years. Children within range of age less than five years old are the group at risk of getting this disease. Besides, in nurseries the children will spend around eight hours per day there due to their parents are working approximately eight hours, thus he children will be easily exposed to HFMD infection. The nursery governess will take over parents' roles for a while in terms of fulfilling children's personal need such as providing food, changing diapers and helping them cleaning (JobStreet.com, 2016).

Nursery governess is chose as study population due to children less than five years old might not aware that they are actually suffering HFMD. Children in day care centre are more prone to be infected with HFMD (Chang et al., 2011). Young children rely mostly to their caregivers (Nga et al., 2016) which in context of nursery the caregiver is the nursery governess. Thus, nursery governesses are the individuals that are responsible to detect the sign and symptoms that arise as the children are depending on adults. In order to be able to detect the signs earlier and prevent from the children suffering the disease, they need to have the better knowledge, attitude and good practice on this disease.

Therefore, this research is intended to assess the knowledge, attitude and practice of the nursery governess in Malaysia towards HFMD since there is lack of study that been done to this group in Malaysia. This study will also help in increasing awareness among related stakeholders regarding the seriousness of this issues.

1.4 Research objectives

1.4.1 General objectives

To study the knowledge, attitude and practice of hand, foot and mouth disease (HFMD) among nursery governesses of nurseries at public universities and residential areas in Klang Valley.

1.4.2 Specific objectives

i. To determine the socio-demographic characteristics distribution among nursery governesses.

ii. To compare the level of knowledge on HFMD among nursery governess between nurseries in public universities and residential areas.

iii. To compare the level of attitude of nursery governess towards HFMD between nurseries in public universities and residential areas.

iv. To compare the level of practice applied on HFMD among nursery governess between nurseries in public universities and residential areas.

v. To determine the association between socio-demographic characteristics with nursery governesses' knowledge, attitude and practice.

vi. To determine the association between knowledge and attitude on practice when dealing with HFMD.

1.4.3 Research hypothesis

i. There is significant difference of knowledge's score on HFMD among nursery governess between nurseries in public universities and residential areas.

ii. There is significant difference of attitude's score on HFMD among nursery governess between nurseries in public universities and residential areas.

iii. There is significant difference of practice's score on HFMD among nursery governess between nurseries in public universities and residential areas.

iv. There is an association between socio-demographic characteristics with knowledge, attitude and practice of nursery governesses.

v. There is an association between the knowledge and attitude on practice when dealing with HFMD.

1.5 Definition of Terms

- **Hand, foot and mouth disease**

  Conceptual: Hand, foot and mouth disease is a viral infectious disease caused by a group of Enteroviruses most frequently are Coxsackie virus A 16 (CAV16) and Enterovirus 71 (EV71) (Xu et al. 2016) which predominantly affects children (Cheng et al. 2014).

  Operational: In this study, the knowledge, attitude and practice on HFMD will be evaluated by self – administered questionnaire to the nursery governess.

- **Socio-demographic factors**

  Conceptual: Socio-demographic factors characterized by sociological and demographic characteristic for example age, year of employment, education level and etc. (Business Dictionary, 2016).

  Operational: Socio-demographic factors will be measured by using self – administered questionnaire consist of information on age, year of employment and education level in Section A of the questionnaire.

- **Knowledge factors**

  Conceptual: Knowledge is defined as understanding, knowing, familiarity and awareness on facts or information about a specific subject (Business Dictionary, 2016).

  Operational: Knowledge factors will be evaluated by using self-administered questionnaire consist of questions about general information on HFMD, symptoms, causes, risk factors and prevention of the disease.

- **Attitude factors**

  Conceptual: Attitude is defined as a tendency to respond positively or negatively towards a certain situation or a way of thinking that will affect a person's behaviour or choice of action (Business Dictionary, 2016).

  Operational: Attitude factors will be evaluated by using self-administered questionnaire consist of questions on practices that they think should be applied during facing HFMD.

- **Practice factors**

Conceptual: Practice is defined as repeatedly or regularly observable actions of an individual in response to a certain stimulus. Practice also acts together with the knowledge gained on that particular subject which will then become regular habit (Business Dictionary, 2016).

Operational: Practice factors will be evaluated by using self-administered questionnaire consist of questions on practices that should the respondents do when encounter the HFMD and also behave to prevent the HFMD to occur.

- **Nursery governess**

Conceptual: Nursery governess is a person who is employed by the owner of the nursery to take care of the children send to the nursery. Her tasks include providing food, changing diapers and helping the children cleaning.

Operational: In this research, all nursery governesses from nurseries in public universities and residential areas will be the respondents. The questionnaires will be distributed among them.

- **Nursery**

  Conceptual: A place where young children and babies are taken care of while their parents are at work (Cambridge Dictionary, 2016).

  Operational: In this research, nurseries that will be selected are in public universities and residential areas at Klang Valley.

1.6 Conceptual Framework

Figure 1.1 shows conceptual framework of this study. This framework is for a clearer view of this research. The coloured boxes represent the factors in concern for this study.

This study was focussing on HFMD. Risk factor that contributes to HFMD is weather, whether or not the children receive breast milk, knowledge attitude and practice of parents and nursery governesses, environmental hygiene and whether there is family member of the child do have asthma due to heredity. Nursery is one of the places that the children will stay in thus study subjects that are chosen are nursery governess because they are the person that will monitor and taking care of the children in the nursery. The study population for this research is nurseries in public universities and residential areas at Klang Valley. The dependent variable for this study will be the practice applied for HFMD that are influenced by independent variables which are knowledge about HFMD, attitude towards HFMD and socio–demographic of respondents.

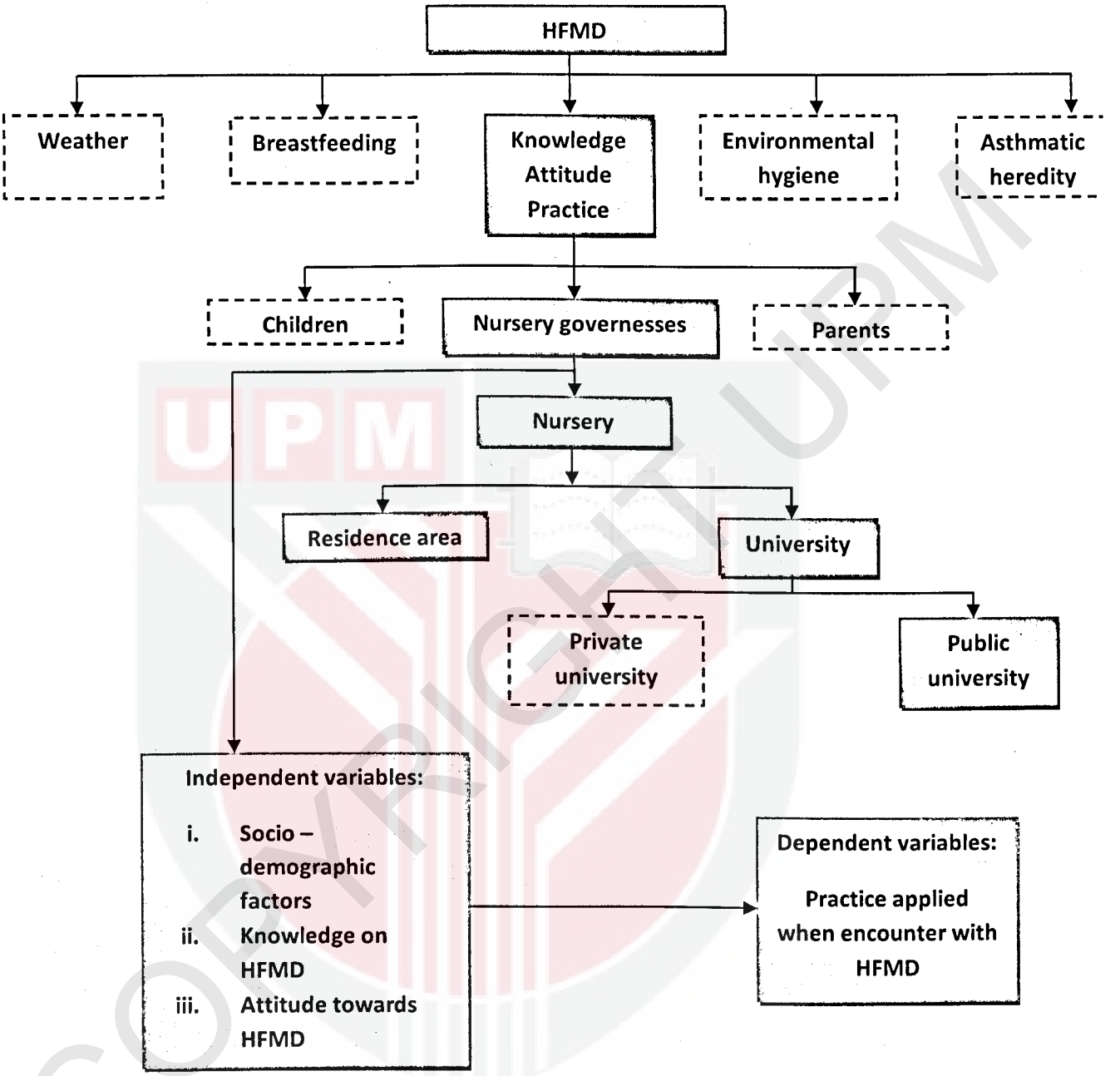


Figure 1.1: Conceptual Framework

Legend:

Representing factors that are not included in study research

Representing factors that being included in study research

Representing variables for this study

CHAPTER 2

LITERATURE REVIEW

Literature review discussed about previous studies by other researchers regarding the HFMD. This chapter explained about the definition, causes, signs and symptoms, mode of transmissions, susceptible groups, diagnosis, vaccination and statistics of HFMD cases in Malaysia.

2.1 Definition of HFMD

HFMD is an acute infectious disease occurring mainly to infants or children under five years old but the disease is rare among adults and it is characterized by fever and herpetic lesions on the hand, feet, or oral mucosa (Aswathyraj et al., 2016). This disease is capable to cause severe complication (Chew et al, 2015). HFMD can also create typical pathological damage in the skin and mucous membranes (Lee et al., 2009. Although this disease is more prone to infect children, adult can still be infected. However, the cases among adult are usually rare. It is a kind of virus disease which was caused by Enterovirus (EV) (Li et al., 2015). It is conclude that, HFMD is the disease that occur due to infection of Enterovirus (EV) and its susceptible group is children under five which the symptoms include the appearance of red spot on skin.

2.2 Causes of HFMD

Enteroviruses (EVs) are among the most common human viruses infecting humans, causing a wide spectrum of illness (Zhang et al., 2013). EVs that can cause HFMD include Coxsackie virus A2 (CV – A2), (CV – A4), (CV – A5), (CV – A6), (CV – A10), (CV – A16), (CVB1 – 5), some serotypes Echovims (ECHO) and Enterovirus 71 (EV – 71) (Li et al., 2015). Common etiological agents causing HFMD epidemics are Enterovirus 71 (EV – 71) and Coxsackie virus A16 (CV – A16) which CV-A16 has attracted less attention due to its infection often project mild and benign clinical symptoms (Sinha et al. 2014) which it may also be associated with myocarditis, pericarditis, and other severe diseases (Yin et al. 2014). EV – 71 is a neurotropic virus that can cause severe neurological and cardiovascular complications in infected patients and can have a high fatality rate (Yin et al. 2014).

2.3 Signs and symptoms for HFMD

In most cases, HFMD is mild and self – limiting. However, more severe clinical symptoms with neurological abnormalities which also include complications such as myocarditis, pulmonary oedema, aseptic meningitis (Mathes et al. 2013) pneumonia, brain – stem encephalitis, acute flaccid paralysis and even death occur for certain children (Zhang et al., 2013). Some severely affected patients may die of aggressive malignancy of HFMD (Li et al. 2016). Unfortunately, the definition and standards of the warning index system for severe cases does not exist. Studies show that high fever (body temperature > 39.1°C) correlates with patients' condition (Xu et al., 2012).

Common clinical signs and symptoms for HFMD are formation of vesicles on palm of hands, sole of feet, in oral mucosa, on surface of tongue and buttocks (Zhu et al. 2013). HFMD has a short incubation period and the average incubation period is from 3 to 7 days (Park et al., 2010). A fever is often the first sign of hand – foot – and mouth disease. One or two days after the fever starts, painful sores can develop in the mouth which is also called as herpangina. The mouth sores usually begin in the back of the mouth, as small red spots or blisters appear which will then can become ulcers in the mouth. If the vesicles in themouth rupture, they can give rise to painful sores. The patient may have difficulty eating if the lesions are plenty, large or also depending on the location.

After that, it followed by a sore throat, cold symptoms, cough, diarrhoea, vomitting and sometimes a poor appetite and general malaise. Malaise is a feeling of being unwell to the body (Mayo Clinic, 2014). A skin rash with red spots, and sometimes with blisters of approximately 3 – 7 mm in diameter (Moreno et al., 2015) may also develop over one or two days on the palms of the hands and soles of the feet; it may also appear on the knees, elbows, buttocks or genital area (CDC, 2017). The disease is benign and its complications are usually rare, the most common that is going to occur is shedding of the nails of the fingers and toes, especially in children, between 4 and 8 weeks after the onset of symptoms (onychomadesis). Onychomadesis is the painless andinflammation-free separation or shedding of the nail platefrom the nail bed beginning at its proximal end, with a newnail plate developing underneath. The fever usually lasts 3 – 4 days; the mouth sores about 7 days; and the lesions on palms and soles about 10 days (Moreno et al., 2015).

2.4 Mode of transmission for HFMD

Enteroviruses are transmitted from person to person through direct contact, the air, and especially through the fecal-oral route (Moreno et al., 2015). According to Sun et al. (2016), fecal – oral mode of transmission contributing higher in new cases of HFMD to be occur. The HFMD outbreaks are often found in nurseries, playgroups, schools, and households where children have lots of close contacts with another children (Chang et al. 2011). According to Wu et al. (2014), the independent risk factors affecting the incidence of HFMD is having history of contacting with HFMD patients, and sharing toys with other children. Therefore, nursery is the place where HFMD virus can be easily disperse as children sent there will be sharing toys with the other children.

Transmission prevention is complicated by the large number of asymptomatic infections and the biological characteristics of Enteroviruses, as infected patients secrete viral particles in their stool for weeks. Due to the fecal – oral transmission, hand washing was recommended to halt the spread of the viruses (Sun et al. 2016). Nursery governess is the individual that will meet the children's need if the children are staying in the nursery. Thus, having knowledge on HFMD and applying good personal hygiene practice may lower the prevalence rate of this disease (Yang et al., 2010).

2.5 Susceptible group for HFMD

Children from age six months to five years old are a group at risk of suffering HFMD. This could be due to the children age less than five years old have low immunity (Chew et al. 2015). Children less than five years old had the highest risk of disease, and age – specific incidence and mortality rate was highest in the 12 to 23 month age-group (Reed & Cardosa, 2016). Similar to other affected countries, incidence was lowest among infants younger than six months, older children (age 5 – 14 years) and adults (age ≥15 years) (Ang et al., 2011). These data are generally consistent with other studies that find about 50 – 80% of children are seropositive for EV – 71 by the time they reach five years of age (Ang et al., 2011, Lee et al., 2012, Tran et al., 2011).

Commonly, children who live in areas of socioeconomic advantage are less likely to develop HFMD because of the availability of healthcare facilities and better sanitation (Gou et al. 2016). Adults are less susceptible to the disease due to immunity from previous exposures to this disease (Sham et al. 2014). As the susceptible group for this disease is children, there are less of reports or study focussing on adults. However, a rising new cases for HFMD among adult might be expected in the future as the result of global warming, continued viral evolution and an increase in global travelling (Yin et al. 2014).

2.6 Diagnosis of HFMD

HFMD can be diagnosed from stool sample or blood sample obtained from the patients. According to Wang et al. (2015), EV – 71 can be detected through reverse transcription polymerase chain reaction (RT – PCR), virus isolation, neutralization assay and phylogenetic analysis while for CV – A16 can also be detected through real–time RT – PCR. In November 2013, the viral RNA of seven suspected cases that were admitted in Victoria Hospital, Bangalore, was tested through RT – PCR which their viral RNA was extracted from urine samples using the QiAmp viral RNA kit (Sinha et al., 2014).

EV – 71 detection in stool specimens was performed using commercially available pan – Enterovirus, EV – 71, and CV – A16 diagnostic kit. Anti – EV – 71 IgM was detected in the peripheral finger tip blood sample using immunochromatographic assay (Wang et al., 2015).

For RT – PCR, virus isolation and neutralization assay, viral RNA was extracted from serum using a viral RNA mini kit. Direct RT – PCR was performed with primer targeting EV – 71 VP1 gene. PCR product was analyzed on a 1 % agarose gel, and then purified using purification kit (Wang et al., 2015).

For phylogenetic analysis, the gel purified PCR products were bi – directionally sequenced using DNA analyzer. Alignment of the entire VP1 nucleotide sequences was performed using program. Phylogenetic tree was constructed in software, using method in Kimura two-parameter model, accompanied by bootstrap analyses with 1000 replicates (Wang et al., 2015).

In addition diagnosis of HFMD caused by EV – 71 largely depends on clinical manifestations and rare serological biomarkers used to identify HFMD however, based on the research conducted in China, serum cholinesterase can be a potential assistant biomarker for HFMD (Cheng at al. 2016).

2.7 Vaccination for HFMD

According to MOH (2016), there is no effective chemoprophylaxis or vaccine available for HFMD in Malaysia. Not only Malaysia, in other Association of Southeast Asian Nations (ASEAN) countries also, there is no specific vaccine to prevent HFMD from affecting children. However in China, new discover on HFMD vaccine has been found. According to Xinhua (2016), China has launched the world's first and second vaccine in December 2015 and January 2016 respectively against EV – 71 in which is one of the primary causes of HFMD.

First inactivated (killed) vaccine is made by Institute of Medical Biology at the Chinese Academy of Medical Sciences which targeting children aged between 6 months – 6 years while the second vaccine which also inactivated vaccine is developed by Sinovac Biotech Ltd and targeting children aged 6 months – 3 years (Sanicas, 2016). Although there is still no news that China will make the new discovered vaccines available to other countries, there is still a great achievement to the global world that suffering from this disease.

Nevertheless, for CV – A16, which is one of the common etiological agents that can caused HFMD despite that EV – 71, still does not have any new discovery on the vaccine that can prevent the infection of this virus.

2.8 Risk factors contributing to HFMD

2.8.1 Impact of temperature variability on HFMD

The short-term temperature variation has been shown to be significantly associated with human health. According to findings from Xu et al. (2016), the temperature change on neighbouring days (TCN) drops may increase the incidence of childhood HFMD in Huainan, which it concentrating on the importance of protecting children from upcoming TCN drops. It also focused to the population that were male, young, scattered and from high risk areas. From other study, findings indicate that extreme precipitation may increase the incidence of childhood HFMD in Hefei which highlighting the importance of protecting children from upcoming extreme precipitation, particularly for those who are young and from urban areas (Cheng et al., 2014). Thus, the temperature variability can influence the incidence of HFMD.

2.8.2 Breastfeeding reduce severity of HFMD

Breastfeeding is recommended by the World Health Organization (WHO, 2017). According to Li et al. (2013), breastfeeding alleviated the severity of HFMD. It becomes protective factor against HFMD. Other finding indicates that breastfeeding may also have a protective effect on the diseased state after enterovirus infections such as HFMD (Zhu et al., 2012). According to the study carried out by Lin et al. (2014), breastfeeding still be the protective factor against EVs infections.

Their findings were exclusive breastfeeding could prevent the occurrence of HFMD and this protection could persist for about 28 months.

2.8.3 Increased Enterovirus 71 antibodies (Ab) in asthmatic compared with non – asthmatic children

Study from Smith – Norowitz et al. (2016) found out four findings which were; first –asthmatic children had higher EV – 71 IgE Ab levels than non – asthmatic children. Second, non – asthmatic children had higher EV – 71 IgM Ab levels than asthmatic children. Third, non – asthmatic children produced more IL – 2 and IL – 4 than asthmatic children. Fourth, in asthmatic children age was related to the levels of EV – 71 IgE Ab but not levels of EV – 71 IgM Ab. Overall, our results showed different patterns of association between specific EV–71 IgE or EV – 71 IgM Ab responses and age, stratified according to asthma status. In conclusion, when there was presence of EV – 71 IgM / IgE Ab, it showed that there were EV–71 infections. However, further study should be conducted.

2.9 Knowledge, Attitude and Practice

Knowledge and practice were essential in determining the practice as both knowledge and attitude could influence the individual to practice a good habit. According to Greenwald and Banaji (1995), attitude reflects the learning impacts on behaviour. Thus, by understanding the level of knowledge, attitude and practice, any awareness program or activity could be done efficiently as the organiser could plan the program based on the needs of the target population (Kaliyaperumal, 2004).

According to the Tran, T. N. H. (2012), child caregivers (nursery governess) usually do have sufficient knowledge regarding on HFMD and their attitude toward the disease was positive which they actively learning about the disease and expressing concerns as their works are dealing with children. However, practices on prevention of the disease were not so good. For example, although they know that they need to clean the floors and childrens toys regularly, they cleaned children's toys only few times and the steps in hand washing for children did not meet hygienic requirements.

Providing HFMD health education program to nursery governess would improve their knowledge, and then the change in their knowledge would contribute to their attitude change and the change in attitude would finally influence their behavioural change. According to Ruttiya, C. & Tepanata, P. (2013), providing health education program through television channel is highly recommended as television is the most effective source of information based on their survey.

2.10 Statistics for HFMD in Asian country

Worldwide, Hand, Foot, and Mouth Disease (HFMD) outbreaks have occurred frequently since its first report in 1958, which then posing a threat to public health especially to children in the Asia – Pacific regions (Zhang et al., 2013).

2.10.1 China

HFMD was first reported in mainland China in 1981. In China, a large scale outbreak of HFMD emerged in 2007 in Shandong Province, with 1149 cases reported. Since then it has prevailed in most provinces of China. Despite nationwide

effort, 1,795,336 cases were diagnosed annually in 2010 with 905 deaths (Xu et al., 2012). According to the data from the national surveillance system of HFMD in mainland China in 2008 – 2012, the case-fatality rate of HFMD is 0.03 % and the case-severity rate is 1.1 % (Xing et al., 2014). In 2012, the Chinese Centre for Disease Control and Prevention (China CDC) confirmed 2,168,737 cases in mainland China including 569 deaths (published on the website of the Ministry of Health of China) (Zhang et al., 2013). A recent study from the Chinese National Enhanced Surveillance System, characterizing the epidemiology of HFMD, found that, from 2008 to 2012, more than 7.2 million cases of HFMD were reported. Between 2010 and 2012, there were 1.2 cases per 1000 person – years and 500 – 900 deaths each year (Wang et al., 2013 & Wang et al., 2012).

2.10.1a Taiwan

An outbreak in Taiwan during the late 1990s was responsible for 78 deaths which were 91% of children less than five years old. Enterovirus infections are now common in Taiwan. In 2008 alone there were 373 confirmed cases of Enterovirus infections with severe complications, including 14 fatalities; the majority of cases were children in their first two years of life.

2.10.2 Singapore

The first recognized HFMD outbreak in Singapore occurred in 1970 which during that time, the etiologic agent still unknown (Qiu, 2008). Two other outbreaks were reported in 1972 and 1981 and involved 104 and 742 persons respectively. CV – A16 was implicated as the cause of the outbreak (Singh et al., 2002 & Leong et al., 2002). During 2008, Singapore experienced its largest ever outbreak of HFMD,

resulting in 29 686 cases, including four cases of encephalitis and one fatality. In 2008, the largest outbreak of HFMD in Singapore afflicted 29 686 patients ranging from kindergarten to primary school students, four of whom developed EV – 71 – related encephalitis. Moreover, a 3 – year – old boy with EV – 71 infections died of encephalomyelitis in August 2008 which was the first HFMD – related death since 2001 (Wu et al., 2010).

2.10.3Vietnam

In Vietnam, EV – 71 was first isolated in 2003. In 2005, an outbreak of HFMD was caused by CV – A16 and EV – 71 (Tu et al., 2015). HFMD outbreaks occurring every three years have been reported from countries in the region to which it is endemic (Mizuta et al., 2005 & Ooi et al., 2007), but Vietnam had a high number of cases during February 2011 – July 2012 which the total of cases were 174,677 (110,897 during 2011 and 63,780 during the first 6 months of 2012) and 200 deaths were reported from Vietnam during this period. Reported case – patients were mainly from southern Vietnam in 2011 wheareas in 2012, the outbreak spread to the northern provinces of Vietnam. (Truong et al., 2012).

2.10.4 Thailand

HFMD has potential to become Thai health problem in the future, since HFMD outbreaks occurred in many of Thailand neighbouring countries such as Malaysia in 1997, 2000, 2003, 2006, and Vietnam in 2008, 2011 (Thongcharoen, 2011). 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 EV – 71 infections (Sakoonkeaw, 2007). During HFMD outbreak in

2012, the number of HFMD cases was higher than ever. Even though, the fatality rate of HFMD is very low, the 2012 outbreak in Thailand and Cambodia still caused panic to the Thai society. (Ruttiya & Tepanata, 2013).

2.10.5 Malaysia

In Malaysia, the first HFMD cases that were reported were in the middle of year 1997 in Sarawak which a few children were died during the epidemic. The cause of the disease was due to the infections of EV – 71 (Cardosa et al. 1999). The total annual HFMD cases in 2008 – 2014 were 15,564, 17,154, 13,394, 7,002, 34,519, 23,331 and 31,322 respectively which the highest number of cases reported was in Selangor (Nik Nadia et al., 2016). The incidence rate of HFMD was the highest in those children that are less than two years (Nik Nadia et al., 2016). In 2015, HFMD with the incidence rate 74.09 per 100,000 populations came in third after dengue with 357.49 and tuberculosis with 74.95 per 100,000 populations (MOH, 2016)

Table 2.1: Number of cases, death and outbreak of HFMD from 2011 – 2016.

No.	Year	Number of cases	Number of death	No. of outbreak
1.	2011	7 002	0	182
2.	2012	**34 519**	**1**	1 893
3.	2013	23 331	0	1 326
4.	2015	19 916	0	895
5.	2016	23 454	0	844

Table 2.1 showed number of cases, death and outbreak of HFMD from 2011 – 2016. The highest reported cases was in 2012 with 34 519 cases which showed

increases 27 517 cases from the year before 2011 (7 002). During 2012 also, there was one reported cases of death in Malaysia. The number of outbreak also showed the highest number in 2012 with 1 893 outbreak.

Table 2.2: Number of HFMD among States in Malaysia from 2015 and 2016.

Year	Sarawak	Selangor	Johor	WPKL	Perak	Sabah	Penang	Others
2015	7 040	**3 044**	1 130	739	718	714	402	< 400
2016	3 007	**7 471**	2 294	2 084	1 361	1 535	1 357	< 1 200

Table 2.2 showed number HFMD cases among States in Malaysia in 2015 and 2016. Selangor reported the increment of 4 427 cases from 2015 to 2016. Thus, Selangor was reported the highest number of cases among other States.

CHAPTER 3

METHODOLOGY

3.1 Study location

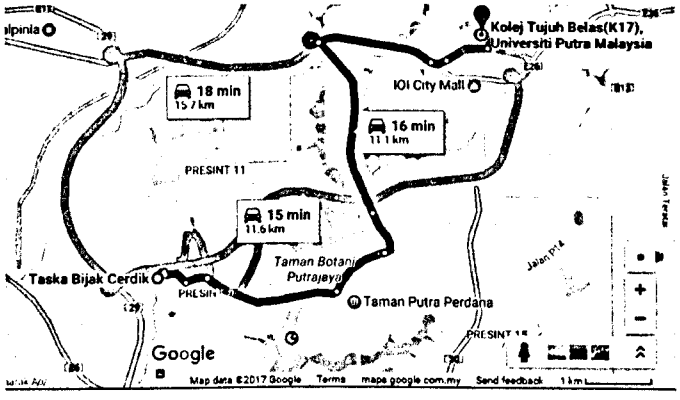
Klang Valley comprise of the following areas which are Federal Territory of Kuala Lumpur, Federal Territory of Putrajaya, Selangor district of Petaling, Selangor district of Klang, Selangor district of Gombak and Selangor district of Hulu Langat. There is no official designation of the boundaries that representing Klang Valley but it is often assumed to comprise the areas mentioned above.

This study was conducted in nurseries of public universities and residential areas that located in Klang Valley. The universities that matched the criteria are Universiti Putra Malaysia (UPM), Universiti Kebangsaan Malaysia (UKM), Universiti Malaya (UM), Universiti Teknologi Mara (UITM), National Defence University of Malaysia (UPNM) and International Islamic University Malaysia (IIUM). However, the only universities that gave permission to do the research in their nurseries are UPM, UM and IIUM. Thus, only UPM, UM and IIUM will be included in the study. The nurseries for residential areas included Taska Bijak Cerdik in Putrajaya, Taska Murni in Kerinchi and Taska Al – Ilmi in Gombak. Instead of only three public universities, nurseries in residential areas also will be included in the study in order to do the comparison between nurseries in universities and residential areas.

The three nurseries in residential areas are chose depending on the distance between both nurseries that were being compared. After the distance had known, the nurseries will be asked for permission from researcher to conduct the research in their nurseries. Unfortunately, for this present study, a number of nurseries had decline to participate in this research although their distance are closer to the nurseries in universities if compared to the current chosen nurseries in residential areas. Therefore, due to limitation of withdrawal and refusal of nurseries to participate, Taska Bijak Cerdik, Taska Murni and Taska Al – Ilmi were chosen as they were willingly to give cooperation to involve in this study.

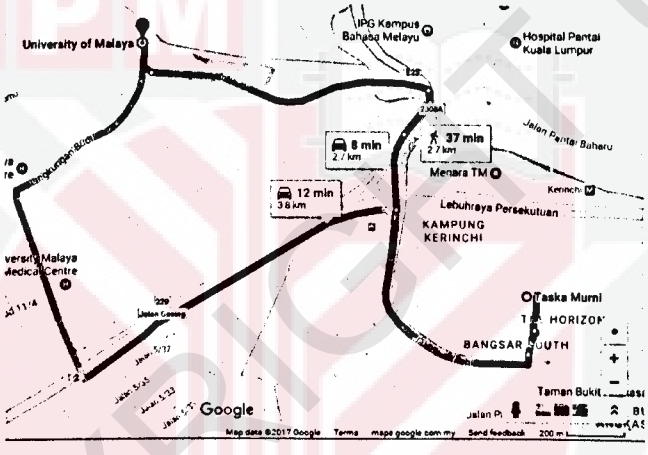
Table 3.1: Comparison of nurseries from research universities with residential areas.

No.	Areas	Research universities	Residential areas	Distance between two nurseries
1	Serdang	Universiti Putra Malaysia	Taska Bijak Cerdik	11.1 km
2	Kuala Lumpur	Universiti Malaya	Taska Murni	2.7 km
3	Gombak	International Islamic University Malaysia	Taska Al – Ilmi	5.9 km



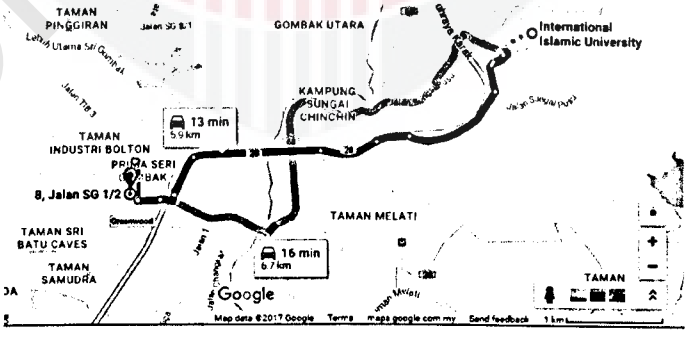
(Source: Google Maps)

Figure 3.1: Distance between UPM with Taska Bijak Cerdik



(Source: Google Maps)

Figure 3.2: Distance between UM with Taska Murni



(Source: Google Maps)

Figure 3.3: Distance between IIUM with Taska Al – Ilmi

3.2 Study design

This research was using comparative cross sectional type of study design as this design can make comparisons at a single point in time. This study is conducted to assess the knowledge, attitude and practice associated with hand, foot and mouth disease. This type of design is chosen due to a limited period of time for data collection.

3.3 Sampling

3.3.1 Sampling population

The sampling population was all nursery governesses in nurseries at Universiti Putra Malaysia (UPM), Universiti Malaya (UM), International Islamic University Malaysia (IIUM), and all three nurseries selected in residential areas. For UPM, there are total of three nurseries which are Taska Ceria Cerdas (Faculty of Engineering), Taska Permata (Faculty of Human Ecology) and Taska Cahaya Mata Koperasi (Taska A, Taska B and Taska C) while for UM there is only one which is Taska UM (TASKUM). For IIUM, there were three nurseries involved which were Taska IIUM Educare Petaling Jaya, Taska IIUM Educare Gombak and Taska IIUM Educare MIDA.

3.3.2 Sampling frame

Table 3.2: The total number of respondents involved in the study from each nurseries in universities

No	University	Nursery	Number of respondent
1.	Universiti Putra	Taska Ceria Cerdas	9
2.	Malaysia	Taska Permata	14
3.		Taska Cahaya Mata Koperasi	20
4.	Universiti Malaya	TASKUM	10
5.	International	Taska IIUM Educare Petaling Jaya	6
6.	Islamic University	Taska IIUM Educare Gombak	17
7.	Malaysia	Taska IIUM Educare MIDA	7
		Total:	83

Table 3.3: The total number of respondents involved in the study from each nurseries in residential areas

No	Nursery	Number of respondent
1.	Taska Bijak Cerdik	9
2.	Taska Murni	7
3.	Taska Al – Ilmi	10
	Total:	26

The list of respondents will be obtained from all the office of nurseries involved. Total number of nursery governesses that working at all six nurseries were 109 and all will be selected in this study.

3.3.3 Study sample

Nursery governesses include both gender and between ranges of age 17 – 60 years old who are working in the nurseries at public universities and residential areas chosen.

Inclusion criteria: Nursery governess, both man and woman, age between 17 – 60 years, working at nurseries in public universities and residential areas.

Exclusion criteria: Staff that does not involve in fulfilling children's needs such as changing diapers, taking the child to bath, give the child food and etc.

3.3.4 Sampling method

For public universities, there are total six universities in Klang Valley. All universities will be universal sampled. However, only three universities agreed to involve in this research which are Universiti Putra Malaysia (UPM), Universiti Malaya (UM), International Islamic University Malaysia (IIUM). The other three did not give permission to undergo the research in their universities.

For nurseries in residential areas, purposive sampling is chosen. The nurseries will be chosen when the management of the nurseries agreed to involved in this study and the distance between the nurseries in the residential areas with the universities is close to one another.

While for the number of respondents, they were sampled through universal sampling. All the nursery governesses from nurseries for all three public universities in Klang Valley and residential areas will be selected in this research.

3.3.5 Sample size

All nursery governesses will be chosen to participate in this research. The number of nursery governesses that working in nurseries from UPM, UM and IIUM are 43, 10 and 30 respectively. While for Taska Bijak Cerdik, Taska Murni and Taska Al – Ilmi are 9, 7 and 10 nursery governesses respectively. Hence, the total nursery governesses were 109. Sample size calculation did not being done for how many number of nursery governesses should be included in the study because universal sampling was conducted. For number of nurseries in residential areas involved which was only three, the calculation did not being done also as only three public universities that willing to participate, thus only three nurseries also from residential areas were invited to participate in this research.

3.4 Study instrumentation

3.4.1 Questionnaire

The respondents will be assessed by using self-administered questionnaire which will comprise of four sections: Section A, B, C and D. Section A will be collecting on their socio-demographic status. Section B will be questioning on the respondents' general knowledge regarding on HFMD. For Section C is comprise of three subsections which will be asking on knowledge of the respondents, attitude

towards HFMD and practices on preventing and dealing with situation when the disease occurs. For Section D, it comprised of the suggestion part on how to efficiently disseminate HFMD information. Questionnaire was modified from Tran (2012). The informations in the questionnaire was obtained from baseline report Tran (2012). However for the structure of questions, likert scale format was used.

3.5 Variables

3.5.1 Dependant variables

The dependent variable for this study is practice towards hand, foot and mouth disease (HFMD).

3.5.2 Independent variables

The independent variable for the research will be knowledge (K) about HFMD, attitude (A) towards HFMD and socio – demographic of respondents.

3.6 Data collection procedure

After all application process accepted, the research investigator will give a phone call as a reminder to the principle of the day–care the day before distributing the questionnaires. Before the questionnaire was distributed, the respondents will be given a short briefing on the purpose of the research. The respondents will be informed that their individual responses would remain anonymous, protected by the research investigator. A self-administered questionnaire will be given to every respondent to be answered and those questionnaires will be collected at the end of

the survey. The respondents will be given 20 – 25 minutes to fill in the questionnaires. The questionnaires are used to collect all the information needed in this research.

3.7 Data analysis

The data obtained from the questionnaires will be analysed by Social Sciences Statistical Programme (SPSS). The scoring method and scoring level were according to Ajit, (2011).

Knowledge

- Right answer : 1 point
- Wrong answer : 0 point

Attitude

- Strongly agree : 5 points
- Agree : 4 points
- Not sure : 3 points
- Disagree : 2 points
- Strongly disagree : 1 point

Practice

- Very frequently: 5 points
- Frequently : 4 points
- Not sure : 3 points
- Rarely : 2 points

- Never : 1 point

Scoring level

- Good : score > mean + SD
- Bad : score < mean - SD

3.8 Quality control

A pre – test had been used as a quality control in this research. A sample of questionnaire had been distributed to 10 nursery governesses as the representative of respondents from nursery in Universiti Tenaga Nasional (UNITEN) which is excluded from the sample population to observe their ability and understanding of answering the questionnaire in order to produce a good research result. The value of Cronbach alpha obtained for reliability was 0.901. Bryman and Cramer (2005) stated that, Cronbach alpha value of 0.7 or more was acceptable for reliability test for questionnaire.

3.9 Ethical consideration

Before conducting the study, the approval from the Ethical Committee for Universiti Putra Malaysia (JKEUPM) was gained with the JKEUPM Ref No. of FPSK (EXP16-OSH) U017 (Appendix 1). The respondents were also given brief explanation on how to answer the questionnaires given. Other than that, written permission by using consent form was filled in by the respondents. To respect the privacy of the subjects, their personal information and responses were kept confidential.

3.10 Study limitation

The outcome of study was measured based on the answer of the respondents from the self – administered questionnaire. It was based entirely on respondents' honesty as the respondents may be reluctant to give information about their knowledge, attitude and practice on HFMD. The respondents might just assume the answers for knowledge sections and their assumption is unfortunately correct while for attitude and practice sections, they might choose that they frequently doing it which actually they are not. The data analysis were done based on a cross – sectional data, thus the causal interpretation of the results cannot be done. The number of respondents for both populations was not the same in this study which was for public universities was 77 and residential area was 25. Thus, for future study, it is recommended to have the same amount of respondents from both groups for comparison purposes. Sample size calculation also should be done in order to produce a better research where the result can be representing the population that have the same characteristics as the study population.

CHAPTER 4

RESULTS

4.1 Response rate

In order to complete the study, 109 samples of questionnaires and consent forms were distributed. The questionnaires were distributed to all nursery governesses in each nurseries selected. Out of 109 samples, 102 (93.6% response rate) samples of questionnaires and signed consent forms were returned to the researcher.

4.2 Socio-demographic data of the respondents.

This part showed about the frequency and percentage distributions of socio – demographic of the respondents. It included the age, race, education level and year of employment. The data of the socio – demographic characteristics were tabulated in Table 4.1.

Table 4.1 Socio-demographic data of the respondents

Variable/Nursery	Public university	Residential area
Age		
Less than 20 years old	10 (13 %)	3 (12.0%)
21 to 29 years old	36 (46.8 %)	16 (64.0%)
30 to 39 years old	21 (27.3 %)	4 (16%)
More than 40 years old	10 (13 %)	2 (8.0%)

Race		
Malay	77 (100 %)	25 (100 %)
Chinese	-	-
Indian	-	-
Others	-	-
Education level		
No education	-	-
Primary school	2 (2.6 %)	-
Secondary school	57 (74 %)	17 (68.0%)
College or University	18 (23.4 %)	7 (28.0%)
Others (*Giatmara*)	-	1 (4.0%)
Year of employment		
Less than and equal to 1 year	19 (24.7 %)	10 (40.0 %)
2 – 3 years	25 (32.5 %)	9 (36.0 %)
4 – 9 years	18 (23.4 %)	3 (12.0 %)
10 – 19 years	13 (16.9 %)	3 (12.0 %)
More than 20 years	2 (2.6%)	-

Regarding on age, for nursery governesses in public universities, the range of age was from 19 years old to 55 years old. Majority of the nursery governesses were in the age group of 21 to 29 years old, which were 36 (46.8 %). Meanwhile, for nursery governesses in residential areas, their age ranged from 18 to 62 years old. There were 16 (64.0%) of nursery governesses aged in 21 to 29 years old age group. The range of age group among nursery governesses was large as there is no age specific requirement for becoming nursery governesses. They can ask for this job as long as they have the ability to handle the children (JobStreet.com, 2016).

For race and gender, all nursery governesses in both public universities and residential areas are Malay and female. It is common to have female nursery governesses because of the nature of job that are more suitable for female. According to Eagly & Crowley 1986, woman possesses the behavior of warm, affectionate and caring towards surrounding. Thus, woman is the group that suitable in dealing with children. For education level, majority of the nursery governesses in both population have qualification up until secondary school only which for government universities were 57 (74 %) while for residential areas were 17 (68.0%). For this job, the job qualification begins with having Sijil Pelajaran Malaysia (SPM). With only having SPM, they are qualified to apply for this job (JobStreet.com, 2016).

Regarding on duration of employment, majority of nursery governesses in public universities worked only in between 2 – 3 years which were 25 (32.5 %). Meanwhile for nursery governesses in residential areas, most of them work in this field less than 2 years which were 10 (40.0 %). Young children are known to have aggressive behaviour (Tremblay, 2000). Majority of the children shows a peak in their level of aggression at the age of 2 or 3 (Alink et al., 2006). Thus, for those who are unable to handle the children tend to leave the job and can only withstand it up until few years only.

4.3 Descriptive statistic on general information

Five questions have been asked to the respondents. The purpose of asking this question was to know their general knowledge on HFMD. Descriptive statistics was done to get the frequency and percentage.

Table 4.2 Descriptive statistic on general information data

Variable	Frequency (n)	Percentage (%)
Hearing about terms of "HFMD"		
Yes	100	98
No	2	2
Notice about HFMD phenomenon in Asia continent		
Yes	95	93.1
No	7	6.9
Aware of HFMD outbreaks in Malaysia		
Yes	99	97.1
No	3	2.9
Sources of information		
Television	81	79.4
Radio	24	23.5
Internet	70	68.6
Friends	69	67.6
Employers	63	61.8
Parents of the children	40	39.2
Others	10	9.8
Recognize symptoms of HFMD		
Yes	94	92.2
No	8	7.8

Hearing about terms of "HFMD"

Regarding the questions, 100 (98 %) of nursery governesses heard about term of HFMD while 2 (2 %) has not heard about it.

Notice about HFMD phenomenon in Asia continent

There were 95 (93.1 %) nursery governesses notice about HFMD phenomenon in Asia continent while 7 (6.9 %) did not notice about it.

Aware of HFMD outbreaks in Malaysia

About 99 (97.1 %) nursery governesses were aware of HFMD outbreaks in Malaysia while 3 (2.9 %) nursery governesses did not aware of it.

Sources of information

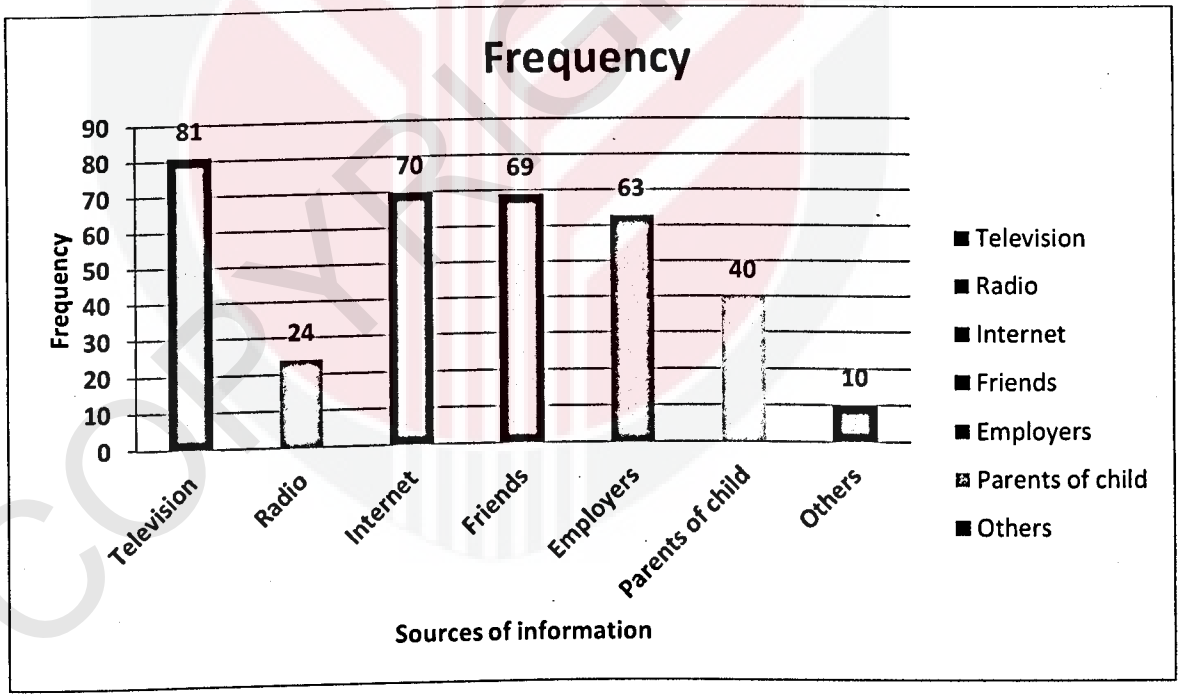


Figure 4.1: Sources of information

Figure 4.1 showed sources of information about HFMD. Majority of the nursery governesses got information via television which was 81 (79.4 %), followed by internet 70 (68.6 %). According to Ruttiya, C. & Tepanata, P. (2013), health education program through television channel is highly recommended as television is the most effective source of information based on their survey. Information on HFMD also can be got from friends 69 (67.6 %), employers 63 (61.8 %), parents of the children 40 (39.2 %), radio 24 (23.5 %) and others 10 (9.8 %). Others sources that being mentioned by nursery governesses include banner that being assembled outside of health clinics, health talk on HFMD, pamphlet that being distributed and health promotion programs that being conducted in shopping malls.

Recognize symptoms of HFMD

There were 94 (92.2 %) of nursery governesses recognize the symptoms of HFMD. Meanwhile, 8 (7.8 %) of nursery governesses did not recognize on it. Considering that majority of the nursery governesses recognize the symptoms, it is good because symptoms are the early indicator to detect whether those children are suffering from HMFD or not.

4.4 Level of knowledge on HFMD between nurseries in public universities and residential areas.

A mean score of 14.47 and standard deviation of 2.48 were used to classify respondents into three groups. The three groups were as followed:

Good level : score of 17 or more

Moderate level : score between 13 – 16

Poor level : score of 12 or below

The distribution of knowledge level was shown in Figure 4.2. Nursery governesses in public universities had good level of knowledge which was 22 (28.6 %) compared to nursery governesses in residential areas which was 4 (16 %). For moderate level of knowledge, nursery governesses in residential areas had 15 (64 %) while for nursery governesses in public universities had 34 (44.2 %). There were 21 (27.3 %) for nursery governesses in public universities and 5 (20 %) for nursery governesses in residential areas who had poor level of knowledge.

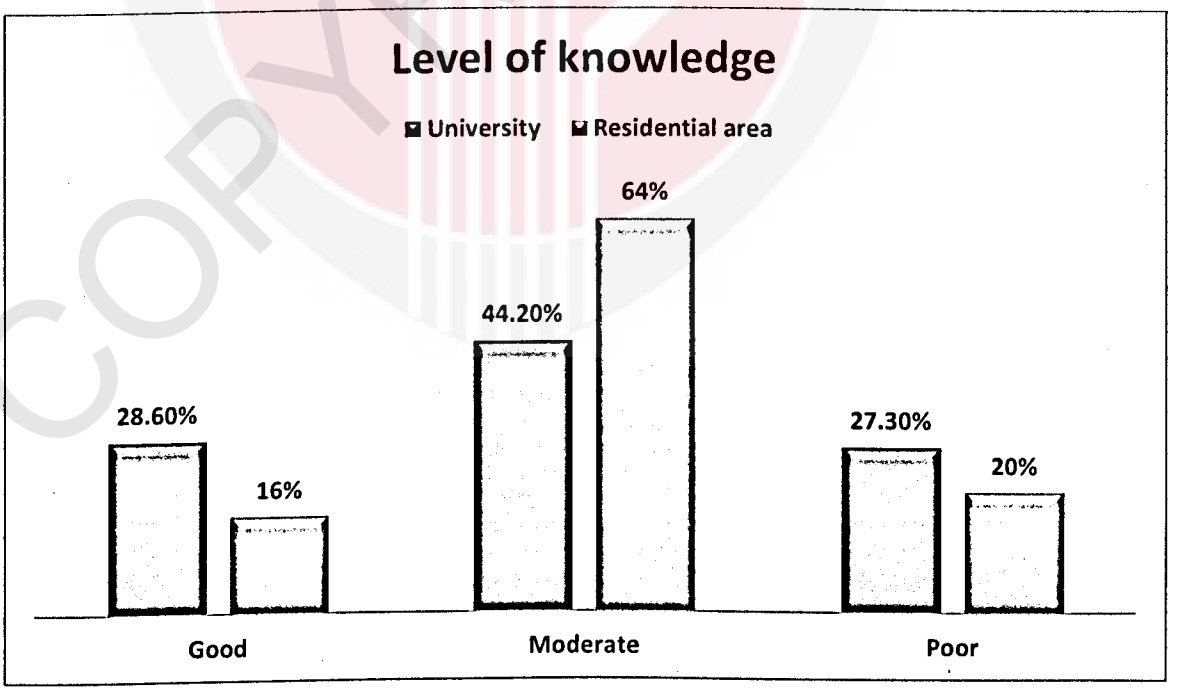


Figure 4.2: Level of knowledge

With the advanced internet technologies nowadays, any information could be acquired easily. However, this study population is not only among Z – generation (1990s – 2000s) that is highly exposed to these current technologies. There is some of the nursery governesses that are in the population that are still mainly depends on mass media such as television (TV). However, in this type of medium the information on HFMD is not sufficient as there are only short segments explaining on HFMD for example during short TV advertisement.

Since HFMD can be prevented while having good personal hygiene (Yang et al., 2010) thus having good knowledge on how the disease will be transmitted can lower down the probability of disease occurrence. Without adequate knowledge, they might have tendency to adopt bad practice that could lead to the increasing number of cases in nurseries. By increasing knowledge and awareness of the public, attitude and practice of them can be altered (Sabouhi et al., 2011). Therefore, by having good knowledge, this disease can be prevented. According to past studies, good hygiene education can raise the knowledge of caregivers can lead to good preventive measure which will then reduce the risk of transmission (Colby et al., 2007, Chompook et al., & Pai et al., 2006).

4.5 Level of attitude on HFMD between nurseries in public universities and residential areas.

The score obtained was sum up and classified into three levels which were high, moderate, and low level of attitude. A mean score of 83.58 and standard deviation of 9.72 were used to classify the subjects into three levels as follow:

Good level : score of 93 or more

Moderate level : score between 75 – 92

Poor level : score of 74 or below

To sum up the attitude toward HFMD, the distributions were tabulated in Figure 4.3. Most of the respondents from nursery governesses in both public universities and residential areas had moderate attitude which were 58 (75.3 %) and 19 (76 %) respectively. Meanwhile, 10 (13 %) and 4 (16 %) from nursery governesses in public universities and residential areas perceived good level of attitude. About 9 (11.7 %) and 2 (8 %) of the respondents from nurseries in public universities and residential areas had poor level of attitude.

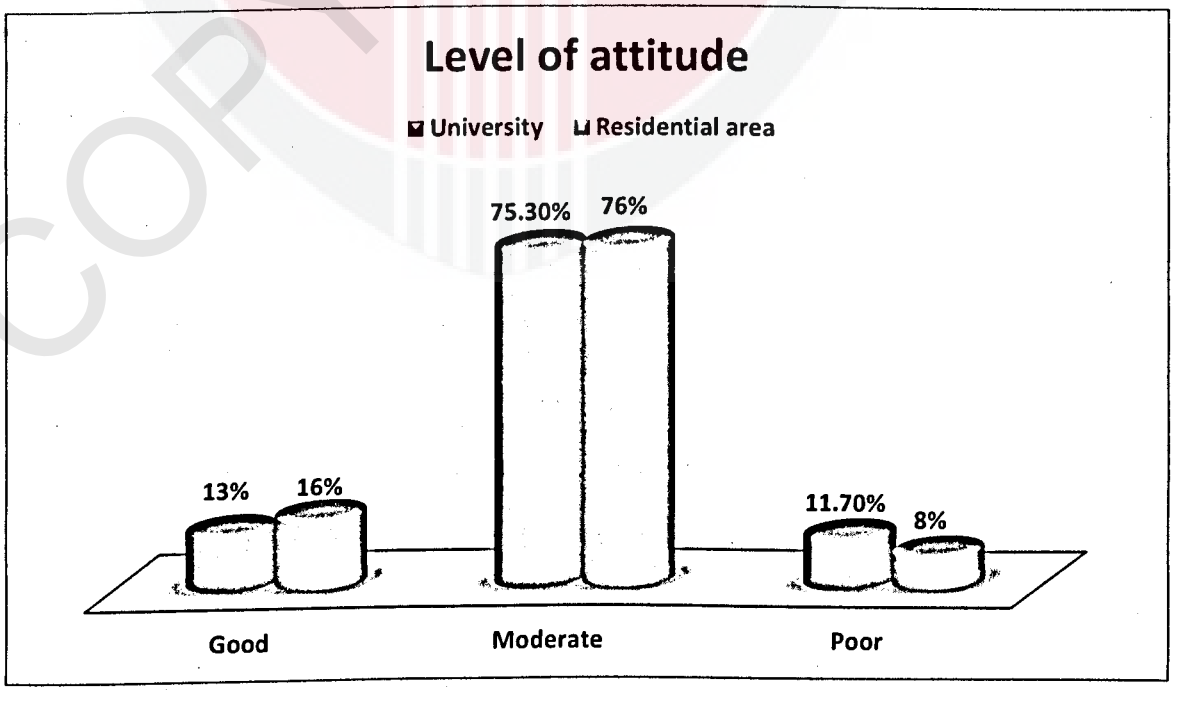


Figure 4.3: Level of attitude

Attitude towards HFMD can affect the practice of nursery governesses whether good or bad when dealing with HFMD. Knowledge and attitude must ally with in order to influence people to practice good habit. It was revealed by previous study that showed attitude towards environment was shape by level of knowledge about the environment (Rosta et al., 2011). This example shows that with good knowledge can elevate attitude of the nursery governesses.

Attitude is a complex mental construct (perception) which emerges out of an integration of an individual's belief and values system (Boershing & de Young, 1993). Hence, it was quite challenging to ensure application of good attitude as attitude already accumulated and formed throughout the upbringing process and the attitude involved what they believed about and what positive value they got (Awang et al., 2013).

4.6 Level of practice on HFMD between nurseries in public universities and residential areas.

The practice score was converted in terms of score level and classified into two groups which were good and bad practice. A mean score of 81.51 and standard deviation of 8.74 were used to classify the respondents into two groups as follow:

Good practice : score of 82 or more

Bad practice : score of 81 or below

Figure 4.4 showed the distribution of level of practice among nursery governesses in public universities and residential areas. Nursery governesses in public universities had good level of practice which was 45 (58.4%) compared to nursery governesses in residential areas which was 9 (36 %). There were 32 (41.6 %)

for nursery governesses in public universities and 16 (64 %) for nursery governesses in residential areas who had bad level of practice.

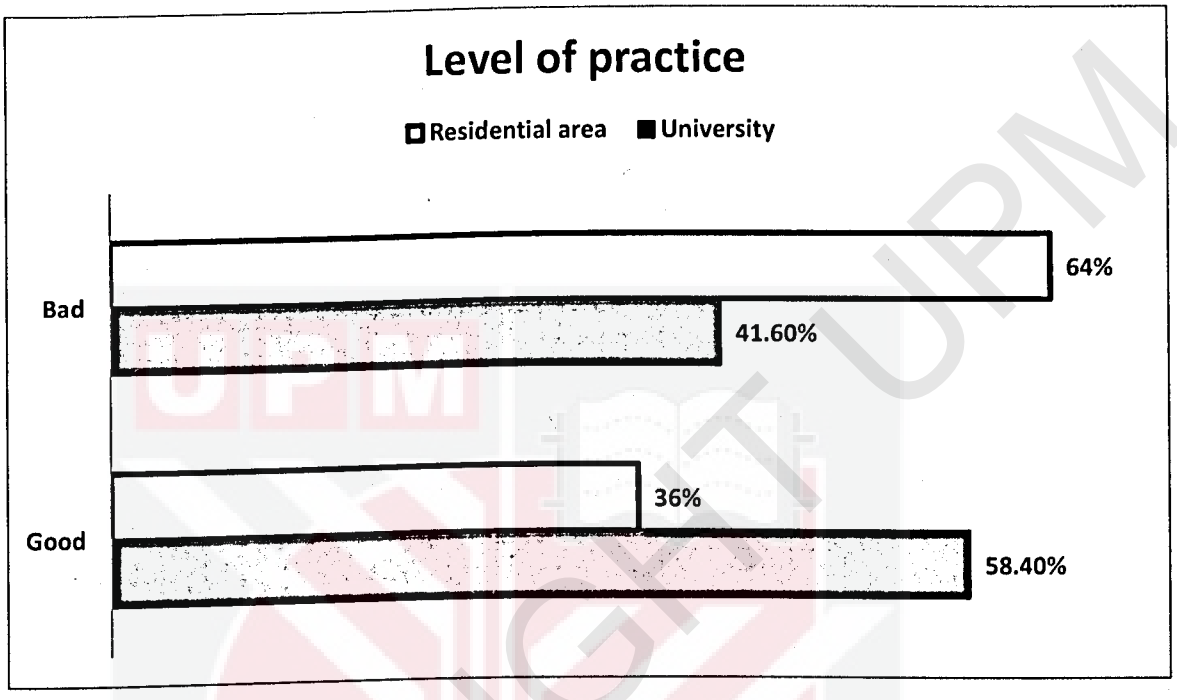


Figure 4.4: Level of practice

Practice was an indicator to know the outcome of any programmes. The programmes were effective and successful if the participant can commit in applying good practice right after attending the programmes. For this present study, nursery governesses in universities have better practice habit if compared to nursery governesses in residential areas. This can be supported by study from Brug (2008) that state health behaviour is influenced by individual motivation and abilities, as well as environmental opportunities. In universities, nursery governesses are surround by people that are aware and concern on health as universities are the centre of learning. University usually organize variety of health promotion programmes to increase awareness on certain health issues. Workplace environment plays an

important role in ensuring employee's job performance (Naharuddin & Sadegi, 2013). In order to increase efficiency, effectiveness, performance and job commitment of employees, the management must satisfy the needs of its employees by providing good working conditions (Raziq & Maulabakhsh, 2015).

4.7 Comparison of Knowledge, Attitude and Practice of HFMD among nursery governesses in public universities and residential areas.

Knowledge

The p – value of Shapiro – Wilk for knowledge score was 0.004. It was not normally distributed, hence Mann – Whitney U test was used. For the knowledge score, the mean rank of nursery governesses in public universities was 51.99 while the mean rank of nursery governesses in residential areas was 49.98. Based on Mann – Whitney U test, the Z statistics was – 0.321 and p – value is 0.748 which is $p > 0.05$.Therefore, null hypothesis was not rejected and the result was not significant. There was no significant difference of median knowledge between public universities and residential areas.

Table 4.3: Comparison of knowledge on HFMD between nursery governesses in public universities and residential areas.

	Group	N	Median (IQR)	Mean rank	Z - statistics	p - value
Knowledge score	Public universities	77	15 (5)	51.99	- 0.321	0.748
	Residential areas	25	14 (3)	49.98		

N = 102, Mann – Whitney U test

The differences of mean rank between both nurseries in universities and residential areas were not too large. This shows that the knowledge between both is more or less the same. This might be because the distribution of education level between both populations was the same. Majority of nursery governesses from both populations were studying up until secondary school. The knowledge score for nursery governesses in public universities was slightly higher compared to residential areas might be because of the exposure to health promotion program are conducted more in universities as lecturers and students tend to organize intervention programs for students assignments purposes. Soft skills being emphasized in the curriculum of higher education (Remedios, 2012) thus lecturer assign students to conduct voluntary projects such as intervention program to acquire soft skills (Arat, 2014).

Attitude

The p – value of Shapiro – Wilk for attitude score was 0.000. It was not normally distributed, hence Mann – Whitney U test was used. For the attitude score, the mean rank of nursery governesses in public universities was 49.51 while the mean rank of nursery governesses in residential areas was 57.64. Based on Mann – Whitney test, the Z statistics was – 1.196 and p – value is 0.232 which is p > 0.05.Therefore, null hypothesis was not rejected and the result was not significant. There was no significant difference of median attitude between public universities and residential areas.

Table 4.4: Comparison of attitude on HFMD between nursery governesses in public universities and residential areas.

	Group	N	Median (IQR)	Mean rank	Z - statistics	p - value
Attitude score	Public universities	77	84 (11)	49.51	– 1.196	0.232
	Residential areas	25	86 (10.5)	57.64		

N = 102, Mann – Whitney U test

For attitude score, nursery governesses in public universities have lower mean rank if compared to residential areas. Although for knowledge score, public universities indicated higher rank, they obtained lower rank for attitude. It indicates that knowledge on HFMD does not influencing the attitude during HFMD. It was supported by the study from Fabrigar et al. (2006) amount of knowledge had only

little impact to the attitude – behaviour change. However, knowledge – attitude and behaviour model argue the previous statement which according to this model, attitude will change as knowledge accumulates (Miller, 2010).

Practice

The p – value of Shapiro – Wilk for practice score was 0.000. It was not normally distributed, hence Mann – Whitney U test was used. For the practice score, the mean rank of nursery governesses in public universities was 54.08 while the mean rank of nursery governesses in residential areas was 43.54. Based on Mann – Whitney U test, the Z statistics was – 1.550 and p – value is 0.121 which is p > 0.05.Therefore, null hypothesis was not rejected and the result was not significant. There was no significant difference of median practice between public universities and residential areas.

Table 4.5: Comparison of practice on HFMD between nursery governesses in government universities and residential areas.

	Group	N	Median (IQR)	Mean rank	Z - statistics	p - value
Practice score	Government universities	77	84 (11)	54.08	– 1.550	0.121
	Residential areas	25	79 (11)	43.54		

N = 102, Mann – Whitney U test

Result of this study showed that practice of nursery governesses in public universities are higher compared to residential areas. This might be associated with the mean rank knowledge score among nursery governesses as it is slightly higher in nurseries at public universities than in residential areas. It is supported by the study from Jhao et al. (2008) that declare by having good hygiene knowledge can influence the child caregivers in changing their hygienic practice. This is because they will know the correct ways to wash hands thus it will influence them to practice it.

4.8 Association between Social Demographic with Students' Knowledge, Attitude and Practice

The association between social demographic (age, education level, and employment year) with nursery governesses' knowledge, attitude and practice were analyzed by using Chi–square test.

There is an association between social demographic (age) with attitude level among nursery governesses in public universities. However, for others, there is no association between social demographic (age, education level and year of employment) with knowledge, attitude and practice among nursery governesses in both public universities and residential areas.

Table 4.6: Association between socio-demographic with knowledge among nursery governesses in public universities.

	Knowledge level, n (%)				
	Good	**Moderate**	**Poor**	**X^2 (df)**	**p – value**
Age					
Less than 20 years old	0 (0 %)	5 (50 %)	5 (50 %)	10.39 (6)	0.109
21 to 29 years old	8 (22.2%)	17(47.2%)	11(30.6%)		
30 to 39 years old	10 (47.6 %)	8 (38.1 %)	3 (14.3 %)		
More than 40 years	4 (40 %)	4 (44.2 %)	2 (20 %)		
Education level					
Primary school	1 (50 %)	0 (0%)	1 (50 %)	3.003 (4)	0.557
Secondary school	14 (24.6 %)	27(47.4%)	16(28.1%)		
College or University	7 (38.9 %)	7 (38.9 %)	4 (22.2%)		
Others	-	-	-		
Year of employment	3 (15.8 %)	9 (47.4 %)	7 (36.8 %)	9.764 (8)	0.282
Less than and equal to 1 year	5 (20 %)	11 (44 %)	9 (36 %)		
2 – 3 years	8 (44.4 %)	7 (38.9 %)	3 (16.7 %)		
4 – 9 years	6 (46.2 %)	6 (46.2 %)	1 (7.7 %)		
10 – 19 years	0 (0 %)	1 (50 %)	1 (50 %)		
More than 20 years					

N =77, Chi Square test

There was no association between socio-demographic (age, education level and year of employment) with knowledge ($p > 0.05$) among nursery governesses in public universities.

Table 4.7: Association between socio-demographic with attitude among nursery governesses in public universities.

	Attitude level, n (%)				
	Good	**Moderate**	**Poor**	**X^2 (df)**	**p – value**
Age					
Less than 20 years	0 (0 %)	6 (60 %)	4 (40 %)	15.759(6)	**0.015***
old	3 (8.3 %)	30(83.3%)	3 (8.3 %)		
21 to 29 years old	6 (28.6%)	13(61.9%)	2 (9.5 %)		
30 to 39 years old	1 (10 %)	9 (90 %)	0 (0 %)		
More than 40 years					
Education level					
Primary school	0 (0 %)	2 (100 %)	0 (0 %)	4.029 (4)	0.402
Secondary school	7 (12.3 %)	41(71.9%)	9(15.8%)		
College or University	3 (16.7 %)	15(83.3%)	0 (0 %)		
Others	-	-	-		
Year of employment					
Less than and equal	2 (10.5 %)	13(68.4%)	4 (21.1%)	4.885 (8)	0.770
to 1 year					
2 – 3 years	2 (8 %)	20 (80 %)	3 (12 %)		
4 – 9 years	3 (16.7 %)	14(77.8%)	1 (5.6 %)		
10 – 19 years	3 (23.1 %)	9 (69.2 %)	1 (7.7 %)		
More than 20 years	0 (0 %)	2 (100 %)	0 (0 %)		

N =77, Chi Square test

There was no association ($p > 0.05$) between socio-demographic (education level and year of employment) with attitude among nursery governesses in public universities. However, for age factor, there is association with attitude of nursery governesses in public universities ($p = 0.015$, $p < 0.05$).

Table 4.8: Association between socio-demographic with practice among nursery governesses in public universities.

	Practice level, n (%)			
	Good	**Bad**	**X^2 (df)**	**p – value**
Age				
Less than 20 years old	4 (40 %)	6 (60 %)	2.384 (3)	0.497
21 to 29 years old	22 (61.1 %)	14 (38.9 %)		
30 to 39 years old	14 (66.7 %)	7 (33.3 %)		
More than 40 years old	(50 %)	5 (50 %)		
Education level				
Primary school	1 (50 %)	1 (50 %)	0.155 (2)	0.926
Secondary school	34 (59.6 %)	23 (40.4 %)		
College or University	10 (55.6 %)	8 (44.4 %)		
Others	-	-		
Year of employment				
Less than and equal to 1 year	7 (36.8 %)	12 (63.2 %)	6.063 (4)	0.194
2 – 3 years	15 (60 %)	10 (40 %)		
4 – 9 years	12 (66.7 %)	6 (33.3 %)		
10 – 19 years	10 (76.9 %)	3 (23.1 %)		
More than 20 years	1 (50 %)	1 (50 %)		

N =77, Chi Square test

There was no association ($p > 0.05$) between socio-demographic (age, education level and year of employment) with practice on HFMD among nursery governesses in public universities.

Table 4.9: Association between socio-demographic with knowledge among nursery governesses in residential areas.

	Knowledge level, n (%)				
	Good	**Moderate**	**Poor**	**X^2 (df)**	**p – value**
Age					
Less than 20 years old	1 (33.3 %)	1 (33.3 %)	1 (33.3%)	5.072 (6)	0.535
21 to 29 years old	3 (18.8 %)	9 (56.3 %)	4 (25 %)		
30 to 39 years old	0 (0 %)	4 (100 %)	0 (0 %)		
More than 40 years	0 (0 %)	2 (100 %)	0 (0 %)		
Education level					
Primary school	3 (17.6 %)	11(64.7%)	3 (17.6%)	4.265 (4)	0.371
Secondary school	1 (14.3 %)	5 (71.4 %)	1 (14.3%)		
College or University	0 (0 %)	0 (0 %)	1 (100 %)		
Others	-	-	-		
Year of employment					
Less than and equal to 1 year	1 (10 %)	7 (70 %)	2 (20 %)	4.969 (6)	0.548
2 – 3 years	3 (33.3 %)	4 (44.4 %)	2 (22.2%)		
4 – 9 years	0 (0 %)	2 (66.7 %)	1 (33.3%)		
10 – 19 years	0 (0 %)	3 (100 %)	0 (0 %)		
More than 20 years old	-	-	-		

N =25, Chi Square test

There was no association ($p > 0.05$) between socio-demographic (age, education level and year of employment) with knowledge on HFMD among nursery governesses residential areas.

Table 4.10: Association between socio-demographic with attitude among nursery governesses in residential areas.

	Attitude level, n (%)				
	Good	**Moderate**	**Poor**	**X^2 (df)**	**p – value**
Age					
Less than 20 years old	0 (0 %)	3 (100 %)	0 (0 %)	4.441 (6)	0.617
21 to 29 years old	4 (25 %)	10(62.5%)	2 (12.5%)		
30 to 39 years old	0 (0 %)	4 (100 %)	0 (0 %)		
More than 40 years old	0 (0 %)	2 (100 %)	0 (0 %)		
Education level					
Primary school	2 (11.8 %)	13(76.5%)	2 (11.8%)	2.079 (4)	0.721
Secondary school	2 (28.6%)	5 (71.4%)	0 (0 %)		
College or University	0 (0 %)	1 (100 %)	0 (0 %)		
Others	-	-	-		
Year of employment					
Less than and equal to 1 year	2 (20 %)	7 (70 %)	1 (10 %)	2.522 (6)	0.866
2 – 3 years	2 (22.2 %)	6 (66.7 %)	1 (11.1%)		
4 – 9 years	0 (0 %)	3 (100 %)	0 (0 %)		
10 – 19 years	0 (0 %)	3 (100 %)	0 (0 %)		
More than 20 years old	-	-	-		

N =25, Chi Square test

There was no association ($p > 0.05$) between socio-demographic (age, education level and year of employment) with attitude on HFMD among nursery governesses residential areas.

Table 4.11: Association between socio-demographic with practice among nursery governesses in residential areas.

	Practice level, n (%)			
	Good	**Bad**	**X^2 (df)**	**p – value**
Age				
Less than 20 years old	2 (66.7 %)	1 (33.3 %)	7.187 (3)	0.066
21 to 29 years old	3 (18.8 %)	13 (81.3 %)		
30 to 39 years old	2 (50 %)	2 (50 %)		
More than 40 years old	2 (100 %)	0 (0 %)		
Education level				
Primary school	-	-	2.897 (2)	0.235
Secondary school	8 (47.1 %)	9 (52.9 %)		
College or University	1 (14.3 %)	6 (85.7 %)		
Others	0 (0 %)	1 (100 %)		
Year of employment				
Less than and equal to 1 year	3 (30 %)	7 (70 %)	6.240 (3)	0.100
2 – 3 years	2 (22.2 %)	7 (77.8 %)		
4 – 9 years	1 (33.3 %)	2 (66.7 %)		
10 – 19 years	3 (100 %)	0 (0 %)		
More than 20 years old	-	-		

N =25, Chi Square test

There was no association ($p > 0.05$) between socio-demographic (age, education level and year of employment) with practice on HFMD among nursery governesses residential areas. However, for age factor, the p value was reaching 0.05 as the p value of it was 0.066.

The result from this study showed that there is association between age and practice of the nursery governesses. It is contrast from the result obtained from study by Ahn et al. (2014) that found a relationship between practice of HFMD prevention and age. However, the age factor found significantly difference with level of attitude of nursery governesses in this present study.

In this present study, educational level does not associated with knowledge, attitude and practice of the nursery governesses. It can be supported by the study from Lou & Lin (2006) that confirmed educational level does not associated with healthy behavior. Healthy behavior can be influenced by good level of knowledge and attitude. Thus, indirectly, the knowledge, attitude and practice are not associated with educational level of nursery governesses. However, the result obtained by this study is contrast from the study from Chen (2003) that argues child caregivers that have higher educational levels would influence lower risk of EV infections. Study from Xie & Xu (2010) also support the hypothesis of individuals with higher educational level will have high cognitive attitudes than individuals with lower educational level.

For this study, there is no association between year of employment with knowledge (K), attitude (A) and practice (P) of nursery governesses. Although some of the nursery governesses start the job at late age, they still gain experience through their long – term learning throughout their live. According to Yang et al. (2010), younger teachers tend to have less experience raising children. This referred to age of individuals. Thus year of employment is unable to influence KAP of certain individuals under certain conditions.

4.9 Association between Knowledge, Attitude and Practice on HFMD

To analyze the association between knowledge and attitude on practice on HFMD, Chi – square test was used.

4.9.1 Association between knowledge and practice

About 14 (53.8 %) nursery governesses had poor knowledge and bad practice on HFMD. Only 13 (50 %) nursery governesses had good knowledge and good practice on HFMD. The Chi – square value obtained was 11.631 and the p – value obtained was 0.581, $p > 0.05$. Therefore, there was no association between knowledge and practice on HFMD.

Table 4.12: Association between knowledge and practice

			Practice level			
		Count	**Good**	**Bad**	**X^2**	**p – value**
Knowledge level	Good	26	13 (50 %)	13 (50 %)	1.085	0.581
	Moderate	50	29 (58 %)	21 (42 %)		
	Poor	26	12(46.2%)	14(53.8%)		

N = 102, Chi – square test

A positive correlation between knowledge of child caregiver and child caregiver's preventive behavior towards HFMD in child care centers was found in study Nguyen et al. (2016). Besides, the PRECEED – PROCEED model states that knowledge was related to behaviour, and knowledge as the antecedent to the behaviour (Green & Kreuter, 2005). However in this present study, there is no association between knowledge on HFMD and practice when dealing with HFMD. It

can be supported by the study from Pang et al. (2015) that argue good knowledge and attitude did not influence behaviour and practice of hygiene in daily lives.

4.9.2 Association between attitude and practice

About 6 (54.5 %) nursery governesses had poor attitude and bad practice on HFMD. Meanwhile only 10 (71.4 %) nursery governesses had good attitude with good practice. 38 (50 %) of nursery governesses that had both good and bad practice with moderate attitude. The Chi – square value obtained was 2.421 and the p – value obtained was 0.298, $p > 0.05$. Therefore, there was no association between attitude and practice on HFMD.

Table 4.13: Association between attitude and practice

			Practice level			
		Count	**Good**	**Bad**	**X^2**	**p – value**
Attitude level	Good	14	10(71.4%)	4 (28.6%)	2.421	0.298
	Moderate	74	38 (50 %)	38 (50 %)		
	Poor	11	5 (45.5 %)	6 (54.5%)		

N = 102, Chi – square test

Self – efficacy display confidence in the ability to engage control over one's own motivation, behavior, and social environment (Carey & Forsyth, 2017). Attitude influences an individual's choice of action and responses to challenges, incentives and rewards (BusinessDictionary, 2017). Self-efficacy has been ascertain as an dominant factor in the practice of many preventive health behaviors (Bandura, 1977). Self – efficacy direct a person's behavior and stimulate how to fulfill activities well

(Green & Kreuter, 2005). Self – efficacy also guide all aspects of behavior, including the gaining new behaviors, and suppression and disinhibition of existing behaviors (Bandura, 1977). When people believed that they are able to perform a behavior and to see significant health benefit, they will effectively execute that behavior (Bandura, 1977).

4.10 Suggestion

In your opinion, what is the most suitable medium to disseminate information on HFMD? (Choose only one).

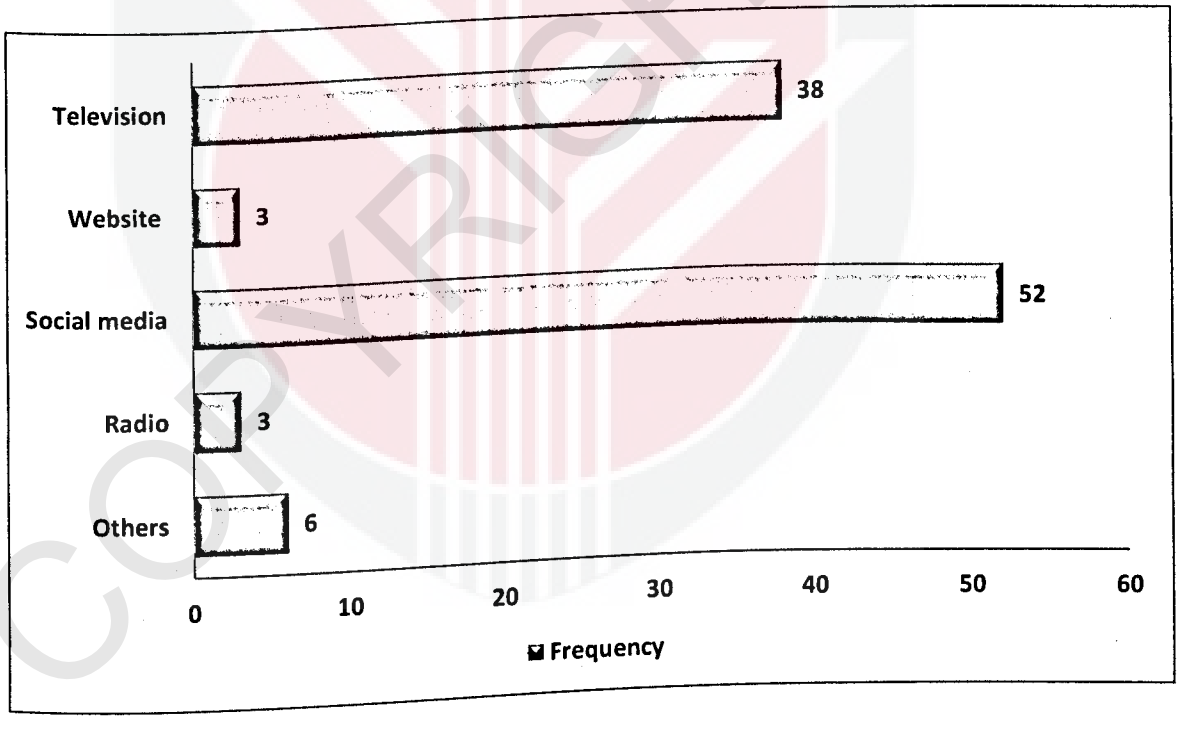


Figure 4.5: The most suitable medium to disseminate information on HFMD

Based on Figure 4.5, out of 102 respondents, 52 chose social media as the most suitable medium to disseminate information on HFMD, followed by television

(38 respondents) and others (6 respondents). For others medium that the respondents listed out were assemble banners or posters at public places, health talk and health exhibition on HFMD and lastly, have a meeting with parents of the children to come out with new solution. The least choice was radio and website (3 respondents) each.

The reason why social media is the most suitable medium?

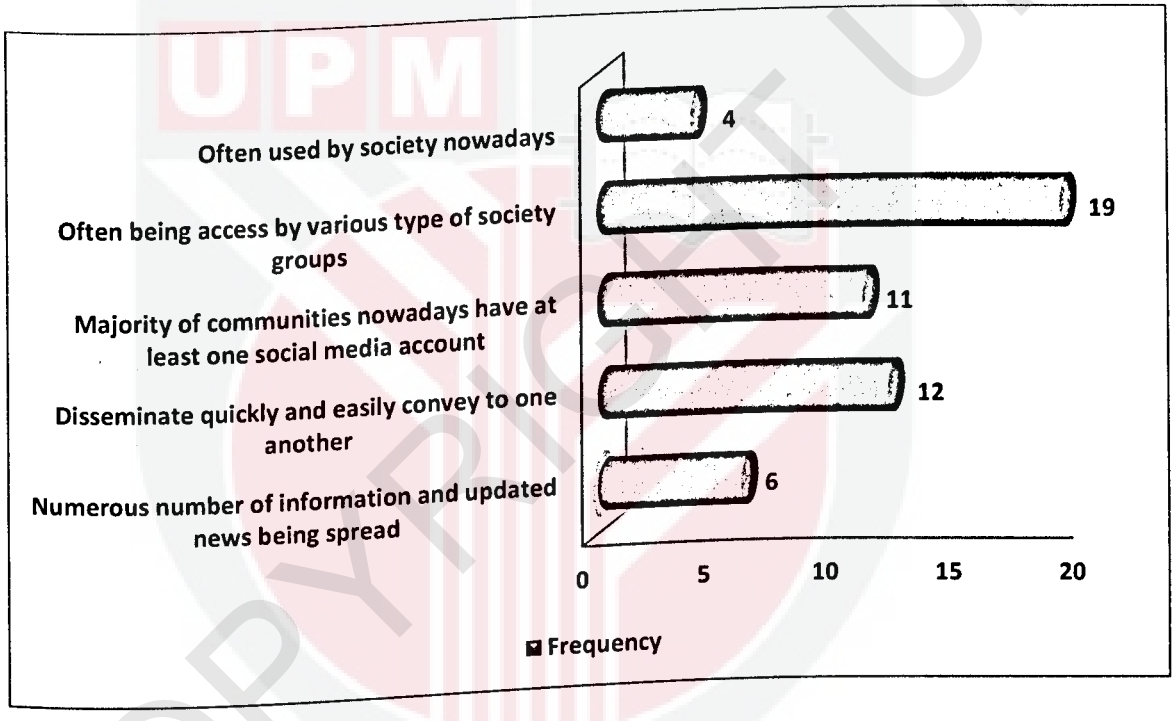


Figure 4.6: The reason social media is the most suitable medium to disseminate information

Based on Figure 4.6, out of 52 respondents that chose social media as the most suitable medium in disseminating information on HFMD, 19 respondents gave reason that social media is the medium that often being access by various type of society groups such as youngsters and adults. The second highest reason was social media also can disseminate information quickly and this medium also can convey information to one another easily (12 respondents. 11 respondents wrote that

majority of the community nowadays have at least one social media account. The other reason why social media was chose was because numerous numbers of information and updated news easily spread through it (6 respondents). Lastly, 4 respondents gave reason that social media is the medium that are often used and favored by society nowadays.

CHAPTER 5

CONCLUSION AND RECCOMENDATIONS FOR FUTURE RESEARCH

5.1 CONCLUSION

The present study showed that nursery governesses in study population have moderate level of knowledge and attitude on HFMD. However, the level of practice was bad for nursery governesses in residential areas but in public universities, nursery governesses were applying good practice. They considered television is their source of information currently. Regardless of how, they suggest social media as the most suitable media in disseminating information on HFMD as this media are often being assess by various type of society groups.

There were no significant difference among nursery governesses in public universities and residential areas regarding level of knowledge, attitude and practice on HFMD. This result revealed that although the environment between both populations are different which nurseries in universities might expose in various kinds of health promotion and might be the one that organizing them, the level of knowledge and attitude of them with nursery governesses in residential areas still the same.

In applying good practice, it must be supported by having good knowledge and attitude. However, in this study, it is found that there was no association between knowledge – practice and attitude – practice. This might be because they might already know the basic transmission of HFMD and the symptoms that children might encounter but it is still not enough. There is still lacking of knowledge on certain areas.

HFMD is serious issues that keep reappear throughout the year. Besides, the susceptible group to this disease is children. In order to solve this issue, it needs cooperation from all related parties. It is the responsible of all people and not only certain parties.

5.2 RECOMMENDATIONS

There were few suggestions made to improve this research for the future. First of all, the sample size for the residential areas should be increase in order to make it compatible with the nursery governesses in universities. Besides, it is better to increase the sample size as the power of the study also will be increase and it will make the result representative to the population. Furthermore, it is recommended to assess nursery governesses in nurseries that already have cases in HFMD. Thus we can identify whether knowledge, attitude and practice of the nursery governesses can be the association predictors of the cases occurred in the nursery.

Knowledge of the respondents was mostly in moderate level. In order to increase the knowledge it is recommended for the management of the nurseries to enable the nursery governesses attend health talk and health promotion on HFMD occasionally. The content of the talk might include and explain more on the signs and symptoms of HFMD. According to this study, most of the nursery governesses still confused on the symptoms. Signs and symptoms are important indicators to detect the occurrence of the disease. If they are unable to detect it earlier, they will make the disease become worse and it will spread to the other children in nursery. Government also needs to search and get information on communicable disease such as HFMD itself to enrich their KAP on this issue.

Social media is the medium that they chose as the most suitable medium in disseminating information on HFMD. Thus, Ministry of Health or State Health Department can try to create new alternative using this medium. While they are

having their break during work, they might hold their phone and scrolling their social media such as *facebook*. Therefore, official page that will give information on HFMD such as mode of transmission, signs and symptoms of HFMD can be created on *facebook* account. This page needs also to post routinely and have two – way of communication which people can ask directly any enquires on HFMD. Besides, this page needs to publicize widely in order for people to know its existence.

Information focusing on signs and symptoms of HFMD should widely being posted on every nursery. Posters on HFMD can be obtained from District Health Office or City Council nearby. Besides, management of the nurseries can also design their own posters by doing poster competition among nursery governesses. Beside they are having fun competing with each other; they will indirectly get and learn the signs and symptoms of HFMD.

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APPENDICES

ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS
(JKEUPM)
UNIVERSITI PUTRA MALAYSIA

Research title	:	**Knowledge, Attitude And Practice Toward Hand, Foot And Mouth Disease (HFMD) Among Nursery Governesses At Nurseries In Research Universities In Klang Valley**
Study Site	:	**Klang Valley**
JKEUPM Ref No.	:	**FPSK(EXP16-OSH)U017**
Researcher	:	**Siti Aida Syaqirah Bt Mahadzar**
Supervisor	:	**Assoc Prof. Dr. Haliza Abdul Rahman**

Documents received and reviewed with reference to the above study:

1. Ethics Application Form, Version 2 dated 9/1/2017
2. Respondent Information Sheet & Consent (Malay) Version 1 dated 18/10/2016
3. Proposal (English), Version 3 dated 20/2/2017
4. Questionnaire (Malay), Version 1 dated 18/10/2016
5. Curriculum Vitae of:
    a. Assoc Prof. Dr. Haliza Abdul Rahman

The University Research Ethics Committee, Universiti Putra Malaysia (JKEUPM) operates in accordance to the ICH-GCP Guidelines.

Decision by JKEUPM:

[X] Approved

[X] **Permission MUST BE OBTAINED from the respective hospitals/ institutions before conducting the research**

[ ] Disapproved

Please note that the approval is valid until 20 February 2018

Researchers should comply with the following:

I. Complete a Study Final Report upon study completion (Form D).

II. Ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.

JAWATANKUASA ETIKA UNIVERSITI UNTUK
PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)
UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA

BORANG B1: PENERANGAN DAN PERSETUJUAN RESPONDEN

Sila baca maklumat berikut dengan teliti. Sekiranya anda mempunyai sebarang pertanyaan, sila kemukakan kepada penyelidik.

1.TAJUK KAJIAN

Tahap pengetahuan, sikap dan amalan terhadap penyakit tangan kaki dan mulut (HFMD) dalam kalangan pengasuh di pusat jagaan kanak – kanak di Lembah Klang.

2. PENGENALAN

Di Malaysia, kes-kes HFMD di kalangan kanak-kanak bukanlah satu isu baharu. HFMD adalah salah satu antara lima penyakit berjangkit yang utama di Malaysia. Wabak HFMD biasanya melanda ke negara-negara Asia seperti China, Vietnam, Singapura, Thailand dan Malaysia (CDC, 2015). Selangor mencatat jumlah kes paling tertinggi di Semenanjung Malaysia. Tanda-tanda klinikal biasa dan gejala untuk HFMD adalah pembentukan vesikel pada telapak tangan, tapak kaki, lutut, di dinding mulut, di permukaan lidah dan punggung.

Kajian ini dijalankan untuk mengkaji pengetahuan, sikap dan amalan mengenai penyakit tangan, kaki dan mulut (HFMD) di kalangan pengasuh pusat jagaan kanak - kanak di Lembah Klang. Pengasuh dipilih sebagai responden kajian adalah kerana mereka adalah antara individu yang turut terlibat dalam mengurus keperluan peribadi kanak – kanak ini selain daripda ibu bapa mereka sendiri. Selain itu, kajian ini

6. ADAKAH IA BERISIKO?

Tidak akan ada risiko yang mungkin berkaitan dengan responden yang mempunyai mengambil bahagian dalam kajian ini.

7. ADAKAH MAKLUMAT DAN IDENTITI SAYA KEKAL RAHSIA?

Semua maklumat dan identiti yang diperolehi semasa kajian ini akan kekal sulit.

8. SIAPA YANG SAYA PERLU HUBUNGI SEKIRANYA SAYA MEMPUNYAI SOALAN TAMBAHAN SEMASA MENGIKUTI PENYELIDIKAN INI?

Untuk sebarang soalan dan pertanyaan anda boleh menghubungi,

Maklumat penyelidik

Nama	: Siti Aida Syaqirah Bt. Mahadzar
Nombor telefon	: 017 - 5431810
Alamat emel	: aira94adz@gmail.com

Researcher supervisor information

Nama	: Assoc. Prof. Dr Haliza Abdul Rahman
Nombor telefon	: 012 - 2111129
Alamat emel	: haliza1974@gmail.com

Sila tandatangan di sini sekiranya anda telah membaca dan memahami kandungan halaman ini _____

9. PERSETUJUAN

Saya..... No Kad Pengenalan. .....
beralamat.....
.....dengan ini bersetuju untuk mengambil bahagian secara sukarela dalam penyelidikan yang tersebut di atas *(kajian klinikal/percubaan ubat-ubatan/rakaman video/kumpulan sasaran/temuduga/ soal selidik).

Saya telah diberi penjelasan secara menyeluruh mengenai penyelidikan ini dari segi metodologi, risiko dan komplikasi (seperti tertulis pada Helaian Penerangan Responden). Saya memahami bahawa saya berhak menarik diri dari penyelidikan ini pada bila-bila masa tanpa memberi sebarang alasan.Saya juga memahami bahawa sebarang maklumat yang berkaitan identiti saya akan dirahsiakan.

Saya* berminat / tidak berminat untuk mengetahui keputusan kajian yang melibatkan saya.

I setuju/tidak bersetuju untuk imei/gambar/rakaman video/ rakaman suara digunakan dalam apa jua bentuk penerbitan atau pembentangan. (sekiranya berkaitan).

*potong yang tidak berkenaan

Tandatangan .....
(*Responden*)

Tarikh :.....

Tandatangan .....
(*Saksi*)

Nama :.....

No. K/P: .....

Saya mengesahkan bahawa saya telah menerangkan kepada responden ini sifat dan tujuan penyelidikan yang tersebut di atas.

Tarikh .....

Tandatangan .....
(*Penyelidik*)

UNIVERSITI PUTRA MALAYSIA

BERILMU BERBAKTI

TAJUK:

Tahap pengetahuan, sikap dan amalan terhadap penyakit tangan kaki dan mulut (HFMD) dalam kalangan pengasuh di pusat jagaan kanak – kanak di universiti awam dan kawasan perumahan dalam Lembah Klang.

Borang soal selidik

ID responden :_____

Tarikh :_____

Tandatangan :_____

Tujuan soal selidik ini ialah untuk mendapatkan pandangan daripada anda mengenai pengetahuan, sikap dan amalan terhadap penyakit tangan kaki dan mulut dalam kalangan pengasuh pusat jagaan kanak – kanak. Semua maklumat yang diberikan akan diproses menggunakan komputer dan akan disimpan secara sulit. Jawapan yang diberikan tidak akan dibentangkan di mana – mana pembentangan. Oleh itu, diharapkan anda dapat menjawab soalan berikut dengan jujur dan tepat. Kerjasama anda amatlah dihargai.

BORANG SOAL SELIDIK

Maklumat yang diberikan ialah untuk tujuan kajian semata – mata dan akan disimpan secara sulit.

Arahan: Sila jawab semua soalan di bawah dan tandakan (/) di kotak yang di sediakan.

A. MAKLUMAT PERIBADI

1. Umur: _____

2. Bangsa:

   Melayu ☐ Cina ☐ India ☐ Lain – lain ☐
   Nyatakan: _____

3. Tahap pendidikan

   Tidak bersekolah ☐ Sekolah rendah ☐ Sekolah menengah ☐
   Kolej / universiti ☐ Lain – lain ☐ Nyatakan:_____

4. Tahun pekerjaan sebagai pengasuh: _____

B. SOALAN UMUM

1. Pernahkah anda mendengar penyakit tangan, kaki dan mulut?

   Ya ☐ Tidak ☐

2. Adakah penyakit ini banyak melanda negara di benua Asia?

   Ya ☐ Tidak ☐

3Adakah anda menyedari wabak penyakit tangan, kaki dan mulut yang melanda Malaysia?

   Ya ☐ Tidak ☐

4. Di manakah anda mendapat maklumat mengenai penyakit ini? (Boleh pilih lebih dari satu).

Televisyen ☐
Radio ☐
Internet ☐
Rakan – rakan ☐
Majikan ☐
Ibu bapa kanak – kanak ☐
Lain – lain. Nyatakan: _____

5. Adakah anda mengetahui simptom yang akan dialami oleh penghidap penyakit ini?

Ya ☐ Tidak ☐

C. PENGETAHUAN, SIKAP DAN AMALAN MENGENAI PENYAKIT TANGAN, KAKI DAN MULUT

i. Pengetahuan mengenai penyakit tangan, kaki dan mulut

No.	Kenyataan	Betul	Salah
1	Penyakit tangan, kaki dan mulut disebabkan oleh bakteria.		
2	Di Malaysia, vaksin diberikan untuk penyakit ini.		
3	Terdapat ubat atau rawatan khas bagi menyembuhkan penyakit ini.		
4	Penyakit ini boleh membawa kepada kematian.		
5	Penyakit tangan, kaki dan mulut membahaya kepada kanak – kanak berumur 5 tahun ke bawah.		
6	Penyakit ini sering berlaku di kalangan kanak – kanak berumur 6 tahun ke bawah.		
7	Orang dewasa tidak boleh dijangkiti penyakit ini.		
8	Kanak – kanak yang menetap di taska atau menyertai kanak – kanak lain secara berkumpulan senang untuk menghidapi penyakit ini.		

No.	Kenyataan	Betul	Salah
9	Penyakit ini boleh menjadi wabak.		
10	Kulit kepada pesakit penyakit tangan, kaki dan mulut akan berwarna keungu – unguan.		
11	Pesakit penyakit tangan, kaki dan mulut akan susah untuk bernafas.		
12	Simptom penyakit ini ialah mendapat demam lebih dari 39 °C dalam masa 2 hari.		
13	Penyakit ini menunjukkan tanda – tanda ruam pada tapak tangan, lutut dan kaki.		
14	Cirit birit merupakan salah satu tanda mempunyai penyakit ini.		
15	Ulser pada mulut tidak akan berlaku pada pesakit penyakit ini.		
16	Amalan pengasuh di pusat jagaan boleh menjadi salah punca penyakit ini.		
17	Berkongsi mangkuk atau cawan beserta permainan tidak akan menyebarkan jangkitan penyakit ini.		
18	Menyentuh lecur yang timbul di kulit kanak – kanak akan menyebabkan penyakit ini terus tersebar.		
19	Salah satu punca yang boleh menyebarkan penyakit ini ialah dengan menyentuh najis kanak – kanak yang dijangkiti penyakit tangan, kaki dan mulut.		
20	Memisahkan kanak – kanak yang sakit dari kumpulan kanak – kanak yang lain boleh menghalang dari penyakit ini terus merebak.		

ii. Sikap terhadap penyakit tangan, kaki dan mulut

Skala: 1 = sangat tidak setuju, 2 = tidak bersetuju, 3 = tidak pasti, 4 = setuju, 5 = sangat setuju

No.	Kenyataan	Skala				
		1	2	3	4	5
1	Saya berminat untuk membaca mengenai penyakit tangan, kaki dan mulut.					
2	Saya percaya penyakit ini boleh dijangkiti di pusat jagaan kanak – kanak.					
3	Saya merasakan budaya membasuh tangan dengan betul perlu diterapkan ke dalam diri kanak – kanak.					
4	Pencegahan penyakit ini adalah tanggungjawab ibu bapa sahaja bukan pada diri saya sendiri.					
5	Saya ingin meluangkan masa menghadiri program promosi kesihatan mengenai penyakit tangan, kaki dan mulut bagi menambahkan pengetahuan mengenai penyakit ini.					
6	Penambahan kes baharu penyakit ini dari masa ke semasa tidak memberi apa – apa kebimbangan kepada saya.					
7	Saya akan berasa kecewa sekiranya tidak mengikuti apa – apa program mengenai penyakit ini.					
8	Rakan sekerja saya mengingatkan saya agar sering berwaspada pada perubahan yang ditunjukkan oleh kanak – kanak.					
9	Saya percaya program promosi kesihatan melalui iklan TV membantu saya memperolehi lebih maklumat.					
10	Saya merasakan pemeriksaan dari pegawai pihak berkuasa tempatan akan membebankan lagi kerja saya di pusat jagaan.					
11	Saya sering mengubah saluran televisyen yang menyiarkan maklumat mengenai penyakit ini.					
12	Saya tidak berminat mengambil risalah mengenai penyakit ini sekiranya diberikan.					

No.	Kenyataan	1	2	3	4	5
13	Saya mahu membantu mengurangkan kadar kes baharu penyakit tangan, kaki dan mulut ini.					
14	Sudah tentu saya akan mengambil kisah tentang penyakit ini kerana penyakit ini boleh membawa maut.					
15	Sekiranya sedang berlaku wabak, maka sudah tentu saya akan risau kepada kanak – kanak di pusat jagaan ini.					
16	Saya tetap akan melancong bersama keluarga saya ke negara – negara di benua Asia sewaktu wabak penyakit ini semakin berleluasa.					
17	Sekiranya terdapat vaksin bagi mencegah penyakit ini, saya akan menerima suntikan untuk anak – anak saya serta ahli keluarga saya.					
18	Sekiranya tiada yang memantau tingkah laku saya di pusat jagaan, saya tidak akan menjaga kebersihan diri dan kawasan sekeliling.					
19	Saya tidak suka ditegur sekiranya saya tidak menjaga kebersihan pusat jagaan kanak – kanak ini.					
20	Saya tidak akan mengambil peduli sekiranya saya melihat rakan sekerja saya tidak menjaga kebersihan diri dan pusat jagaan ini.					

Skala: 1 = sangat tidak setuju, 2 = tidak bersetuju, 3 = tidak pasti, 4 = setuju, 5 = sangat setuju

iii.' Amalan terhadap penyakit tangan, kaki dan mulut

Skala: 1 = tidak pernah, 2 = jarang – jarang, 3 = tidak pasti, 4 = selalu melakukannya, 5 = sangat sering melakukannya

No.	Kenyataan	Skala				
		1	2	3	4	5
1	Saya membasuh tangan sekiranya tangan saya kotor.					
2	Sebelum menyentuh kanak – kanak, saya akan membasuh tangan.					
3	Saya akan membasuh tangan sebelum memberi makanan kepada kanak – kanak.					
4	Saya akan membasuh tangan selepas menggunakan tandas.					
5	Saya akan membasuh tangan selepas membersihkan najis kanak – kanak.					
6	Saya membasuh tangan bukan sahaja dengan air, tetapi juga dengan menggunakan sabun.					
7	Saya membersihkan permainan kanak – kanak dengan sabun.					
8	Saya membersihkan tempat permainan kanak – kanak dengan sabun.					
9	Saya membersihkan permainan kanak – kanak apabila kotor.					
10	Saya membersihkan tempat permainan kanak – kanak apabila kotor.					
11	Saya membersihkan permainan kanak – kanak sebelum mereka menggunakannya.					
12	Saya membersihkan permainan kanak – kanak selepas mereka menggunakannya.					
14	Saya akan membasuhkan tangan kanak – kanak bawah 3 tahun yang telah kotor **Manakala** Bagi kanak – kanak umur 3 tahun keatas, saya akan pastikan mereka pergi membasuh tangan sekiranya kotor.					

No.	Kenyataan	1	2	3	4	5
15	Saya pastikan kanak – kanak membasuh tangan atau tangan mereka dibasuh sebelum dan selepas mereka makan.					
16	Saya pastikan kanak – kanak membasuh tangan atau tangan mereka dibasuh selepas mereka menggunakan tandas.					
17	Saya pastikan kanak – kanak membasuh tangan atau tangan mereka dibasuh sebelum mereka tidur di siang hari.					
18	Saya pastikan kanak – kanak membasuh tangan dengan sabun.					
19	Saya pastikan kanak – kanak membasuh tangan mengikut 7 langkah membasuh tangan yang disarankan Kementerian Kesihatan Malaysia.					
20	Saya memerhatikan tubuh badan kanak – kanak agar dapat mengesan tanda – tanda awal yang muncul disebabkan sebarang penyakit.					

Skala: 1 = tidak pernah, 2 = jarang – jarang, 3 = tidak pasti, 4 = selalu melakukannya, 5 = sangat sering melakukannya

D. CADANGAN

a. Pada pandangan anda, apakah media yang paling sesuai bagi menyebarkan maklumat mengenai penyakit ini. Sertakan alasan bagi pilihan anda. (Pilih hanya SATU)

Televisyen	☐
Radio	☐
Media sosial (cth: *Facebook*)	☐
Laman web	☐
Lain – lain:	☐

Alasan:

_____

_____

_____

_____

Soalan tamat.

Terima kasih.