

# Doktor Muda Competencies: Self-efficacy and Hand Washing Demonstration Skill among School Children in Malaysia

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## Abstract

**Introduction:** “Doktor Muda” (DM) programme was developed by the Ministry of Health (MOH), Malaysia to train a group of pupils as peer educator for change in motivating and assisting their peers to adopt healthy practices especially in hand washing through good knowledge, positive attitude, high self-efficacy and skill to deliver health messages

**Aim:** This study aims to identify the association of socio demographic, knowledge, attitude, and practices with self-efficacy in proper hand washing.

**Methods:** A cross-sectional study using a self-administered questionnaire and observation checklists for hand washing demonstration skills.

**Result:** This study showed that the subjects` knowledge (16.7%), practice (23.8%) and self-efficacy (41.7) in proper hand washing were low. Significant association were found between gender ( $p=0.004$ ), academic achievements ( $p=0.038$ ) and practices ( $p=0.003$ ) with self-efficacy in proper hand washing.

**Conclusion:** Various strategies are needed to strengthen DM role as peer educators and health change agents in school as levels of their knowledge, practice and self-efficacy were low.

**Keywords:** Doktor Muda, competencies, self-efficacy, hand washing, hygiene, peer educator

## 1. Introduction

School children are constantly expose to infectious diseases both at school, home and in the wider social environment (Yu et al., 2011). Children are most susceptible to bacterial and viral infections (Lopez-Quintero, Freeman, & Neumark, 2009). Thus, primary school children are the targeted group for information dissemination and are being exposed to steps of proper hand washing (Scott, Curtis, Rabie, & Aidoo, 2007; Sansam et al., 2016; Storr et al., 2017). Hygiene education at schools (Aiello & Larson, 2002) and health promotion strategy (Strunz, 2013) proved to be the cheapest, most effective and common method of dealing with this issue (Lopez-Quintero, Freeman, & Neumark, 2009). In order to nurture a healthy, intelligent and active pupil; efforts are needed to empower them so that they can be responsible for their own health. Therefore, hygiene promotion is the main focus of the policymakers to reduce the occurrence of infectious disease (Curtis, S. Cairncross, & R. Yondi, 2000; Te et al., 2013).

### 1.1 Health Agent Programme

MOH, Malaysia has developed a school-based health agent programme since 1989 called “Doktor Muda” which literally translated as Young Doctor. This programme is used to foster healthy lifestyle among primary school children aged between 10 to 12 years old. DM programme involves year 4, 5 and 6 pupils that were selected by the

school authorities based on certain criteria. They are trained in knowledge and skills in various health topics based on the module. They assist in implementing health promotion activities in schools and act as agents of change for health to their peers, family members and the community in general (Ministry of Health Malaysia, 2008).

Communication skills and abilities to convey health messages, are important competencies in DM training, to enable them to perform as change agent. Ultimately, clear and precise information delivered by them, will enhance better understanding of health messages to peer family and community. Children, as peer educators in promoting on hand washing practices can help create sense of ownership to enhance good health behaviour.

Self-efficacy refers to confidence level of individual to encourage him or her to act or adopt behaviour practices (Zimmerman, Bandura, & Martinez-Pons, 1992). Self-efficacy is the most important prerequisite for changing behaviour because it can affect the effort to complete a task. The higher level of self-efficacy will produce greater performance (Bandura, 1990; Torkzadeh & Van Dyke, 2002; Glanz, Rimer, & Viswanath, 2008). Hence, this study aims to identify the association of socio-demographic, knowledge, attitude and practices with self-efficacy in proper hand washing.

## 2. Materials and Methods

A cross-sectional study was conducted among primary school children in Terengganu, Malaysia from March 2014 to February 2015. A simple random sampling method by ballot box was carried out to select the schools in this study. A total of 7 primary schools were included for this study. Universal sampling was carried out to select the subjects at age 12 which made up of 84 DM from Year 6.

Primary data were collected using self-administered questionnaires and observation checklists for hand washing demonstration skills. The self-administered questionnaires were divided into socio-demographic data, knowledge, attitudes, practices and self-efficacy. Observation using a checklist was used to evaluate hand washing demonstration skills. The questionnaires on knowledge, attitude and practice were adapted from hand, food and mouth disease prevention study in Thailand (Charoenchokpanit & Pumpaibool, 2013). Questionnaire on hand washing practices was adapted from previous studies conducted in Ghana and Turkey (Steiner-Aseidu, Van-Ess, Papoe, Setorglo, & Aseidu, 2011; Ergin, Bostanci, Onal, Bozkurt, & Ergin, 2011). Self-efficacy questionnaire was adapted from The General Self-Efficacy Scale (GSE) (Schwarzer & Scholz, 2000). Pre-testing and validation by technical expert was carried out to validate the questionnaire. Secondary data regarding academic achievement and socio economics status of the subjects were retrieved from the school records. The revised questionnaire was piloted at a government school in Terengganu with Cronbach's alpha scores of 0.87, 0.83 and 0.77 on the knowledge, attitude and practice respectively.

High knowledge was defined as a score of 18 and above when the subjects answered between true or false for the statements given and the score was one for the right answer and zero for the wrong answer. The questions on knowledge consist of seven items which includes importance, time and steps of hand washing with the total score of 22.

Favourable attitude was defined as a score of 36 and above. The subjects answered a group of questions on perception where there was a probability of contracting a disease, perception on the usefulness of hand washing when the hands are visibly dirty, perception on steps of hand washing that were not important, barriers in hand washing due to being lazy or time consuming and the importance of hand washing. The questions on favourable attitude were designed as 5 points Likert Scale where 45 was the total score.

Good practice was defined as a score of 19 and above. The subjects answered twelve questions on seven steps of hand washing, time and practice of hand washing. The questions were coded in 3 points Likert Scale where zero was never, one was seldom and two was every time with the total score of 24.

High self-efficacy was defined as a score of 20 over 20. This 5 points Likert Scale were based on the self-claimed among subjects on steps for hand washing. The subjects consequently were asked to demonstrate the steps on hand washing and were given score on the demonstration skills between right and wrong.

Ethical approval was obtained from MOH Medical Research Ethics Committee, Terengganu State Health Department and Terengganu State Education Department prior to the start of the study. Permission to conduct the study was obtained from the schools' headmaster. Written inform consent was obtained from the parents or guardians before the data collection. This study was registered under Malaysia National Medical Research Registry (NMRR) with the identification number NMRR-14-854-21850 and supported by MOH research grant.

### 2.1 Data Analysis

Data was analysed by Statistical Package for Social Science (SPSS) version 21. Socio-demographic, knowledge,

attitudes, practices, self-efficacy and skills were analysed using descriptive analysis. The results are presented in tables, graphs and charts as appropriate. Pearson Chi-Square and Fisher's Exact Test were used to determine the correlation between socio-demographic factors with self-efficacy in washing hands. Pearson Chi-Square test was used to examine the relationship between knowledge, attitude and hand washing practice with self-efficacy to demonstrate hand washing steps. Significant association was set at  $p < 0.05$ .

### 3. Results

Almost 62% of the subjects were females. Most of the subjects were involved as committee members of co-curriculum activities in their schools (85.7%). Majority (91.7%) of the subjects were excellent in their academic achievement. 42.7% subjects were from families with high economic status and 67.3% were from lower economic status (Table 1).

Table 1. Distribution of socio-demographic characteristics among subjects

Variable	n=84 (%)
<b>Gender</b>	
Male	32(38.1)
Female	52(61.9)
<b>Subject Ranking in the family</b>	
1 <sup>st</sup> child	28(33.3)
Others	56(66.7)
<b>Committee members in co-curriculum</b>	
Members	72(85.7)
Non members	12(14.3)
<b>Academic achievement</b>	
Excellent	77(91.7)
Average	7(8.3)
<b>Family economic status</b>	
High	35(41.7)
Medium	26(31.0)
Low	23(27.4)

Scoring for knowledge, attitude, practice and self-efficacy were shown in Table 2. Overall, the level of knowledge and practices on hand washing was low (16.7%, 23.8%), positive attitude towards hand washing was low (20.2%). Moreover, self-efficacy in proper hand washing steps was also low (41.7%).

Table 2. Level of competencies in hand washing among the subjects

Variable	n=84(%)
<b>Knowledge</b>	
High	19(16.7)
Low	65(83.3)
<b>Attitude</b>	
Favourable	17(20.2)
Unfavourable	67(79.8)
<b>Practice</b>	
Good	20(23.8)

Not Good	64(76.2)
Self-efficacy	
High	35(41.7)
Low	49(58.3)

The main barriers for hand washing practices were forget to wash hand (70.2%), assumed that their hands were not dirty (66.7%), no time (40.5%) and laziness (35.7%) (Table 3). Overall, majority of the subjects did not master hand washing demonstration skills such as giving brief introduction, explaining the purpose of hand washing, demonstrate the 7 steps and carry out reinforcement and closure of demonstration session except for the step 1 (96.4%). Result showed that majority of the subjects did not show a good practice in proper hand washing according to the demonstrated steps (Table 4).

Table 3. Barriers in hand washing practice

Barriers	n=84(%)
Forget to wash hands	59(70.2)
Assume hand not dirty	56(66.7)
Time constraint	34(40.5)
Laziness	30(35.7)
Location of hand washing facility	7(8.3)

Table 4. Subjects performance in hand washing demonstration skills

Steps of Hand Washing Skills	n=84(%)
a. Introduction	0(0%)
b. Show briefly	6(7.1)
c. Demonstrate and explain:	
Step 1: Wet hands and apply soap	81(96.4)
Step 2: Rub both palms with your fingers	42(50.0)
Step 3: Rub each thumb and fingers webs	43(51.2)
Step 4: Rub the nails on the palms	43(51.2)
Step 5: Rub the back of both hands	42(50.0)
Step 6: Wash with clean water	48(57.1)
Step 7: Dry hands with a clean cloth or tissue	81(96.4)
d. Getting feedback from peers	0(0)
e. Teach back (reinforcement)	0(0)
f. Closure	0(0)

Gender ( $p=0.004$ ) and academic achievement ( $p=0.038$ ) showed a significant association among children with high self-efficacy in proper hand washing (Table 5). A significant association between the practice of hand washing and self-efficacy was also demonstrated ( $p=0.003$ ) (Table 6).

Table 5. Relationship between socio-demographic characteristics and high self-efficacy in proper hand washing

Variable	N=35(%)	$\chi^2$ (df)	p value
<b>Gender</b>			
Male	7(20.0)	8.331 (1)	0.004*
Female	28(80.0)		
<b>Ranking in Family</b>			
1 <sup>st</sup> Child	14(40.0)	1.200 (1)	0.273
Others	21(60.0)		
<b>Committee Members in School</b>			
Members	30(85.7)	0.000 (1)	1.000
Non-Members	5(14.3)		
<b>Academic Achievement</b>			
Excellent	35(100)	5.455 (1)	0.038**
Average	0		
<b>Socio-economic Status</b>			
High	14(40.0)	0.509 (2)	0.775
Medium	10(28.6)		
Low	11(31.4)		

\* p <0.05 by Pearson Chi-Square Test.

\*\* p <0.05 by Fisher's Exact Test.

Table 6. Relationship between knowledge, attitudes and practices with self-efficacy in proper hand washing

Variable	n=35(%)	$\chi^2$ (df)	p value
<b>Knowledge</b>			
High	7(20.0)	0.480 (1)	0.488
Low	28(80.0)		
<b>Attitude</b>			
Positive	31(88.6)	2.883 (1)	0.089
Negative	4(11.4)		
<b>Practice</b>			
Good	14(40.0)	8.670 (1)	0.003*
Not Good	21(60.0)		

\* p <0.05 by Pearson Chi-Square Test.

#### 4. Discussion

The finding of this study show a significant association between gender and self-efficacy in proper hand washing which is similar with several studies done elsewhere (Ghadamgahi, Zighaimat, Ebadi, & Houshmand, 2011; Mariwah, Hampshire, & Kasim, 2012). Another finding from this study show that subjects who excel in academic have better self-efficacy (Sarani, Balouchi, Masinaeinezhad, & Ebrahimitabs, 2014; Rosen, Zucker, Brody, Engelhard, & Manor, 2009; Scott, Lawson, & Curtis, 2007). Good practice has a significant association with self-efficacy in hand washing practice (Sarani, Balouchi, Masinaeinezhad, & Ebrahimitabs, 2014)

The study findings show low knowledge score on hand washing (16.7%). Knowledge score on 7 steps of hand washing is 32.1%, wash hands before touching the face (14.3%) and after touching the face (9.5%). This score is below standard knowledge achievement of 80% that was set by DM programme competency committee. Lack of

knowledge will hinder them from practicing healthy behaviour. This finding is consistent with the finding from study done by Rosen et.al which stated that lack of knowledge about personal hygiene will increase the risk of infectious diseases (Rosen, Zucker, Brody, Engelhard, & Manor, 2009). School children are potential agents in spreading the disease among themselves, their families and community. Knowledge on current disease such as hand, foot and mouth (HFMD) and upper respiratory tract infection is also very low (Scott, Lawson, & Curtis, 2007). Hence, DM needs to have sufficient information on the current disease, the importance of washing hands thoroughly and on the right and critical time suggested. They need these competencies in order to guide their peers to practice health behaviour.

The study found that the barriers to practice hand washing has significant influence towards hand washing practices among subjects. Studies done among university students in Turkey and Malaysia show similar results (Ergin, Bostanci, Onal, Bozkurt, & Ergin, 2011; Rothschild, 1999). The finding of these studies was similar with the study done by Lopez-Quintero et.al (2009) on poor adherence to the constant practice of proper steps in hand washing. This study also showed that hand washing practices is low among the DM (Besha et al., 2016; Sultana, Mahumud, Sarker, & Hossain, 2016).

The poor practices are supported by the barrier such as, forgetfulness, assumption that hands are not dirty, lack of time and laziness to practice hand washing. This negative perceptions are similar to study finding done on HFMD prevention in Ghana which reported that people will wash their hands only if they feel deplorable or disgusting and not as everyday practice (Scott, Lawson, & Curtis, 2007). Positive perception towards health can promote better hygiene practices. Study in Italy found that individuals who consider themselves at risk are adherence to preventive practices against Influenza (Albano, Matuozzo, Marinelli, & Di Giuseppe, 2014). Therefore, the perception of barriers to practice proper hand washing among DM should be stopped in order to increase awareness to adopt it as a healthy habit and enable them to become effective peer educator (Mearkle, Houghton, Bwonya, & Lindfield, 2016).

Practice proper hand washing is the most important basic hygiene in preventing infectious diseases (Mathur, 2011; Issa, McHenry, Issa, & Blackwood, 2015). School children are important agents in spreading the disease either among themselves or to the members of the family and the community. Hence, the emphasis of hand washing is very important (Talaat et al., 2011). Majority (77.4%) subjects admitted their parents did not practice the 7 steps of hand washing at home. Most children learn by observing and imitating the parents and adult. Children will be encouraged to follow the practice of their family members and friends in their social environment. Lack of role models among adult may cause the children not practicing hand washing (Bandura, 1977; Dickie, Rasmussen, Cain, Williams, & MacKay, 2017). Thus, the role of parents in fostering the practice of proper hand washing is important because they are the most important agents of socialization for children (Johnson et al., 2015; Al-Naggar & Al-Jashamy, 2013).

The study also found that the subjects have low score in self-efficacy in proper hand washing (41.7%). Low self-efficacy was recorded in difficult steps which only 69.0% capable in adopting the third step (rubbing the fingers and fingers webs) and 54.8% for the fourth step (rubbing nails in the palms). Lack of self-efficacy among DM will affect peers' perception towards their ability in delivering health messages. Study done by Pises et al. (2015) among peers in school that implement DM Programme, found that they are not confident in the ability of DM delivering the health messages. Self-efficacy is crucial in influencing confident especially in completing the task effectively and reinforces the behaviour (Bandura, 1990; Turner, Chandler, & Heffer, 2009). However, the subject shows low self-efficacy in proper hand washing practice despite of positive attitudes towards hand washing (Aiello, Larson, & Sedlak, 2008; Schunk & Meece, 2005).

Study revealed that family of higher socio-economic status has better potential to increase their children's self-efficacy. However, finding from this study shows no relation between socio-economic status and self-efficacy in proper hand washing. The ranking of child in the family also did not show relationship with self-efficacy. On the other hand, a study done by Gohari et al. (2012) showed that first child has higher self-efficacy. This study also showed that children who were involved with committee or organization did not correlate with higher self-efficacy which is inconsistent with finding by Fertman and Primack (2009) which stated student who are active in curriculum has higher self-efficacy.

Self-efficacy and skills are important attribute in educating their peers. The study found that the subject self-efficacy did not match with their skills. A total of 69.0% subjects claim to have confidence in adopting the third step (rubbing each finger and fingers webs), but only 51.2% were capable to demonstrate the step. About 54.8% subjects claim to have confidence to do the fourth step (rubbing nail in the palm), but only 51.2% were able to demonstrate correctly. Another 73.8% subjects claimed as having confidence in doing the fifth step (rub the

back of hands and fingers), however only 50.0% were able to demonstrate confidently. This finding shows the incompetency of DM to demonstrate proper hand washing technique to their peers which may be due to lack of knowledge on proper hand washing steps and poor hand washing practice. Knowledge and practices play an important role in influencing a person's skills (Bandura, 1977). However, a study done by Mwangi et.al (2007) stated that pupil believed in their own competence to carry out the task and they demonstrate commitment in relation to challenges as a change agent. This study could not measure the relationship between self-efficacy in proper hand washing and skills to demonstrate hand washing as all subjects are unable to demonstrate the proper steps of hand washing.

DM is seen as having low confidence in delivering the health messages to their peers. Consequently, this may affect the success of the DM programme as DM plays important role as peer educators in changing health knowledge, attitudes and practices of their peers at school (Pises, Hasnor, Suraiya, Kamarul Zaman, & Suriya, 2015). Thus, the quality of training needs to be improved to increase the knowledge, practice, self-efficacy and strengthen their skills to demonstrate proper hand washing (Oyibo, 2012).

## 5. Conclusion

DM was groomed and trained to educate their peers in personal hygiene practices including hand washing. However, the study found that levels of their knowledge, practice and self-efficacy are low. This limitation will hamper them to demonstrate proper steps in hand washing. DM should be exposed to more demonstration session in order to master the steps. Their perception of barriers to practice proper hand washing should also be addressed. Parents play a very important role in setting a good role model in hand washing practice.

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## Human and Animal Rights and Informed Consent

All procedures followed were in accordance with ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. Informed consent was obtained from all patients for being included in the study.

## Competing Interests Statement

The authors declare that they have no conflict of interest.

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