

# *The Relationships Between Socio-Demographic Factors, Availability of Hand Washing Facilities, Perceived Benefits, Perceived Self-Efficacy and Hand Washing Behavior among Elementary Schools Students in Indonesia*

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## **Abstract**

*Background: Hand washing is the most effective method of preventing the transmission disease and also a key factor of reducing transmission of acute respiratory infection and diarrhea in a community setting. The objective of this study was to identify relationship between socio-demographic factors, availability of hand washing facilities, perceived benefit, and perceived self-efficacy with hand washing behavior among sixth grade students of public elementary school in Belitung district, Indonesia. A cross-sectional research study was employed for describing the relationship. A total of 309 sixth grade students, were participated in this study. Data were analyzed using descriptive statistics and Chi-square test. The results of this study revealed that 71.8% of the participants were not hand washing properly. The results of this study also revealed that gender, parents' occupation, role of students at home, availability of clean water, soap, and hand washing stands were not significantly related with hand washing behavior. However, perceived benefits of hand washing ( $\chi^2 = 0.223$ ,  $p < .01$ ) and perceived self-efficacy of hand washing ( $\chi^2 = 0.141$ ,  $p < .05$ ) were significantly related with hand washing behavior. Based on these findings, health care providers in rural area of Indonesia should be strengthening health promotion regarding hand washing behavior by involving teachers and students that may influence on the success of hand washing program in the schools setting.*

**Keywords**—relating factors, hand washing, elementary schools

## **I. INTRODUCTION**

The primary causes of morbidity and mortality among young children in developing countries were acute respiratory infection and diarrhea. In addition, an estimate of 3.8 million children aged die each year from acute respiratory infection and diarrhea according to WHO [1].

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As one of the developing countries, Indonesia also faces these problems and has experienced of the impact of the wide-spread of infection caused by acute respiratory infection and diarrhea. The National Health Basic Research (NHBR) research findings in 2013 showed that three provinces in Sumatera region with high period prevalence of acute respiratory infection were Aceh province (30%), West Sumatera province (25.7%), and Bangka Belitung province (24%).

Belitung, one of the districts located within Bangka Belitung province, currently faces this common problem with acute respiratory infection and diarrhea. In 2013, Health Department of Belitung District revealed that the number of incidences of acute respiratory infection and diarrhea were 33,296 and 1,652 respectively. Environmental Health Risk Assessment (EHRA) reported that in 2014, approximately 23.5% of population living in Belitung district had suffered with acute respiratory infection and diarrhea [2]. Belitung with its demographic and geographic characteristic posing risk of high rate of incidence of communicable disease such as acute respiratory infection and diarrhea, and since Belitung district is a cluster of islands numbering approximately one hundred islands spreading around the district with most of its population still lacking of knowledge on hygiene, hygienic facility, and resource for clean water [2].

Acute respiratory infection and diarrhea are also commonly transmitted within the compound of elementary schools. Crowded settings, sharing of objects, and lack of self-care awareness, these are the conducive factors for the transmission of pathogenic micro-organisms [3]. Through their contaminated hands micro-organisms are easily transmitted directly among the children with inanimate objects serving as medium of transmission of diseases [4]. This would imply that these elementary school students could potentially spread the acute respiratory infection and diarrhea unknowingly, and not only among the children themselves but also to the community [5].

Hand washing is the most effective method of preventing the transmission of diseases through hands. The previous study reported hand washing with clean water and soap was a good intervention resulting in 53% reduction of influenza and diarrhea [6]. In addition, Hands hygiene was also specifically recommended for the prevention of diseases with pandemic potential such as severe acute respiratory syndrome [7].

The objective of the study was to identify relationship between socio-demographic factors, availability of hand washing facilities, perceived benefits, and perceived

self-efficacy with hand washing behavior among sixth grade students of public elementary school. These findings would be useful for health care providers in reviewing and designing intervention strategies to improve hand washing behavior among students of public elementary schools in Belitung district, Indonesia.

## II. METHOD

### A. *Design and Sample*

A cross-sectional research study was used in this study. 309 participants were recruited in 11 public elementary schools from 3 sub districts that has been implemented the hand washing program in Belitung, Indonesia. Purposive sampling method was used to select the participants with inclusion criteria were as follows: (1) sixth grade students who were studying at the public elementary schools, (2) students who were allowed by their parents or guardian to participate, and (3) students who are willingly volunteer to participate in the study. This study was used a self-administered questionnaire with minimal interference in order to minimize bias and by emphasizing to the students that this is not an examination.

### B. *Operational Definitions*

In this study parent occupation refers to job or career of student's father and mother. The availability of hand washing facilities refers to perception of sixth grade students of public elementary school in Belitung district, Indonesia about sufficiency and accessibility of the infrastructure for supporting hand washing practice including location, hand washing stand, soap, tap water, and clean water. Perceived benefits of hand washing refers to the believe of sixth grade students of public elementary schools that performing proper hand washing behavior is beneficial because of the advantages of proper hand washing including protection of infection diseases, consequences promotion of personal hygiene, and being accepted by the others. The perceived self-efficacy refers to perception of sixth grade students of public elementary schools in Belitung district, Indonesia about belief of students regarding abilities to perform proper hand washing practice such as wash hands at least 20 seconds, confident to always wash hands in term of times required, events, and facilities required for hand washing. The hand washing behavior refers to the activity for sixth grade students of public elementary schools in Belitung district, Indonesia refers to the frequency of the activities to perform hand washing properly in terms of time and situation required for hand washing [8].

### C. *Instruments*

In this study parent occupation refers to job or career of student's father and mother. The availability of hand washing facilities refers to perception of sixth grade students of public elementary school in Belitung district, Indonesia about sufficiency and accessibility of the infrastructure for supporting hand washing practice

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Furthermore, the instruments were tested for the content validity and reliability before data collection process. The instrument was examined for content validity by panel of experts. The panel of experts consisted of 3 scholar persons in the areas of pediatric nursing, community health nursing, and health promotion. Panel experts were reviewed and assessed all of items of question by checking the content clarity and content relevance. All three experts were asked to rate the clarity and relevance of the instrument using Content Validity Index Item (CVI-I) [13]. The experts were asked to rate each item clarity and relevancy using 4-point rating scale: 1 = not relevant, 2 = items needs revision, 3 = relevant, it takes a bit revision and 4 = very relevant [13], [14]. Panel experts were also welcome to give suggestion and add any other items that important and relevant to the study. The result of content validity index was given by panel experts were 99% for content relevance and clarity. Then, the researcher tested the reliability of the questionnaires. The questionnaire in Indonesia language version was administered to the 30 sixth grade students in one public elementary school of Belitung district. The Cronbach's alpha coefficient was used to assess internal reliability coefficient (ICR) of hand washing behavior questionnaire since the questionnaire was in multi point scaled item. The results were ranging from 0.70-0.89

### D. *Data Collection Process*

The study was approved by Committee and Ethics Review Board (ERB) Committee for Research Involving Human Research Subjects, Boromarajonani College of Nopparat Vajira, Bangkok, Thailand. The permissions for data collection were obtained from Head of Belitung district Health Department, Head of Belitung district Educational Department, Head of the Elementary Schools selected for data collection, and Head of Public Health Centers (PHC) of each sub-district involved in this study. Data were collected from October to November 2015. The participants were assured that the rights and confidentiality during the study were protected. The participants were informed about the objectives, procedures, and benefits of the study through information sheet. Those parents who were willing to allow their children to participate in this study were signed the

informed consent. Then, the participants who were agreed to participate in the study were asked to sign the informed consent. This study was used a self-administered questionnaire. Name, or any identify of students were not filled in the questionnaire. Researcher met the teachers who were responsible for sixth grade students in each public elementary school to set the time for collecting data. During data collection, the researcher guided the participants by reading the questionnaire in the front of class to prevent of misunderstanding especially for those participants who had insufficient reading ability. Teachers was asked to cooperate by not being present or entering the classroom while data collection was in progress. After the participants finishing with the questionnaire, the researcher checked and- picked up the completed questionnaires from participants and then kept in the sealed envelope. Data was kept in the locked cabinet and secured computer.

### E. Data Analysis

Chi-square test was used to identify the relationships between gender, father's occupation, mother's occupation, perceived benefits of hand washing, perceived self-efficacy of hand washing and hand washing behavior among sixth grade students of public elementary schools since the data were nominal scale. Phi statistic was used to examine the strength of the relationships [15], [16].

## III. Result and Discussion

### A. Results

The results shows that more than half of participants (55.3%) were female, and male were 44.7%. With regard to parent's occupation characteristics, all of student's fathers had occupation (100%), including both government occupation and not government occupation. The majority of them were not government employee (76.4%) and less than half of them were government employee (23.6%). Regarding mother's occupation, the majority of them were not government employee (64.4%), unemployed (25.2%), and government employee (10.4%). Regarding hand washing facilities at the schools, the results shows the majority of clean water, soap, and hand washing stands for hand washing had available at the schools (98.1%, 98.4%, and 85.8%). Furthermore, about 51.1% of participants had high level of perceived benefits of hand washing followed by the participants who had low level of perceived benefits were 48.9%. The participants who had high level of perceived self-efficacy of hand washing were 78.0% and the participant who had low level of perceived self-efficacy of hand washing were 22.0%. Furthermore, this study showed gender ( $\chi^2 = 2.445$ ,  $p > .05$ ), father's occupation ( $\chi^2 = 0.578$ ,  $p > .05$ ), mother's occupation ( $\chi^2 = 1.985$ ,  $p > .05$ ), availability of clean water at schools ( $\chi^2 = 1$ ,  $p > .05$ ) availability of soap at schools ( $\chi^2 = 0.623$ ,  $p > .05$ ), and availability of hand washing stands at schools ( $\chi^2 = 0.049$ ,  $p > .05$ ) were not significantly related to hand washing behavior. However, the results of this study shows perceived benefits of hand washing ( $\chi^2 = 15.412$ ,  $p < .01$ ) and

perceived self-efficacy of hand washing ( $\chi^2 = 6.185$ ,  $p < .05$ ) were significantly related to hand washing behavior. The strength of the relationship between perceived benefits of hand washing and hand washing behavior was positively moderate ( $\Phi = 0.22$ ). The strength of the relationship between perceived self-efficacy of hand washing and hand washing behavior was positively weak ( $\Phi = 0.14$ ). The results of this study were presented in **Table 1** and **Table 2**.

TABLE1. SUMMARY RESULTS

Variables	Frequency	Percent
<b>Gender</b>		
Male	138	44.7
Female	171	55.3
<b>Father occupation</b>		
Not Government employee	236	76.4
Government employee	73	23.6
<b>Mother occupation</b>		
Not Government employee	199	64.4
Government employee	32	10.4
Unemployed	78	25.2
<b>Availability of clean water</b>		
Available	303	98.1
Not available	6	1.9
<b>Availability of soap</b>		
Available	304	98.4
Not available	5	1.6
<b>Availability of hand washing stands</b>		
Available	265	85.8
Not available	44	14.2
<b>Perceived benefits of hand washing</b>		
High	158	51.1
Low	151	48.9
<b>Perceived self-efficacy of hand washing</b>		
High	241	78.0
Low	68	22.0

TABLE2. SUMMARY RESULTS

Variables	Proper Hand Washing		$\chi^2$
	Yes	No	
<b>Perceived benefit</b>			
Low	27 (17.9%)	124 (82.1%)	15.41**
High	60 (38%)	98 (62%)	
<b>Perceived self-efficacy</b>			
Low	11 (16.2%)	57 (83.8%)	6.18*
High	76 (31.5%)	165 (68.5%)	

\*\*  $p$ -value  $< .01$ , \*  $p$ -value  $< .05$

### B. Discussion

The results shows that gender was not related with hand washing behavior among sixth grade students of public elementary schools in Belitung district, Indonesia. The results were consistent with the previous studies revealed that there were not relationship between gender and hand washing behavior among students in the elementary schools [17], [18]. The gender was not related with hand washing behavior in this study due to all of participants have similar role or opportunity between boys and girls to perform hand washing in the schools. Similar to the previous study conducted by Lopez et al (2009) revealed that availability and accessibility of clean water and soap given appropriate condition that support the students both male and female to perform hand washing in the schools. These external factors

that may facilitate the students have similar opportunity to perform hand washing behavior

Parents' occupation was not related with hand washing behavior among sixth grade students of public elementary schools in Belitung district, Indonesia. This results study was congruent with the previous study conducted in Indonesia and also identified that there was no relationship between parents' occupation and hand washing behavior among elementary schools students [11]. The possible reason of this study finding was about schools setting that provided the students with parents as government occupation and not government occupation had the same chance or opportunity in practicing hand washing. The study conducted by Setyautami (2012) showed that schools regulation and school setting that provided all students who come from both parents working with government and nongovernment occupation in the same opportunity of learning and practicing hand washing, could lead them together in performing hand washing behavior.

Regarding availability of hand washing facilities, the results shows that there were not relationship between availability of hand washing facilities and hand washing behavior among sixth grade students of public elementary schools. This study finding was inconsistent with the previous studies mentioned that facilities affected proper hand washing in the schools, including the availability, supplies, functionality of water, soap, and toilets [19], [20], [11]. The possible reason of this finding due to the hand washing facilities was placed in the unseen area and uneasy to reach. For example, hand washing stands were not in the front of class, soap were not always available in the washing stands and toilets, even supporting by clean water sufficiency. According to (previous study) conducted in the schools showed that hand washing compliance was greater when the availability of hand washing facilities were clean and posted in the strategic places could improve awareness and also remind the student to wash hands [25].

The findings of this study shows that perceived benefits of hand washing and perceived self-efficacy were related with hand washing behavior among public elementary schools students. According to HBM theory, the individuals that have positive perceived benefits will raise the opinion about value or usefulness of a new behavior in decreasing the risk developing a disease [21]. Based on the afore HBM theory mentioned, This finding indicated that increasing of perceived benefits of hand washing would increase proper hand washing behavior among sixth grade students of public elementary schools. In this study, participants significantly realized that proper hand washing is good for them because it can prevent them from having diarrhea and acute respiratory infection and accepted by teachers and friends. Based on these reasons, the majority of participants apparently perform proper hand washing as the result. The result of this study was consistent with some previous studies reported that perceived benefits have positive relationship with hand washing behavior among sixth grade students [22], [23].

Perceived self-efficacy of hand washing was also related with hand washing behavior among sixth grade students of public elementary schools. The finding of study

indicated that increasing of perceived self-efficacy of hand washing could increase proper hand washing behavior among sixth grade students of public elementary schools. This result was reflected that good perceived self-efficacy drives the elementary school students to be confident and intent to perform proper hand washing. The reason of this finding because the high of perceived self-efficacy encouraged the sixth grade students of public elementary schools to perform hand washing behavior [2], [6]. The reason of this finding is also supported by the HBM mentioned that perceived self-efficacy is personal belief in individuals ability to do something, as the conviction that individuals can successfully execute the behavior required to produce the outcomes, the greater perceived self-efficacy would lead the individual perform new behavior proficiency. [21], [24]

#### iv. Conclusions

In conclusions, the results of this study shows that 28.2% of participants washed their hands properly, and majority of participants (71.8%) did not washed their hand properly. This study also shows that gender, parents' occupation, and availability of hand washing facilities were not related with hand washing behavior among sixth grade students of public elementary schools in Belitung district, Indonesia. However, study also shows that perceived benefits of hand washing and perceived self-efficacy of hand washing were related with hand washing behavior among sixth grade students of public elementary schools in Belitung district, Indonesia.

According to the findings of this study, health care provider could develop specific intervention programs based on HBM to promote perceived benefits of hand washing and perceived self-efficacy of hand washing among elementary schools students since perceived self-efficacy and perceived benefits can motivate hand washing behavior among elementary schools students effectively. The results of this study could be used as evidence, supporting information, and health education to design programs in nursing curriculum especially in family and community health. The results could be implemented by using creative ideas of health promotion at schools through nursing education curriculum such as motivators of proper hand washing behavior using peer activities, sticker or posters in many place at schools area.

#### v. Limitations

The findings of this study could be applied for the schools that had implemented the hand washing program, may not be generalized to the schools that had not implemented the program of hand washing. Further, the results of this study may not be able as reference of explanation the hand washing behavior in the private elementary schools and in other regions.

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