

THE PERCEPTION OF DISEASES AND HAND HYGIENE BEHAVIOR AMONG ELEMENTARY SCHOOL CHILDREN IN INDONESIA

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ABSTRACT

Acute respiratory infection and diarrhea are the two leading causes of mortality especially among children. Furthermore, nearly 22 million school days are lost annually due to the respiratory infection and diarrhea and on average the students are absent from school 4.5 days per year. Hand hygiene is a key factor of reducing transmission of diseases in the community setting such as school environment. Washing hands with soap and running water could significantly reduce the risk of diseases. Objective: The objective of this study was to identify relationships between knowledge, socio-demographic factors, and perception of diseases with hand washing behavior among elementary school children in Belitung district, Indonesia. Methods and Setting: A cross-sectional research study design was employed for describing the relationship between perception of diseases and hand hygiene behavior among school children in Belitung, Indonesia. A total of 309 sixth grade students from 11 sub-districts that have been implemented of hand washing campaign were participated in this study. Results: The results showed that socio-demographic factors and knowledge were not related with hand hygiene behavior. However, perception of diseases were significantly related with hand hygiene behavior. Based on these findings, health care providers in Indonesia should be strengthening health promotion of hand washing behavior.

Keywords: Relationships, Hand Hygiene, Elementary schools

I. INTRODUCTION

It has been known worldwide that acute respiratory infection and diarrhea are the two leading causes of mortality especially among children. Most of the estimated 5.5 million deaths associated with acute respiratory infection and diarrhea occur in children from resource-limited countries [1].

As one of the developing countries, Indonesia also faces these problems and has experienced the impact of the widespread 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]. 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]. The impact of acute respiratory infection and diarrhea among school-aged children affect not only the number of absentee at schools but also the physical well-being and hence child development. Study conducted in Bangladesh found that communicable disease such as diarrhea impeded physical growth in children aged over 5-year. 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, knowledge, and perceived of disease with hand washing behavior among sixth grade students of public elementary school. Furthermore, The results of study 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. Instruments

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.

C. Data Collection Process

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.

D. Data Analysis

Chi-square test was used to identify the relationships between knowledge, socio demographic factors, perceived susceptibility, perceived severity, perceived barrier, perceived benefits, cues to action, and perceived self efficacy of disease with 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, 86.4% of the participants were high level of knowledge of hand washing and about 45.3% were high level of perceived susceptibility of disease related hand washing. the participant who high level of perceived severity of diseases

related hand washing were 76.1% and 51.1% of participants had high level of perceived benefits of hand washing. The participants who had low level of perceived barrier were 49.5%. The participants who had high level of perceived self-efficacy of hand washing were 78.0% and the participant who had high level of cues to action of hand washing were 33.7%. Furthermore, this study showed gender, father's occupation, mother's occupation, availability of clean water at schools, availability of soap at schools, and availability of hand washing stands at

schools were not significantly related to hand washing behavior. However, the results of this study shows perceived susceptibility of disease ($\chi^2 = 13.73$, $p < .01$), perceived severity ($\chi^2 = 6.857$, $p < .01$) perceived benefits of hand washing ($\chi^2 = 15.412$, $p < .01$), cues to action ($\chi^2 = 9.839$, $p < .01$) and perceived self-efficacy of hand washing ($\chi^2 = 6.185$, $p < .05$) were significantly related to hand washing behavior.

The results of this study were presented in **Table 1** and **Table 2**.

TABLE1.
SUMMARY RESULTS

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

TABLE2.
SUMMARY RESULTS

Variables	Proper Hand Washing		χ^2
	Yes	No	
<i>Perceived Susceptibility</i>			
Low	33 (19.5%)	136 (80.5%)	13.73**
High	54 (38.6%)	86 (61.4%)	
<i>Perceived severity</i>			
Low	12 (16.2%)	62 (83.8%)	6.857**
High	75 (31.9%)	160 (68.1%)	
<i>Perceived benefit</i>			
Low	27 (17.9%)	124 (82.1%)	15.41**
High	60 (38%)	98 (62%)	
<i>Cues to action</i>			
Low	46 (22.4%)	159 (77.6%)	9.834**
High	41(39.4%)	63 (60.6%)	
<i>Perceived self-efficacy</i>			
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 results of this study showed that perceived susceptibility of diseases toward hand washing related with hand washing

behavior among sixth grade students of public elementary schools. This result indicated that an increase in perceived susceptibility would increase proper hand washing behavior among sixth grade students of public elementary schools. The result of this study showed relationship between perceived seriousness of disease related to hand washing and hand washing behavior among sixth grade students of public elementary schools. These results are similar to the previous studies that identified relationship between perceived seriousness and hand washing behavior [7]. This finding indicated that the sixth grade students of public elementary schools realized that the diseases related to hand washing behavior were significantly related with daily life and they needed to be prevented by using proper hand washing. 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. The positive perceived benefits can also increase the participation of the individuals in supporting health behavior. 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]. The results of this study showed the relationship between the cues to action toward hand washing and the hand washing behavior among sixth grade students of public elementary schools. This result indicates that the increasing of cues to action toward hand washing would increase the hand washing behavior among sixth grade students of public elementary schools.

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 susceptibility, perceived severity, perceived benefits of hand washing, cues to action 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 of hand washing and among elementary schools students since perception of disease 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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References

- [1] Talaat, Afifi Salma, Dueger Erica and E.-A. Nagwa. 2011. Effects of Hand Hygiene Campaigns on Incidence of Laboratory-Confirmed Influenza and Absenteeism in Schoolchildren, Cairo, Egypt. *Emerging Infectious Diseases*. 17(4): 619-625.
- [2] Biran, T.R., W. Schmidt, R. Aunger and V. Curtis. 2014. Effect of a Behaviour-Change Intervention on Handwashing with Soap in India (Superamma): A Cluster-Randomised Trial. **The Lancet Global Health**. 2(3): e145-e154.
- [3] Halder, C. Tronchet, S. Akhter, A. Bhuiya, R. Johnston and S.P. Luby. 2010. Observed Hand Cleanliness and Other Measures of Handwashing Behavior in Rural Bangladesh. *BMC Public Health*. 10(1): 545-545.
- [4] Health Department of Bangka Belitung Province. 2013. Bangka Belitung Province Health Profile. 3(1): 199.
- [5] Vessey, Sherwood, Warner and Clark. 2007. Comparing Hand Washing to Hand Sanitizers in Reducing Elementary School Students' Absenteeism. *Pediatric Nursing*. 33(4): 368-372.
- [6] Centers for Disease Control and Prevention. 2011a. A Framework for Preventing Infection Disease: Sustaining the Essentials and Innovating for the Future. Atlanta, Georgia.
- [7] Lopez, Freeman Paul and N. Yehuda. 2009. Hand Washing among School Children in Bogotá, Colombia. *American Journal of Public Health*. 99(1): 94-101.
- [8] Biran, T. Rabie, W. Schmidt, S. Juvekar, S. Hirve and V. Curtis. 2008. Comparing the Performance of Indicators of Hand-Washing Practices in Rural Indian Households. *Tropical Medicine & International Health: TM & IH*. 13(2): 278-285.
- [9] Ministry of Health Republic of Indonesia. 2009. Guidelines Hand Washing Use Soap Ministry of Health Republic of Indonesia, Jakarta.
- [10] Rismawan. 2013. Predictors of Hand Washing Behavior among Fifth Grade Students of Public Elementary School in Bali Indonesia. 405.
- [11] Hayden, J.A. 2009. Introduction to Health Behavior Theory. Jones and Bartlett Publishers, New Jersey.
- [12] Setyautami. 2012. Proper Hand Washing Practices among Elementary School Students in Selat Sub-District, Indonesia. *Journal of Public Health and Development*. 10(1): 3-20.

- [13] Ministry of Health Republic of Indonesia. 2011. Totally Sanitation Community Empowerment. Ministry of Health Indonesia, Jakarta.
- [14] Susan K Grove, Nancy Burns and J.R. Gray. 2013. The Practice of Nursing Research. ELSEIVER, Texas.
- [15] Polit and Beck. 2012. Nursing Research, Generating and Assessing Evidence for Nursing Practice. 9. Wolters Kluwer, Australia.
- [16] Pallant, J. 2010. Survival Manual a Step by Step Guide to Data Analysis Using Spss. Allaen an Unwin, Australia.
- [17] Plichta and Kelvin. 2013. Statistical Methods for Health Care Research. Wolter Kluwer, New York.
- [18] Asiedu, Van Ess, Papoe, Setorglo and Anderson. 2011. Hand Washing Practice among School Children in Ghana. 293-300.
- [19] Lopez, Freeman Paul and N. Yehuda. 2009. Hand Washing among School Children in Bogotá, Colombia. American Journal of Public Health. 99(1): 94-101.
- [20] Oswald, G.C. Hunter, A.G. Lescano, L. Cabrera, E. Leontsini, W.K. Pan, V.P. Soldan and R.H. Gilman. 2008. Direct Observation of Hygiene in a Peruvian Shantytown: Not Enough Handwashing and Too Little Water. Tropical Medicine & International Health: TM & IH. 13(11): 1421-1428.
- [21] Rabbi, S. and N. Dey. 2013b. Exploring the Gap between Hand Washing Knowledge and Practices in Bangladesh: A Cross-Sectional Comparative Study. BMC Public Health. 13(1): 1-7.
- [22] Rosenstock, Victor J. Strecher and M.H. Becker. 1988. Social Learning Theory an the Health Belief Model. 15 (20): 175-183.
- [23] Kadam, Pati, Chauhan and Singh. 2014. A Study on Knowledge and Practice of Hand Washing among Slum Children and Their Mothers in Bhubaneswar, Odisha. Indian Journal of Public Health Research & Development. 5(3): 67-71.
- [24] Morton and Schultz. 2004. Healthy Hands: Use of Alcohol Gel as an Adjunct to Handwashing in Elementary School Children. Journal of School Nursing 20(3): 161-167.
- [25] Hayden, J.A. 2009. Introduction to Health Behavior Theory. Jones and Bartlett Publishers, New Jersey.
- Borchgrevink, C.P., J. Cha and S. Kim. 2013. Hand Washing Practices in a College Town Environment. Journal Of Environmental Health. 75(8): 18-24