Do Primary Schools Have Contextual Influence on Health Behavior? A Multilevel Evidence from Nganjuk, East Java

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ABSTRACT

Background: Health problems among primary school age children caused by poor personal hygiene can be prevented by good clean and healthy life behavior. Clean and healthy life behavior is affected by perceived susceptibility, perceived seriousness, perceived benefit, perceived barrier, cues to action, and self-efficacy. This study aimed to analyze the contextual effect of primary school on clean and healthy life behavior in primary school age children in Nganjuk, East Java.

Subjects and Method: This was cross sectional study conducted at 25 primary schools in Nganjuk, East Java, from August to December 2019. There were 200 primary school age children aged 6-12 years involved as the sample of this study. The study used stratified random sampling. The dependent variable was clean and healthy life behavior. The independent variables were perceived susceptibility, perceived seriousness, perceived benefit, perceived barrier, cues to action, and self-efficacy. This study used questionnaires to collect the data. This study used multilevel multiple logistic regression with Stata 13 to analyze the data.

Results: Clean and healthy life behavior in the primary school age children increased with high perceived susceptibility (b=1.06; 95%CI=0.31 to 1.80; p=0.005), high perceived seriousness (b= 0.92; 95%CI=0.16 to 1.68; p=0.018), strong perceived benefit (b=0.76; 95%CI=0.05 to 1.47; p= 0.036), strong cues to action (b=0.97; 95%CI=0.26 to 1.68; p=0.007), and strong self-efficacy (b= 1.16; 95%CI=0.43 to 1.89; p=0.002). Clean and healthy life behavior in the primary school age children decreased with strong perceived barrier, but the result was statistically non-significant (b= -0.27; 95%CI=-1.02 to 0.33; p=0.484). Primary school had a contextual effect on clean and healthy life behavior (ICC 17.33%).

Conclusion: Clean and healthy life behavior in primary school age children is affected by perceived susceptibility, perceived seriousness, perceived benefit, perceived barrier, cues to action, and self-efficacy. Primary school has a contextual effect on clean and healthy life behavior.

Keywords: clean and healthy life behavior, Health Belief Model, contextual of primary school

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BACKGROUND

The implementation of clean and healthy life behavior has a very important role in child growth and development, because the primary school children at the age of 6 to 12 years have a body that is susceptable to health problems (Umaroh et al., 2016). The health problems will generally inhibit students' achievement at school.

Every year, the diseases caused by poor clean and healthy life behavior are in the top 10 diseases in Nganjuk Regency. Diarrhea is a disease caused by poor clean and healthy life behavior. If it is not treated properly, the death will occur. In 2017, the number of diarrhea sufferers was 56,635 cases (27%). Based on this number, as many as 20,675 cases (36.5%) suffered by school-age children (Nganjuk Regency Health Office, 2017).

Most health problems among school children are caused by poor personal hygiene; it can be prevented by clean and healthy life behavior (Paul et al., 2017). Primary school age children need much more attention. Clean and healthy life behavior in school positively affects children's personal hygiene (Taware et al., 2018).

Human behavior is the result of all kinds of experiences and interactions with the environment that are manifested in the form of knowledge, attitude, and action. The theory of Health Belief Model states that behavior is caused by factors such as susceptibility, seriousness, benefit, barrier, and cues to action. The Social Cognitive Theory states that a one's reasons to behave are human and environmental factors. Individual personal factor includes self-efficacy (Sulaeman, 2016).

SUBJECTS AND METHOD
1. Design of the Study
This study was an observational analytic study with cross sectional approach. This study was conducted at 25 primary schools in Nganjuk, East Java, from August to December 2019.
2. Population and Sample
The population of the study was 200 primary school age children as the study subjects aged 6-12 years who studied at 25 primary school in Nganjuk, East Java. This study used stratified random sampling.
3. Variables of the Study
The dependent variable was clean and healthy life behavior. The independent variables were perceived susceptibility, perceived seriousness, perceived benefit, perceived barrier, cues to action, and self-efficacy.
4. Operational Definition of Variables
Perceived susceptibility was a subjective perception of a person about the risk of contracting a disease, and the perceived possibility that referred to the risk of certain diseases or the negative effect on health. This study used questionnaires as the measurement instrument. This study used continuous data scale. The data was converted into a dichotomy to facilitate analysis. Code 0=low and 1=high.

Perceived seriousness was a perception of the seriousness/severity of a disease if it was not treated immediately (including evaluation of both medical, clinical and social consequences that might arise) according to condition/action that might occur. This study used questionnaires as the measurement instrument. This study used continuous data scale. The data was converted into a dichotomy to facilitate analysis. Code 0=low and 1=high.

Perceived benefit was the benefit gained when paying for health facilities and services compared to the risk of illness. Health-related behavior was also affected by an individual perception of the benefits of taking healthy actions or behaviors. The data was converted into a dichotomy to facilitate analysis. Code 0=low and 1=high.

Perceived barrier was a barrier that a person felt when conducting healthy behavior. This study used questionnaires as the measurement instrument. This study used continuous data scale. The data was converted into a dichotomy to facilitate analysis. Code 0=low and 1=high.

Cues to action were stimuli needed by children to trigger a decision making process, so that health behavior occured. Cues to action did not only come from the outside, but it also came from the inside. In addition, it measured social and environmental effects that stimulate a person's desire to take health actions. The data was converted into a dichotomy to facilitate analysis. Code 0=low and 1=high.

Self-efficacy was a belief in her/his ability

to do something. It was a person's belief about how far she/he was able to control the motivation, behavior, and social environment. It aimed to produce a behavior. This study used questionnaires as the measurement instrument. This study used continuous data scale. The data was converted into a dichotomy to facilitate analysis. Code 0=low and 1=high.

Clean and healthy life behavior was health behavior carried out based on the awareness, so that the primary school age children could help themselves in the health sector, especially in clean and healthy life behavior. Clean and healthy life behavior in primary school children included throwing the garbage, getting enough rest, washing hands, maintaining dental hygiene, nail hygiene, skin hygiene, hair hygiene, and eating healthy food. The data was converted into a dichotomy to facilitate analysis. Code 0=low and 1=high.

5. Data Analysis

Univariate analysis was used to generally describe each of the variables studied, such as clean and healthy life behavior, perceived susceptibility, perceived seriousness, perceived benefit, perceived barrier, cues to action,and self-efficacy.

Bivariate analysis was used to explain the effect of one independent variable (perceived susceptibility, perceived seriousness, perceived benefit, perceived barrier, cues to action, and self-efficacy) on one dependent variable (clean and healthy life behavior).

Multivariate analysis was used to explain the effect of more than one independent variable, namely determinants of the theory of Health Belief Model and Social Cognitive Theory (perceived susceptibility, perceived seriousness, perceived benefit, perceived barrier, cues to action, and self-efficacy) on clean and healthy life behavior. The variable at level one was individual. In this study, the level one was children. The variable at level two that would be studied was contextual of primary school.

6. Study Ethics

This study was conducted based on study ethics that were consisted of informed consent form, anonymity, confidentiality, and ethical clearance. The ethical clearance in this study came from the Health Research Ethics Committee of Dr. Moewardi Hospital, Surakarta, Indonesia, Number: 1.016/VIII/HREC/2019.

RESULTS

1. Sample Characteristics

The description of the sample of the categorical data explained about the continuous data of each variable of the study including clean and healthy life behavior, perceived susceptibility, perceived seriousness, perceived benefit, cues to action, and self-efficacy.

Table 1. The description of the characteristic of continuous data as a sample

Variable	N	Mean	SD	Min	Max
Clean and healthy life behavior	200	31.27	2.84	24	42
Perceived susceptibility	200	30.06	1.60	25	33
Perceived seriousness	200	14.46	1.60	10	18
Perceived benefit	200	21.07	2.86	13	27
Perceived barrier	200	16.11	2.01	12	21
Cues to action	200	19.31	2.02	12	24
Self-efficacy	200	26.28	2.56	20	34

2. Univariate Analysis

Table 2 shows 2 parts of clean and healthy life behavior in this study, namely good clean and healthy life behavior and poor clean and healthy life behavior. Based on the result of the study, there were 120

(60%) children who had poor clean and healthy life behavior, which is bigger than good clean and healthy life behavior.

The perceived susceptibility in this study was divided into two, namely low perceived susceptibility and high perceived susceptibility. Based on the result of the study, there were 122 children (61%) who had low perceived susceptibility, which is bigger than high perceived susceptibility.

Table 3. The description of the characteristic of categorical data as a sample

Variable	Frequency (n)	Percentage (%)
Clean and healthy life behavior		
Poor	120	60.0
Good	80	40.0
Perceived susceptibility		
Low	122	61.0
High	78	39.0
Perceived seriousness		
Low	108	54.0
High	92	46.0
Perceived benefit		
Weak	111	55.5
Strong	89	44.5
Perceived barrier		
Weak	121	60.5
Strong	79	39.5
Cues to action		
No	110	55.0
Yes	90	45.0
Self efficacy		
Weak	107	53.5
Strong	93	46.5

Perceived seriousness in this study was divided into two parts, namely low perceived seriousness and high perceived seriousness. Based on the result of the study, the number of the study subjects who had low perceived seriousness was the highest, which was 108 children (54%).

Perceived benefit in this study was divided into two parts, namely weak perceived benefit and strong perceived benefit. Based on the result of the study, the number of the study subjects who had weak perceived benefit was the highest, which was 111 children (55.5%).

Perceived barrier in this study was divided into two parts, namely weak perceived barrier and strong perceived barrier. Based on the result of the study, the number of the study subjects who had weak perceived seriousness was the highest, which was 121 children (60.5%).

Cues to action in this study was divided into two parts, namely no cues to action and with cues to action. Based on the result of the study, the number of the study subjects who had no cues to action was the highest, which was 110 children (55%).

Self-efficacy in this study was divided into two parts, namely weak self-efficacy and strong self-efficacy. Based on the result of the study, the number of the study subjects who had weak self-efficacy was the highest, which was 107 children (53.5%).

3. Bivariate analysis
Table 3. The Chi Square test of factor affecting clean and healthy life behavior

Independent Variable	Clean and healthy behavior				Total		OR	p
	Poor		Good					
	n	%	n	%	n	%		
Perceived Susceptibility								
Low	81	66.4	41	33.6	122	100	1.98	0.021
High	39	50.0	39	50.0	78	100		
Perceived Seriousness								
Low	72	66.7	36	33.3	108	100	1.83	0.037
High	48	52.2	44	47.8	92	100		
Perceived Benefit								
Weak	74	66.7	37	33.3	111	100	1.87	0.032
Strong	46	51.7	43	48.3	89	100		
Perceived Barrier								
Weak	71	58.7	50	41.3	121	100	0.87	0.637
Strong	49	62	30	38	79	100		
Cues to Action								
No	74	67.3	36	32.7	110	100	1.97	0.020
Yes	46	51.1	44	48.9	90	100		
Self-efficacy								
Weak	77	72	30	28	107	100	2.98	<0.001
Strong	43	46.2	50	53.8	93	100		

Table 3 presents the data about the effect of the independent variables (perceived susceptibility, perceived seriousness, perceived benefit, perceived barrier, cues to action, and self-efficacy) on clean and healthy life behavior.

Perceived susceptibility had an effect on clean and healthy life behavior; it was statistically significant. Children with high perceived susceptibility were 1.98 times more likely to conduct good clean and healthy life behavior than children with low perceived susceptibility (OR=1.98; p= 0.021).

Perceived seriousness had an effect on clean and healthy life behavior; it was statistically significant. Children with high perceived seriousness were 1.83 times more likely to conduct good clean and healthy life behavior than children with low perceived seriousness (OR=1.98; p=0.021).

Perceived benefit had an effect on clean and healthy life behavior; it was statistically significant. Children with strong perceived benefit were 1.87 times more likely to conduct good clean and healthy life behavior than children with weak perceived benefit (OR=1.87; p=0.032).

Perceived barrier had an effect on clean and healthy life behavior; however, was statistically non-significant. Children with weak perceived barrier were 0.87 times more likely to conduct good clean and healthy life behavior than children with strong perceived barrier (OR=0.87; p= 0.6-37).

Cues to action had an effect on clean and healthy life behavior; it was statistically significant. Children with cues to action were 1.97 times more likely to conduct good clean and healthy life behavior than children with no cues to action (OR=1.97;

p= 0.020).

Self-efficacy had an effect on clean and healthy life behavior; it was statistically significant. Children with strong self-effi-cacy were 2.98 times more likely to conduct good clean and healthy life behavior than children with weak self-efficacy (OR=2.98; p<0.001).

4. Multivariate Analysis

Table 3. The analysis of multilevel multiple logistic regression of the implementation of Health Belief Model and Social Cognitive Theory on clean and healthy behavior

Independent Variable	Regression Coefficient (b)	(95%) CI		p
		Upper Limit	Lower Limit	
Fixed Effect				
Perceived susceptibility (High)	1.06	0.31	1.80	0.005
Perceived seriousness (High)	0.92	0.16	1.68	0.018
Perceived benefit (Strong)	0.76	0.5	1.47	0.036
Perceived barrier (Strong)	-0.27	-1.02	0.33	0.484
Cues to action (Yes)	0.97	0.26	1.68	0.007
Self-efficacy (Strong)	1.16	0.43	1.89	0.002
Random Effect				
Primary School	0.69	0.16	2.92	
Var (Constant)				
N observation= 200				
Log likehood = -144.25				
LR test vs logistic regression, p=0.015				
Chibar2 (01)=4.70				
ICC = 17.33%				

Table 4 presents the data on the result of the multivariate analysis of the effect of the independent variables (perceived susceptibility, perceived seriousness, perceived benefit, perceived barrier, cues to action, and self-efficacy) on clean and healthy life behavior.

Based on table 4, clean and healthy life behavior of the primary school age children increased with high perceived susceptibility (b=1.06; 95%CI=0.31 to 1.80; p= 0.005), high perceived seriousness (b=092; 95%CI= 0.16 to 1.68; p=0.018), strong perceived benefit (b=0.76; 95%CI= 0.05 to 1.47; p=0.036), cues to action (b=0.97; 95%CI= 0.26 to 1.68; p=0.007), and strong self-efficacy (b=1.16; 95%CI=0.43 to 1.89; p=0.002).

Clean and healthy life behavior in primary school age children decreased with strong perceived barrier, but the result was statistically non-significant (b= -0.27; 95% CI= - 1.02 to 0.33; p=0.484). There was a contextual effect of school on clean and healthy life behavior of primary school age children with an ICC of 17.33%. It means, the variation in clean and healthy life behavior by 17.33% was determined by variables at the primary school level.

DISCUSSION

1. The effect between perceived susceptibility and clean and healthy life behavior

Based on the result of the study, there was a significant effect between perceived susceptibility and clean and healthy life behavior.

The result is in line with a study which showed that children with high perceived susceptibility had good clean and healthy life behavior (Jones et al., 2015).

Children who realize that they are susceptible or at risk of contracting disease will try to prevent the disease by carrying out

clean and healthy life behavior. This is in accordance with the theory of Health Belief Model developed by Rosenstock (1994) that the assumption of that he/she will be contracted a disease will make him/her aware of prevention and protection (Murti, 2018). Someone who considers that he/she is susceptible to a condition or serious problem will take action to protect themselves (Patterson et al., 2018).

The theory of Health Belief Model predicts that someone who has the perception that she/he is susceptible to a disease is much more likely to take preventive action. However, someone who has poor perceived susceptibility of having a disease is little likely to take preventive action (Murti, 2018).

An individual is more likely to take unhealthy behavior or risky behavior (Murti, 2018). Knowledge is very influential on perceived susceptibility felt by someone (Sulaeman, 2016).

2. The effect of perceived seriousness on clean and healthy life behavior

Based on the result of the study, there was a significant effect between perceived seriousness and clean and healthy life behavior. Another result of a study also showed that there was an effect of low perceived seriousness on clean and healthy life behavior (Shao et al., 2018).

Perceived seriousness refers to a person's subjective assessment of the severity level of a disease, as well as the potential occurs if it is not treated or prevented. (Situmorang et al., 2017). Someone who considers a disease as a serious disease are much more likely to take action needed to prevent the occurrence of the disease, or reduce its severity (Murti, 2018).

The construction of perceived seriousness concerns an individual's beliefs about the seriousness or severity level of a disease. Meanwhile, perceived seriousness

is often based on medical information or knowledge. It can also come from a person's belief that she/he will have difficulties due to disease and will have an effect in her/his life (Sulaeman, 2016).

The perceived seriousness of a disease will affect belief about the disease itself (Masoudiyekta et al., 2018). Someone will be motivated to seek treatment and prevention of a disease if they have perceived seriousness of a disease (Shabibi et al., 2017).

3. The effect of perceived benefit on clean and healthy life behavior

Based on the result of the study, there was a significant effect between perceived benefit and clean and healthy life behavior. It showed that someone who had strong perceived benefit was possible to conduct clean and healthy life behavior (Shao et al., 2018).

Based on the theory of Health Belief Model, health-related behavior is also affected by one's perception of the benefit of taking healthy action or behavior. The perceived benefits of a person will affect preventive action (Murti, 2018). Perceived benefit refers to an individual's assessment of the value or efficacy of involvement in promoting health behavior to reduce the risk of a disease. If an individual believes that certain actions will reduce susceptibility to health problems or reduce seriousness, he tends to engage in behavior besides objective facts about the effectiveness of an action (Sulaeman, 2016).

The more a person feels the benefit in taking an action to avoid an illness, the greater the individual's tendency to take that action (Zeigheimat et al., 2015). Perceived benefit will affect a person's judgment to behave in reducing the risk or taking prevention. If someone believes in certain actions that can reduce the susceptibility of a disease, he will tend to be involved (Aunger et al., 2015).

Another study suggests that someone who feels that an action might have benefit in reducing the risk of a disease will tend to take that action. (Rah et al., 2015). Based on the theories above, the higher the motivation, the more positive the perceived benefit.

4. The effect of perceived barrier on clean and healthy life behavior

Based on the result of the study, perceived barrier was at risk of decreasing clean and healthy life behavior; however, it was statistically non-significant. The result of this study is in line with another study that perceived barrier was at risk of decreasing healthy hygiene behavior in children (Almadi et al., 2019)

Based on the concept of the theory of Health Belief Model, the individual has perception about barriers that can occur or are felt, thus affecting the individual not to change her/his behavior. Therefore, it takes confidence of the greater benefit than the perceived barrier. The barriers that usually occur are high costs, unpleasant side effects, and activities that are complicated and take time (Burke, 2013).

School age children in this study were not constrained by high costs due to adequate access to health information services in Nganjuk Regency. The access to information about health through print and electronic media has been found. As a result, finding health information about clean and healthy life behavior is not difficult and does not take time.

5. The effect of cues to action on clean and healthy life behavior

Based on the result of the study, there was a significant effect between cues to action and clean and healthy life behavior. The result of the study is in line with another study that someone who had cues to action was possible to conduct good clean and healthy life behavior (Cresswell et al.,

2018).

The theory of Health Belief Model shows that behavior is also affected cues to action. Cues to action is an event, people, or things that move to change behavior (Sulaeman, 2016). The stimulus for an action is the stimulus needed to trigger the decision making process, so that health behavior occurs (Murti, 2018).

6. The effect of self-efficacy on clean and healthy life behavior

Based on the result of the study, there was a significant effect between self-efficacy on clean healthy life behavior. The result of this study is in line with another study that showed that children who had high self-efficacy improved better clean and healthy behavior than children who had low self-efficacy (Zapka et al., 2017). Someone who has strong motivation tends to have strong self-efficacy (Huang et al., 2016).

Trust in one's ability is the key to affecting changes in health behavior. Self-efficacy can be used in predicting healthy behavior and facilitating behavior change (Clayton et al., 2015). Someone generally does not try to do something new unless they can do it.

If someone believes that a new behavior is useful but he thinks that he is not able to do it (perceived barrier), it is possible for him not to do a behavior. Variations of this model are perceived value and intervention determined as a main belief. (Imtichan et al., 2019). The construction of mediation factor becomes a link between various types of perceptions with health behavior in the community (Murti, 2018).

7. The effect of level of school health unit on clean and healthy life behavior

Based on the result of the study, the ICC value was 17.33%. This indicator showed that the variation of clean and healthy life behavior as much as 17.33% was deter-

mined by variables at the school level.

The result of this study is in line with another study which stated the level of school health unit affected clean and healthy life behavior (Stiefel et al., 2017). This study shows that the minimum level of school health unit have a higher risk of conducting poor clean and healthy life behavior compared to the school health unit with standard, optimal, and plenary level. It occurs due to poor knowledge and inadequate facilities that lead to poor clean and healty behavior in primary school age children.

Based on the finding in the field, there was only 28% of the total school health units that have a standard, optimal, and plenary level. The school health unit with minimum level did not have health education partnership program with related institutions (community health center). Therefore, the health education was inadequate.

AUTHOR CONTRIBUTION

FUNDING AND SPONSORSHIP

CONFLICT OF INTEREST

This study did not have any conflict of interest.

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REFERENCE

Almadi MA, Alghamdi F, Newton S, Anaya MM (2019). The gap between knowledge and undergoing colorectal cancer screening using the Health Belief Model: A national survey. Saudi J Gastroenterol. 25(1): 27–39. doi: 10.4103/sjg.SJG_455_18

Aprilia N, Tamtomo D, Sulaeman ES, (2018). Path Analysis on the effectiveness of chronic disease prevention program using Health Belief Model. J Health Promot Behav. 4(2): 85-97 https://doi.org/10.26911/thejhpb.2019.04.02.01

Aunger R, Greenland K, Ploubidis G, Schmidt W, Oxford J, Curtis V (2016). The determinants of reported personal and household hygiene behaviour: A multi-country study. PLOS ONE. 11(8): e0159551. doi:10.1371 /journal. pone. 0159551

Bishop AC, Baker GR, Boyle TA, MacKinnon NJ (2015). Using the Health Belief Model to explain patient involvement in patient safety. PLOS ONE. 18(6): 3019–3033. doi :10.1111 /hex.12286

Clayton ML, Clegg SK, Neff RA, Pollack KM, Ensminger M (2015). Listening to food workers: Factors that impact proper health and hygiene practice in food service. Int J Occup Med Environ Health. 21(4):314–327. doi:10.1179/2049396715Y.0000000011

Cresswell P, Monrouxe LV (2018). And you'll suddenly realise 'I've not washed my hands': medical students', junior doctors' and medical educators' narratives of hygiene behaviours. BMJ. 8(3): e018156, doi:10.1136/ bmjopen-2017-018156

Dinas Kesehatan Kabupaten Nganjuk (2017). Profil Kesehatan Kabupaten Ngajuk Tahun 2017. Nganjuk: Dinkes Nganjuk. Retrieved from https//-www.nganjukkab.go.id

Huang GK, Stewardson AJ, Grayson ML (2014). Back to basics: Hand hygiene and isolation. CURR OPIN INFECT DIS. 27(4): 379–389. doi:10.1097/Q-CO.0000000000000080

Imtichan SN, Tamtomo D, Sulaeman ES (2019). Path Analysis: Application of Health Belief Model on the determinants of clean and healthy behavior among elderly with hypertension. Health Promot Behav 4(2): 110-120 https://doi.org/10.26911/thejhpb.20-19.04.02.03

Jones CL, Jensen JD, Scherr CL, Brown NR, Christy K, Weaver J (2015) . The Health Belief Model as an explanatory framework in communication research: exploring parallel, serial, and moderated mediation. Health Commun. 30(6):566–576. doi: 10.1080 /10410236.2013.873363

Masoudiyekta L, Rezaei H, Dashtbozorgi B, Gheibizadeh M, Malehi AS, Moradi M (2018). Effect of education based on Health Belief Model on the behavior of breast cancer screening in women. Asia Pac J Oncol Nurs. 5(1):114–120. doi:10.4103 /apjon.apjon _36_17

Murti B (2018). Teori Promosi dan perilaku kesehatan. Karanganyar: Bintang Fajar Offset

Paul K, Panigrahi S, Soodi A, Sahu T (2017). Association of personal hygiene with common morbidities among upper primary school children in rural Odisha. J Family Med Prim. 6(3):509. https//doi: 10.4103 /2249-4863. 222039

Patterson NM, Bates BR, Chadwick AE, Nieto-Sanchez C, Grijalva MJ (2018). Using the health belief model to identify communication opportunities to prevent chagas disease in Southern Ecuador. PLOS ONE. 12(9): e000-6841. doi:10.1371/journal.pntd.0006-841.

Rah JH, Cronin AA, Badgaiyan B, Aguayo VM, Coates S, Ahmed S (2015). Household sanitation and personal hygiene practices are associated with child stunting in rural India: A cross-sectional analysis of surveys. BMJ. 5(2): e005180 –e005180. https// doi:10.1136/bmjopen-2014-005180

Sarwono S (2017). Sosiologi kesehatan beberapa konsep beserta aplikasinya. Yogyakarta: Gadjah Mada University Press

Shabibi P, Zavareh M, Sayehmiri K, Qorbani M, Safari O, Rastegarimehr B Mansourian M (2017). Effect of educational intervention based on the Health Belief Model on promoting self-care behaviors of type-2 diabetes patients. Electron Physician. 9(12): 5960–5968. doi:10.19082/5960

Shao C, Wang J, Liu J, Tian, F, Li, H (2018). Effect of a Health Belief Model-based education program on patients' belief, physical activity, and serum uric acid: A randomized controlled trial. Patient Prefer Adherence. 12: 1239–1245. doi:10.2147/PPA.S16-6523.

Situmorang LN, Andayani LS, Maaas, LT. (2017). Association between perceived seriousness, cues to action, and voluntary counseling and testing uptake

in men who have sex with men in Pematangsiantar, North Sumatera. J Health Promot Behav. 4(2): 121-125 https://doi:10.26911/thejhpb.2019.0-4.02.04

Stiefel L, Elbel B, Pflugh M, Aneja S, Schwartz AE (2017). School wellness programs: Magnitude and distribution in New York City. Public Schools J Sch Health. 87(1): 3–11. doi:10.1111-/josh.12463

Sulaeman S (2016). Pembelajaran model dan teori perilaku kesehatan konsep dan aplikasi. Surakarta: UNS Press

Taware S, Gawai P, Chatterjee A, Thakur H (2018). Outcome of school-based intervention program in promoting personal hygiene in primary school children of Mumbai, India. Int Q Community Health Educ. 39(1):31–38. https// doi: 10.1177/0272684X1-8809487

Umaroh AK, Hanggara HY, Choiri C (2016). Gambaran perilaku hidup bersih sehat di wilayah kerja Puskesmas Bulu Kabupaten Sukoharjo bulan Januari-Maret 2015. Farmasains. 9(1): 25. https//doi: 10.23917/ jurkes. v9i1. 3375

Zapka C, Leff J, Henley J, Tittl J, De Nardo E, Butler M, Edmonds S (2017). Comparison of standard culture-based method to culture-independent method for evaluation of hygiene effects on the hand microbiome. Bio. 8(2): e00093-17.doi:10.1128/mBio.00093-17.

Zeigheimat F, Ebadi A, Rahmati F, Ghadamgahi F (2016). An investigation into the effect of health belief model-based education on healthcare behaviors of nursing staff in controlling nosocomial infections. Health Promot Pract. 5: 23. doi:10.4103/2277-9531.-184549