

Effect Of Behavioral Changes Among Dental Health Volunteers On Community Empowerment In Community Dental Health Effort Program

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Abstract

Background: This study aims to analyze the effect of behavioral changes in dental health volunteers on community empowerment in the Community Dental Health Effort (UKGM) program.

Design and Methods: A quantitative approach with surveys was used, while data involving 242 respondents were collected using a questionnaire with a Likert scale on dental health. This is conducted in Semarang Regency with a random cluster sampling method from July 16 to August 18, 2021. The data obtained were then analyzed with SEM using the Lisrel 8.8 software.

Results: The results showed three exogenous variables found in this study, namely the threat perception consisting of the dimensions of perceived susceptibility and severity, as well as the perception of expectations including barriers and benefits of action, along with self-efficacy. Furthermore, the perception of cues to action was predicted to affect the personal hygiene behavior. An analysis was then carried out to obtain a fit model and all variables had a CFA > 1.96.

Conclusion: The threat perception variable which includes perceived susceptibility and severity, while the perception of expectations consisting of the dimensions of perceived barriers and benefits of action, self-efficacy, along with trigger variables affect the behavior to maintain personal hygiene of dental and oral health among dental health volunteers.

Keywords: dental health behavior, dental health volunteer, community empowerment .

Introduction

The most common dental and oral health problems in Indonesia are cases of dental cavities or caries with a prevalence of 88.8%. Damage to permanent teeth as indicated by the DMF-T (Decay Missing Filling-Teeth) index is approximately 7.1 consisting of D = 4.5, M = 2.5, F = 0.1, meaning that on average, each resident suffers damage up to 7.1 teeth (Kemenkes-RI, 2019). Personal hygiene behavior in dental and oral health including daily brushing of teeth showed a relatively high number, namely 94.7%, but the

percentage of the population who brush their teeth appropriately according to program recommendations, namely after breakfast and before going to bed at night only reached 2.8% (Kemenkes RI, 2018). These conditions indicate that people's behavior towards personal hygiene is still low. Behavior is one of the determinants of health, which influences the incidence of disease or positive aspects such as quality of life, life skills, or health expectations, as well as actions by individuals related to health. Meanwhile, lifestyle is a way of life, based on behavioral patterns that can

be identified by the interactions of individual personal characteristics, social interactions, as well as socio-economic and environmental conditions of life (Sulaeman, 2016) and (WHO, 1998).

Aside from the behavioral factors, the participation of all parties is also needed to improve the level of dental and oral health. The condition of community participation carried out by dental health volunteers is not optimal. A study by Pratiwi in 2004 in the Pasuruan area reported that 18.5% of dental health volunteers were not active in working and coaching. This study also found that promotion is one of the dimensions and indicators of health behavior possessed by dental health volunteers (Pratiwi, 2004).

Community participation is one of the main points in health promotion activities. The formulation obtained at the International Conference on Health Promotion in Ottawa on November 21, 1986, led to an agreement in the form of the Ottawa Charter, containing 6 main points of agreement, one of which is the need for efforts to strengthen community action (World Health Organization, 2009).

Empowerment can be seen from the individual, organizational, and community levels. Theories and models of health promotion at the individual level include the Health Belief Model (Zimmerman, 2000). According to Glanz, HBM contains several key concepts that predict why people take action to prevent, screen, or control disease conditions, these include susceptibility, seriousness, benefits, and barriers to behavior, triggers for action, and most recently, self-efficacy (Glanz et al., 2008; Rosenstock, 1960).

The model of community empowerment in the health sector in Indonesia is applied through UKBM (Community Based Health Efforts). One form of UKBM is UKGM (Community Dental Health Efforts), an educational approach that aims to increase the ability and participation of the community in maintaining dental health by integrating promotive and preventive efforts based on an approach known globally as the Primary Oral Health Care Approach (Kemenkes RI, 2012).

A preliminary study in Semarang Regency on 14 dental health volunteers who had received UKGM training on dental health found that 4 people or 28% do not brush their teeth regularly before going to bed, while 12

people or 85% do not regularly undergo dental check-ups nor participate in tartar cleaning in the last six months.

Dental health volunteers are expected to effectively act as innovators for their groups, play a leading role, and have a sufficient basis for positive health behavior. Furthermore, as agents of change, they are also expected to have a higher level of behavioral adoption than other social groups. Natural volunteers take a proper approach to wellness programs (Bergstrom, 1982). These complex adaptive systems consist of several agents that dynamically interact in fluctuating and combinative ways, following local rules to maximize their abilities while also influencing other individual consistency (Caroline et al., 2002; Perrouin et al., 2012; Donald I Warren, 1981).

In an innovation, an agent is often referred to as a professional assistant for the clients, hence, to increase trust, there is a need to show the success that an innovator has made. Repetto, a vasectomy surveyor in India found that to apply the success of a vasectomy, a surveyor must also be able to show the success experienced. (Phillips & Pittman, 2009; Repetto, 1968)

Furthermore, a preliminary study on dental health volunteers in Semarang Regency showed that there are still problems in personal hygiene behavior that need attention. As an agent of change, dental health volunteers are expected to have a better basis for self-care behavior to set an example for the community in the region. Based on the background above, health promotion and empowerment in the UKGM program have not been running optimally. Therefore, this study aims to examine the factors that influence changes in personal hygiene behavior in dental and oral health. The results are expected to form a model of health promotion and empowerment in the Community Dental Health Efforts (UKGM) program in Semarang Regency.

Design and Methods

Population and Sample

The population in this study includes 1,401 dental health volunteers in Semarang district spread across 141 UKGM villages. The cluster random sampling method was used with a sample frame of 242.

Study dimensions, variables, and operational definitions of variables

This study consisted of 3 exogenous variables, namely the threat perception, which includes the dimensions of perceived susceptibility and

severity, the perception of expectations consisting of the benefits of action, barriers to activity, self-efficacy, as well as action trigger variables. Meanwhile, the endogenous variable was one, namely the behavior towards personal hygiene of dental and oral health. A complete description of the variable limits is described in table 1:

Table.1. Independent Variables of the influence of behavioral change factors for self-care of dental health volunteers in preventing dental and oral diseases

NO	Variable/ Dimension	Operational Definition
1	Threat perception:	
a	Perceived susceptibility	A condition that is felt by a person that can make it easy to get dental and oral diseases a. Subjects who are easily affected by dental and oral diseases b. Conditions of the teeth and periodontal tissues that are susceptible to dental caries and periodontitis
b	Perceived severity	The assessment subjective assessment of the severity of dental and oral disease. a. possible complications of other diseases and death. b. possibility of disruption of daily activities c. possible loss of opportunity to occupy certain jobs/profession
2	Expectations perception:	
a	Perceived benefits of action	A condition that the respondent wants for the benefits obtained from carrying out personal hygiene a. benefits of taking care of oneself by increasing (specific protection) b. benefits to carry out an early examination (diagnosis and from treatment)
B	Perceived barriers to action	Are possible barriers that occur as a result of performing personal hygiene a. Financing b. Side effects c. Conditions accepted by the community d. Feelings experienced e. Time required
C	Perceived self-efficacy	The growing self-confidence after performing personal hygiene a. emergence of self-confidence to be insusceptible to attack because of dental disease prevention b. emergence of confidence in the association
3	Cues to Action	The existence of aspects that provide encouragement, both from oneself, and those closest to them to carry out personal hygiene a. from myself

		b. friends, social workers c. close family d. health workers.
4	Behavior to maintain personal hygiene dental and oral health	A behavior carried out by a dental health volunteer on how to maintain personal hygiene to prevent dental and oral diseases including three dimensions of knowledge, attitude, and action.

Reference : limitations made by researchers based on literature review

Study types and approaches

This was a quantitative analytic study with a cross-sectional approach, the data collection was carried out using a survey method.

Study instrument, validity and reliability test

Data collection was carried out using a questionnaire on perceptions of threats, expectations, and cues to action, as well as behavior towards maintaining personal hygiene. The equipment used includes questionnaire sheets, stationery, data recap sheets and the Likert Summated Rating (LSR) (Nazir, 2013). Before the instrument was used, the validity and reliability were tested with expert judgment, then the results are analyzed with the Aiken V Index, when the value is higher than 0.8, it is confirmed to be very valid (Lewis R. Aiken, 1985). The reliability test was analyzed using the Interclass Correlation Coefficient (ICC) (Mardapi, 2012; Shrout.PE & Fleiss.JL, n.d., 2011). Subsequently, to prove whether the questions used in the instrument are social indicators to identify latent variables, the Confirmatory Factor Analysis (CFA) test was carried out. The results showed that all indicators of the questions used were selected from variables or candidate factors that met all of the requirements in the acceptance level namely a

loading factor > 0.5. Data analysis was carried out to determine the effect of exogenous variables on the endogenous using Structural Equation Modeling (SEM) with Lisrel 8.8. (Haryono, 2016; Hendryadi & Suryani, 2014)

Result

Univariate data for exogenous and endogenous variables

That there are 3 exogenous variables with indicator achievements with a good category above 70%, namely the perception of vulnerability on indicators (X1.2), perceptions of benefits of action on indicators (X3.1), perceptions of barriers to action on indicators (X4.1), and perception of self-efficacy (X5.1). For the other 2 exogenous variables, the achievement in the good category is relatively lower below 60%, namely the severity perception variable on the indicator (X2.1) and the cues to action variable on the indicator (X5.1). In the endogenous variable for the self-maintaining behavior variable on the knowledge dimension (Y1.1) the achievement is lower in the medium category (35.1 %). For the condition of the attitude dimension (Y1.2) the achievement is relatively higher, namely in the good category (59.1 %), as shown in table 2:

Table 2. State of the data univariate exogenous and endogenous variables

Variabel	Sangatbaik		Baik		Sedang		Kurangbaik		Sangatkurang		TOTAL	
	f	%	f	%	f	%	f	%	f	%	f	%
Perceived susceptibility												
X1.1	15	6.2	157	64.9	65	26.9	5	2.1	0	0.0	242	100
X1.2	17	7.0	186	76.9	39	16.1	0	0.0	0	0.0	242	100
Perceived Severity												
X2.1	52	21.5	134	55.4	49	20.2	7	2.9	0	0.0	242	100
X2.2	116	47.9	116	47.9	7	2.9	3	1.2	0	0.0	242	100
X2.3	78	32.2	121	50.0	35	14.5	7	2.9	1	0.4	242	100
Benefits to Action												
X3.1	7	2.9	179	74.0	56	23.1	0	0.0	0	0.0	242	100

X3.2	82	33.9	152	62.8	6	2.5	1	0.4	1	0.4	242	100
Barriers to Action												
X4.1	44	18.2	174	71.9	24	9.9	0	0.0	0	0.0	242	100
X4.2	29	12.0	172	71.1	17	7.0	19	7.9	5	2.1	242	100
X4.3	52	21.5	162	66.9	16	6.6	11	4.5	1	0.4	242	100
X4.4	105	43.4	127	52.5	9	3.7	0	0.0	1	0.4	242	100
Y4.5	47	19.4	159	65.7	36	14.9	0	0.0	0	0.0	242	100
Self-efficacy												
X5.1	38	15.7	174	71.9	29	12.0	1	0.4	0	0.0	242	100
X5.2	55	22.7	148	61.2	38	15.7	1	0.4	0	0.0	242	100
Cues to action												
X6.1	47	19.4	125	51.7	66	27.3	3	1.2	1	0.4	242	100
X6.2	8	3.3	88	36.4	71	29.3	46	19.0	29	12.0	242	100
X6.3	9	3.7	60	24.8	98	40.5	55	22.7	20	8.3	242	100
X6.4	5	2.1	66	27.3	84	34.7	65	26.9	22	9.1	242	100
Behavior to maintain personal hygiene												
Y1.1	18	7.4	56	23.1	85	35.1	64	26.4	19	7.9	242	100
Y1.2	32	13.2	143	59.1	67	27.7	0	0.0	0	0.0	242	100
Y1.3	5	2.1	68	28.1	133	55.0	35	14.5	1	0.4	242	100

The results of the validity and reliability of the instrument

A Confirmatory Factor Analysis (CFA) was initially carried out to determine whether or

not indicators are valid to form the dimensions for creating the variables. The results from several indicators, dimensions, and variables were obtained as shown in table 3:

Table.3. CFA Test Results for Indicators as a form of the dimension on Exogenous and Endogenous variables

No	Variable/dimension	Indicator	Loading factor	Interpretation
1	Threat perception variable:			
a	Dimension of Perceived susceptibility	X1.1	0.5	Valid
		X1.2	0.4	Invalid
b	Dimensions of Perceived Severity	X2.1	0.67	Valid
		X2.2	0.4	Invalid
		X2.3	0.6	Valid
2	Expected perception variable:			
a	Dimension of Benefits to Action	X3.1	0.12	Invalid
		X3.2	0.7	Valid
b	Dimension of barriers to Action	X4.1	0.7	Valid
		X4.2	0.4	Invalid
		X4.3	0.5	Valid
		X4.4	0.8	Valid
		X4.5	0.3	Invalid
c	Dimension of self-efficacy	X5.1	0.6	Valid
		Y5.2	0.6	Valid
3	Cues to action	X6.1	1.8	Valid
		X6.2	0.8	Valid
		X6.3	0.7	Valid
		X6.4	0.8	Valid
4	Behavior to maintain personal hygiene dental and oral health :			Invalid

Knowledge Dimension	Y1.1	0.3	Invalid
Attitude Dimension	Y1.2	0.5	Valid
Action Dimension	Y1.3	0.5	Valid

Reference: SEM analysis output results with Lisrel 8.8.

Table 3 shows that the indicator which formed an invalid dimension has a loading factor < 0.5, hence, the perceived susceptibility dimension had one indicator (X1.2), the perceived severity had one indicator (X2.2), the perceived benefit of action with one indicator (X3.1), perceived barriers to action had two indicators (X4.2, Y4.5), and behavioral variables on the knowledge dimension (Y1.1). All the invalid indicators were discarded and not included in the study instrument.

Dimensional accuracy test results as forming variables

Two variables had dimensions, namely the threat perception with two sizes namely perceived susceptibility and severity, as well as the expectation perception variable with three dimensions including benefits and barriers to action, along with self-efficacy. To determine the accuracy of the dimensions, a CFA test was also carried out and the results are shown in (Table 4).

Table.4. CFA test results for dimensions as forming variables on the Exogenous variable of threat and expectation perceptions

Num	Variable	Dimension	Loading factor	Interpretation
1	Threat perception variable:	Susceptibility perception	1.0	Valid
		Severity perception	1.0	Valid
2	Expectancy perception variable:	Benefits of action	1.0	Valid
		Barriers to Action	1.0	Valid
		Self-efficacy	0.9	Valid

Reference: SEM analysis output results with Lisrel 8.8 program

Table 4 shows that the threat and expectation perception variables had a loading factor value > 0.5 hence, all dimensions on both variables were declared valid.

This was carried out to ensure that the SEM analysis has specifications that are already-fit (Fit model), the processing results by Lisrel 8.8 is shown in table 5 below:

Model fit test results (Goodness of fit).

Tabel.5. Result of Structural Equation Modelling (SEM) analysis

Goodness of fit index	Cut -off Value	Result	
X ² -Chi square (df=92. p=0.05)	≤ 115.39	102.19	Fit
df	≥ 0	92	Fit
GFI	≥ 0.90	0.94	Fit
AGFI	≥ 0.90	0.92	Fit
CFI	≥ 0.90	0.99	Fit
TLI/NNFI	≥ 0.90	0.99	Fit
NFI	≥ 0.90	0.94	Fit
IFI	≥ 0.90	0.99	Fit
RMSEA	≤ 0.08	0.021	Fit
RMR	≤ 0.05	0.037	Fit

Reference: SEM analysis output results with Lisrel 8.8.

Based on the results, the ten indicators used all indicated that the model is fit (Goodness of fit).

Effect of exogenous variables on the endogenous

Furthermore, the study hypothesis was tested by conducting SEM analysis, the tests were carried out on three proposed theories, including the effect of the cues to action

variable (Y6), threat perception, and perception of expectations on self-care behavior in the prevention of dental and oral disease. The hypothesis test results from the effect of exogenous variables on the endogenous are shown in table 6:

Table.6. Test results on the direct effect of exogenous variables on the endogenous

Number	Exogenous variable	Endogenous variable	CR (critical ratio).	Interpretation
1	Perception of threat	The behavior to maintain personal hygiene dental and oral health	2.53	accepted
2	Perception of expectation		1.97	accepted
3	Perception of Cues to action		2.08	accepted

Reference: SEM analysis output results with Lisrel 8.8.

Table 6 shows that the hypothesis testing used the t-value with a significance level of 0.05. When the t-value is 1.96 or the probability value (P) is 0.05, then H0 is rejected and the study hypothesis is accepted.

The influence of the threat perception variable on personal hygiene behavior

The threat perception variable, had a t-value of 2.53 which is > 1.96 , hence, the hypothesis was accepted, meaning that threat perception influences the behavior to maintain personal hygiene among dental health volunteers. This is supported and shaped by the presence of two dimensions, namely the perceived susceptibility and severity. The results showed that the perception of a person's susceptibility affected changes in the behavior of dental health volunteers in carrying out personal hygiene in the dimensions of attitudes and actions. The higher the assessment of one's exposure, the better the attitude. Meanwhile, the lower the perception of one's susceptibility, the lower the perspective. Most of the respondents are optimistic about brushing their teeth before going to bed at night. They also have a positive attitude to avoid/reduce the types of sweet and sticky foods, which are the dominant substrates that facilitate the formation of acid conditions in the oral cavity.

Furthermore, there is a positive susceptibility dimension which correlates with the realization of the action taken by the respondent. The positive impact carried out by the respondents was in terms of brushing their teeth regularly after breakfast with the correct technique. In this case, a person's perception of the teeth being susceptible to caries attacks will facilitate positive personal hygiene.

There is a correlation between the perceived susceptibility and behavior, this is consistent with a previous study by Chen and Land, which stated that a reciprocal causal relationship exists between health beliefs and preventive dental visits. Higher perceived susceptibility levels in an individual increase their likelihood of having a dental examination, but the act of visiting the dentist led to a decrease in the level of perceived susceptibility. Without regular dental check-ups, individuals become unsure about their teeth health status and feel vulnerable to dental problems. In contrast, by visiting the dentist regularly, an individual learns about the teeth health status, the confidence towards dental condition increases, and feels less susceptible to dental disease (M. Chen & Land, 2013; M.-S. Chen & Land, 1986).

The results showed that perceived severity influenced personal hygiene behavior in oral health on the dimensions of attitudes

and actions. Dental and oral disease lead to absenteeism from work, and being unable to partake in certain occupational professions, such as the TNI (Indonesian National Army) and POLRI (Indonesian Republic Police). This perception of severity makes the respondent feel the essentiality of preventing dental and oral disease. The majority of respondents already have a positive perception of the damage or occurrence of dental disease as something painful and needs to be prevented. Therefore, the respondents' perceptions of severity are related to indicators of work disturbances and lost job opportunities. These results were obtained following a quantitative analysis on the dominant aspects related to the behavior of self-care by dental health volunteers.

According to Rosenstock, the influence of perceived severity about contracting a disease or leaving it untreated, include evaluation of medical and clinical consequences, for example, death, disability, and pain as well as possible social consequences such as the effects of the condition on work, family life, and social relationships. The combination of susceptibility and severity is known as a perceived threat (Rosenstock, 1960).

The influence of the expectation perception variable on personal hygiene behavior

The expectation perception variable (Y55), had a t-value of 1.97 which is > 1.96 , hence, the hypothesis was accepted, indicating that the expectation perception influences the behavior to maintain personal hygiene among dental health volunteers. The variable was formed by three dimensions, namely perceived benefits and barriers to action, as well as self-efficacy. The benefits felt by dental health volunteers after taking appropriate dental and oral health care lead to a positive attitude change which then facilitates future actions. There is an optimistic assumption that respondents feel dental care is helpful, followed by a condition in the positive attitude dimension. The existence of a positive assessment as a valuable effort in carrying out personal hygiene such as the importance of brushing teeth is highly correlated with attitude indicators in the aspect of proper brushing.

In terms of action dimensions, the perceived benefits of performing personal hygiene by someone with an optimistic assumption will be reflected in action. However, conditions that occur in the behavioral variable of the action dimension cannot be maximized despite the correlation with perceived benefits. The condition of respondents in the category of very often is still not optimal. The results showed that the perception of benefits in performing personal hygiene correlated with the behavioral dimension of brushing the teeth using the correct technique with the tip of the brush bristles being directed to the gums while turning towards the chewing surface. Another aspect of action that is relatively better is the behavior of brushing after every breakfast.

The correlation between the benefits of action with all behavioral dimensions including attitudes and actions shows that people tend to carry out the prevention aspect when they are aware of the great benefits. This is in line with the theory presented by Rosenstock, which stated that a person's behavior depends on how useful they believe in various alternatives. An option might be seen as beneficial when it relates subjectively to reducing a person's susceptibility to disease. Moreover, a person's beliefs about the availability and effectiveness of various alternatives determine the action to be taken and not objective facts about the efficacy of efforts (Rosenstock, 1960).

The theory also shows that the benefits of the actions taken by a person are closely related to their susceptibility, where positive benefits tend to make the person behave to reduce exposure. The results prove that when a person has the right perception towards preventing dental and oral diseases through personal hygiene, such individual will continue to take preventive measures to reduce vulnerabilities that might arise due to teeth susceptible to caries attacks. This also includes the aspect of tooth tissue structure due to the lack of calcium and fluoride, as well as suppressing the susceptibility of specific target groups.

The perceived benefits of action influenced all dimensions of personal hygiene behavior including knowledge, attitude, and action. The results showed that there was a positive and significant relationship between maternal behavior on dental health and oral

health with perceived benefits and self-efficacy (Gharlipour et al., 2016; Vaezipour et al., 2018).

Moreover, the perceived barriers to action affected personal hygiene behavior in the field of dental and oral health. The indicator that plays a role in this study is the obstacle in whether there is a sense of comfort when carrying out personal hygiene. The results showed that the more a person perceives no significant barriers, the more positive the person behaves, and vice versa.

The influence of perceived barriers on personal hygiene proves that an aspect of obstacles is the inability to carry out the behavior. As stated by Rosenstock (1960), the potentially negative part of specific health actions is the perceived obstacle that can limit the practice of the recommended behavior. In the cost-benefit analysis where individuals weigh the expected benefits of the action against the perceived barriers, there is a possibility that the financing aspect can help, but it might be expensive, have adverse side effects, be unpleasant, uncomfortable, or time-consuming (Rosenstock, 1960). These results support previous studies which applied the HBM theory, stating that those with higher perceived barriers tend to disobey better behaviors (Alsulaiman and Rentner, 2021).

In this study, the obstacle in question is whether there is a sense of comfort in making personal hygiene efforts. Based on the results, there was no obstacle in carrying out individual hygiene. The more a person feels uncomfortable, the greater the barrier. The perceived barrier to action factor, which showed the lowest obstacle, was the feeling of comfort in maintaining personal hygiene. It was accompanied by other factors that contributed to strengthening the performance of personal hygiene, namely the originator of the action, the role of dental health volunteers, and self-efficacy.

Regarding the influence of self-efficacy on behavior in the dimension of attitude, the results showed that attitude strongly supports a person's self-confidence, the higher the self-confidence, the higher the perspective. In the field of dental health, self-confidence is expressed in a feeling of being free of caries after carrying out self-maintenance. This condition is also in line with the attitude in terms of being optimistic about the right time to brush the teeth. Another

positive attitude that exists is the reduction of sweet and sticky foods such as bread and biscuits even with regular brushing of the teeth.

The influence of self-efficacy in performing personal hygiene on the action dimension shows that the presence of sufficient self-confidence is reflected in the action. In this study, there was a reasonably good perception that taking care of dental health makes the teeth not susceptible to caries. This condition was then supported and followed up by behavioral needs in the dimensions of taking action. Self-confidence about the importance of personal hygiene maintenance is demonstrated in the form of concrete activities such as brushing teeth using the proper technique, with the tip of the brush bristles directed to the gums while turning towards the chewing surface. Additionally, there were other dominant actions regarding consuming spinach, katuk leaves, and Moringa leaves containing fluoride, which can strengthen the tooth layer.

The influence of one's self-efficacy is also inseparable from the threat perception factors namely susceptibility and severity. Conditions that are susceptible to dental and oral diseases prompt a person to take action. The feeling of self-confidence supports this condition as prevention efforts were taken to carry out personal hygiene. The World Health Organization (WHO) explained that for behavior change to be successful, people must feel threatened by their current patterns including perceived susceptibility and severity as well as believe that a particular type of change will produce valuable outcomes at an acceptable cost with good benefits (Bandura, 2010). They must also feel competent (self-efficacy) to overcome perceived barriers to taking action. Furthermore, the results are consistent with a previous study which showed that there was a positive and significant relationship between maternal behavior towards dental and oral health with perceived benefits and self-efficacy (Bandura, 2010; Gharlipour et al., 2016).

The influence of the cues to action variable on personal hygiene behavior

The cues to action variable (X4), had a T-value of 2.08 which is > 1.96 , hence, the hypothesis was accepted, meaning that the cues to action variable influenced the behavior

to maintain personal hygiene among dental health volunteers. This variable which originates from several aspects such as oneself, volunteer friends, close family, and health workers can make a cadre perform more optimal self-care behavior. Based on the results, 4 indicators act as the cues to action, but volunteer friends play the most dominant role followed by health workers, close family, and oneself, respectively. This indicates that the role of other volunteer friends for behavior is highly expected. Aspects that are expected to be triggered by fellow health volunteers, include reminding cadre friends to constantly maintain dental health to avoid teeth ache, and regularly performing tartar tooth cleaning.

The results are in line with a previous study which stated that the cues to action is a concept than can trigger reactions. It is thought that readiness to take action including perceived susceptibility and perceived benefits can only be strengthened by other factors, particularly by cues to actions, such as bodily or environmental events which include media publications. However, the role of cues was not studied empirically nor systematically although the concept as trigger mechanisms is interesting, this is because triggers are difficult to study in explanatory surveys. The cues can be a fleeting sneeze or a barely perceptible poster perception (Hochbaum, 1958).

In general, the results obtained in this study are not consistent with the construction of the HBM theory, which was reconstructed in 1988 by Rosenstock, Streaker, and Bekecker. In the revision, HBM is constructed in: (a) Background, which is a socio-demographic factor such as education, age, gender, ethnicity, ethnicity; (b) Perception, including (i) threat, namely perceived susceptibility or receiving a diagnosis, and perceived severity of health and illness; (ii) Expectations including perceived benefits and barriers to action, as well as perceived self-efficacy for action; (c) Cues to action, such as the media, personal influence along with a reminder, and (d) Behavior to reduce threat based on expectation (Becker, 1974) (Irwin et al., 1994; Sulaeman, 2016).

In this study, individual background variables were not proven to affect changes in a person's behavior. Meanwhile, variables that affect behavior include perception, which consists of (i) threat, namely perceived susceptibility or receiving a diagnosis, and

severity of health or illness; (ii) Expectations including perceived benefits and barriers to action, along with self-efficacy, and (c) cues to action. Therefore, the HBM theory reconstructed by Rosenstock is not always applicable to all health problems.

There is no conformity between the results of this study and the reconstructed HBM theory presented by Rosenstock, where individual background variables do not affect the occurrence of the behavior, it is possible that the scope of previous studies is about the condition of health behavior in general. In contrast, this study focused on behavior that is more specific in the field of dental health, and the target dimension is dental health volunteers. These individuals are personally drawn from the community and are trained in dental health, hence, their unique background no longer significantly influences behavior change. This is possibly caused by homogeneous conditions of individual background. When a community group is homogeneous, the individual background variables no longer play a role in behavior change. Other variables that significantly influence behavior change in applying HBM theory, are threat and expectation perception, as well as the trigger for action. Furthermore, observations on the endogenous variables and behavior show that there are still numerous respondents who do not brush their teeth regularly before going to bed at night, do not carry out routine checks every six months, only go for dental check-ups when their teeth hurt.

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Conflict of Interest: The authors declare that they do not have any conflict of interest with the scope of this study material.

Availability of data and materials: All data generated or analyzed during this study are included in this published article.

Ethics approval and consent to participate: This study followed ethical standards supported by the certificate of ethical standard issued by the health research ethics committee of the Health Research Polytechnic, Ministry of Health Semarang with the No. 315/EA/KEPK/2021 21 JULI 2021. All respondents in this study expressed their willingness to participate by filling out the consent form.

Patient consent for publication: This is a social and not a clinical study, hence, it is not related to clinical patients.

Informed consent: The manuscript does not contain personal data in any form.

Significance for public health

Health volunteers have a significant role in helping dental health professionals in Indonesia, but these roles have not been optimal for a long time. To be an example and at the same time a motivator for the surrounding community, dental health volunteers need to show more abilities and positive behavior in maintaining personal hygiene in the field of oral health. This study is expected to provide more insight into the factors that affect the behavior of dental health volunteers in maintaining personal hygiene in the field of dental and oral health.

Conclusion

The perception about the threat of dental and oral disease comes from the existence of two-dimensional support, namely perceived susceptibility and severity. The awareness that dental and oral disease has a high level of susceptibility, supported by the perceived severity improves behavioral changes. Meanwhile, the perception of expectations to maintain personal hygiene in the field of

dental health is formed by three dimensions, namely benefits and barriers to action, as well as self-efficacy. Based on the results, there are no obstacles in making efforts to maintain personal hygiene due to the perceived benefits and high self-confidence, which then lead to positive changes in attitudes and actions. These two variables are further strengthened by cues to action that plays a role in providing support that comes from oneself, fellow dental health volunteers, family, and health workers.

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