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## The Role of Behavioral Planning Interventions in Maintaining Dental and Oral Health Behavior among Students in Yogyakarta, Indonesia

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### ABSTRACT

Various efforts and methods have been developed to increase individual awareness of maintaining oral health. Behavioral planning interventions differ from interventions or counseling, which generally only prioritize aspects of knowledge. The theory of planned behavior states that a behavior is not necessarily born from mere knowledge; there are contributions of other factors, such as the role of peer groups and beliefs, which play a role in triggering a behavior. This study aimed to evaluate the role of behavioral planning interventions in maintaining oral health behavior in adolescents. This study is a quasi-experimental study with a pre and post-test design approach. The research was conducted on new students at Universitas Muhammadiyah Yogyakarta, Indonesia. The inclusion criteria for participants were new students (less than six months studying in college), 18 years old, and willing to participate. Participants filled out the initial questionnaire as a pre-test to assess aspects of knowledge related to dental health. Then the subjects were given behavioral planning interventions by creating a group community using social media for all research subjects. The intervention process was carried out for three months. A post-test evaluation was conducted to assess the success of the intervention. Data analysis was carried out using the SPSS version 25 program. The results of this study indicate an improvement in scores related to personal attitude, subjective norms, perceived behavioral control, and behavior to maintain dental and oral health after conducting behavioral planning interventions ( $p < 0.05$ ). In conclusion, behavioral planning interventions help improve individual behavior in maintaining oral health in adolescents.

### 1. Introduction

Dental and oral health is an essential aspect of health.<sup>1</sup> The teeth and mouth are the first gates and the initial digestive organs of food that will enter the body.<sup>2</sup> It could be feared that severe problems could be caused by imperfect mechanical digestion in the oral cavity by the teeth.<sup>3,4</sup> Failure of mechanical digestion by the teeth causes difficulties for the stomach and intestine organs in further digestion of food, triggering a series of digestive disorders in the stomach and intestines.<sup>4</sup> A more severe impact of the digestive process that is less than optimal in the oral cavity

disrupts the process of absorbing nutrients into the body, which in turn will disrupt the metabolic processes of cells and various organs of the body. Other health problems that can arise as a result of not being good at maintaining dental and oral health is the potential for tooth decay followed by an infection that spreads to the systemic circulatory system, which causes infection of other organs of the body, such as the potential for infection of the heart organ due to infection in the teeth.<sup>5</sup> Several studies show that dental and oral health problems are still global health problems.<sup>6-8</sup> The incidence of dental and oral health

problems is experienced by around 56.7% of people in Indonesia.<sup>9,10</sup> This fact, of course, must be a joint vigilance from various parties to increase awareness of the importance of maintaining healthy teeth and mouth.

Various efforts and methods have been developed to increase individual awareness of maintaining oral health.<sup>11,12</sup> Campaign efforts ranging from print media, electronic media, and social media have been attempted to raise awareness of the importance of maintaining oral health. However, these various efforts are challenging. These various efforts are still not effective in the Indonesian community, as evidenced by a high incidence of dental and oral disorders in Indonesia.<sup>9</sup> This condition requires innovative counseling methods or interventions that are more optimal in increasing awareness of dental and oral health.

A youth generation is a group of people who need awareness efforts on the importance of maintaining oral health; where this generation has the largest population in Indonesia, in line with Indonesia's demographic bonus. In addition, the younger generation is still very vulnerable to hoax news and pressure from their peer groups in responding to various things in their life. Behavioral intervention by adopting the theory of planned behavior is an opportunity to develop.<sup>13,14</sup> Behavioral planning interventions differ from interventions or counseling, which generally only prioritize aspects of knowledge. The theory of planned behavior states that a behavior is not necessarily born from mere knowledge; there are contributions of other factors, such as the role of peer groups and beliefs, which play a role in triggering a behavior.<sup>15</sup> This study aimed to evaluate the role of behavioral planning interventions in maintaining oral health behavior in adolescents.

## 2. Methods

This study is a quasi-experimental study with a pre and post-test design approach. The research was conducted on new students at Universitas Muhammadiyah Yogyakarta, Indonesia. The inclusion

criteria for participants were new students (less than six months studying in college), 18 years old, and willing to participate. Before participating in this research, the students received informed consent, and they were told that they could leave the study anytime. A total of 61 students participated in this study. This study has received ethical approval from the research ethics committee, Faculty of Medicine and Health Sciences, Universitas Muhammadiyah Yogyakarta, Indonesia. (Ref. number: 601/EP-FKIK-UMY/IX/2022).

The participants were given an initial questionnaire as a pre-test to assess aspects of knowledge on how to maintain dental and oral health, assess the role of peer groups and beliefs that related to oral and dental health, and assess behavior in maintaining dental and oral health. Then the subjects were given behavioral planning interventions by creating a group community using social media. Furthermore, various information was given on how to maintain proper dental and oral health; then, each participant was asked to make plans and actions to be taken to maintain dental and oral health. Each group member provides comments and responses to the plans and actions of another group member. The intervention process was carried out for three months. Then, the participants were given a post-test evaluation to assess the success of the intervention. The pre-test and post-test scores were evaluated; the higher the score, the better the result. Data analysis was carried out using SPSS for Windows version 25. Univariate analysis was performed to present the data distribution descriptively. Bivariate analysis using the dependent T-test was conducted to find the difference in the mean score between the pre-test and post-test, with a p-value <0.05.

## 3. Results and Discussion

In this study, most of the participants are female (55.7%) and live in urban areas (68.9%) (Table 1). Table 2 shows the effect of behavioral planning interventions on personal attitude variables, subjective norms, perceived behavioral control, and

behavior to maintain oral health. Personal attitude includes aspects of knowledge and the subject's attitude toward maintaining oral health. This study indicates an improvement in scores related to personal attitude after the behavioral planning intervention. Subjective norms include aspects of the peer-group role in the construction of behavior to maintain oral health. The results of this study indicate that behavioral planning interventions help improve scores related to subjective norms. Perceived behavioral

control includes aspects of the subject's belief in various matters related to the importance of maintaining oral health. The results of this study indicate that behavioral planning interventions help improve scores related to perceived behavioral control. This study's results also clearly indicated an improvement in the behavior score for maintaining oral health after the behavioral planning intervention was carried out.

Table 1. Characteristics of participants.

Characteristics	Frequency (%)
Gender	
Male	27 (44.3)
Female	34 (55.7)
Domicile	
Urban area	42 (68.9)
Rural area	19 (31.1)

Table 2. Effects of behavioral planning intervention on various test variables.

Variables	Pre-test score Mean±SD	Post-test score Mean±SD	p-value*
Personal attitude	43.2±2.5	47.5±2.3	0.001
Subjective norm	13.6±1.1	39.8±1.8	0.001
Perceived behavioral control	14.8±1.2	34.6±2.1	0,001
Maintaining oral health behavior	25.6±1.4	44.5±3.9	0,001

\*Dependent T-test, p<0.05.

The theory of planned behavior is a theory that underlies the development of behavioral planning interventions.<sup>15</sup> This theory emphasizes three elements that play a role in behavior formation. The personal attitude, consisting of the subject's knowledge and attitude towards efforts to maintain oral health, is one of the three constituent elements of behavior.<sup>16,17</sup> Several studies show that good knowledge about oral health is only sometimes in line with behavior to promote dental and oral health.<sup>7,8</sup> An individual sometimes knows that he needs to have his teeth checked at least twice a year by the dentist to ensure his teeth are in healthy condition. However, several factors influence a person to refrain from routinely having a dental health checkup at the dentist.<sup>7,18</sup> Subjective norms are other behavioral constituents believed to play a significant role in developing behavior. The existence of a peer group can

be an inspiration; for example, peer motivation encourages adolescents to form a behavior. The existence of a peer group that posts visits to the dentist on social media is believed to provide inspiration, motivation, or pressure for individuals who witness it, especially individual friends or the individual's family, to do the same thing, which in turn can have a positive impact in shaping behavior.

The two factors that make up this behavior need to be supported by the third behavioral aspect, perceived behavioral control, namely the belief in an individual about something. An individual sometimes has confidence in himself for something.<sup>19</sup> As an illustration, an individual believes it is essential to maintain healthy teeth and mouth, but they need the help of a dentist or the community. Sometimes some individuals have other beliefs; for example, they believe it is better to look after and care for teeth using

charcoal because it is an inheritance recipe that their ancestors have proven.<sup>20</sup> Of course, efforts are needed to improve or reorient the individual's beliefs. No matter how great the other two factors are improved, the third factor, namely perceived behavior control, needs to be oriented; it will undoubtedly cause less than optimal behavior.

Behavioral planning interventions that seek to build the three fundamental factors that make up the behavior have shown promising results in improving the behavior of the intervention subjects. Interventions that seek to build a community (peer group) where each community member can interact with each other, ask questions, share experiences, provide solutions, and are supported by facilitators who are experts in the field of dental and oral health can build an optimal intervention system.<sup>17</sup> The facilitator (dentist) can provide popular information to build knowledge and attitudes. On the other hand, the facilitator can provide scientific information by referring to the results of scientific studies to improve beliefs that may need to be straightened out and reoriented. The results of this study indicate that behavioral planning intervention can improve the behavior of maintaining oral health for research subjects by strengthening the aspects of personal attitude, subjective norms, and perceived behavioral control.

#### 4. Conclusion

Behavioral planning interventions help improve individual behavior in maintaining oral health in adolescents.

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