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Identification of Adolescent Behavioral Tendencies After Utilization of Health Promotion Applications About Pre-Pregnancy Care Based on the Health Belief Model Framework

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ABSTRACT

Background: Increasing knowledge and attitudes towards pregnancy preparation is one of the earliest possible efforts to produce a healthy pregnancy. This study aims to identify behavioral tendencies regarding pregnancy preparation in adolescents by applying the Health Belief Model.

Methods: A total of 300 adolescents in Metro City participated in an experimental study on the use of health promotion application media. Identification of behavioral tendencies regarding pregnancy preparation is explained using hierarchical regression on knowledge, attitudes, peers, access to information, and perception constructs in the Health Belief Model.

Results: Benefits ← friends (R=0.016, ρ=0.026), obstacles ← friends (R=0.106, ρ=0.001), barriers ← knowledge (R=0.016, ρ=0.045), motivation ← benefits (R=0.286, ρ =0.001), motivation ← obstacles (R=0.286, ρ=0.007), attitude ← knowledge (R=0.088, ρ=0.001), behavior ← attitude (R=0.160, ρ=0.005), behavior ← motivation (R=0.160 , ρ=0.001), behavior ← access (R=0.160, ρ=0.009).

Conclusion: Identification of behavioral tendencies that are influenced by peers, access to media, and the HBM constructs in this study can be a basis for midwives for health promotion interventions. In addition, the use of digital media is a wise choice to start early pre-pregnancy preparation for teenagers.

Keywords: *Adolescents, Behavior, Preparation for pre-pregnancy*

BACKGROUND

Preparation for pregnancy is an important agenda in a series of pregnancy planning in the reproductive age range. The current situation is that 90.2% of women do not have a reproductive health plan (Chivers et al., 2020). This phenomenon is supported by the high rate of unwanted pregnancies ending in abortions reaching 61% in 2015-2019 (Guttmacher Institute, 2022). In Indonesia, unplanned reproductive health is illustrated by high fertility at an early age. In 2017 the fertility rate at the age of 15-19 years reached 48 births per 1000 births (Kemenkes RI, 2017). This condition is exacerbated by accompanying health problems. It was reported that adolescents aged 15-19 years experienced a chronic lack of energy reaching 36.3% (Kemenkes RI, 2021). In addition, 32% of young women experience anemia (Kemenkes RI, 2018).

Teenagers themselves, if they experience pregnancy are a risk factor for getting problems during pregnancy. Especially if it is coupled with other risk factors such as anemia and chronic energy deficiency (CED). An unplanned pregnancy will provide greater risks and opportunities to give birth to premature babies and babies with low birth weight (OWH, 2021). If a pregnant woman is in this condition, she will be very vulnerable to the risk of gestational diabetes mellitus or pregnancy-induced hypertension. To overcome this, it is necessary to have several screening procedures carried out as early as possible before pregnancy.

Conditions, the context of preparation for pregnancy has shifted from the pre-pregnancy period to an earlier period or even throughout the female reproductive life cycle (Kim et al., 2022). This shift was recommended by the International Federation of Gynecology and Obstetrics which stated that maternal health is part of a life journey approach to address women's health as a whole (Hanson et al., 2015). A pregnant woman is expected to be in good health to have a good pregnancy. This is in line with the goals of pre-pregnancy care which are closely related to preparing expectant mothers to stay healthy and be healthy as a whole throughout their lives so that they can produce healthy babies (Arteaga et al., 2019). But research results show that many unplanned pregnancies are included among young people (Backhausen et al., 2014; Kim et al., 2022).

Indonesia has a triple burden of nutritional problems (triple burden) namely stunting, wasting, and obesity as well as micronutrient deficiencies such as anemia. All of these conditions are found in adolescents. Based on the 2018 Riskesdas, 32% of young women in Indonesia have anemia, 25.7% of adolescents aged 13-15 years are stunted and 26.9% of adolescents are stunted at ages 16-18, 14.5% are women aged fertile with an age range of 15-44 years experience CED, the prevalence of overweight and obesity is 16.0% in adolescents aged 13-15 years and 13.5% in adolescents aged 16-18 years (Fraser Diane M, 2009; Kemenkes, 2019). In addition, adolescents are identified as a group that requires special attention related to health behaviors that can impact adulthood and have a significant impact on the health of the next generation (Hanson et al., 2015). A survey conducted by Global School Health in 2015 provides an overview of adolescent eating patterns, including not always having breakfast (65.2%), most teenagers do not consume enough fiber, fruit vegetables (93.6%), and often consuming foods containing flavorings (75.7%). In addition, these adolescents also lacked physical activity (42.5%). If this condition continues, it will increase the risk of non-communicable diseases and affect reproductive function (Widyawati, 2018).

The problems found among adolescents further prove that adolescence is an important time to shape health behaviors that support the creation of healthy reproduction in the framework of pre-pregnancy preparation. On this basis, of course, the identification of risk factors and healthy behavior is needed in the framework of pre-pregnancy preparation (Kim et al., 2022). The Health Belief Model (HBM) is a belief model that theoretically can be used to guide health promotion and disease prevention programs depending on individual perceptions (RHI Hub, 2018). In addition, HBM can also be applied in the context of reproductive health, including adolescent health beliefs and motivations which have a direct relationship to the utilization of health services such as pre-pregnancy care (Kim et al., 2022). Therefore this study aims to identify behavioral tendencies re.garding pregnancy preparation in adolescents by applying the Health Belief Model.

METHOD

Design and sampling

An experimental study applied to adolescents in the use of health applications as a medium for health promotion to assess adolescents' knowledge and attitudes towards pre-pregnancy preparation was the precursor in this study. Furthermore, the identification of adolescent behavior toward pre-pregnancy preparation is carried out. Participants totaled 300 young women who were determined based on a formula to estimate comparing the mean of the two

populations (Lameshow et al, 1997; Murti Bhisma, 2018).

Measurement

Measurements were made using a questionnaire prepared by researchers based on adolescent reproductive health standards and pre-pregnancy screening.

The behavior of young women is assessed based on everything that teenagers do in preparing themselves related to lifestyle during the pre-pregnancy preparation period with indicators: not smoking, and prevention of STIs. other infection prevention, disease control, importance, and confidence in pregnancy preparation behavior.

Items were assessed using a Likert scale with 5 points of choice (1=strongly disagree, 2=disagree, 3=somewhat agree, 4=agree, 5=strongly agree) with a panel of experts conducting content validity and analyzed using Aiken's V table index = 0.83 and ρ = 0.19 (count index V = 0.844). For internal consistency using Cronbach's alpha, a value of 0.812 was obtained.

The knowledge of young women is based on all the information that is known to adolescents related to pre-pregnancy care.

Items were assessed using true and false choices (1=true, 0=false) with a panel of experts conducting content validity and analyzed using Aiken's index V table = 0.83, ρ = 0.19 (index V count = 0.842). For internal consistency using Cronbach's alpha, a value of 0.892 was obtained.

The attitude of young women is based on adolescent beliefs regarding pre-pregnancy preparatory care.

Items were assessed using a Likert scale with 5 points of choice (1=strongly disagree, 2=disagree, 3=somewhat agree, 4=agree, 5=strongly agree) with a panel of experts conducting content validity and analyzed using Aiken's V table index = 0.69, ρ = 0.41 (index V count = 0.852). For internal consistency using Cronbach's alpha, a value of 0.899 was obtained.

Peers in question are about the role of peers in determining behavior.

Items were assessed using a Likert scale with 5 points of choice (1=strongly disagree, 2=disagree, 3=somewhat agree, 4=agree, 5=strongly agree) with a panel of experts conducting content validity and analyzed using Aiken's V table index = 0.69, ρ = 0.41 (index V count = 0.765). For internal consistency using Cronbach's alpha, a value of 0.765 was obtained.

Media access information is the facilities owned to obtain information about pre-pregnancy preparation

Items were assessed using true and false choices (1=true, 0=false) with a panel of experts conducting content validity and analyzed using Aiken's index V table = 0.83, ρ = 0.19 (index V count = 0.836). For internal consistency using Cronbach's alpha, a value of 0.897 was obtained.

Construct Perceptions in HBM include perceived vulnerability, perceived severity, perceived benefits, perceived barriers, healthy motivation, and action requirements that reflect a desire or the will to act in preparing for pregnancy.

Items were assessed using a Likert scale with 5 points of choice (1=strongly disagree, 2=disagree, 3=somewhat agree, 4=agree, 5=strongly agree) with a panel of experts conducting content validity and analyzed using Aiken's V table index = 0.69, ρ = 0.41 (index V calculated vulnerability = 0.788, severity = 0.789, benefits = 0.785, obstacles = 0.760, healthy motivation = 0.790, and action = 0.807). For internal consistency using Cronbach's alpha, the value of vulnerability = 0.952, severity = 0.969, benefits = 0.869, obstacles = 0.806, healthy motivation = 0.866, and action = 0.732

General characteristics of the general physical description of adolescents related to indicators of pre-pregnancy preparation in adolescence.

Ethical considerations

Ethical approval was obtained from the Tanjungkarang Ministry of Health Health Polytechnic Ethics Commission number 260/KEPK-TJK/XI/2021. The Official Letter of Research implementation was obtained by the Metro City Kesbangpolimas Office number 800/279/B-6/2021 and the Metro City Health

Office number 074/9341/D-02/05/2021. Consent to participate was obtained from the respondents. Previously explained the purpose of the study, and confirmed willingness to participate. Proof of willingness by including the signature of the respondent who is willing.

Data Collection and Analysis

Data collection took a little longer because PPKM was still in effect as a result of the Covid-19 pandemic, namely from 20 January 2022 to 25 August 2022. All analyses used Amos version 18. Statistical significance was set at $p<0.05$.

RESULTS

Adolescent characteristics

An overview of the values of young women based on anthropometric values for hemoglobin levels is presented in the following table.

TABLE 1: Results of Anthropometric Examination and Hemoglobin Levels of Young Girls in Metro City

No	Check items	n	Minimum	Maximum	Means	SD
1	Age	300	15	22	18.76	1.09
2	Weight	300	35	103	50,50	10,20
3	Height	300	139	173	154	6.00
4	BMI	300	15	37,8	21.30	3.99
5	Hemoglobin Levels	300	7	19	14	1.93
6	LILA	300	15.5	39	25.5	3,15

The values of several indicators fall into abnormal categories such as height (139 cm), BMI (15), Hb level of 7 gr/dl, and LILA 15.5 cm.

Further interpretations regarding the physical condition of adolescents from the results of anthropometric examinations and hemoglobin levels are as follows

TABLE 2: Description of the Interpretation of Anthropometric Examination Results and Hemoglobin Levels of Young Girls in Metro City

No	Interpretation of examination results	n	Mark	Frequency	%
1	Anemia Status: Anemia Not anemic	300	>11.9 g/dl	 43 257	 14,33 85,67
2	Short Status: Short Not short	300	>156cm	 196 104	 65,33 34,67
3	Nutritional Status based on BMI: Thin Normal Overweight Obesity	300	 <18.5 18.5 – 24.9 25 – 29.9 >30	 70 180 38 12	 23,33 60.00 12.67 4.00

It shows that there are 24.67% of adolescents experience anemia, 23% of them have less height (short), and 29.33% with a thin nutritional status.

Only 14.67% (44 youth) did not have this problem.

TABLE 3: Description of the Habits of Young Women in Metro City Habit

Habit	**Frequency**	**%**
Consumption of Blood Add Tablets at least 10 items every month	109	36,3
Daily consumption of fast food	274	91.3
Eat vegetables every day at least 1 small bowl at each meal	131	43,7
eat fruit every day	127	42,3
Active smoker	0	0
Passive smoker	163	54,3
Exercise 150 minutes a week	65	21,7

n=300

Table 3 shows that the habits of young women for healthy living are still far from good. Not exercising (78.3%) and the habit of consuming fast food (91.3%) still dominate unhealthy behavior among young women.

Identification of Behavioral Tendencies in Pre-Pregnancy Preparation

Identification of adolescent behavior towards pre-pregnancy preparation is reviewed based on the theory of the Health Belief Model involving the variables of knowledge, attitudes, access to information, and peers. The results are as follows:

TABLE 4: Initial Model Regression Weight Path Analysis Test

Direct Influence Variables			Path Coefficient (estimated)	Standard Error	ρ	R Square
Critical	←	Knowledge	0.648	0.293	0.027	0.027
Critical	←	Attitude	-0.539	0.612	0.379	
Critical	←	Access	0.171	0.269	0.525	
Critical	←	Friends of the same age	-0.705	0.423	0.096	
Prone to	←	Knowledge	0.539	0.275	0.050	0.022
Prone to	←	Attitude	-0.602	0.574	0.295	
Prone to	←	Access	0.029	0.252	0.908	
Prone to	←	Friends of the same age	-0.589	0.397	0.138	
Benefit	←	Knowledge	0.011	0.046	0.816	0.023
Benefit	←	Attitude	0.040	0.095	0.674	
Benefit	←	Access	0.055	0.042	0.186	
Benefit	←	Friends of the same age	-0.161	0.066	0.014	
Obstacle	←	Knowledge	-0.121	0.058	0.036	0.109
Obstacle	←	Attitude	0.071	0.120	0.557	
Obstacle	←	Access	-0.045	0.053	0.390	
Obstacle	←	Friends of the same age	0.461	0.083	***	

Act	←	Knowledge	0.000	0.032	0.988	0.008
Act	←	Attitude	-0.005	0.066	0.936	
Act	←	Access	-0.001	0.029	0.971	
Act	←	Friends of the same age	-0.069	0.046	0.132	
Motivation	←	Knowledge	-0.012	0.035	0.734	0.035
Motivation	←	Attitude	-0.075	0.072	0.303	
Motivation	←	Access	0.061	0.032	0.055	
Motivation	←	Friends of the same age	-0.131	0.050	0.009	
Behavior	←	Critical	-0.008	0.006	0.201	0.155
Behavior	←	Prone to	0.006	0.007	0.376	
Behavior	←	Benefit	0.018	0.041	0.656	
Behavior	←	Obstacle	-0.063	0.033	0.052	
Behavior	←	Act	0.086	0.059	0.148	
Behavior	←	Motivation	0.298	0.054	***	
Behavior	←	Knowledge	0.004	0.033	0.906	
Behavior	←	Attitude	0.170	0.068	0.013	
Behavior	←	Access	0.071	0.030	0.019	
Behavior	←	Friends of the same age	0.102	0.051	0.045	

Note: *** < 0.001

The results of the analysis in table 4 show that there are 10 significant influences between variables (ρ <0.05), namely the effect of knowledge on severity (0.027), knowledge on vulnerability (0.05), peers on benefits (0.14), knowledge to barriers (0.36), peers to barriers (<0.001), peers to motivation (0.009), motivation to behavior (<0.001), attitudes to behavior (0.013), access to behavior (0.019) and peers to behavior (0.045).

Based on the results of the initial model path analysis test, the stage I model test was carried out on the results that affect between variables with a significance value of ρ <0.05. The results are as follows:

TABLE 5: Regression Weight Model I Path Analysis Test

Direct Influence Variables			Path Coefficient (estimated)	Standard Error	ρ	R Square
Attitude	←	Knowledge	0.142 _	0.027 _	***	0.088
Motivation	←	Friends of the same age	-0.118 _	0.050	0.017 _	0.019
Behavior	←	Access	0.069 _	0.030 _	0.022 _	0.166
Behavior	←	Attitude	0.178	0.065	0.006	
Behavior	←	Friends of the same age	0.074	0.048	0.120	
Behavior	←	Motivation	0.368	0.054	***	
Prone to	←	Knowledge	0.465	0.264	0.078	0.010
Critical	←	Knowledge	0.585	0.282	0.038	0.014
Obstacle	←	Knowledge	-0.111	0.055	0.045	0.106

Obstacle	←	Friends of the same age	0.454	0.082	***	
Benefit	←	Knowledge	0.017	0.044	0.704	0.017
Benefit	←	Friends of the same age	-0.144	0.065	0.026	
Note: *** < 0.001						

The results of the analysis in table 5 show that there are 3 influences between variables that are not significant (ρ > 0.05), namely peer variables with behavior (0.120), knowledge with vulnerability (0.078), and knowledge with benefits (0.704).

The path analysis model I test, a phase II model test was carried out on the results that affect the variables with a significance value of ρ <0.05. The results are as follows:

TABLE 6: Regression Weight Model II Path Analysis Test

Direct Influence Variables			Path Coefficient (estimated)	Standard Error	ρ	R Square
Benefit	←	Friend	-0.144	0.065	0.026	0.016
Obstacle	←	Friend	0.454	0.082	***	0.106
Obstacle	←	Knowledge	-0.111	0.055	0.045	
Motivation	←	Benefit	0.392	0.037	***	0.286
Motivation	←	Obstacle	-0.076	0.028	0.007	
Attitude	←	Knowledge	0.142	0.027	***	0.088
Behavior	←	Attitude	0.185	0.066	0.005	0.160
Behavior	←	Motivation	0.355	0.054	***	
Behavior	←	Access	0.078	0.030	0.009	

Note: *** < 0.001

The results of the analysis in table 6 show the final model results which describe the influence of variables in identifying adolescent behavior toward pre-pregnancy preparation. Thus the analysis path can explain the influence between variables in identifying adolescent behavior.

DISCUSSION

The main programs of pre-pregnancy care are early detection, health promotion, and intervention (Sainafat et al., 2020). Through pre-pregnancy care, it is hoped that it can increase knowledge (Abriyani et al., 2022). and healthy behavior for prospective mothers so that they can create healthy pregnancies for mothers and produce healthy babies (Lassi et al., 2020). The low utilization of pre-pregnancy care is because this program is not familiar to women and their partners. The causative factor is the low awareness of the use of pre-pregnancy care (Du et al., 2021). This condition is supported by low knowledge (Wegene et al., 2022), unsupportive attitude (Okemo et al., 2021), high financing so they do not have access to services (Mazza et al., 2013), not having enough time (Habte et al., 2021), and lack of socialization about the use of preconception treatments (Sori et al., 2021). Another cause that is the main reason for the low utilization of pre-pregnancy services is unplanned pregnancies (Du et al., 2021; Ukoha & Mtshali, 2022). On the other hand, empirically, pre-pregnancy care has an impact on good pregnancy outcomes, including a decrease in congenital abnormalities (Setegn Alie et al., 2022). At least pre-pregnancy care through educational interventions can delay the first gestational age and regulate the spacing of pregnancies (Lassi et al., 2020).

The Health Belief Model (HBM) is a model that explains why a person responds to the prevention services offered. In addition, HBM also identifies how individuals respond to symptoms and diseases and adherence to medical directions. The results of HBM modification by Becker explain how individual responses to symptoms and disease and adherence to medical directions (Roden, 2004; (Sallis JF & Owen N, 2008; Raingruber Bonnie, 2014).

Knowledge

Based on the results of research that identified adolescent responses to pre-pregnancy preparatory care, it was explained that knowledge could not directly shape adolescent behavior. This study identified that knowledge has a significant effect on the formation of attitudes ($\rho = 0.001$). In addition, knowledge develops perceptions of the obstacles that are felt when a teenager experiences health problems related to pre-pregnancy preparation ($\rho = 0.045$). Perceptions related to these obstacles influence motivating adolescents to behave ($\rho = 0.007$).

Lack of understanding is the main obstacle for individuals regarding the importance of preventing and controlling a disease (Ning et al., 2020). Knowledge acquired and felt by individuals influences understanding and use in individual decision choices regarding the information received (Park et al., 1988). Therefore correct knowledge is a prerequisite for adolescents to act on the importance of pre-pregnancy preparation.

The knowledge in this study was formed from the results of education conducted on adolescents about pre-pregnancy preparation care. The importance of knowledge in disease prevention and control has been proven in various countries from the results of previous studies. Appropriate knowledge becomes the foundation for individuals to facilitate correct actions and also encourage individuals to act (Zhong et al., 2020). In HBM education, which is a way of forming knowledge, plays an important role in shaping individual perceptions regarding how vulnerable and the seriousness (severity) of the problem being faced (Parmar & Taylor, 2010; Murti Bhisma, 2018b). But the two constructs were not formed in this study. The knowledge possessed by adolescents does not shape perceptions of severity, vulnerability, motivation, and cues to act. The adolescent knowledge formed in this study was only able to develop two constructs from the HBM construct, namely barriers, and motivation. This condition is possible because of the character of today's teenagers. Teenagers today have the characteristics of learning quickly from various sources and have instant gratification (Savira Azizah, 2022). The tendency is that teenagers will focus on things that are considered important.

Attitude

This study identified that the attitude of young women directly influences the behavior of pre-pregnancy preparation ($\rho = 0.005$). Attitude is a tendency to consistently respond whether it is pleasant or unpleasant to an object. This tendency is not hereditary but is the result of the individual's learning (Ajzen, 2012). The process of forming attitudes is learned in the same way as other habits. When an individual obtains information and facts, they will also learn the feelings that lead to a belief and the values associated with these facts and values.

This study reports that attitudes directly influence the behavior of adolescents to act in pre-pregnancy care, but on the other hand, it is found that attitudes are formed based on the knowledge possessed by adolescents. These results are corroborated by the Knowledge, Attitude, and Practice Model which states that attitude is one of the main elements that shape individual behavior, and the attitude itself is formed due to beliefs that are built by knowledge acquired by individuals (Launiala, 2009). Attitude is a belief that is needed by individuals in acting. Individuals will act when experiencing threats or risks, but only when the perceived benefits outweigh the obstacles, both real and perceived. In HBM attitude is formed from the perception of the belief in a problem.

Peers

The results showed that peers did not directly influence adolescent behavior in preparation for pre-pregnancy care. In this study, peers had a direct effect on the barrier construct ($\rho = 0.001$) and the benefit construct ($\rho = 0.026$) in shaping perceptions of pre-pregnancy care. The formation of perceptions of obstacles and benefits has an impact on the formation of adolescent motivation (motivation ← obstacles: $\rho = 0.001$ and motivation ← benefits: $\rho = 0.001$) which ultimately shapes adolescent behavior ($\rho = 0.001$).

Peers in this study did not have a direct influence, especially on adolescent behavior in pre-pregnancy care. In this study, peers were identified as playing a role in developing adolescent perceptions of perceived obstacles and benefits, thereby supporting the formation of adolescent motivation in acting or behaving. Peers can encourage positive behavior by increasing positive behavior in taking care actions (Tazangi et al., 2022). This phenomenon is inseparable from the character of adolescents who prioritize peer groups in making decisions.

Access to media

Based on the research results, access to pre-pregnancy preparation care services directly influences the formation of adolescent behavior ($\rho = 0.009$). Looking at the Knowledge Attitude and Practice Model, changes in human behavior can occur in three stages: knowledge acquisition, belief generation, and behavior formation (Launiala, 2009). In this study access to information ownership is one of the assets for individuals to obtain an education so that individuals can gain knowledge. In HBM theory, the formation of individual perceptions in determining an action to act is influenced by information media that can educate (Parmar & Taylor, 2010; Murti Bhisma, 2018b). Therefore, the existence of access to information is important for individuals.

In this study, the ownership of access to information sources for adolescents varied greatly (teachers, parents, peers, and the virtual world). In the daily lives of teenagers, the internet is commonplace and a must-have (for the most part). This is because their generation was born with rapid technological developments and grew up in an all-digital and sophisticated environment (Savira Azizah, 2022). Today's teenagers prefer the learning-by-doing method. They prefer to experiment or practice something rather than have to sit in class. They are used to learning and learning quickly and digging up information instantly from cyberspace, so it is not surprising that today's youth are very suitable for learning online by relying on digital technology.

The Health Belief Model is a belief model that theoretically can be used to guide health promotion and disease prevention programs. This model is most widely used to understand health behavior because it can explain and predict individual changes in health behavior. A key element of the HBM is focusing on individual beliefs about health conditions, which predict health-related behavior. The key factors are the individual's perceived susceptibility to health problems, perceived severity, perceived benefits, perceived barriers to action, exposure to appropriate action factors, and belief in the ability to achieve which are closely related to motivation to be healthy. To obtain optimal benefits in using HBM, it is important to identify individual "cues to action" or "what motivates" individuals that are meaningful and appropriate to the target population (RHI Hub, 2018).

The results of this study show that the key factors that form the basis for identifying adolescent behavior in pre-pregnancy care do not develop as a whole. Of the six key factors, three factors can develop, namely perceived obstacles, perceived benefits, and motivation to be healthy associated with cues to act. These three factors are influenced by knowledge and peers. Therefore, these three factors become the focus of education about the importance of pre-pregnancy care starting from adolescence. The hope is that positive behavior will develop in adolescents in preparing for pregnancy in the future.

CONCLUSION

This study is an attempt to identify the behavioral tendencies of adolescents after the use of health

promotion applications in the framework of pre-pregnancy preparation. The results of this research reveal that some adolescents are physically in an unhealthy condition to reproduce. Knowledge and attitudes that are formed after the use of health promotion applications at least develop perceptions about the benefits of pre-pregnancy preparation and perceived obstacles if ignored, to be able to encourage adolescents to act or behave positively towards pre-pregnancy preparation. Therefore it is important to start pre-pregnancy preparations since adolescence so that when the time comes for these adolescents to enter the reproductive period, these adolescents are in a healthy reproductive condition.

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