

Teacher Empowerment to Prevent Oral Health Problems Related to Anemia in Adolescent Girls at SMPN 41 Surabaya

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ABSTRACT

Background: An epidemiological study at SMPN 41 Surabaya revealed that approximately 50% of 7th and 8th-grade adolescent girls have poor daily eating behavior. Around 19 female students (63.3%) experience oral health problems related to anemia during menstruation. According to the Theory of Reasoned Action (TRA), subjective norms were found to have the most influence on forming intention toward good daily eating behavior. Subjective norms refer to the influence or pressures from the surrounding environment. Within the school environment, teachers play a role as one of the subjective norms that affect the decision-making of female students regarding their daily eating behavior. **Aims:** To empower teachers to conduct examinations for anemia symptoms and clinical signs of oral health problems during menstruation among adolescent girls and to record their findings in the manual book. **Methods:** This program provides counseling and training on examining anemia symptoms and oral health problems to 23 teachers, utilizing a manual book as a medium. The effectiveness of the activity was evaluated using pre-test and post-test assessments. The scores obtained from both tests were analyzed using paired sample tests to assess the teachers' knowledge and skills improvement. **Results:** Based on the scores obtained from the pre-test and post-test assessments, it was found that the level of knowledge and skills of the teachers after the empowerment (Mean= 73.26; SD= 10.72) was higher compared to before the empowerment (Mean= 61.95; SD= 15.5). Statistically, it was determined that teacher empowerment significantly ($p < 0.05$) improved their knowledge and skills in examining anemia symptoms and oral health problems. **Conclusion:** Empowering teachers through counseling and training significantly enhances their knowledge and abilities in examining anemia symptoms and oral health problems.

Keywords: Anemia symptoms, Daily eating behavior, Empowerment, Menstruation, Oral health problems.

INTRODUCTION

Anemia is a decrease in the number of red blood cells or hemoglobin in the bloodstream, often occurring in adolescent girls due to menstruation. Menstruation is a physiological process that usually lasts for 28 days but can vary in each individual. Nutrition plays an essential role in the menstrual process. Imbalanced nutrient intake can cause menstrual disorders in adolescent girls, such as experiencing pain at the beginning of menstruation and

decreased appetite. If left untreated, adolescent girls are at risk of experiencing malnutrition and anemia, which can also impact irregular menstrual cycles (Guyton & Hall, 2014; Wahyudi & Nugrahati, 2022). During menstruation, bleeding can cause a daily loss of approximately 5 mg or more of iron. If not properly managed, such as maintaining a healthy diet and using additional supplements, menstruation can lead to iron deficiency and increase the risk of anemia in the future (Amalia & Tjiptaningrum, 2016; Mirza *et al.*, 2020;



Sherwood, 2014). Anemia affects oral and dental health by disrupting the transportation of oxygen and nutrients to the cells. This results in disturbances in the function of mitochondrial enzymes, which affect cell differentiation and proliferation. As a result, the oral epithelial tissue becomes thin and loses normal keratinization, making the individual more susceptible to oral and dental health problems. In another phase, anemia can also reduce saliva production, leading to disruptions in saliva function and causing dry mouth (Mersil, 2021). The disturbances that occur in oral and dental health due to the condition of anemia can disrupt eating patterns. These eating pattern disruptions can also interfere with the intake of essential nutrients adolescent girls need for reproductive development and maturation and can have long-term effects, such as iron-deficiency anemia and even malnutrition (Dinetti *et al.*, 2022).

From previous epidemiological research, it has been found that adolescent girls with poor eating behaviors are more likely to have oral and dental health problems related to anemia symptoms during menstruation. Of 60 female respondents, 50% (30 respondents) had poor eating behaviors. Among the 30 respondents with poor eating behaviors, 83% (25 respondents) experienced menstrual disorders. Out of the 25 respondents with menstrual disorders, 84% (21 respondents) had symptoms of anemia. Among the 21 respondents with anemia symptoms, 90% had oral and dental health problems. Based on odds ratio calculations, adolescent girls with daily poor eating behavior are 1.52 times more likely to have menstrual phase disorders compared to those with good daily eating behaviors. Adolescent girls with menstrual phase disorders are 3.5 times more likely to have anemia symptoms compared to those without menstrual disorders. Furthermore, adolescent girls with anemia symptoms are 9.5 times more likely to have oral and dental health problems compared to those without anemia symptoms.

According to the Theory of Reasoned Action, several aspects influence the daily eating behavior of adolescent girls during menstruation, namely intention, attitude, and subjective norms (Montano *et al.*, 2015). Previous epidemiological research found that having a good intention towards daily eating provides a two-fold likelihood

of exhibiting good behavior. A positive attitude towards daily eating also provides a two-fold likelihood of having good intentions. A positive subjective norm, including social support from parents, teachers, and friends, provides a four-fold likelihood of having good intentions. Therefore, subjective norm plays the most significant role in promoting good daily eating behavior in adolescent girls. Furthermore, if the subjective norm of adolescent girls is unfavorable, their daily eating behavior tends to be less optimal.

Anemia occurring in adolescent girls can have significant implications for their health. It can impact the reproductive health of adolescent girls, who will eventually become mothers. Anemia diagnosis can only be confirmed through a hemoglobin level test conducted in a laboratory. However, in Indonesia, only a few adolescent girls seek healthcare services when they do not have any health complaints. This indicates the need for innovative approaches to conducting screenings for anemia symptoms that can be done anytime and anywhere, utilizing the available resources (Devita *et al.*, 2021).

One effort to reduce the risk of oral and dental health problems related to anemia symptoms during menstruation is to strengthen social support in the environment. This support can come from parents, peers, and teachers. Enhancing social influence can be done by providing teachers with an understanding of anemia symptoms during menstruation to prevent oral and dental health disorders. The role of teachers in identifying anemia symptoms in adolescent girls is crucial as an initial step in preventing more serious illnesses. Teachers can provide information about anemia, its symptoms, how to recognize them, and preventive measures. Additionally, teachers can perform simple examinations on menstruating adolescent girls to detect anemia symptoms, such as observing signs of weakness, fatigue, lethargy, tiredness, and paleness, as well as checking the condition of the oral cavity for mouth ulcers, bleeding gums, and gum swelling.

METHODS

The empowerment program in this research involves training teachers to

examine anemia symptoms and provide information about the symptoms and their prevention, with the aim of shaping good behavior. The program utilizes an educational approach and targets all teachers at SMPN 41 Surabaya including headmasters, school health unit teachers, and homeroom teachers. Subjective norm interventions on teachers are carried out because teachers possess the knowledge and skills to educate and educate, in addition to their workplace, which is at school, being a place for implementing health promotion programs (Dewhirst *et al.*, 2014). The total participants in this program are 29 teachers. Based on the preliminary research we have conducted, 19 out of 30 adolescent girls who experience menstruation have oral health problems related to symptoms of anemia, and one aspect that plays a role in reducing this is the teacher's role as a health promotor. The goal of the program is to enhance the teacher's role in decreasing the prevalence of oral health problems related to anemia symptoms by giving them the ability to perform examinations on their students. Teachers are responsible for conducting anemia symptom assessments, educating adolescent girls about general health conditions and oral cavity health, and promoting good daily eating behavior. The implementation stages of the empowerment program activities include program planning. The community empowerment program is designed based on the findings of an epidemiological study conducted in May 2023. The community empowerment program is developed after determining priority issues using the USG method. The program activities conducted so far include training teachers on examining anemia symptoms and oral and dental health disorders in adolescent girls. Next, program preparation begins with presenting the findings of the epidemiological study with guidance from faculty advisors from the Department of Public Dental Health at the Faculty of Dental Medicine, Universitas Airlangga, and the dentist from Puskesmas Tambakrejo. Discussions regarding the empowerment program plan are held with faculty advisors from the Department of Public Dental Health, Universitas Airlangga, and the dentist from Puskesmas Tambakrejo, and advocacy is conducted

with representatives from the school/teachers of SMPN 41 Surabaya.

After the program design is approved, the preparation continues by creating empowerment and health promotion materials. In addition to the materials, preparations are made for the content and technical arrangements for the activities on the implementation day. The approved empowerment and health promotion materials are then printed and duplicated. Program planning and preparation are carried out to ensure the smooth implementation of the program. The empowerment program is conducted face-to-face using educational methods and simulation for 7th and 8th-grade teachers at SMPN 41 Surabaya on Thursday, June 15, 2023, in the Teacher's Room of SMPN 41 Surabaya. Teachers are trained to conduct physical and non-physical examinations. Physical examinations include examining eyelids, palms, and nails, while non-physical examinations involve taking anamnesis regarding the health of adolescent girls. In addition, teachers are also trained to understand indicators of anemia symptoms, such as fatigue, paleness, dizziness, and difficulty concentrating. Subsequently, an evaluation of the implemented program is conducted. The empowerment program evaluation is done through a post-test, where participants answer questions related to the previously delivered material. The success indicators are objectively assessed based on the post-test results.

RESULTS AND DISCUSSION

The activity starts with providing materials about anemia, the procedure for examining anemia symptoms, oral and dental health, and the procedure for examining oral and dental health disorders to the teachers at SMPN 41 Surabaya. After that, a question and answer session and practice for examining anemia symptoms and oral and dental health disorders are conducted among the teachers. The success criteria for this empowerment program are when teachers have the knowledge and ability to conduct examinations for anemia symptoms and oral and dental health disorders in adolescent girls.

The empowerment program was conducted offline on Thursday, 15th June 2023, at SMPN 41 Surabaya. The number of target respondents who intervened in this

empowerment program is 23 teachers. The evaluation results were obtained from the pre-test and post-test scores conducted after the materials' presentation and

training among teachers. The pre-test and post-test questions consisted of 10 multiple-choice questions.

Table 1. The difference in mean scores of the pre-test and post-test of the empowerment program.

Evaluation Variable	Mean	Standard Deviation	Normality Test	Paired T-Test
Pre-test	61,95	15,50	0,154	0,001*
Post-test	73,26	10,72	0,181	

Table 1 shows that the mean pre-test score is 61.95 (SD 15.50), and the mean post-test score is 73.26 (SD 10.72). The Shapiro-Wilk test was used to test for normality. The pre-test and post-test scores were normally distributed ($p > 0.05$). Therefore, a parametric paired t-test was conducted. In the paired t-test,

the p-value was < 0.05 ($p = 0.001$), indicating that the hypothesis is accepted or there is an influence of the training program on the examination of anemia symptoms and oral and dental health disorders on the teachers' ability to perform the examination.



The activity started with the participants (A) completing the pre-test. The pre-test consisted of questions regarding examining anemia symptoms through the conjunctiva, palms, nails, and oral and dental health. The activity continued with delivering materials about anemia and the physical examination of anemia symptoms (B). Participants were also provided information about oral and dental health disorders related to anemia (C). After the presentation of the materials, the session proceeded to a question and answer session (D). Some questions raised by the participants were as follows: "Is there a simple way to test Hb levels without laboratory examination?", "What is the normal Hb value used to assess whether someone has anemia or not?", "Are there any differences in Hb levels between males and females?", "Is there any research indicating a relationship between anemia and canker sores?", "Is there a genetic influence on the occurrence of persistent canker sores?", "What is the relationship between anemia and dry mouth? Because usually there are no complaints related to anemia, but the mouth feels dry?" Participants were allowed to demonstrate the physical examination of anemia symptoms and the examination of oral and dental health disorders (E, F). The session concluded with a post-test to assess the participant's level of understanding (G), and the activity ended with a symbolic presentation of media materials to a representative of the teachers (H).

The activity was conducted offline or face-to-face on June 16, 2023, for teachers at SMPN 41 Surabaya. The implemented program was a training program on examining anemia symptoms and oral and dental health disorders for teachers. Prior to the presentation of the materials, a pre-test was conducted, followed by the presentation of the materials, a question and answer session, and practice examinations among the teachers. After completing this series of activities, in the end, the teachers filled out a post-test regarding the materials and training that were provided. The number of teachers who attended the training activity was 23.

The Theory of Reasoned Action can be used as a predictor in determining a person's behavior based on their intention. There are two aspects that can influence

intention: attitude and subjective norms (Tambi & Hurai, 2022; Ajzen, 1995). In this empowerment program, the intervention focuses on subjective norms, which refer to the influence or support from the surrounding environment towards a specific behavior. Based on previous epidemiological research, it has been shown that subjective norms have a higher likelihood than attitudes in shaping intentions. These findings are consistent with the study conducted by Paul et al. (2016), which states that when individuals receive encouragement or positive feedback regarding a specific action from people around them, they are more likely to have a positive intention to engage in that behavior.

In the previous epidemiological research, we found out that intention has a greater probability (OR=4) in creating intention towards good behaviour compared with attitude. In addition to being one aspect of subjective norms, teachers also play an important role in the success of a health promotion program. Schools are an ideal setting for implementing health promotion programs. Teachers have a role in health promotion programs. Providing training to teachers is an important step in shaping them as health promoters (Dewhirst *et al.*, 2014). Another reason why teachers are the target of this empowerment is related to the sustainability of this program. A study by Herlitz *et al.* (2020) shows that sustainability relies on schools that develop and retain teachers with knowledge, skills, and motivation to continuously promote health in ever-changing circumstances. This indicates that despite changes in the school student population, teachers are irreplaceable and can continue to fulfill their role in promoting health within the school environment.

The pre-test score resulted in an average score of 61.95 (SD = 15.50) for all respondents, while the post-test score had an average score of 73.26 (SD = 10.72), indicating an increase in the post-test average compared to the pre-test score. The Shapiro-Wilk normality test was conducted, and the results indicated that the pre-test and post-test data were normally distributed, as the significance values were greater than 0.05 (pre-test: sig. = 0.154 and post-test: sig. = 0.181). Therefore, a parametric paired t-test was

conducted. The paired t-test resulted in a significance value of 0.001.

Based on the parametric test, it was found that there is a significant difference between the post-test scores and the pre-test scores. This indicates that providing materials and training to teachers can significantly improve their skills and abilities in examining symptoms of anemia and dental and oral health disorders. Through the enhanced ability of teachers to conduct examinations for anemia symptoms and dental and oral health disorders, teachers are expected to fill out the provided manual book consistently. The data obtained can serve as a reference for schools or health centers in providing iron supplementation tablets for adolescent girls in need. Schools and health centers can conduct regular training for teachers, making it a routine program implemented by both the school and the health center.

In order to evaluate several factors influencing the program, we use the SWOT analysis which has the capability in determining both internal and external factors influencing the strategy of the program (Puyt et al, 2020). The SWOT analysis of this empowerment program includes several factors. The strength of the program are that no similar program has been conducted before at SMPN 41, which provides training to teachers on early detection of anemia symptoms and oral health disorders. The materials are delivered by competent experts, ensuring the accuracy of the information. The content is presented in plain language that the teachers easily understand, and the media used have user-friendly interfaces, facilitating the data entry process. On the other hand, weaknesses of the program include the potential disruption of teachers' regular activities, reliance on individual teachers' willingness to use the provided media, and the burden felt by teachers who already have a heavy workload. There are opportunities for collaboration with third parties such as Puskesmas Tambakrejo and FKG Unair, which can enhance the accreditation of SMPN 41 and allow the program to be adapted and implemented by other schools to improve teachers' skills in early detection of anemia symptoms and oral health disorders. However, a threat to the program is the lack of support from the school regarding funding and

infrastructure, which may hinder the implementation of the activities.

The SWOT analysis strategy of this empowerment program includes the following strategies: Strength-Opportunity (S-O), which involves conducting the program on a larger scale by engaging other third parties such as the health department and education department. Weakness-Opportunity (W-O) strategy suggests that the activities can be carried out outside of regular teaching hours to avoid disrupting the school's schedule and teachers' activities.

Strength-Threat (S-T) strategy focuses on organizing the program regularly at predetermined times and covering lightweight topics to prevent teachers from feeling overwhelmed while conducting student examinations. Weakness-Threat (W-T) strategy emphasizes the need for effective advocacy with the school and health center, ensuring they clearly understand the program to be implemented.

CONCLUSION

The training program on examining symptoms related to anemia and dental and oral health disorders can significantly enhance teachers' abilities to examine these issues among adolescent girls. The ultimate goal of this program is for teachers to perform regular examinations and input the data into the provided media. This way, the data obtained can serve as a valuable reference for the health center and school in providing additional blood tablets.

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