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The Benefits of E-SAR (Adolescent Anemia Screening) in Efforts to Free Adolescents from Anemia

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ABSTRACT

The problem of anemia among adolescent girls in Indonesia remains a significant challenge due to its high prevalence, primarily due to unbalanced nutritional intake, low consumption of iron-fortified tablets (TTD), and menstrual patterns that increase the risk of iron loss. Currently, in island regions, particularly at the Healthy Teenagers Integrated Health Post (Posyandu), anemia screening is not yet digitally based, so examinations, recording, and reporting of anemia status are still carried out manually without the use of digital technology. This process usually relies on simple examination tools, recording in a register, and reporting using conventional methods, making it prone to delays, errors, and data loss. Therefore, this community service program, which includes outreach on the importance of early anemia detection and the development of guidelines for using the anemia screening website for adolescents, and mentoring cadres and adolescents in website usage, can reduce the incidence of anemia in adolescents. Thus, this program is expected to increase the independence of Posyandu in monitoring adolescent health while strengthening sustainable anemia prevention efforts.

A. INTRODUCTION

Anemia is a public health problem frequently experienced by adolescents, especially young women. According to the World Health Organization, more than 25% of adolescents worldwide suffer from anemia, while in Indonesia the prevalence remains quite high. Anemia in adolescents can negatively impact learning concentration, productivity, and physical development, reduce quality of life, and potentially increase the risk of complications during future pregnancies (Dewi et al., 2023). Efforts to prevent and control anemia have been implemented through various health programs, such as the provision of Iron Tablets (TTD) in schools. However, early detection of anemia in adolescents still faces challenges, one of which is the limited availability of routine hemoglobin tests. Therefore, a screening method that is practical, easily accessible, and capable of reaching a large adolescent population is needed (Hariya Fitri, Susilowati, and Kurniarum, 2022). Developments in information technology, particularly the internet, have opened up opportunities for the use of web-based screening. The website allows adolescents to conduct an initial anemia risk assessment by filling in personal data, medical history, diet, and symptoms. The system then analyzes the information and provides screening results and follow-up recommendations (Chandra,

Noviestari, and Purwaningsih, 2021). Theoretically, this innovation is supported by the Health Belief Model, which explains that preventive behavior is influenced by perceived susceptibility, perceived severity, benefits of action, and perceived barriers. Through web-based screening, adolescents can improve their perception of the risks and benefits of prevention, thus encouraging adherence to iron supplement consumption and improving their diet. Furthermore, the Digital Health Adoption Model emphasizes that ease of use, usefulness, accessibility, and system support will increase user acceptance and use of health technology. This community service program was implemented at the Integrated Health Post for Healthy Adolescents (Posyandu) as a form of technological innovation in implementing anemia screening for adolescents, which has been proven to improve recording and reporting efficiency, risk identification accuracy, and service coverage through real-time monitoring. Indicators of program success include: increasing the number of adolescents undergoing screening, increasing knowledge and perception of anemia risk, increasing iron supplement consumption, providing integrated data for monitoring, and reducing the proportion of adolescents at high risk of anemia during periodic evaluations. Therefore, website-based anemia screening is not only an innovative alternative to support anemia prevention programs, but also strengthens the role of the Youth Integrated Health Post (Posyandu) as a modern, responsive, and technology-based health service center in efforts to achieve the target of reducing anemia rates for adolescent girls in Indonesia.

B. METHODS

The community service program conducted at the Healthy Teeneger Posyandu (Integrated Health Post) is a form of innovative media implementation focused on anemia and mentoring in utilizing website-based anemia screening services. This activity involved all adolescents at the Healthy Teeneger Posyandu. This media implementation method aims to utilize continuously evolving technology. The implementation stages include:

1) Healthy Teeneger Posyandu location survey
   The location survey was conducted to determine the conditions and situation of adolescents at the Healthy Teeneger Posyandu. Furthermore, the survey was conducted to determine the type of anemia screening services available at the Posyandu. Surveys are essential to understand how to solve existing problems at the Posyandu and to facilitate comprehensive problem management.
2) Initial data collection at the Healthy Teeneger Posyandu
   Initial data collection was used to determine the number of adolescent girls attending the Posyandu.
3) Discussion with partners regarding needs to address identified issues
   Discussions were conducted across sectors, including with the relevant community health centers (Puskesmas) and the midwife in charge of the integrated health post (Posyandu) to ensure the smooth and optimal implementation of the website-based anemia screening program for adolescents.
4) Problem Analysis
   The next crucial step in finding solutions to partner issues was problem analysis. This analysis involved in-depth discussions among team members to identify solutions. In this case, it was discovered that developing technology for website-based anemia screening was essential to support health services.

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5) Application Design
Designing a website-based screening application model aimed to enable students to use the anemia screening program anywhere and also to assist the community health center (Puskesmas).

6) Tool Development and Partner Training
Once the tool design was completed, the team began developing the website-based anemia screening application. Training was then conducted for adolescent cadres at the Posyandu.

7) Evaluation and Monitoring
Evaluation and monitoring were conducted directly by the community service team to provide direction and improvements to partners to achieve optimal implementation results. Indicators of the success of E-SAR (Anemia Screening for Adolescents) in efforts to free adolescents from anemia can be seen from the increase in adolescent screening coverage, increased knowledge and awareness of the risks of anemia, and changes in behavior such as fulfilling Iron Supplement Tablet (TTD) consumption and improving iron-rich diets. In addition, success is also demonstrated by the increase in the number of high-risk adolescents identified and receiving follow-up or referrals, the availability of integrated and accurate screening data, high levels of user satisfaction with the system, and a decrease in the proportion of adolescents at risk of anemia or anemia prevalence in periodic evaluations.

C. RESULTS AND DISCUSSION

This community service activity was carried out through mentoring adolescents in the use of E-SAR (Electronic Adolescent Anemia Screening) for early detection of anemia. The activity included outreach, anemia education, E-SAR training, and assistance in completing the screening independently. The target group was 20 adolescent girls within the Youth Integrated Health Post (Posyandu) community. The activity proceeded smoothly and received support from the Posyandu staff and positive enthusiasm from the participants.

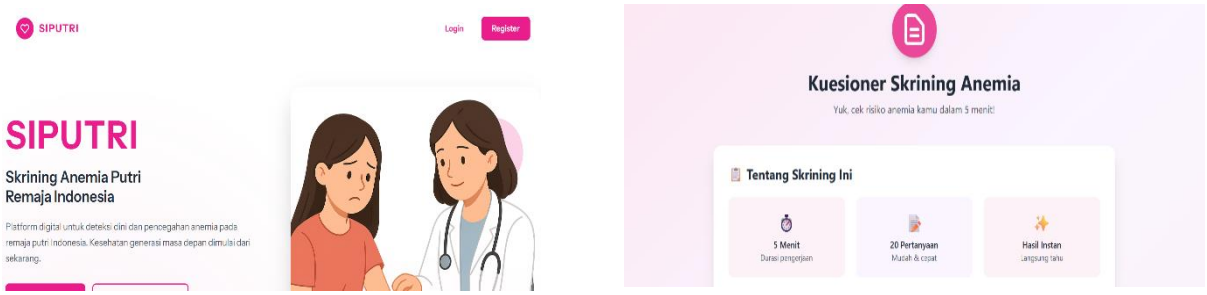

Figure 1. Appearance of the E-SAR Website

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Figure 2. Teenagers using the E-SAR Website

The results of the activity showed an increase in adolescent knowledge after receiving health education. A good understanding of anemia is the first step in changing preventative behaviors, such as a balanced nutritional diet and adherence to iron tablet consumption. Education accompanied by hands-on practice through E-SAR provided a more effective learning experience than lectures alone.

Mentoring in the use of E-SAR showed that:
1. All participants were able to use the E-SAR application with guidance.
2. Adolescents were able to perform screening independently using digital devices.
3. The E-SAR application made it easier for adolescents to identify anemia risk factors based on screening results.

The screening results showed that:
1. Some adolescents were not at risk for anemia.
2. Others were at risk of mild to moderate anemia, requiring follow-up in the form of nutrition education and iron tablet consumption recommendations.

Mentoring is a crucial factor in the successful use of E-SAR. With mentoring, adolescents not only learned how to operate the application but also understood the screening results and necessary follow-up actions. This demonstrates that integrating technology and direct mentoring can increase the effectiveness of adolescent health programs.

Participants responded positively to the activity, particularly regarding:
1. Ease of use of the E-SAR application
2. Easy-to-understand material delivery
3. Benefits of screening for early anemia detection

Adolescents stated that E-SAR helped them become more aware of their health conditions, particularly those related to anemia.

D. CONCLUSION

Community service activities in the form of Mentoring the Use of E-SAR (Adolescent Anemia Screening) have been implemented well and provide real benefits for adolescents as the target

of the activity. This mentoring is able to increase adolescent knowledge and awareness about anemia, risk factors, and the importance of early detection as an effort to prevent anemia. Utilization of the E-SAR application makes it easier for adolescents to carry out anemia screening independently, quickly, and practically. Screening results can be an initial basis in recognizing the risk of anemia so that adolescents can take appropriate follow-up, such as improving diet, increasing iron intake, and compliance with the consumption of Iron Supplement Tablets.

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