

Evaluation of Iron Tablet Supplementation Program of Female Adolescent in Surakarta

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ABSTRACT

Background: The 2021 Indonesian Nutritional Status Survey (SGI) found that the prevalence of stunting in Indonesia was 24.4%, exceeding the global prevalence of 22.2%. The prevalence of stunting in Central Java Province in 2022 was 20.9%. The percentage of stunted toddlers in Surakarta City in 2022 was 1.87%, an increase compared to 1.39% in 2021. Based on 2018 data from the Surakarta Health Office, the highest incidence of stunting was found at the Sangkrah Community Health Center (Puskesmas), at 3.35%. Stunting in children is often caused by inadequate nutritional intake for preconception adolescents during the first 8,000 days of life. One sign of inadequate nutrition is anemia in adolescents. Anemia can be prevented by regularly taking iron supplements (TTD) from adolescence.

Purpose: To evaluate iron supplement administration among adolescent girls in Surakarta City.

Methods: This study used a mixed-methods design. The study population was junior high and high school students in the Sangkrah Community Health Center (Puskesmas) area. Participants were 150 female students selected using cluster sampling. The first stage involved hemoglobin (Hb) testing and measuring the girls' knowledge and adherence to iron supplement administration using a questionnaire. The second stage involved focus group discussions (FGDs) with health workers from the Surakarta City Health Office, teachers, and junior high and high school students. Quantitative data were analyzed using product-moment correlation, while qualitative data were analyzed using thematic analysis.

Results: The human resources involved in the iron supplement administration program at this school complied with the Anemia Prevention and Control Guidelines. The iron supplement distribution program has been implemented by the Surakarta City Health Office since 2022. Iron supplement distribution is carried out by 2-4 individuals. Most respondents in this study were compliant with iron supplement administration (73.3%). There was a significant relationship between iron supplement adherence and hemoglobin levels, with a p-value of 0.0001.

Conclusion: The iron supplement program for adolescent girls has been running well. Monitoring is conducted by the Sangkrah Community Health Center every three months, and the majority of girls are compliant with iron supplement consumption.

Keywords: adolescent girls, iron supplement tablets, stunting

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BACKGROUND

Stunting is a nutritional problem that has received major attention, especially in Indonesia because it hinders children's physical and mental development (Djauhari, 2017). The results of the 2021 Indonesian Nutrition Status Survey (SSGI), the prevalence rate of stunting in Indonesia is 24.4% (Kemenkes RI, 2021). above global prevalence: 22.2% (De Onis et al., 2013). The prevalence of stunting in Central Java Province in 2022 is 20.9 percent (BKKBN Jateng, 2022). The percentage of stunted toddlers in Surakarta City in 2022 is 1.87% (Pranama, 2024), this figure has increased compared to 2021, which was 1.39% (Dinkes Kota Surakarta, 2022). Based on data from the Surakarta Health Office in 2018, data was obtained that the highest incidence of stunting was in the Sangkrah Community Health Center at 3.35% (74 toddlers out of 76 toddlers in all Sangkrah Community Health Centers) in Pasar Kliwon District. In second place is the Nusukan health center with a presentation of 3.87% (37 toddlers) and the third with a presentation of 3.91% (34 toddlers) in Banjarsari District (Dinkes Kota Surakarta, 2022).

The trigger for stunting in children will be caused by inadequate fulfillment of nutritional needs in preconception adolescents in the first 8,000 days of life. In the 8000 HPK concept, systematic efforts and appropriate interventions can be implemented in three phases of life after 1000 HPK, one of the concepts in which is the availability of adequate nutrition during adolescence with proper preparation will create a healthy, stunting-free generation (Bundy DAP, Silva Nd, Horton S, 2017). One sign of inadequate nutrition is anemia in teenagers. Adolescent girls during puberty are at particular risk of experiencing anemia due to the large amount of iron lost during menstruation and this is exacerbated by a lack of iron intake, where iron in adolescent girls is really needed by the body to accelerate growth and development (Rizqiya & Elvira, 2022). Based on the 2018 Riskesdas results, the proportion of anemia in pregnant women was 46.7% and anemia in teenagers was 48.9% (Bundy DAP, Silva Nd, Horton S, Patton GC, 2018).

Prevention of anemia can be done by consuming blood supplement tablets (TTD) by teenagers regularly. This is in accordance with the Republic of Indonesia Ministry of Health Circular Letter No. HK.03/03/V/0595/2016 concerning Providing Blood Supplement Tablets to Adolescent Girls and Women of Childbearing Age (WUS). Generally, blood supplementation tablets are given to school children such as middle school and high school. The city of Surakarta has implemented the Gema Sobat (Great Solo Youth Movement) program since 2019 as an effort to reduce the Maternal Mortality Rate (MMR), Infant Mortality Rate (IMR) and stunting. This activity includes providing IEC regarding anemia and giving blood supplement tablets (TTD) to young women at school once a week. It is hoped that by providing this TTD, anemia can be prevented, nutritional needs are met so that stunting does not occur (Dinkes Kota Surakarta, 2022). However, based on a survey conducted by researchers, it was found that 4 out of 5 female students were reluctant to consume TTD due to the unpleasant taste of TTD, not knowing the benefits of TTD, laziness and side effects that arise. Therefore, it is necessary to conduct research on the evaluation of TTD provision so that stunting can be prevented.

OBJECTIVE

The purpose of this study is to evaluate the provision of TTD to adolescent girls in Surakarta which includes input, process and output of the TTD provision program. The urgency of this research is that stunting can be prevented not only from 1000 HPK but can be prevented from 8000 HPK by increasing nutritional adequacy (one of the indicators is anemia) in adolescent girls with TTD provision.

METHODS

The research design used in this study is a mixed method. The study population was junior high and high school students in the Sangkrah Community Health Center working area with a sampling technique that is cluster sampling by taking adolescent girls in each class both in junior high and high school randomly. The number of samples obtained was 150 female students (adolescent girls). The inclusion criteria in this study were adolescent girls in grades 7 to 12 (junior high and high school students), healthy and obtained parental consent. The first stage of data collection is a study by conducting Hb examinations on adolescent girls by taking blood samples through a vein to ensure the accuracy of the examination results and is carried out by a diagnostic laboratory and measuring the knowledge and compliance of adolescent girls in consuming blood supplement tablets using a questionnaire. The questionnaire used for the previous study was first tested for validity and reliability on students who had the same criteria as the research subjects amounting to 35 adolescent girls. The results of the validity test obtained a valid questionnaire and the results of the reliability test using the Cronbach's Alpha test with a result of 0.83. Furthermore, data collection in the second phase of the study was conducted through Focus Group Discussions (FGDs) with health workers from the Surakarta City Health Office, teachers, and young women in both junior and senior high schools. Quantitative data were analyzed using Product Moment correlation, while qualitative data were analyzed using thematic analysis. This study has met ethical clearance under Number 80/UN27.06.11/KEP/EC/2023 issued by the Research Ethics Committee of the Faculty of Medicine, Sebelas Maret University.

RESULTS

The Sangkrah Community Health Center is in the city of Surakarta which supervises several schools in its target area in the field of student health and some of them were used in this research, including Junior High School and Senior High School. The number of participants in this research was 150 female students and 3 UKS teacher coordinators, nurses, nutritionists, midwives and 3 female students to be interviewed.

Description of Human Resources Input

Human resources are one aspect that supports the success of a program. According to Istianah et al. (2010) workers are people who are responsible for coordinating a program in the community, for this reason health workers must be adjusted based on their quantity and quality with their educational background, length of work, training they have attended, and adjusted to the required needs. In this TTD provision program, the human resources involved consist of:

Table 1. Duties of health workers involved in the Blood Supplement Tablet (TTD) program

Power	Duties
Nurse	Measuring Hemoglobin levels
Nutritionists	Conduct outreach about anemia and TTD to young women
Midwife	Coordinate with the school
Schoolgirl	Remind to consume TTD

Source: Triprasetya and Laksono (2014)

The human resources involved in the TTD provision program in this school are in accordance with the Guidelines for the Management and Prevention of Anemia, consisting of doctors or nurses, nutritionists, midwives and female students (Kemenkes RI, 2016). The TTD distribution program has been carried out by the government, in this case the Surakarta

City Health Service, since 2022. The process of distributing TTD is usually carried out by 2-4 people, including 2 health workers from the Sangkrah Community Health Center, who previously carried out outreach to the school and female students.

"..... since 2022 there will be a blood supplement tablet program... and previously there was an activity to provide blood supplement tablets, socialization was carried out from the Community Health Center or the health service, then a health screening was held for young women to find out the health of young women regarding menstruation and blood supplement tablets. From Sangkrah Community Health Center, go straight to junior high school. From the Department, Community Health Center, Surakarta Youth NGO under the auspices of the Surakarta Health Office. NGOs are actively looking for schools as targets for work programs at the Health Department..."(Informant 1, UKS Teacher).

"Thank God, this year I am holding the PMR supervisor. Every time there is an event from the Health Service, it is usually the PMR who comes. We collaborate with the Sangkrah Community Health Center every year, once every 3 months we get TTD for a number of students. "Here there are 33. Later we will get all of them for female students only, as long as the students are here they have to spend every 3 months."(**Informant 2**, UKS teacher).

"The activity of giving TTD refers to the Puskesmas. Usually the Puskesmas comes and then gives TTD, so we already have a program, so once a week, every Friday, we schedule a drink with TTD..."(**Informant 3**, UKS teacher).

Budget allocation

Funds are a support in a program so that the program prepared can run well and achieve the goals to be achieved (Ministry of Health of the Republic of Indonesia, 2016). Based on the results of interviews, funds for the procurement of TTD in the Sangkrah Community Health Center work area come from the BLUD (Regional Public Service Agency). Puskesmas as a Regional Public Service Agency (BLUD) has the opportunity to improve services to the community. The health financing subsystem is the management of various efforts to extract, allocate and spend health funds to support the implementation of health development in order to achieve the highest level of public health.

Funds for procuring TTD in the Sangkrah Community Health Center working area are taken from the BOK (Health Operational Costs). According to the Sangkrah Community Health Center Nutritionist Coordinator, funding for the re-entry program is planned in stages from the sub-district to the Health Service.

Facilities and infrastructure

The available facilities and infrastructure, both in terms of quantity and quality, will support achieving the goals of a program. The facilities and infrastructure needed in this TTD program include tools for measuring Hb levels in the blood, brochures/leaflets/booklets, recording and reporting forms, nutritional supplementation cards, and temporary storage warehouses (Maulida et al., 2021).

Based on the results of interviews with Sangkrah Community Health Center nutritionists, they said that the number of TTD given to each school was adjusted to the number of young women there. The facilities and infrastructure used in providing TTD are in the form of a box as a container for extra blood tablets to be distributed, a smart phone camera as a tool for documentation.

Another study shows that facilities and infrastructure were only available in 2018 in the form of brochures, leaflets for outreach activities and young women were given TTD supplementation cards. However, in 2018, it was no longer provided by the Surakarta City Health Service and the Sangkrah Community Health Center UPT. The only means used were a box for packaging the TTD, a cellphone camera belonging to each individual from the TTD

implementation team which was used for documentation activities. UKS Teacher Whats App (WA) Group and Sangkrah Community Health Center WA Group as a means of information on the implementation of the TTD program.

DISCUSSION

Process Description

Preparation

This section includes the needs planning process (calculating the number of targets and calculating needs), provision, and outreach to evaluate the TTD provision program that has been carried out by the local government to increase the hemoglobin levels of female students attending schools in the areas supported by the Sangkrah Community Health Center. Preparation determines the progress of an activity or program. If an activity is well prepared, it will provide opportunities for the activity to be successful (Alita and Ahyanti, 2013). Based on the results of interviews with informants, the needs planning process, in this case the need for strips for taking blood samples to determine the hemoglobin levels of the female students, was previously carried out by screening at each school to determine the number of young women at school who were willing to take samples. his blood.

Implementation

The implementation of this research involved conducting blood samples on young women in middle/high school and/or equivalent in the working area of the Sangkrah Surakarta Community Health Center. Before taking blood samples, TTD socialization was given in the school hall area. Initially, interviews were conducted with female student representatives and school UKS teachers to confirm that the schedule for giving TTD to juveniles at school could be done by determining the day to drink TTD together each week according to the agreement at each school. During school holidays TTD is given before school holidays (Indonesian Ministry of Health, 2016). Based on the research results, the distribution process starts from the Health Service, then it is distributed to the Community Health Center, then from the Community Health Center it is distributed to schools within its work area.

“Those who provide TTD from the community health center drop it off to the teacher..... Every Friday one tablet is given per child and taken together.....after that they are asked to do it themselves according to the child's awareness...usually at the beginning of the semester they are given TTD. So every homeroom teacher during the first period and there is time to read prayers together and then given time to drink TTD....you get 1 to 2 strips. The number of female students is 63. For girls, the classes are 7B 7D 8B 8D 9B 9D so there are 6 classes” (**Informant 1**, UKS teacher).

The first distribution was carried out in November 2022 by the Community Health Center to middle and high schools in the area under the guidance of the Sangkrah City Health Center, Surakarta City, until February 2020, the distribution was carried out twice. Distribution of TTD by Puskesmas is carried out at once for 2-3 months. According to the Guidelines for the Management and Prevention of Anemia, TTD is given every week. This shows that the distribution of TTD is completely handed over to the school, but the school, represented by the UKS teacher, does not understand the scheduling, and is waiting for instructions from the nutritionist for distribution.

“... In the past, in 2022 it was given every Friday, then starting in February 2023, according to a circular from the Surakarta City Health Office, it was held every Tuesday. Distributed to schools and then the teacher will distribute it. Drink 1 strip at school then take 1 strip home. Class 7, 8, 9 young women”(Informant 2, UKS Teacher).

The distribution of TTD by schools to young women is given simultaneously when

there is distribution from the health center, and some are given every Friday or Tuesday. If young women are unable to attend the distribution of TTD, they will be immediately called the next day and given instructions to drink TTD at home.

“..... Every Friday one tablet is given per child and taken together.....after that they are asked themselves according to the child's awareness.....usually at the beginning of the semester they are given TTD. "So every homeroom teacher during first period has time to read prayers together and then is given time to drink TTD."(Informant 3, UKS Teacher)

“..... In the past, in 2022 it was given every Friday, then starting in February 2023, according to a circular from the Surakarta City Health Office, it was held every Tuesday. Distributed to schools and then the teacher will distribute it. Drink 1 strip at school then take 1 strip home."(Informant 2, UKS Teacher)

Evaluation monitoring

Monitoring is a whole series of activities carried out periodically after the distribution of TTD for young women is carried out. Monitoring in this case includes monitoring and evaluation activities. Monitoring is carried out using a recording and reporting system, coaching by a technical team, and field visits (Ministry of Health, 2016).

Based on the research results, monitoring activities carried out by community health center officers for young women took the form of WhatsApp chat groups. Monitoring of adolescent girls is carried out every 3 months to see compliance with adolescent girls consuming TTD.

"There is an obstacle when giving the first TTD, you have to have breakfast first, because sometimes students like not to prepare from home because if they don't have breakfast they usually get dizzy. Some of the effects are stomach ache until the evening. They told their friends that there was one class that wanted to drink, there was one class that didn't want to drink... they didn't prepare at home because if they don't have breakfast they usually get dizzy. Can't monitor when taking TTD in one strip because it's taken home... can only monitor what you drink together at school once a week. Used to rest, lie down, and drink TTD at night before going to bed. Monitoring TTD drinking at home and prolonged pain after drinking TTD, we give advice to just stop" (Informant 1, UKS Teacher)

“Usually the problem is that they don't like the taste.... Some children are regular, some are not, and usually some are disciplined, some are not... So far no one has complained about the pain, it's just a matter of taste. We have told parents about drinking TTD so it is beyond our control. what is certain is that we have informed parents to help their children drink TTD....we want to continue the program of drinking TTD every Friday but not just once a month so we will hold a blessed Friday event and we will move together to drink TTD....day First Friday, then we will maximize the program on the new teachings."(Informant 3, UKS Teacher).

“Drunk it, didn't feel anything...after drinking TTD didn't feel anything...all my friends drank TTD so there were no problems...nothing...""(Informant 1, female student)

“I don't drink it regularly because I'm lazy and sometimes the effect makes me dizzy and tired or nauseous. "It would be better for the school or community health center to monitor students more in drinking TTD so that it is more routine."(Informant 3, female student).

According to researchers, the monitoring process carried out is still not effective for the success of the TTD program, because community health center officers only rely on chat groups, which allows young women to be dishonest in consuming the TTD provided.

Characteristics Respondent

Table 2. Average Age

Variable	Min	Max	Mean+SD
Age	11	18	14.73+0.162

Table 3. Frequency Distribution

No	Variable	f	%
1	Class		
	7	52	34.7
	8	25	16.7
	10	19	12.7
	11	33	22
	12	21	14
2	School		
	Senior High School	73	48.7
	Junior High School	77	51.3
3	Parental Education		
	Elementary school/equivalent	27	18
	Middle school/equivalent	17	11.3
	High school/equivalent	70	46.7
	College	36	24
4	Knowledge		
	Good	143	95.3
	Enough	6	4
	Not enough	1	0.7
5	BMI		
	Thin	35	23.3
	Normal	87	58
	Fat	9	6
	Obesity	19	12.7

The characteristics of the respondents who took part in this research were school girls in the Sangkrah Community Health Center area with an age range of 11-18 years and the majority of respondents in this research were female students in grade 7 (34.7%), most of the respondents were currently studying junior high school (34.7%). 51.3%), Most of the respondents' parents' last education was high school/equivalent (46.7%), Most of the respondents' knowledge was in the good category (95.3%), and Most of the respondents had a normal Body Mass Index (BMI) (58%).

Relationship between Compliance and HB

Table 3. Relationship between Compliance and Hb

Variable	Hb category				p value	OR
	Normal		Anemia			
	f	%	f	%		
Obedience						
Yes	110	73.3	5	4.51	0.0001	0.038
No	40	26.7	19	47.5		

Most of the respondents in this study adhered to taking blood supplement tablets (73.3%). There is a significant relationship between adherence to taking blood supplement

tablets and hemoglobin with a p value of 0.0001. Female students who adhere to taking blood supplement tablets are 0.038 x more likely to have a normal HB than female students who do not comply with taking blood supplement tablets.

Anemia prevalence and compliance

Based on the results of a survey conducted on 150 adolescent girls at junior high and senior high schools under the guidance of the Sangkrah Community Health Center in Surakarta City, data showed that 73.3% of the girls were compliant with their iron supplementation tablets, while 26.7% were non-compliant due to factors such as laziness and the occasional nausea, as reported in previous interviews.

The program remains viable considering the importance of meeting iron requirements in adolescence. The study showed a relatively high compliance rate. However, efforts are needed to improve iron supplementation compliance, particularly through strong collaboration between schools and the Community Health Center (Puskesmas) to increase iron supplementation consumption among adolescent girls, particularly in schools under the guidance of the Sangkrah Community Health Center in Surakarta City. One approach is to conduct regular monitoring and appropriate methods, such as using monitoring cards and regular monitoring, combined with online (WhatsApp) and face-to-face support, and holding simultaneous iron supplementation tablet consumption activities at school. Another study conducted at schools in the Air Bangis Community Health Center area showed that some schools were still not complying with iron supplementation protocols due to a lack of monitoring and evaluation by the schools and the community health center, which resulted in adolescent girls not regularly taking iron supplements. Schools in the Air Bangis Community Health Center area did not conduct evaluations due to teachers' busy schedules, and the community health center only visited the schools once (Susanti et al., 2021)

CONCLUSION

1. The program for providing blood supplement tablets (TTD) has been carried out by the Surakarta City Health Service since 2022 and the process of distributing TTD to schools is carried out by 2-4 health workers from the Sangkrah Community Health Center who have previously carried out outreach to the school and female students.
2. Monitoring activities for adolescent girls' compliance with TTD consumption are carried out once every 3 months by community health center officers for young girls in the form of a WhatsApp chat group.
3. As many as 73.3% of young women were compliant in consuming TTD and 26.7% were non-compliant due to several factors.

SUGESTION

1. The school
Collaborating with community health centers to increase TTD consumption, for example providing education to young women about the importance of TTD, holding TTD consumption together at a certain time
2. Community Health Center
Monitor compliance with TTD consumption, for example by using a monitoring card combined with an online system (Whatsapp) or face to face with young women at school.
3. Teenage girl
Increase knowledge about the benefits of TTD and the side effects that arise from consuming TTD.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding this manuscript

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