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FACTORS INFLUENCING THE INCIDENCE OF ANEMIA AMONG ADOLESCENT GIRLS IN THE TALISE COMMUNITY HEALTH CENTER WORK AREA

Faradila Trisagita[1]*, Merlin[1], Darmayanti[1], Henny[1], Rosmala Nur,[2] Abd Rahman[2], Rosa Dwiwahyuni[3], Ratna Devi[3]

[1]Magister of Public Health, Faculty of Public Health, Tadulako University, Palu, Indonesia. Address: Jl. Soekarno Hatta, KM 9, 90417

[2]Department of Public Health, Faculty of Public Health, Tadulako University

[3]Department of Nurse, Faculty of Medicine, Tadulako University

[4]Department of Medicine, Faculty of Medicine, Tadulako University

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Corresponding Author:

Faradila Trisagita

Email:
trisagitafara@gmail.com

ABSTRACT

Anemia is a condition characterized by a lower-than-normal number of red blood cells or hemoglobin (Hb) levels in the blood, specific to age and gender groups. Normal Hb levels differ between males and females, with anemia defined as Hb levels below 12 g/dL for females and below 13.5 g/dL for males. The highest incidence of anemia was recorded in the working area of the Talise Public Health Center, with a prevalence of 21.36%. This study aims to identify the factors influencing anemia among adolescent girls, focusing on sleep quality, Fe tablet consumption, knowledge, and menstrual patterns in the working area of the Talise Public Health Center. This research utilized a quantitative approach with a cross-sectional study design. The population comprised adolescent girls from all senior high schools within the Talise Public Health Center's working area, with a total sample of 84 respondents selected through proportional random sampling. Data analysis was conducted using univariate and multivariate techniques, with a significance level of $p \leq 0.05$. The results indicate significant relationships between sleep quality ($p = 0.005$), knowledge ($p = 0.035$), Fe tablet consumption ($p = 0.014$), and menstrual cycle ($p = 0.007$) with the incidence of anemia in the Talise Public Health Center, Palu City. The study underscores the importance of disseminating information about the role of good sleep quality for adolescent girls, integrating nutritional health and anemia education into school curricula to raise awareness among students, and providing outreach to adolescent girls and their parents about the benefits of consuming Fe tablets to prevent anemia.

INTRODUCTION

Anemia is a global health issue that warrants significant attention, particularly in developing countries such as Indonesia. According to data from the World Health Organization (WHO), the global prevalence of anemia was 29.9% in 2019, with Southeast Asia recording a prevalence of 41.9%, and Indonesia (for individuals aged 15–49 years) at 30.6%. Data from the Indonesian Basic

Health Research (Riskesdas) survey revealed an increase in anemia prevalence among adolescents from 27.7% in 2013 to 32% in 2018.

A preliminary study conducted at the Palu City Health Office found that one of the highest anemia incidences occurred in the working area of the Talise Public Health Center, with a prevalence of 21.36%. The Talise Public Health Center oversees four subdistricts: Talise, Talise Valangguni, Tondo, and Layana Indah. Data on anemia among adolescent girls in these subdistricts show that 55 girls (12.85%) in Talise, 36 girls (37.11%) in Talise Valangguni, 93 girls (23.60%) in Tondo, and 26 girls (40.63%) in Layana Indah were affected. Based on these findings, this study seeks to examine the factors influencing the incidence of anemia among adolescent girls in the working area of the Talise Public Health Center.

METHODOLOGY

This study employed a quantitative method with a cross-sectional study design. The study population comprised adolescent girls from all senior high schools within the working area of the Talise Public Health Center, with a sample size of 84 respondents. The samples were selected using proportional random sampling. Data were analyzed using univariate and multivariate analysis, with a significance level set at $p \leq 0.05$.

RESULTS AND DISCUSSION

Table 1. Frequency Distribution of Sleep Quality, Knowledge, Fe Tablet Consumption, Menstrual Patterns, and Anemia Incidence among Adolescent Girls in the Talise Public Health Center Work Area

No.	**Sleep Quality**	**Frequency**	**Percentage (%)**
1	Poor Quality	49	55.1
2	Good Quality	34	38.2
	Total	**84**	**100**

No.	**Knowledge**	**Frequency**	**Percentage (%)**
1	Poor	54	60.7
2	Good	30	39.3
	Total	**84**	**100**

No.	**Fe Tablet Consumption**	**Frequency**	**Percentage (%)**
1	Did Not Consume	49	55.1
2	Consumed	35	44,9
	Total	**84**	**100**

No.		**Frequency**	**Percentage (%)**

1	Poor	48	53.9
2	Good	36	46,1
	Total	**84**	**100**

No.	**Anemia Incidence**	**Frequency**	**Percentage (%)**
1	Severe Anemia	47	58,4
2	Mild Anemia	37	41.6
	Total	**84**	**100**

The data in Table 1 indicate that the majority of respondents reported poor sleep quality, with 49 individuals (55.1%), while 34 respondents (38.2%) reported good sleep quality. Most respondents had poor knowledge, totaling 54 individuals (60.7%), whereas 30 respondents (39.3%) demonstrated good knowledge. Regarding Fe tablet consumption, 49 respondents (55.1%) did not consume Fe tablets, while 35 respondents (44.9%) did. A significant proportion of respondents had poor menstrual patterns, amounting to 48 individuals (53.9%), while 36 individuals (46.1%) had good menstrual patterns. Finally, the majority of respondents experienced severe anemia, with 47 individuals (58.4%), compared to 37 respondents (41.6%) who experienced mild anemia.

Multivariate Analysis

Table 2 Model Fit Test, Coefficient of Determination, and F Test Results

Hosmer and Lemeshow Test		
Chi-square	***Df***	***Sig.***
234	8	1.000

Model Summary		
-2 Log likelihood	***Cox & Snell R Square***	***Nagelkerke R Square***
20.082[a]	.640	.891

Omnibus Tests of Model Coefficients		
Chi-square	***df***	***Sig.***
83.838	4	.000
83.83	4	.000
83.838	4	.000

Variable B		**Wald**	**Sig.**
Sleep Quality	-1.179	7.827	.005
Knowledge	-.546	4.450	.035

Fe Tablet Consumption	.561	5.980	.014
Menstrual Cycle Patterns	-1.650	7.264	.007

Source: Primary Data, 2024

From the table, the significance value of 1.00 > 0.05 indicates that H0 is accepted. This demonstrates that the binary logistic regression model is appropriate for subsequent analyses, as there is no significant difference between the classifications examined and those observed. The Nagelkerke R square value of 0.891 indicates that independent variables (sleep quality, knowledge, Fe tablet consumption, and menstrual patterns) explain 89% of the variation in the dependent variable (anemia incidence), while the remaining 11% is attributed to variables not included in the study. The table also reveals a significance value of 0.000 < 0.05, meaning H0 is rejected and Ha is accepted. This indicates that sleep quality, knowledge, Fe tablet consumption, and menstrual patterns significantly influence the incidence of anemia among adolescent girls.

Discussion

The Effect of Sleep Quality on Anemia Incidence among Adolescent Girls in the Talise Health Center Area

The findings of this study indicate a significant effect of sleep quality on anemia incidence among adolescent girls in the Talise Health Center area, with a p-value of 0.005, which is less than the threshold of 0.05. Among the 84 respondents, the majority (49 individuals, or 55.1%) had poor sleep quality, while 34 individuals (38.2%) reported good sleep quality. This study reveals that poor sleep quality is associated with an increased risk of anemia through various physiological mechanisms. Poor sleep disrupts the regeneration of red blood cells and impedes the production of erythropoietin, a hormone essential for erythrocyte formation.

The results align with a study conducted by Nirmala et al. (2024), which found a significant relationship between sleep quality and anemia incidence. Their chi-square statistical test revealed a p-value of 0.000 ($p < 0.05$), demonstrating a significant association between poor sleep quality and anemia incidence among female students at MTs. Negeri 2 Lombok Tengah. The odds ratio (OR) value of 20.487 indicated that students with poor sleep quality are at a substantially higher risk of developing anemia compared to those with good sleep quality.

The Effect of Knowledge on Anemia Incidence among Adolescent Girls in the Talise Health Center Area

The findings of this study also demonstrate a significant effect of knowledge on anemia incidence among adolescent girls in the Talise Health Center area, with a p-value of 0.035 ($p < 0.05$). Of the 84 respondents, the majority (54 individuals, or 60.7%) had poor knowledge, while 30 individuals (39.3%) had good knowledge. This indicates that adolescent girls with limited knowledge are more likely to experience anemia than those with adequate knowledge.

These results are consistent with the findings of Maslikhah & Putri Andanawarih (2023), who reported a significant relationship between knowledge and anemia incidence among adolescent girls in Jenggot Village, Pekalongan City, with a p-value of 0.000 ($p < 0.05$). Similar findings were reported by Viorenza et al., (2024), whose statistical analysis showed a p-value of 0.008 ($p < 0.05$), confirming a significant relationship between knowledge and anemia incidence among adolescent girls in Banding Agung Village, Pesawaran Regency, in 2024. Furthermore, research by Alfiah & Dainy (2023), supports this conclusion, with a p-value of 0.003 ($p < 0.05$), indicating a significant influence of knowledge levels on anemia incidence among adolescent girls at SMP IT Majmaul Bahrain Bogor.

The Effect of Iron Tablet (Fe) Consumption on Anemia Incidence among Adolescent Girls in the Talise Health Center Area

The findings of this study indicate a significant effect of iron tablet (Fe) consumption on anemia incidence among adolescent girls in the Talise Health Center area, with a p-value of 0.014 ($p < 0.05$). Among the 84 respondents, the majority (49 individuals, or 55.1%) did not consume iron tablets, while 35 individuals (44.9%) had consumed them. The study highlights that regular consumption of iron tablets significantly reduces the prevalence of anemia among adolescent girls. Data show an increase in hemoglobin levels in groups that consistently consumed iron tablets compared to those who did not. This suggests that iron tablet supplementation effectively meets iron requirements, particularly in adolescent girls who are vulnerable to anemia due to menstruation and inadequate dietary patterns.

The findings of this research are consistent with a study conducted by Amalia et al., (2024), which demonstrated a correlation between adherence to consuming iron supplementation (iron tablets) and anemia incidence (p-value = 0.000 < 0.05). Cross-tabulation analysis revealed that the percentage of respondents who did not adhere to iron tablet consumption and experienced anemia (85.4%) was significantly higher than those who adhered to iron supplementation (30.8%). Similarly, research by Kurniawati et al., (2023), showed a significant effect of adherence to iron tablet consumption, with a p-value of 0.017 (< 0.05), on anemia incidence among pregnant women in their second trimester. This emphasizes the importance of consuming iron tablets and iron-rich foods, as adherence to iron supplementation is a key factor influencing anemia incidence in pregnant women.

The Effect of Menstrual Patterns on Anemia Incidence among Adolescent Girls in the Talise Health Center Area

The results of this study demonstrate a significant association between menstrual patterns and anemia incidence among adolescent girls in the Talise Health Center area, with a p-value of 0.007 ($p < 0.05$). Out of 84 respondents, the majority (48 individuals, or 53.9%) reported irregular menstrual patterns, while 36 individuals (46.1%) had regular menstrual patterns. Excessive menstrual bleeding or prolonged cycles, which often result in irregular patterns, were found to increase the risk of anemia. This is primarily due to excessive blood loss, which depletes iron reserves in the body, particularly when dietary iron intake is insufficient to compensate for these losses. The study underscores the importance of monitoring menstrual patterns as an initial step in the early detection of anemia risk.

These findings align with research conducted by M. R. Sari (2020), which identified a correlation between menstrual cycles and anemia incidence. Statistical analysis yielded a p-value of 0.000, indicating a significant relationship ($p < 0.05$). The study revealed that 74.2% of respondents with abnormal menstrual cycles had a 5.111 times greater risk of developing anemia compared to those with normal cycles. Similarly, research by Dineti et al. (2022), employing Chi-Square analysis at a 95% confidence level, showed a p-value of 0.000 ($p < 0.05$), highlighting a significant relationship between menstrual patterns and anemia incidence among adolescent girls in the coastal areas of Bengkulu City.

Moreover, findings from Sunirah et al., (2024)corroborate these results, demonstrating a significant association between menstrual patterns and anemia incidence among female students at MA PINK 03 in Tambun Selatan. A chi-square test produced a p-value of 0.000, confirming statistical significance ($p < \alpha$, 0.05). The study revealed that adolescent girls with menstrual pattern disorders were 3 to 6 times more likely to experience anemia. These studies collectively emphasize the critical need for awareness and intervention strategies targeting menstrual health, particularly in adolescent girls, to mitigate anemia risks effectively.

CONCLUSION

The findings of this study indicate a significant association between sleep quality and anemia incidence among adolescent girls in the Talise Health Center area, with a p-value of 0.005 ($p < 0.05$). Additionally, the study revealed a significant relationship between knowledge levels and anemia incidence in the same population, with a p-value of 0.035 ($p < 0.05$). The consumption of iron (Fe) tablets was also found to significantly influence anemia incidence among adolescent girls in the Talise Health Center area, with a p-value of 0.014 ($p < 0.05$). Furthermore, there is a significant association between menstrual patterns and anemia incidence, as indicated by a p-value of 0.007 ($p < 0.05$). These findings underscore the importance of holistic interventions to address anemia among adolescent girls. Socialization initiatives should emphasize the role of good sleep quality in preventing anemia, particularly targeting schools and youth communities. Families should also be involved in educational programs to create a home environment conducive to healthy sleep patterns. Furthermore, health education campaigns should be intensified to increase adolescent girls' awareness of the causes, symptoms, prevention, and management of anemia through accessible platforms such as seminars, social media, and digital tools. Schools should incorporate nutrition and anemia prevention into their curricula to ensure that students receive the necessary knowledge and skills to maintain their health. Such comprehensive measures can effectively reduce the prevalence of anemia and improve the overall well-being of adolescent girls.

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