



**TELENURSING WITH WA-REMINDER FOR EDU-ANEMIA AND FE
MEDICATION ADHERENCE**

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ABSTRACT

The development of modern technology in the form of increasingly sophisticated use of smartphones is making it important for various activities, especially in the health sector, often referred to as telenursing. Telenursing, through the use of the WA-Reminder application with messaging for adolescents suffering from anemia, is a solution that can be used by health workers to increase education related to anemia and monitoring of FE medication use in an effort to maintain HB levels within normal limits.. Aims: the purpose of this study is to determine the effectiveness of Telenursing With Wa-Reminder For Edu-Anemia and Fe Medication Adherence in SMA Negeri 2 Ciamis 2023. Method: the research method used was a quasi-experimental one group pretest-posttest design. The study population included all adolescent girls with anemia at SMA Negeri 2 Ciamis using a non-probability sampling technique. The instruments used were a mobile phone as a container for the Whatsapp application, a questionnaire that had been tested for validated and reliable with Cronbach's alpha values 0.769 to measure adolescents' knowledge about anemia, and an observation sheet to measure compliance with FE medication. Data were analysed using univariate and bivariate techniques. Results: The results of the paired t-test showed that students' knowledge of anemia and compliance in taking FE medication were 0.039 and 0.000, respectively ($p < 0.05$). Conclusions: Telenursing with WA-Reminder is effective in improving knowledge and compliance with FE medication among adolescents with anemia.

Keywords: adherence; anemia; knowledge; telenursing; wa-reminder

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INTRODUCTION

Adolescence is a period in which individuals experience a developmental phase with secondary sexual signs until they reach sexual maturity at the age of 10-19 years (Regasa & Haidar, 2019; WHO, 2018). Adolescence is also a period of transition from childhood to adulthood. During this period, there is a fairly rapid increase in reproductive function, so it influences changes in development both physically and mentally, as well as social roles in everyday life (Putrianingsih et al., 2022). Adolescence is often referred to as puberty, during which time adolescent girls experience an event called menstruation, which can be one of the causes of iron loss (Berhe et al., 2022; Runiari & Ruspawan, 2021; Seyoum et al., 2019). This puts young women at risk of anemia. Another factor contributing to anemia in adolescents is poor eating habits, which can leave them feeling pale and weak during school and out-of-school activities (Rodhiyana et al., 2022). This is in line with research by Akib & Sumarmi, (2017), which suggests that one of the risk factors for anemia, particularly in adolescents, is irregular eating habits. Other research also suggests that behaviour, knowledge, attitudes and actions influence the risk of anemia. (Tambunan et al., 2016).

Anemia is a condition in which the amount of haemoglobin (Hb) in the body is lower than normal (Abeje et al., 2023; Asres et al., 2022; Sinulingga et al., 2023). The prevalence of

anemia in the world is 1.62 billion people, with 47.4% in the preschool age group, 25.4% in the school age group and 41.8% in women of childbearing age. According to the 2018 Riskesdas data, the prevalence of anemia is around 32% in the adolescent group with an age range of 15-24 years (Riskesdas, 2018). The prevalence of anemia is higher among adolescent females (27.2%) than among males (20.3%) (Putrianingsih et al., 2022). Anemia is currently one of the nutritional problems in developing countries, including Indonesia. The current incidence of anemia among adolescents is 48.9%, while the consumption of blood supplement tablets < 52 items is 98.6% and the consumption of ≥ 52 items is 1.4% (Riskesdas, 2018). Low knowledge, poor adherence and increasing anemia among adolescents are problems that need to be addressed urgently (Sholikhah et al., 2021). Since adolescent girls are future mothers who will become pregnant and have children, if not addressed quickly, the risk of maternal mortality, premature birth and low birth weight increases (Lismiana & Indarjo, 2021).

The Indonesian government has planned a programme to reduce the incidence of anemia, particularly among adolescents. The programmes that have been implemented provide a solution for the prevention of anemia (Nurhasanah et al., 2022). The programme involves the provision of iron tablets or blood supplement tablets to increase haemoglobin levels in the blood (Yuanty, 2020). This programme targets all age groups at risk of anemia, especially adolescent girls and pregnant women (Aprilia, 2020; Arozah et al., 2023). However, this did not work well as many vulnerable groups did not comply with the programme, presumably due to a lack of knowledge about the disease and its treatment (Nurhasanah et al., 2022). Nowadays, digital technology has developed rapidly (Pujihastuti et al., 2022). In this case, digital technology can help government strategies, especially health workers, to increase knowledge and adherence to Fe supplementation among adolescent girls with anemia. One of the government's efforts to overcome anemia, especially among adolescent girls, is to provide iron (Fe) tablets with a minimum of 90 tablets. (Pratama et al., 2019). However, adherence among adolescent girls is considered unsatisfactory. Therefore, technology in the form of telenursing is being used to help and facilitate nurses in monitoring the adherence of adolescent girls to iron tablets (Wirmando et al., 2021).

Telenursing is a medium for delivering care at a distance using telecommunications equipment (Finley & Shea, 2019). Through the telenursing method, it becomes a solution to overcome the limitations of health workers, reach knowledge and health, especially among adolescents, widely, also makes it easier for adolescent girls to reach health facilities and shortens the service time. Adolescent girls can access health information, care and even treatment from home or school via telephone or the Internet (Fadhila & Afriani, 2019). Digital implementation, including telenursing with Wa-Reminder, has now become a solution to end the epidemic of anemia among adolescent girls, which continues to grow year after year. Evidence shows that mobile technology can be useful in resource-constrained countries to address limited access to healthcare facilities and quality of healthcare purchasing (Gashu et al., 2021). Research conducted by Nurhasanah et al, (2022) showed that a small proportion of adolescent girls were taking iron tablets and a large proportion were not. In addition, adolescents do not understand the rules for taking iron tablets, so there is a need for education about iron tablets. And than Runiari & Ruspawan, (2021) also suggests that there is an effect of health education using videos and whatsapp reminders on adherence to blood supplement tablets among adolescent girls in SMA 6 Makasar. In addition, the research Wirmando et al, (2021) explained that there is an effect of the telenursing method of education on adherence to iron supplementation in pregnant women.

It is still considered necessary to continue with the treatment for compliance with FE medication and to increase the knowledge of adolescents with anaemia in SMA N 2 Ciamis, since adolescence is an age that is considered unstable and often disobedient, even though health education has been provided previously on the importance of compliance with treatment for anaemia. The Whatsapp application is one of the technologies that is widely used in different circles, especially among adolescents. In addition, research with the use of digital technology through WA-Reminder in adolescents with anaemia is still considered necessary, researchers want to combine the Telenursing method with Wa-Reminder as one of the efforts of health workers to be able to increase the knowledge of adolescent girls about anaemia and can be a reminder for adolescent girls in increasing compliance with taking Fe medication as an effort to stabilise haemoglobin levels to remain in a normal state. therefore this study aims to determine the effectiveness of Telenursing With Wa-Reminder For Edu-Anemia and Fe Medication Adherence in SMA Negeri 2 Ciamis 2023.

METHOD

This study is a quantitative study with a Quasy experimental design, one group pre-post design. The population of this study were all adolescents who suffered from anemia at SMA Negeri Ciamis as many as 98 people. The sampling technique used non-probability sampling which was 30 respondents. This research was conducted from April-June 2024. In the early stages of conducting the study, researchers conducted socialisation with head teachers, teachers, UKS supervisors and students who had a history of anemia to be used as research samples. The researchers also collaborated with the Ciamis Regency Health Office, Puskesmas and UKS supervisors for the research implementation process. After the respondents completed the informed consent form, the researchers conducted the pre-test, continued with the intervention of providing education about anemia and reminders about adherence to taking FE medication via WhatsApp messages for 3 months, and then concluded with a post-test. The instruments in this study were mobile phones to send messages via WhatsApp, questionnaires that had been tested for validity and reliability with Cronbach's alpha values 0.769, including respondent characteristics and knowledge about anemia, and observation sheets to measure respondents' adherence to FE medication. Data were analysed using univariate and bivariate techniques. Univariate analysis was used to describe age, body mass index, knowledge and adherence to FE. While bivariate analysis was conducted to determine the effect of the Edu-Anemia intervention with WA-Reminder on knowledge and adherence to FE medication in adolescents with anemia using paired t-tests.

RESULTS

The results showed that there were 15 students (50%) aged 15 and 15 students (50%) aged 16. Further analysis showed that students' knowledge before the intervention showed that most were in the good category as many as 23 people (76,7%) and after the intervention this increased to 28 people (93,3%) with a mean pre-post study score of 17.73-18.27. Adherence to FE medication before the intervention showed that most were in the less category as many as 25 people (83.3%) and after the intervention most were in the good category as many as 21 people (70%) with a mean pre-post study score of 2.60-5.00. The results of the paired t-test showed that students' knowledge of anemia and adherence to taking FE medication were p-value ($0.017 < 0.05$) and ($0.000 < 0.05$) respectively.

Table 1
Frequency distribution of age, knowledge and adherence to FE medication (n=30)

Variables	f	%
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Age		
15 years	15	50
16 years	15	50
Knowledge (Pre)		
Good	23	76,7
Enough	5	16,7
Less	2	6,7
Knowledge (Post)		
Good	28	93,3
Enough	2	6, 7
Less		
FE medication adherence (Pre)		
Good	4	13,3
Enough	1	3,3
Less	25	83.3
FE medication adherence (Post)		
Good	21	70,0
Enough	6	20,0
Less	3	10,0

Table 2.
Paired t-test of knowledge and adherence to FE medication (n=30)

Intervention	Mean	SD	CI (95%)	P-Value
Pre - Post Knowledge	17.73-18.27	2.638±1.0818	18.72±18.95	0,017*
Pre - Post FE medication adherence	2.60-5.00	1.404±1.339	3.12±5.50	0,000*

DISCUSSION

The use of technology in healthcare, including telenursing, has become an increasingly researched topic in recent year (An et al., 2021; Isidori et al., 2022). This technology can help improve the quality of care, reduce costs and increase patient satisfaction (Ferreira et al., 2023). The use of mobile phone technology, either through Whatsapp applications, is declared effective to support health goals towards transforming healthcare services around the world. In particular, mobile technology applications can provide new opportunities to integrate mobile health into existing services, as well as facilitate continued growth in healthcare management, particularly in the world of quality care (Manji et al., 2021; Stoumpos et al., 2023). Telenursing with WA-Reminder is one of the innovations that has received a lot of attention due to its potential to improve patient compliance (Shimoyama et al., 2023), particularly in relation to anemia and the use of iron supplements. Previous studies have confirmed that the use of WA-Reminder can improve patient compliance with medication. One of these is a study conducted by Runiari & Ruspawan, (2025) showed that there was an effect of health education using videos and WhatsApp reminders on adherence among adolescent girls taking oral contraceptive pills in the intervention group compared to the control group. Also supported by other research from Magdalena et al, (2024) which found that whatsapp blast (messaging via Whats App) had a very significant impact on adherence to taking blood supplement tablets. However, in contrast to the findings of the Fitriyah, (2023) suggesting that there is no effect of WhatsApp group on self-regulation among adolescents with anemia symptoms at SMK Sari Farma Depok in 2021.

Educational media, delivered and packaged in an attractive way, has been shown to increase knowledge and adherence to treatment of a disease, particularly anemia (Syahrina et al., 2020). Effect of telenursing with WA-Reminder for anemia education and iron medication adherence shows great potential in modern healthcare revolution (Wirmando et al., 2021). Simple technology such as WhatsApp, which has become part of everyday life, is now being

used for a deeper and more beneficial purpose, helping people with anemia to adhere to successful treatment (Ilham et al., 2022). These technological developments are very positive, given that medication adherence is often a major challenge in the management of chronic diseases such as anemia (Rohani et al., 2022). We believe that the regularity and personalisation of the messages were key factors in the success of this intervention. Regular and personalised messages make patients feel more cared for and connected to the health worker, which in turn motivates them to follow medication instructions. In a daily life full of activities and distractions, patients often forget or ignore their medication schedule. With reminders sent at regular intervals, patients feel more reminded and supported in complying with medication instructions. In addition, the educational messages about anemia help deepen patients' understanding of the importance of treatment and the risks they may face if they do not comply, thus changing their attitude towards treatment to a more positive one.

The researchers also found that the effectiveness of WA reminders is highly dependent on the quality and relevance of the messages sent. Messages that are too long or too technical may be ignored by patients, so it is important for health professionals to design messages that are short, clear and to the point. In addition, patients should feel that they are not just passive recipients of information, but that they are an active part of their care process. Of course, this can be achieved by offering the opportunity to ask questions or provide feedback on the same platform, so that a two-way communication can be established. Despite the benefits, the technological challenges cannot be ignored. WhatsApp is a popular platform, but not all patients have equal access to this technology. Some respondents may face problems with internet access or lack of digital literacy, which can reduce the benefits of telenursing. To overcome these barriers, additional programmes focusing on digital literacy may be needed so that all patients, without exception, can benefit from this intervention. Researchers believe that telenursing with WA Reminder has great potential to improve iron medication adherence and anemia knowledge. However, to maximise the benefits, a more structured and adaptive approach is needed that takes into account individual patient challenges and needs. Thus, telenursing with WA-Reminder can be an effective and sustainable tool in efforts to improve public health, particularly in anemia management.

CONCLUSION

The results showed that there was a significant effect of using Telenursing with WA-Reminder on knowledge and compliance with taking FE medication in adolescents with anemia with a p-value of 0.017 and 0.000 respectively. This study is expected to be one of the solutions for health workers in their efforts to prevent and manage anemia, especially for the adolescent population in educational settings. This research can also be used as a reference for further research so that it can be developed through a wider research topic by adding other variables / methods that could be a solution in overcoming anemia, especially among adolescents.

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