Overview of the Knowledge Level of Ninth-Grade female Students Regarding the Prevention of Anemia at SMP Putri Cahaya Medan

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Abstract. Anemia is a medical condition characterized by a lower-than-normal number of red blood cells or hemoglobin levels in the blood. This results in a reduced ability of the blood to carry oxygen throughout the body. Consequently, individuals with anemia may experience various symptoms such as fatigue, dizziness, and shortness of breath. The main causes of anemia are generally due to a lack of knowledge about this condition and deficiencies in nutrients such as iron.The purpose of this study is to determine the level of knowledge among ninth-grade female students regarding the prevention of anemia and their ability to prevent it. This study uses a descriptive research method, focusing on describing the level of knowledge of ninth-grade female students about the prevention of anemia.The study uses the Total Sampling method as the sampling technique, which means that all members of the population are included as respondents. Therefore, the number of respondents in this study is equal to the total population of female students, which are 54 individuals. Data collection is conducted using a closed-ended questionnaire consisting of 20 items covering indicators such as the definition of anemia, its etiology, signs and symptoms, treatment, and prevention.The results of the study show that knowledge regarding the definition of anemia is in the good category for 35 respondents (64.8%), knowledge about etiology is in the fair category for 35 respondents (64.8%), knowledge of signs and symptoms was in the fair category for 45 respondents (83.3%), knowledge about treatment is in the good category for 33 respondents (61.1%), and knowledge of prevention is in the fair category for 32 respondents (59.3%).It is hoped that by increasing the knowledge of ninth-grade female students about the prevention of anemia, schools and health workers can work together to carry out regular health education.

Keywords: Anemia; Female Ninth-Grade; Knowledge; Prevention; SMP Putri Cahaya

1. INTRODUCTION

When we enter adolescence, major changes occur in our bodies. Adolescent physique usually undergoes rapid changes in a short period of time, accompanied by an evolution of mindset that is no less important. Adolescence is a period that links two important phases in life, namely childhood and adulthood. Lestari et al. (2022) say that adolescence is a transition period where the body needs more nutrient intake. During this stage, adolescents tend to feel emotional closeness with those closest to them, in addition to that they are increasingly motivated to hone their ability to analyze information (Suraya et al., 2024).

Adolescence is a developmental period that connects children to adult life. Based on data from the Ministry of Health of the Republic of Indonesia (2007), those aged 10 to 19 years and unmarried are classified as adolescents. In 2012, BKBN stated that adolescents include

individuals both men and women with an age range of 10 to 24 years (Mahdalena & Jumiati, 2024).

Young women have a greater tendency to suffer from anemia than adolescent boys. One of the main causes is the monthly menstrual cycle that adolescent girls experience, which naturally leads to blood loss. During menstruation, a number of iron substances that are important for the formation of hemoglobin are also released. This is one of the reasons why the prevalence of anemia is quite high among adolescent girls. In addition, adolescent girls are in a growth phase that requires more nutritional intake, including iron. Therefore special attention to diet and health is very important for them .(Pangestu et al., 2022).

Anemia is a health problem characterized by low levels of hemoglobin (Hb) in the blood below normal limits. For adolescent girls, the amount of hemoglobin that is considered normal is above 12g/dL. Until now, anemia is still a serious global health issue because in addition to affecting the condition of the body, it also affects the social and financial life sectors. For example, this condition can reduce productivity levels, interfere with academic achievement, and increase the risk of other health complications (Rahayu & Prajayanti, 2024).

A person's knowledge has an important role in influencing the risk of anemia. Knowledge can influence behavior, including lifestyle and eating habits. Lack of information about anemia, its symptoms, impacts, and prevention methods often lead adolescents to choose foods with low iron levels. As a result, the iron that is needed to support the physical development and health of adolescents cannot be met. A variety of factors, such as age and the type of information received, both from official and unofficial sources, can affect the way adolescent girls understand anemia. What affects the understanding of adolescent girls related to anemia includes their age and the information they receive, both from formal and informal sources. Providing more frequent information can encourage more permanent behavioral changes (Damayanti et al., 2021).

The main symptom of anemia that often appears is paleness of the skin. This condition is usually caused by a lack of blood volume, decreased hemoglobin levels, and vasoconstriction in blood vessels that aim to maximize the delivery of oxygen to the body's tissues. In addition, tachycardia and noise in the heart also indicate an increase in the workload of the heart and an increase in the flow of pumped blood. Some of the complaints that people with anemia often experience include weakness, fatigue, lethargy, as well as headaches and blurred or blurred vision. In severe anemia, it causes more serious symptoms such as lethargy, confusion, and also complications that can be fatal, including heart failure, heart rhythm disorders, heart attacks, and chest pain (Pangestu et al., 2022).

The effects of iron deficiency can be seen in various aspects such as decreased immunity, focus, learning outcomes, adolescent physical condition, and overall performance, in addition to that for adolescents who experience anemia the impact can be more dangerous, because they have the potential to become mothers who will go through pregnancy and childbirth, anemia is able to increase the risk of death during childbirth, triggers premature birth, and risks giving birth to underweight babies (Pangestu et al., 2022).

Globally, anemia is a serious public health problem affecting 571 million women around the world. Based on an analysis conducted by WHO, it is estimated that the prevalence of anemia in the world reaches 40% among children aged 6-59 months, in adolescent girls as much as 30% in the world who experience anemia, this is most common in low- and middle-income countries (Putri et al., 2024).

According to the results of the 2018 basic health research, it was revealed that almost half of the population in Indonesia experienced anemia with an incidence rate of 48.9% of which 27.2% were women and 20.3% of men suffered from anemia. Data obtained from basic health research shows that anemia due to iron deficiency records a prevalence rate in adolescent girls reaching 22.7%, while among adolescent boys it reaches 12.4% (Lubis et al., 2023).

The incidence of anemia in North Sumatra province was recorded at 25% in adult women, 26.8% in adult men and 14.5% in children. Based on an anemia survey conducted in 2016 in a number of areas such as Medan City, Binjai City, and Deli Serdang Regency, it was found that 40.5% of adolescent girls experienced anemia with most cases due to iron deficiency and lack of Vitamin A. In 2017 the prevalence of anemia among adolescent girls in Padang Sidimpuan City reached 60%. This condition is influenced by a number of causes, including the menstrual cycle, low family income, and insufficient iron consumption.

Adolescents with adequate access to information about anemia generally have a lower risk of developing it. This is in accordance with the results of an experimental study conducted by Notoatmodjo and is also strengthened by the findings of Pangathousands et al. (2022). The role of age also affects the degree of understanding of adolescent girls about anemia. Lack of knowledge makes them more vulnerable to this condition, due to a lack of awareness and limitations in understanding the importance of prevention. Women who experience anemia are at risk of fatigue, reproductive health disorders, obstacles in mental and motor development, difficulty in achieving a career, and decreased productivity levels. In addition, among women who have gone through menopause, this condition can persist into old age and have a negative impact on their quality of life, which increases the potential for anemia in the long term. In addition, it can contribute to the risk of birth to low-weight babies, increase the risk of

premature death, as well as vision impairment in children. Old age in postmenopausal women can persist into old age and negatively impact their quality of life, increasing the risk of developing anemia too late. Blindness (IUGR) of premature death and blindness in children due to serious bleeding during childbirth and early death, the possibility of the child becoming stunting (Suraya et al., 2024).

Efforts to encourage increased knowledge through counseling about the factors that cause anemia, its symptoms and signs, and other negative impacts. The things that can be done by patients who have anemia are by providing adequate iron intake to the body to encourage the formation of hemoglobin. Then, another effort is in the form of providing food intake with high levels of iron, through food sources that have balanced nutrition including a variety of food ingredients, especially those derived from animals such as poultry, meat, fish, and liver, to plant foods, such as dark green vegetables and nuts. In addition, through food fortification, to the provision of additional iron supplements such as blood supplement tablets (TTD) routinely in the appropriate time and dose. These aspects can avoid the occurrence of anemia and encourage the availability of iron reserves in the body (Nurvita et al., 2024).

Based on the initial survey conducted by the researcher, the researcher was interested in raising the title regarding the description of the level of knowledge of grade IX students about the prevention of anemia incidence in junior high school Putri Cahaya Medan in 2025.

2. RESEARCH METHOD

In this study, the research method to be used is descriptive. Where the focus of the research is to describe the level of knowledge of grade IX students about the prevention of anemia. In this study, the population includes 54 female students in grade IX at Cahaya Medan Women's Junior High School in 2025. In this study, *the Total Sampling* method is used as a sampling technique, which means that all members of the population are used as respondents. Therefore, the number of respondents in this study is equal to the total population, which is 54 female students.

In the study, the variable studied was the level of knowledge of grade IX students about the prevention of anemia. This study utilizes questionnaires as a data collection tool that includes 20 questions, which are divided into 5 components consisting of definition, etiology, signs and symptoms, treatment, and prevention. The type of questionnaire used has a closed-ended question form, where respondents only need to mark (√) for the option to be chosen. This questionnaire is intended to measure the level of knowledge of grade IX students about

the prevention of anemia, the researcher uses a questionnaire as a research instrument containing 20 questions.

In this study, the researcher did not conduct a validity test and reliability test because the data collection used by the researcher used a standardized questionnaire. The analysis method used in the study is univariate analysis which intends to explain or explain the characteristics of each variable. This type of univariate analysis is adjusted to the form of research. In this study, a univariate statistical approach was used to recognize dependent variables, namely the level of knowledge of grade IX students at Cahaya Medan Women's Junior High School in 2025. The accumulation of the percentage distribution and its occurrence rate included in the percentage analysis of one type of data.

This research has passed the ethics test from the research commission of the Santa Elisabeth College of Health Sciences Medan with the number: 044/KEPK-SE/PE-DT/IV/2025

3. RESULT AND DISCUSSION

Table 1. Frequency Distribution Based on Demographic Data (age, class) of Grade IX Students at Junior High School Putri Cahaya Medan in 2025

Characteristics	*f*	%
Age		
13 Years	1	1,9
14	26	48,1
15	26	48,1
16	1	1,9
Total	**54**	**100**
Class		
IX-1	16	29,6
IX-2	13	24,1
IX-3	12	22,2
IX-4	13	24,1
Total	**54**	**100**

In accordance with table 1 above, the results of data research based on the age category of 13 years old as 1 respondent (1.9%), 14 years old as many as 26 respondents (48.1%), 15 years old as many as 26 respondents (48.1%), 16 years old as 1 respondent (1.9%). Based on class categories, data were obtained from class IX-1 as many as 16 respondents (29.6%), class IX-2 as many as 13 respondents (24.1%), class IX-3 as many as 12 respondents (22.2%), class IX-4 as many as 13 respondents (24.1%).

Table 2. Frequency Distribution based on the definition of anemia at Putri Cahaya Medan Junior High School in 2025.

Defenition	f	%
Good	35	64,8
Enough	17	31,5
Less	2	3,7
Total	**54**	**100,0**

Referring to table 2 It was obtained that the knowledge of grade IX students about the definition of anemia in the good category was 35 people (64.8%), 17 people (31.5%) were sufficient, and 2 people (3.7%) were deficient.

Table 3. Frequency distribution based on etiology or cause of anemia at Putri Cahaya Medan Junior High School in 2025

Etiology	f	%
Good	9	16,7
Enough	35	64,8
Less	10	18,5
Total	**54**	**100,0**

Referring to table 3 It was obtained that 9 people (16.7%) of class IX students had knowledge of the etiology or causes of anemia in the good category, 35 people (64.8%) in the adequate category, and 10 people in the poor category (18.5).

Table 4 . Distribution of Anemia Signs and Symptoms in Putri Cahaya Medan Junior High School in 2025

Signs and Symptoms	f	%
Good	0	0,0
Enough	45	83,8
Less	9	16,7
Total	**54**	**100,0**

Referring to table 4, it was obtained that the knowledge of grade IX students about the signs and symptoms of anemia in the category was sufficient as many as 45 people (83.8%), less than 9 people (16.7%).

Table 5. Frequency Distribution of Anemia Treatment at Putri Cahaya Junior High School Medan in 2025

Handling	*f*	%
Good	33	61,1
Enough	15	27,8
Less	6	11,1
Total	**54**	**100,0**

Referring to table 5 It was obtained that the knowledge of grade IX students about handling anemia in the good category was 33 people (61.1%), the adequate category was 15 people (27.8%), and 6 people were less (11.1%).

Table 6. Frequency distribution of anemia prevention at Putri cahaya Medan Junior High School in 2025

Prevention	*f*	%
Good	1	1,9
Enough	32	59,3
Less	21	38,9
Total	**54**	**100,0**

Referring to table 6 It was obtained that the knowledge of grade IX students about anemia prevention was in the good category as many as 1 person (1.9%), the adequate category was 32 people (59.3%), and the poor category was 21 people (38.9%).

Table 7. Frequency Distribution Based on Knowledge of Grade IX Students on the Prevention of Anemia Incidence at Putri Cahaya Medan Junior High School in 2025

Knowledge Level of Grade IX Students	*f*	%
Good	32	59,3
Enough	22	40,7
Less	0	0,0
Total	**54**	**100,0**

Referring to table 7, it was obtained that the level of knowledge of grade IX students about the prevention of anemia in the good category was 32 people (59.3%), the fair category was 22 people (40.7%).

**Discussion of Research Results**

Defenition Anemia
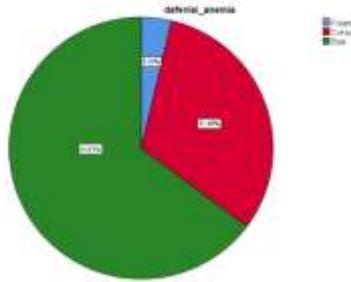
Based on the diagram regarding the understanding of the definition of anemia from a total of 54 respondents, it was found that as many as 35 students (64.%) were in the good category, 17 students (31.5%) were in the adequate category, and 2 students (3.7%) were classified as poor.

The researchers concluded that the level of understanding of the dominant definition of anemia was in the good category, possibly due to the respondents' age range between 13 and 16 years, which is early adolescence when the level of curiosity about various things tends to be high.

The results of this study are in line with the findings (Nurhalimah, 2024) in her research entitled Overview of the level of knowledge about anemia in adolescent girls in Tegal Sari village in 2024. In the study, it was explained that as they get older, a person tends to have a more mature mindset so that their level of knowledge also increases. Thus, age can be a factor that affects the level of knowledge, because as a person gets older, a person's thinking ability will also develop.

This research is in line with the results of a study conducted by (Zakiah et al., 2023) entitled An overview of the level of knowledge of students of the Faculty of Tarbiyah and Teacher Training of UIN Mataram about anemia. In the study, it was explained that the age of the respondents also affects the level of knowledge, where the older a person gets, the more his ability to understand and filter information also increases, so his knowledge tends to be high.

Etiology Anemia
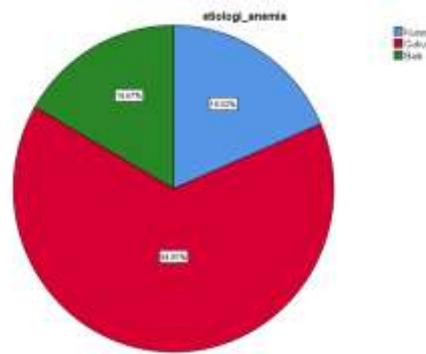
Based on the diagram of the etiology of anemia from 54 respondents, it was known that as many as 9 students (16.7%) had knowledge in the good category, 35 students (64.8%) were in the sufficient category, and 10 students (18.5%) were in the poor category.

The researcher argues that the knowledge of grade IX students about the causes of anemia is mostly at an adequate level, likely due to limited access to formal information sources, such as health subject matter in schools and the lack of direct health counseling and education activities.

The results of this study are in line with a study conducted by (Ali et al., 2016) entitled Overview of Knowledge of Adolescent Girls Related to Anemia at SMP Negeri 10 Gorontalo City. The study revealed that as many as 65.5% of adolescent girls have a sufficient level of knowledge about anemia, including an understanding of its causes. In addition, the study also shows that one of the factors that affect the level of knowledge is limited access to adequate health information in the school environment.

This research is in line with the results of a study (Mar' atul & Gusfina, 2022) entitled Overview of Knowledge about Anemia in Adolescent Girls at State High School 6 Bengkulu City. The study showed that most of the respondents, namely (34%) obtained information through health counseling activities. It can be concluded that the provision of health counseling in the school environment plays an important role in increasing students' knowledge about health issues.

This research is in line with a study conducted by (Hanifah et al., 2022) entitled Anemia Counseling as a Preventive Effort and the Sabenta Ceria (Friends of Anemia Prevention Prevention Program). In the study, it was explained that counseling activities play a role in conveying information to the community to increase knowledge and encourage behavior change. In addition, counseling usually uses the media as a means to help the audience more easily understand the material being delivered.

Signs and Symptoms of Anemia
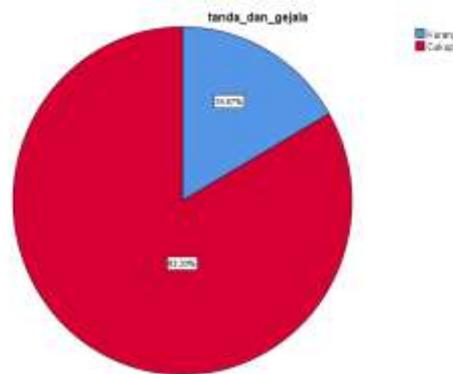
Based on the diagram that illustrates the understanding of the signs and symptoms of anemia, it is known that as many as 45 respondents (83.3%) are in the sufficient category while 9 respondents (16.7%) are classified as deficient.

The researcher suspects that the respondents' level of knowledge about signs and symptoms indicators is at a sufficient level due to their family's economic factors. Young women who come from families with limited economic conditions generally have difficulty in gaining access to health information resources such as health books, nutritional counseling services, and digital devices that can access medical information. These limitations can affect their understanding of common symptoms of anemia such as tiredness, dizziness, and pale-looking faces.

This research is in line with the findings (Anjali et al., 2025) in a study entitled Overview of Risk Factors and Knowledge About Anemia in Adolescent Girls at SMAN 1 Paguyaman. The study supports this assumption by showing that most respondents come from low-income families, and as many as 55.3% of schoolgirls have knowledge about anemia in the adequate category. The researchers concluded that limited economic conditions have an impact on adolescents' limited access to health information and education, which ultimately affects their level of understanding, particularly in identifying symptoms and signs of anemia.

This research is in line with the results of a study (Suryani et al., 2020) entitled The relationship between knowledge and socioeconomics and the incidence of anemia in adolescent girls at SMK Negeri 6 Palu. In the study, it was explained that adolescent girls who come from low-income families tend to experience anemia, because they do not pay attention to the nutritional content in the food consumed. This is due to the priority given more to the amount of food than to the nutritional quality.

This research is in line with the findings (Suandana et al., 2023), in a study entitled Analysis of Factors Related to the Incidence of Anemia in Adolescent Girls. The study shows

that families with low income levels tend to have difficulty meeting the needs of nutritious food intake, which ultimately directly affects the health condition of their children.

Anemia Handling
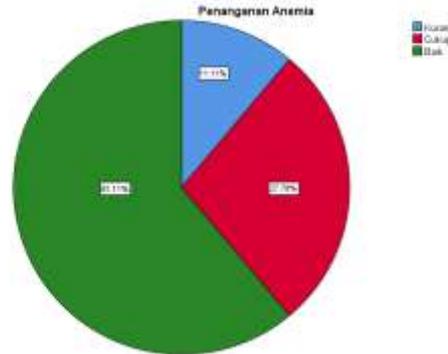
Berdasarkan data dari diagram mengenai penanganan anemia, diketahui bahwa sebanyak 33 responden (61,1%) memiliki pengetahuan dalam kategori baik, 15 responden (27,8%) berada pada kategori cukup dan 6 orang (11,1%) termasuk dalam kategori kurang.

Based on data from the diagram regarding the handling of anemia, it is known that as many as 33 respondents (61.1%) have knowledge in the good category, 15 respondents (27.8%) are in the sufficient category and 6 people (11.1%) are included in the poor category.

The researcher concluded that this high level of knowledge is related to the educational background of the parents. Parents who have a low level of education tend to lack understanding and communicate health information effectively to their children. As a result, students lack education and support from their families regarding measures to handle and prevent anemia.

This research is in line with the results of a study (Satriani et al., 2019) which states that low parental education levels have an impact on a lack of attention to family needs, especially in adolescents who are in the growth period. The low level of education also affects the ability of parents to receive and understand information, especially related to health.

This research is in line with the findings (Jaelani et al., 2020) which stated that parents with better educational backgrounds tend to be better able to receive and understand information about nutrition and appropriate parenting patterns. Parental education also plays an important role as a basis for supporting family economic conditions. The higher the level of formal education has, the greater the likelihood that parents will have access to and understanding of health information, including related to nutritional needs in the family.

This research is in line with findings (Nurhayati & Khairiah, 2025) which reveal that a mother's low level of education can be an obstacle in dealing with health problems in her

family, especially related to nutritional intake. The lack of educational background also plays a role in the limited access to information, so that the mother's understanding of nutritional needs becomes less optimal.

This research is in line with Sari's 2022 findings which stated that parental education levels have an important role in determining family health conditions. To achieve an optimal degree of family health, parents need to keep their knowledge up to date. Currently, the development of knowledge is taking place rapidly, along with increasing awareness and mother's desire to continue learning. This allows mothers to provide the best support for their teens to grow and develop healthily.

Anemia Prevention
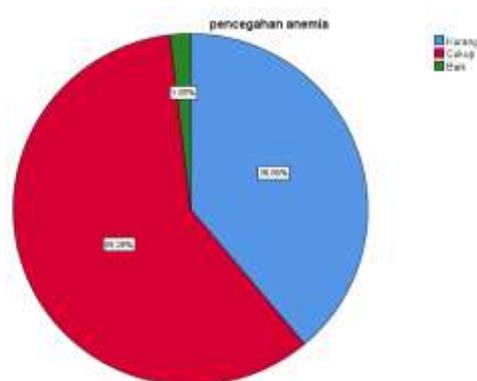
Based on the data in the diagram regarding anemia prevention efforts, it is known that anemia prevention as many as 1 respondent (1.9%) has knowledge in the good category, as many as 32 respondents (59.3%) in the adequate category, and as many as 21 respondents (38.9%) in the poor category.

The researcher argues that the level of knowledge of students about anemia prevention is sufficient due to the role of the family, especially parental attention and support in forming healthy living habits in the home environment. The routine applied at home also supports the improvement of students' understanding in preventing anemia.

This study is in line with the findings (Ningtyas et al., 2021) in a study entitled The relationship between knowledge about anemia and family support for adherence to the consumption of blood-boosting tablets in adolescent girls at SMPN 01 Brondong Lamongan. The study states that family support is one of the important roles in shaping healthy diets, habits, and lifestyles. This form of support can come from parents, siblings, or other family members who live with young women in the same house.

This research is in line with the results of a study (Harlisa et al., 2023) entitled Knowledge, Motivation, and Family Support with TTD Consumption Compliance in

Adolescent Girls in SMAN 5 Tuban. In the study, it was explained that support from the family plays a big role in increasing the compliance of young women in maintaining their health. This is because teenagers are at a stage of development that is still unstable, so they really need guidance and encouragement from the closest people, especially family. On the other hand, if family support is minimal, then young women tend to be less motivated and tend to be less motivated and tend to ignore the importance of maintaining health. Therefore, family involvement is an important factor in encouraging healthy behaviors in young women during their growing years.

This research is in line with (Rukmaini, 2022) with the title of research on the role of health workers, teachers, and families in knowledge about anemia in adolescent girls in Tangerang Regency which says that family support relationships are one of the factors needed to shape the intention of adolescent women to increase their knowledge, especially about anemia. Therefore, the high role given by the family will increase knowledge and will certainly form a normative belief and young women will tend to form a positive perception of anemia prevention behavior.

Diagram of the Knowledge Level of Grade IX Students on the Prevention of Anemia Incidence at Putri Cahaya Medan Junior High School in 2025
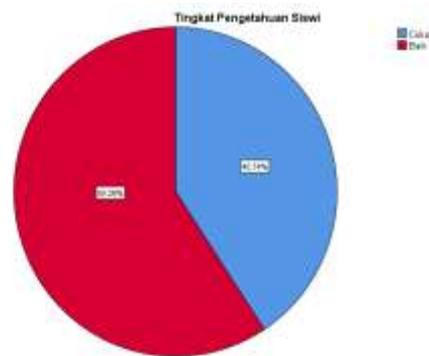
Based on the distribution diagram of the level of knowledge of grade IX students regarding efforts to prevent anemia, out of a total of 54 respondents, 32 people (59.3%) had knowledge in the good category, while 22 respondents (40.7%) were in the sufficient category.

The researchers concluded that the majority of female students have good knowledge related to anemia prevention. This verifies the extent of adolescents' understanding of the definitions, risk factors, mechanisms of occurrence, signs and symptoms, as well as how to manage and treat anemia. This knowledge is reflected in the preventive behaviors they carry out, such as maintaining a nutritious and balanced diet, avoiding excessive diets, and eating regularly according to the body's needs.

This research is in line with the findings (Meliati & Sundayani, 2021) in their study entitled Efforts to Increase Adolescent Knowledge in Maturing Marriage Age during the Covid-19 Pandemic. In the study, it was classified that individuals with a good level of knowledge tend to have higher awareness of health, including in terms of choosing and consuming nutritious foods. Women who have a good understanding of healthy nutrition have a lower risk of developing anemia, because they are 1.9 times more likely to meet dietary diversity standards.

This research is in line with the results of a study (Damayanti et al 2021), which states that knowledge reflects the extent to which a person understands and pays attention to something in an effort to solve problems and in the learning process. Knowledge, especially in the cognitive realm, has a crucial role in shaping individual actions. Based on experience and research findings, knowledge-based behaviors tend to be more stable and long-lasting compared to behaviors that are not supported by adequate understanding.

4.   CONCLUSIONS AND SUGGESTIONS

The definition of anemia at SMP Putri Cahaya Medan was in the good category as many as 35 respondents (64.8%) and less as many as 2 people (3.7%). The etiology of anemia at Putri Cahaya Medan Junior High School was in the adequate category of 35 respondents (64.8%) and the good category of 9 people (16.7%). The signs and symptoms of anemia at Putri Cahaya Medan Junior High School were in the sufficient category as many as 45 respondents (83.3%) and less as many as 9 people (16.7%). The handling of anemia at Putri Cahaya Medan Junior High School was in the good category of 33 respondents (61.1%) and 6 people (11.1%) were poor. Anemia prevention at Putri Cahaya Medan Junior High School was in the adequate category of 32 respondents (59.3%) and the good category of 1 person (1.9%).

It is hoped that future researchers will be advised to carry out further studies. With expanded scope, because this study has limitations in the number of respondents and the location of the study is limited to one school.

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