The Importance of Increasing Knowledge About Worm Infection and Hemoglobin (Hb) Testing as An Efforts To Prevent Anemia in Students of Cikiwul 2 Elementary School, Bantar Gebang, Bekasi

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Abstract.

Worm infection occurs when eggs or larvae enter the body, the worm parasites attach to the intestinal mucosa, suck blood chronically, resulting in significant blood loss. In addition, worms interfere with nutrient absorption (malabsorption), causing deficiencies in iron, folate, and protein, which are essential for hemoglobin formation, thus causing anemia. Infections often occur in elementary school students due to limited knowledge about worm invasion. Community service activities with the Community Partnership Program (CPP) Science and Technology Scheme, The Importance of Increasing Knowledge About Worm Infections and Hemoglobin (Hb) Examination as an Effort to Prevent Anemia in Students of SDN Cikiwul 2, Bantar Gebang, Bekasi. The target group is 102 students in grades 5 and 6.The method of increasing knowledge through pre-test and post-test using a questionnaire, and measuring Hemoglobin (Hb) levels using a Point of Care (POCT) tool. Determination of anemia categories based on cut-offs by WHO in the Guideline on Hemoglobin Cut-offs to Define Anaemia in Individuals and Populations.The results of the activity showed an increase in students' knowledge of worms, from 74.8 in the pre-test to 81.3 in the post-test. The proportion of students with a score of 70 or above also increased, from 68.6% in the pre-test to 82.4% in the post-test. The average HB level was 12.3 g/dL, with a minimum of 9.4 g/dL and a maximum of 16.3 g/dL. The overall prevalence of anemia remains relatively high (32.3%), with mild anemia predominating (18.6%). No students were found to have severe anemia. Male students tended to have anemia more often (40%), with 24.0% having mild anemia compared to female students. The age of students experiencing anemia ranged from the age group > 12 years at 48.3%, with 34.5% being in the mild anemia category. The proportion of 5th grade students with anemia was 36.3%, with 22.7% being in the mild anemia category. The results indicate the potential for continued accumulation of nutritional deficiencies.

Keywords: *Anemia; Hb level; Worms and Point of Care Testing (POCT).*

I. INTRODUCTION

Helminthiasis is a disease caused by worm infestation. Worm disease itself does not receive much attention (neglected disease) because it is considered a disease that does not cause outbreaks or deaths[1]. Worms are an endemic and chronic disease, although they are not fatal, they disrupt health and reduce students' learning abilities, disrupting nutrient absorption, causing anemia[2]. In the body the worm parasites attach to the intestinal mucosa and suck blood chronically, resulting in significant blood loss. In addition, worms interfere with nutrient absorption (malabsorption), causing deficiencies in iron, folate and protein which are important for the formation of hemoglobin, thus causing anemia. In fact, anemia has long-term impacts such as decreased endurance, decreased fitness, susceptibility to disease, decreased body performance, and children's achievement and development are also disrupted. Worm worms can cause a lack of ability in students due to a lack of iron, macro nutrients, slowing down the child's physical growth and development, activity and intelligence. In elementary school students, worm infections interfere with learning abilities, because substances that students need during growth are absorbed by the worms. Students who experience worms for a long period of time can affect the quality of future human resources[3]. Anemia is a condition where the number of red blood cells or hemoglobin levels is less than normal.

WHO in the World Wide Prevalence of Anemia reports that the entire world population suffers from anemia, 1.62 billion people with a prevalence of elementary school students (25.4%) and 305 million school students worldwide suffer from anemia. In general, the cause of anemia is nutritional deficiencies, especially iron deficiency and parasitic infections such as worms[4]. Worm infections experienced by elementary school students are related to knowledge of healthy living practices which are not yet well understood as a risk factor for worm infections. Clean and Healthy Living Behavior (PHBS), such as practicing healthy living attitudes, washing hands and cutting nails, bathing twice a day, and using footwear [5]. The research results show that personal hygiene and environmental sanitation have a significant relationship to the incidence of worms. However, worms can also be influenced by other factors such as parents' knowledge regarding clean and healthy living behavior (PHBS), poverty or the family's socio-economic conditions[6]. Increasing knowledge about worms is significantly related to reducing the incidence of worm infections.

Good knowledge, especially among elementary school students, increases awareness of clean and healthy living behavior (PHBS), such as washing hands, using footwear, and cutting nails, which directly prevents worm infections. Better knowledge motivates individuals to practice personal and environmental hygiene. Knowledge about the dangers and ways of transmitting worms helps reduce bad habits (such as playing in the dirt barefoot or not washing your hands before eating) which are the main causes of infection[7].The government's efforts to eradicate worms include mass drug administration, promotion of healthy lifestyles and clean sanitation. Preventing worm infections is quite easy by implementing clean and healthy living habits (PHBS), washing hands with soap after defecating, before eating, cutting nails and using footwear, using clean water for household needs, maintaining food cleanliness and safety, using healthy latrines, striving for healthy environmental conditions. These efforts can be provided by increasing knowledge through education[6]. Worm worms can interfere with the formation of hemoglobin, causing anemia, therefore apart from increasing knowledge, efforts to prevent anemia are also through checking hemoglobin (Hb) levels. Increasing knowledge about worms and checking Hb levels of elementary school students to prepare and improve the quality of the future human resources of the Indonesian nation[8].

II. PRIORITY ISSUES

Cikiwul 2 Bantar Gebang State Elementary School (ES), Bekasi City, with NPSN 20223559, address at Jalan Pangkalan 2 RT 01/02, has the vision of creating a generation of independent piety, enthusiasm for learning, logical thinking, and harmonious relationships between school residents and the environment. The latest data for the number of students at the end of 2024 or odd semester 2024/2025, with a total of around 541 students (287 men and 254 women) [9]. This school is under the auspices of the Bekasi City Education Department. The location is very close to the Bantar Gebang Final Disposal Site (FDS), and is even on the side of the road in an area that is easy to reach from the area around the FDS.Being at the FDS location, this school always has lots of vehicles carrying garbage. Often the unpleasant smell that stings the nose from FDS waste can be smelled from this school. There are quite a large number of students and they are located on a roadside location where lots of rubbish trucks pass, so many students play in the yard during recess and are also exposed to dust, which may be a risk factor for carrying disease sources[10].The priority program of the Ministry of Health of the Republic of Indonesia on Neglected Tropical Diseases (NTDs) is focused on achieving the target of eliminating and being free from NTDs by 2030. NTDs are a group of infectious diseases that are commonly found in poor and neglected populations. In Indonesia, based on the strategic plan and elimination roadmap, the Indonesian Ministry of Health has 11 priority diseases (main focus), one of which is worms (Helminthiasis).

The program implementation strategy starts from providing mass preventive medication in worm endemic areas, early detection and active surveillance to prevent disability, community empowerment through education on clean and healthy living behavior (PHBS), and elimination certification in the form of awarding certificates to districts/cities that successfully achieve the national NTDs elimination target in line with the WHO 2021-2030 road map[11]. To support this program's priorities through primary health transformation and strengthening disease surveillance to ensure equitable and sustainable health services, one of the prevention program steps is needed in the form of community empowerment in the form of

community service. For this reason, the presence of universities is needed in implementing the Tri Dharma of Higher Education in the form of community service in developing the next generation into healthy Indonesian children. The strategy for implementing the program in community service activities is in the form of Education on Clean and Healthy Living Behavior to reduce environmental risk factors. Activity topic: The Importance of Increasing Knowledge About Worms and Hemoglobin (Hb) Examination as an Effort to Prevent Anemia in Students at state ES Cikiwul 2 , Bantar Gebang, Bekasi. Increasing knowledge through PHBS education to prevent worms. Meanwhile, the results of the Hemoglobin (HB) examination are used as an initial detection of anemia, which is one of the impacts of experiencing a worm infection.

III. METHODS

Community Service Program Science and Technology Scheme Community Partnership Program (CPP), measuring increased knowledge through providing education about worms and checking hemoglobin (Hb) levels for students at Cikiwul 2 State Elementary School (ES), Bantar Gebang District, Bekasi.Participants were a team of lecturers and students from the Department of Medical Laboratory Technology, school principals, class teachers at Cikiwul 2 State Elementary School, Bantar Gebang, Bekasi, and the Head of the Public Health Center. The targets are 102 students in grades 5 and 6 of Cikiwul 2 State Elementary School, Bantar Gebang, Bekasi.Time and place of implementation, 11 and 15 September 2025, at Cikiwul 2 State Elementary School, Jl. Pangkalan 2, RT.1/RW.2, Cikiwul, Kec. Bantar Gebang, Bekasi City, West Java 17152.Stages of Implementation of Activities: Preparation, Coordination with the Cikiwul Village Community Health Center, Coordination with the Principal of ES Cikiwul 2, Preparing worm education materials in the form of booklets and power points, Making a knowledge test questionnaire about worm 1).

Implementation: Measuring initial knowledge through a Pre-Test by a team of lecturers and students using a questionnaire, Providing knowledge (Education) about worms, by a team of lecturers and students using Educational material in accordance with the Regulation of the Minister of Health of the Republic of Indonesia Number 15 of 2017 Concerning Overcoming Worms, which contains knowledge material about anemia, definition of anemia, symptoms of anemia, risk factors for anemia, risk factors for worms, introduction to types of worms that cause anemia, ways to prevent worms, causes and targets of worms, impact of worms, transmission/infestation of worms, symptoms/signs, impact of worms and detection of worms in the form of power points and booklets, Measuring knowledge increase through Post-Test by a team of lecturers and students using questionnaires, Checking hemoglobin levels of 102 students using capillary blood which is read on a POCT device.Reports and Data analysis to determine whether there was an increase in knowledge before and after education was carried out using the *McNemar test* using the SPSS for windows version 11.5 program. Analysis of data from examination of students' Hb levels using standard status criteria of the World Health Organization (WHO), 2001. Criteria for anemia are Hb < 11.5 g/dL for respondents aged between 10 - 11 years and Hb < 12.0 for respondents aged 12 years. Not anemia is Hb ≥ 11.5 g/dL for respondents aged between 10 - 11 years and Hb ≥ 12.0 gr/dL for respondents aged 12 years.

IV. RESULT AND DISCUSSION

Result

A. Increasing knowledge about worms for students at Cikiwul 2 Elementary School, Bantar Gebang, Bekasi

1. Characteristics of Participants to Improve Worm Worm Knowledge for State Elementary School Students Cikiwul 2, Bantar Gebang, Bekasi

Table 1. Participant Characteristics (n=102)

Variable		Frequency	Percentage	Mean ± SD	Median (minimum—maximum)
Gender	Woman	52	51,0 %		
	Man	50	49,0 %		
Age (Years)				11,1 ± ,8	11 (10—13)
Age Group	5—11 years	73	71,6 %		

	≥ 12 years	29	28,4 %		
Class	5	44	43,1 %		
	6	58	56, 9%		

The average age of participants is 11 years and most of them are grade 6 elementary school students. At this age, it is hoped that students will be able to receive knowledge and can be evaluated for an increase in knowledge after providing the knowledge.

2. Initial Knowledge Measurement Results (Pre-Test) and Knowledge Improvement Results (Post-Test)

Table 2. Rekapitulasi Hasil Pengukuran Pengetahuan Mengenai Kecacingan

Test		Frequency	Percentage	Mean ± SD	Median (minimum - maximum)
PRE-TEST					
Pre-Test Score				74,8 ± 16,4	81,8 (9,1—100,0)
Pre-Test Score Category	Value < 70	32	31,4 %		
	Value ≥ 70	70	68,6 %		
POS-TEST					
Pos-Test Score				81,3 ± 20,6	81,8 (0—100,0)
Pos-Test Score Category	Value < 70	18	17,6 %		
	Value ≥ 70	84	82,4 %		

In Table 2, you can see an increase in students' average (mean) knowledge score regarding worms, pre-test 74.8 to post-test 81.3. The proportion of students who got a score ≥ 70 also increased, at the pre-test it was 68.6%, increasing at the post-test to 82.4%. It should be noted that the lowest score during the pretest was 9.1, while during the posttest, the lowest score was 0 (zero). This is because during the post-test, there were two students who did not take the test, so they got a score of 0 (zero). In general, as seen in Table 2, it is clear that after the education (counseling) was carried out by the community service team, there was an increase in students' knowledge about worms.

3. Knowledge Increasing Variables for Each Helminth Variable

There was an increase in knowledge for all variables, except for the worm prevention variable, there was no increase in knowledge. In table 3, increased knowledge occurs in the variables:

1. Variable recognition of worm types increased: 50%
2. The worm prevention variable did not increase
3. Variables causing and targeting worms increased: 64%
4. The variable impact of worms increased: 58%
5. Worm detection variable increased: 9.7

In detail for increasing each knowledge variable as in table 3 below:

Table 3. Knowledge Variables Regarding Worm Worms in Detail

Types of Knowledge	Test Type	Number of correct answers	Frequency	Percentage
Introduction to Worm Types	Pre-test	0	1	1,0 %
		1	5	4,9 %
		2	58	56,9 %
		3	38	37,3 %
	Pos-test	0	2	2,0 %
		1	3	2,9 %
		2	21	20,6 %
		3	76	74,5 %
Worm Prevention	Pre-test	0	22	21,6 %
		1	80	78,4 %
	Postest	0	35	34,3 %
		1	67	65,7 %
Causes & Targets of Worms	Pre-test	0	1	1,0 %
		1	13	12,7 %
		2	44	43,1 %
		3	44	43,1 %
	Pos-test	0	4	3,9 %
		1	7	6,9 %
		2	23	22,5 %

		3	68	66,7 %
Impact of Worms	Pre-test	0	4	3,9 %
		1	16	15,7 %
		2	53	52,0 %
		3	29	28,4 %
	Pos-test	0	8	7,8 %
		1	7	6,9 %
		2	37	36,3 %
		3	50	49.0 %
Worm Detection	Pre-test	0	20	19.6 %
		1	82	80.4 %
	Postest	0	18	17.6 %
		1	84	82.4 %

B. Examination of Hemoglobin (Hb) Levels of students at Cikiwul 2 Elementary School, Bantar Gebang, Bekasi

1. Results of examination of hemoglobin (Hb) levels of students at Cikiwul 2 Elementary School, Bantar Gebang, Bekasi based on hemoglobin category

Determination of the anemia category is based on the cut-off determined by WHO in the Guideline on Hemoglobin Cutoffs to Define Anaemia in Individuals and Populations. n the group of children aged 5 to 11 years, both boys and girls, Hb levels are considered normal if they are ≥ 11.5 g/dL. Meanwhile, the anemia categories are: mild anemia (11-11.4 g/dL), moderate anemia (8-10.9 g/dL), and severe anemia < 8 g/dL (World Health Organization, 2024). The results of checking Hb levels are in table 4 below:

Table 4. Hemoglobin Level Examination Results

Variable		Frequency	Percentage	Mean ± SD	Median (min—max)
Hemoglobin Level (g/dL)				12,3 ± 1,3	12,2 (9,4—16,3)
Hemoglobin Category	Normal	69	67,6%		
	Mild Anemia	19	18,6%		
	Moderate Anemia	14	13,7%		
	Severe Anemia	0	0,0%		

Table 1 shows that the prevalence of anemia among students at SDN Cikiwul 2, Bantar Gebang, Bekasi is 32.3%, with mild anemia at 18.6%.

2. Results of Hemoglobin (Hb) Examination of Students at Cikiwul 2 State Primary School, Bantar Gebang, Bekasi based on Gender

Table 5. Hemoglobin Categories Based on Gender

Gender	Hemoglobin Category								Amount	
	Normal		Mild Anemia		Moderate Anemia		Severe Anemia			
	n	%	n	%	n	%	n	%	n	%
Woman	39	75,0%	7	13,5%	6	11,5%	0	0,0%	52	100,0%
Man	30	60,0%	12	24,0%	8	16,0%	0	0,0%	50	100,0%

Table 2 shows that 40% of male students suffer from anemia, with the highest category being mild anemia at 24%.

Table 6. Hemoglobin Categories Based on Age Groups

Age Group	Hemoglobin Category								Amount	
	Normal		Mild Anemia		Moderate Anemia		Severe Anemia			
	n	%	n	%	n	%	n	%	n	%
Ages 5-11 years	54	74,0%	9	12,3%	10	13,7%	0	0,0%	73	100,0%
Ages ≥ 12 Years	15	51,7%	10	34,5%	4	13,8%	0	0,0%	29	100,0%

Table 3, based on age, the majority of people who experience anemia are in the age group > 12 years, amounting to 48.3%, namely in the mild anemia category 34.5%

Table 7. Hemoglobin Categories Based on Class

Class	Hemoglobin Category								Amount	
	Normal		Mild Anemia		Moderate Anemia		Severe Anemia			
	n	%	n	%	n	%	n	%	n	%
5	28	63,6%	10	22,7%	6	13,6%	0	0,0%	44	100,0%
6	41	70,7%	9	15,5%	8	13,8%	0	0,0%	58	100,0%

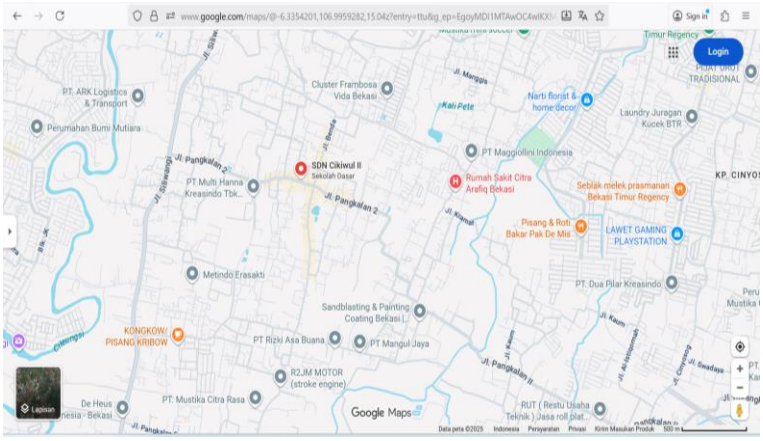

Fig 1. Target Partner Location Map, Jl. Pangkalan 2, RT.1/RW.2, Cikiwul, Kec. Bantar Gebang, Kota Bks, Jawa Barat, 17152

Fig 2. Class 5 and Class 6 Education Participants at Cikiwul 2 State Elementary School

Fig 3. Providing Education by the Community Service Team

Fig 4. Providing education using booklets and videos

Fig 5. Taking Capillary Blood Samples and Checking Hemoglobin Levels

Fig 6. Check Hb levels using the Essy Touch Rapid Diagnostic Test (RDT).

Discussion

Prevention of nematodes diseases caused by worms requires adequate intervention to prevent worms, one of which is through increasing knowledge (education). It is hoped that the results of the intervention will be an increase in the knowledge that is already available, which can be reflected in the attitudes and behavior of clean and healthy living (PHBS)[9]. Education about worms is a process of increasing an individual's knowledge from not knowing about worms to knowing and being able to take precautions themselves so as not to experience worms[12]. Providing education about worms to Cikiwul 2 elementary school students, Bantar Gebang, Bekasi, to 102 students showed an increase in students' average (mean) knowledge about worms, from pre-test 74.8 to post-test 81.3. The proportion of students who got a score ≥ 70 also increased, at the pre-test it was 68.6%, increasing at the post-test to 82.4%. This increase in knowledge shows that students already have an understanding of the importance of maintaining personal hygiene, environmental health, and the ways and types of worms that are often invasive in children, which can be seen from the enthusiasm in the question and answer session.

The success of increasing students' knowledge can be used as an effort to prevent worms because students will remember every risk factor that causes worms during activities[13]. Providing knowledge through education provides direct and indirect benefits because it has increased insight regarding the negative impacts of worms so that students try to prevent worms through personal and environmental hygiene measures[6]. Worm infections in children will have negative impacts, including: can cause anemia due to chronic absorption of nutrients and blood loss, weakness, drowsiness, laziness in studying, decreased IQ, decreased achievement and productivity, disruption of physical and mental development and malnutrition[14]. Anemia is characterized by a decrease in hemoglobin levels[15]. There is a relationship between personal hygiene knowledge and the incidence of worms. According to the research results[16], it was concluded that students who have good personal hygiene knowledge can avoid worm infections.

V. CONCLUSION

102 students at Cikiwul 2 State Elementary School showed good interest, were active and had great curiosity in participating in activities that were important in increasing knowledge about preventing worms that cause anemia, demonstrated by active discussions and questions and answers.There was an increase in students' average (mean) knowledge about worms, from 74.8 at the pretest to 81.3 at the posttest. The proportion of students who got a score of 70 and above also increased, from 68.6% at the pretest, the proportion increased to 82.4% at the posttest. In general, there was an increase in students' knowledge about worms in all knowledge variables.The overall prevalence of anemia is still relatively high (32.3%), with a predominance of mild anemia (18.6%). There were no students found who experienced severe anemia. Male students tend to experience anemia at a rate of 40% with a mild anemia category of 24.0% compared to females.The age of students who experience anemia ranges from the age group > 12 years to 48.3%, namely the mild anemia category is 34.5%.Class 5 students showed an anemia proportion of 36.3%, with the highest category of mild anemia (22.7%), indicating the potential for ongoing accumulation of nutritional deficiencies.

VI. ACKNOWLEDGMENTS

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REFERENCES

[1] Kemenkes RI, 2018 Hasil utama RISKESDAS 2018. *Online) http://www. depkes.go.id/resources/download/info-terkini/materi_ra korpop_2018/Hasil %20 Riskesdas, 2018*).

[2] Nirwana Laddo, Ela Sapta Ningsih B, 2023. Faktor Risiko Infeksi Kejadian Kecacingan pada Anak Usia Sekolah di Wilayah Kerja Puskesmas Panambungan Makassar.

[3] Yosiana Rahmawati, Tiara Dini Harlita, Dini Indriaty Yusran, 2024. *Hubungan Pengetahuan Personal Hygiene Dengan Infeksi Cacing Pada Siswa Sekolah Dasar*. ***Journal Health & Science : Gorontalo Journal Health and Science Community. Department of Public Health***, *Universitas Negeri Gorontalo, Indonesia*

[4] *Rita Agustina, Tusy Triwahyuni, Devita Febriani Putri, Nindi Destiani.2021.* Hubungan Kecacingan dengan Kejadian Anemia pada Anak Sekolah Dasar di Kecamatan Tanjung Senang Bandar Lampung., ***MAHESA : Malahayati Health Student Journal***, Universitas Malahayati Lampung

[5] Netta Meridianti Putri , Dodik Briawan, Yayuk Farida Baliwati, 2021.Faktor Risiko Anemia pada Anak Sekolah Dasar di Temanggung. ***Indonesian Journal Of Nutrition***, https://ijhn.ub.ac.id/index.php/ijhn/article/view/409

[6] Reski Ramdana Universitas Halu Oleo, Asnia Zainuddin , Hariati Lestari, 2025. Hubungan Tingkat Pengetahuan Orang Tua, Sanitasi Lingkungan Serta Perilaku Hidup Bersih Dan Sehat Dengan Kejadian Kecacingan Di SD Negeri 12 Kendari. ***Jurnal Kesehatan Lingkungan Universitas Halu Oleo (JKL-UHO)***

[7] Sinaga, S., Sihombing, I., Kemala, S. D., Barus, S., Ginting, J. G., dan Purba, H. (2024). Penyuluhan Tentang Penyakit Kecacingan Pada Anak Di Desa Ujung Labuhan Kecamatan Namorambe. ***Community Development Journal, Jurnal Pengabdian masyarakat*** di Lembaga Penelitian dan Pengabdian Masyarakat (LP2M) Universitas Pahlawan TuankuTambusai 5(4), 7794–7797.

[8] Saifuddin Sirajuddin & Masni, 2015, Kejadian Anemia Pada Sekolah Dasar, ***Jurnal Kesehatan Masyarakat Nasional***, Vo. 9 No.3 Februari, 201 Kemenkes. 2023. Kemenkes Minta Masyarakat Untuk Waspadai Sejumlah Penyakit Tropis Ini.

[9] Profile SDN Cikiwul 2. 2024 Pusdatin © Kementerian Pendidikan, Kebudayaan, Ristek dan Teknologi 2024 https://dapo.kemdikbud.go.id/sekolah/C4D56585C2B360529896

[10] Kemenkes RI, 2023. Kemenkes Kejar Target Eliminasi NTDs di Indonesia. Generasi Sehat , Generasi Hebat.

[11] Kharin Hamida Syaputri1, Okta Muthia Sari2*, Ahmad Riduan3, Khoirunnisa Muslimawati ***Jurnal Pelayanan dan Pengabdian Kesehatan untuk Masyarakat*** Vol. 2, No. 2 ***September 2024 Jurnal Unv. Respati Indonesia***.

[12] Ali Rakhman Hakim1*, Rina Saputri1, Mustaqimah. 2023. Edukasi Tentang Penyakit Cacingan Dan Cara Mencuci Tangan Yang Benar Pada Siswa Sekolah Dasar. Majalah Cendekia Mengabdi.

[13] Waode Rustiah1, Sartika F. Rahman, Nurul Ni'ma Azis, Dewi Arisanti, Muawanah, 2022. Pentingnya Pengetahuan Tentang Penyakit Kecacingan Dengan Menerapkan Pola Hidup Bersih Dan Sehat (Phbs), LONTARA ABDIMAS ***Jurnal Pengabdian*** kepada, Politeknik Kesehatan Muhammadiyah Makassar,, Sulawesi Selatan Vol 3, No.2 Desember. 2022.

[14] Neilva Lailatusyifa1*, Ratu Ayu Dewi Sartika2, Tati Nuryati3. 2022. Determinan Kejadian Kecacingan pada Siswa SD. ***Jurnal Ilmu Kesehatan Masyarakat.*** Unv. Indonesia Maju

[15] World Health Organization (2024) *Guideline on haemoglobin cutoffs to define anaemia in individuals and populations.* Geneva: World Health Organization.

[16] Reza Anindita, Melania Perwitasari, Dede Dwi Nathalia, Maya Uzia Beandrade, Intan Kurnia Putri, Wahyu Nuraini Hasmar. 2022. Edukasi Pencegahan Cacingan Sebagai Implementasi Program Generasi Sadar Stunting, ***Jurnal Mitra Masyarakat (JMM).***