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Knowledge and Awareness of Parasitic Worms among Biology Student-Mothers in Zaria, Nigeria

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Abstract
This study titled Biology Student-Mothers Knowledge and Awareness of Parasitic Worms Affecting Children in Zaria, Nigeria was a survey work carried out at the Federal College of Education, Zaria. Three research objectives and three research questions guided the study. The sample for the study comprised two hundred and thirty-six biology student-mothers drawn from a population of two thousand and thirty-four using a purposive sampling technique. The data collection instrument utilized in this study was a questionnaire titled the Student-Mothers Awareness of Parasitic Worms Questionnaire (SMAPWQ). The questionnaire underwent validation by two experienced science education experts. Split-half method was used to determine the reliability resulting in a Cronbach alpha value of 0.71. The instrument was distributed to student mothers over two weeks. The data gathered was analysed using mean and standard deviation. The results revealed that there is a high awareness level among student-mothers on parasitic worms in Zaria (M=3.02, SD = 1.0), roundworm, hookworm and tapeworm were the major types of worms that affect children of biology student-mothers in Zaria, and there is high knowledge level on eradication and control of parasitic worms among Biology student-mothers in Zaria (M=3.71, SD = 0.86). This research recommends that the management of FCE, Zaria and the Department of Biology should provide targeted educational interventions and public health awareness campaigns on managing parasitic infections for all members of the College community, among others.

Keywords: Biology, Student-Mothers, Knowledge, Awareness, Parasitic Worms, Children

Introduction

Parasitic worms, also known as helminths, are a diverse group of parasitic organisms that can infect humans and animals. They belong to the phylum Platyhelminthes (flatworms) and the phylum Nematoda (roundworms). These worms can cause a wide range of diseases in their hosts and are a significant public health concern in many parts of the world. The term "this wormy world" was initially used in the 1940s to refer to the predominance of parasitic worms (helminths), including schistosomes and helminths spread by soil (Stoll, 2017). Helminth infections continue to afflict millions of individuals worldwide. More than half of the world's population is in danger due to the more than 1 billion people who have soil-transmitted schistosomiasis and helminthiasis, which Gall et al. (2017) estimate could cost the globe more than 40 million disability-adjusted life years annually. Even if attempts to control the spread of helminths have advanced in many parts of the world, worm diseases continue to pose a serious socioeconomic and public health risk (Hotez, 2018; El-Aal et al., 2022). The most vulnerable people usually have many infections at once, and helminth diseases disproportionately affect the poorest people (Hotez & Ehrenberg, 2020). Contributing factors include inadequate housing, poor personal hygiene, dirty living conditions, congestion, increased exposure to polluted soil and water, and a lack of easily accessible health services (WHO, 2017). Moreover, helminth infections are influenced by various factors including behavioural, environmental, biological, socioeconomic, and healthcare-related factors.

A few variables that influence the spread of diseases and the subsequent morbidity and even mortality include family income, educational attainment, work position, and the quality of the civil infrastructure (Deng et al., 2019). Most intestinal parasite infections occur as a result of the infective larva stage entering the host's epidermis after

swallowing infected foods or beverages or coming into contact with contaminated soil and water. Infection can occasionally develop from close personal contact, especially between schoolchildren (Husin et al., 2022). The future of society rests on the health of children, a vulnerable group in the community. The term "school age" refers to the age range of six to twelve. Mealy et al., (2018) found that kids are particularly susceptible to a range of health problems, such as malnutrition, non-infectious disorders, and intestinal parasite diseases. Children are more susceptible to illness because of their limited awareness, immature immune systems, and high dietary needs (Nisa et al., 2022). Intestinal parasite infections in children are significantly associated with wasting and reduced growth. The World Health Organisation (WHO, 2017) advises periodically administering anti-helminthic drugs to schoolchildren, especially in regions with high infection rates, to improve their nutritional status, haemoglobin level, cognitive function, and overall health state.

Intestinal parasite infection is one of the major socioeconomic and public health problems that adversely affect the well-being of the poor in developing countries. The most prevalent intestinal parasites in Nigeria, including *Ascaris lumbricoides*, hookworms, *Trichuris trichiura*, *Giardia lamblia*, *Entamoeba histolytica*, and *Schistosoma species*, contribute to over 10.5 million new cases annually (WHO, 2017). Of particular concern is their impact on children, who are significantly affected by schistosomes, *Trichuris trichiura*, and *Ascaris lumbricoides.* Due to poor nutritional use and impaired driving, these parasite disorders inhibit children from excelling in sports and academics (Kasimayan et al., 2021). The future of every nation on the globe depends on its children. They are the current generation, and they can make things better. Therefore, the health of primary school kids has been highly valued throughout history. Additionally, they incur a significant risk of contracting parasitic worms at the same time. Therefore, the mother's participation is essential in the current system of child health care, which emphasises preventive care rather than curative care (Pabalan et al., 2018). Mothers are seen as the main adults responsible for raising their children. Mothers often handle the food at home to protect the children's health and fitness. Evaluation of the mother's knowledge and conduct, as well as data collection on a healthy home environment, are crucial for reducing the transmission of infection (Sharma & Dhar, 2017). The World Health Organisation has long recognised the need to educate women about their responsibility to safeguard the food safety of their children. Ten Golden Rules for Safe Food Preparation were released by WHO (2017) and have been widely translated and reproduced (Kamboj et al., 2020). The key principles outlined in the Ten Golden Rules for Safe Food Preparation emphasize selecting foods processed for safety, ensuring thorough cooking, consuming cooked food promptly, storing cooked foods carefully, reheating food thoroughly, preventing cross-contamination between raw and cooked foods, practising regular handwashing, maintaining clean kitchen surfaces, and safeguarding food from pests like insects, rodents, and other animals. Use only pure water, and then student mothers are mothers who are also enrolled in school. Without abandoning either one's activities, they successfully juggle being a mother and a student.

The engagement of women in education is essential to achieving development goals in every society (Esia-Donkoh, 2014). Every person wants the chance to grow personally since it is a fundamental human right; as a result, student mothers exist, even though their situation is considerably different from that of other students. Mothers who are engaged in the three-year NCE programme and who have a child or children, as appropriate, are referred to as student mothers. Students who are mothers face various challenges in their pursuit of a degree. Retention is a serious concern, even though the precise percentage of student-mother dropouts is yet unknown (Moreau & Kerner, 2022). Additional challenges include the student-mothers' caring obligations, their incapacity to graduate from college with a respectable mark, anger, loneliness, restlessness, skipping classes and lectures, and failing some courses (Taukeni, 2020). Managing both family and academic duties is part of being a student mother. According to Brooks (2022), having a small child and being a student should not be a hindrance to pursuing education and training. Student mothers, according to Andres (2021), are driven to finish their education, to persist through every adversity they encounter for the benefit of their kids, and to have parents who still provide for them. They may experience difficulties, but their child is undoubtedly a rock for them. Success is a student mother's top priority, despite challenges and adverse comments from others (Lyonette et al., 2015). In addition to the obstacles faced by the female student, she is driven by the necessity to generate income to support her family and fulfil their needs and desires. They kept going to school despite societal discrimination. Student-mothers enrolled in biology courses, including parasitology, have the opportunity to acquire valuable knowledge about the prevention, diagnosis, and treatment of parasitic infections. This knowledge equips them with essential skills to identify common parasitic diseases, understand their transmission dynamics, and implement preventive measures within their families and

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communities (Okoli et al., 2017). By empowering student mothers with relevant knowledge and skills, educational institutions contribute to the promotion of public health and the well-being of society as a whole.

Statement of The Problem

Parasitic worm infections pose a significant public health concern, particularly among children, in many regions of the world, including Zaria, Nigeria. These infections can lead to various health issues, including malnutrition, impaired growth, and cognitive deficits, with potentially lifelong consequences. While various public health initiatives have aimed to control these infections, awareness and knowledge among the population, especially mothers who are often the primary caregivers, play a critical role in prevention and management. Incorporating student mother's knowledge and awareness of parasitic infections for biology students enhances the understanding of the broader context in which parasitology intersects with public health, community empowerment, and social justice. This study seeks to investigate the level of awareness and understanding of parasitic worm infections among Biology student-mothers in Zaria, Nigeria, to identify knowledge gaps and areas for targeted educational interventions to reduce the burden of these infections on children's health in the region.

Objectives of the Study

The objectives of the study were to:

1. determine the awareness level of student-mothers on parasitic worms in Zaria.
2. ascertain the specific types of parasitic worms affecting children of Biology student-mothers in Zaria.
3. determine the knowledge level on eradication and control of parasitic worms among Biology student-mothers in Zaria.

Research Questions

The study was guided by the following set of research inquiries:

1. What is the awareness level of student-mothers on parasitic worms in Zaria?
2. What are the specific types of worms affecting children of Biology student-mothers in Zaria?
3. Do the students have any knowledge of the eradication and control of parasitic worms?

Methodology

The research design adopted for this study is a descriptive survey. All female N.C.E. Biology students at the Federal College of Education in Zaria made up the study's population. Two thousand and thirty-four (2,034) female students are enrolled in the Department of Biology. Purposive sampling was used to select all student-mothers taking census of the student-mothers to determine two hundred and thirty-six (236) student-mothers as sample size for the study. An adapted questionnaire from Ahmed and Abu-Sheishaa (2022) titled "Students Mothers Awareness of Parasitic Worms Questionnaire (SMAPWQ)" was used to gather data. The instrument was a 27-item questionnaire with a Likert scale. Section A contains the bio-data of respondents, section B contains statements on the awareness level of student-mothers on parasitic worms, section C contains statements on the types of worms affecting children of student-mothers, while section D contains statements on awareness on eradication and control of parasitic worms. The questionnaire underwent validation by two experienced science education experts from the department of Science Education, Ahmadu Bello University, Zaria. The split-half method was used to assess the instrument's reliability. A pilot research was conducted in the study area. The test was given at random to fifty (50) students and a Cronbach alpha value of 0.71 was obtained which indicates that the instrument is reliable for the study. The researchers used two (2) weeks to collect data by going around Biology classes after lectures for the administration of the questionnaire. Descriptive statistics involving mean, and standard deviation were used to analyse the data gathered from the field.

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Results

Table 1: Awareness Level of Student-mothers on parasitic worms in Zaria

S/N	STATEMENTS	A	UN	NA	Mean	SD	Remark
1	Parasitic worm infections frequently lead to abdominal cramping.	31	64	141	2.07	0.81	Low
2	Undercooked meat can also spread parasitic worms like tapeworms.	131	63	42	3.75	1.20	High
3	I know how parasitic worms are transmitted and their life cycles	72	36	128	2.52	0.75	Low
4	I actively engaged in an educational program focused on raising awareness about parasitic worms.	49	15	172	1.96	0.70	Low
5	Parasitic worm infection can cause diarrhoea.	68	31	137	2.42	0.77	Low
6	I have sought medical attention due to suspected parasitic worm infestations.	125	67	44	3.69	1.17	High
7	Blood in faeces indicates parasitic worms due to intestinal injury	131	52	53	3.66	1.26	High
8	Parasitic worms have the potential to disrupt the absorption of nutrients, resulting in unintended weight loss.	101	74	61	3.34	1.29	High
9	When parasitic worms induce gastrointestinal issues, individuals may experience vomiting.	84	33	119	2.70	0.86	Low
10	Infections may trigger a fever as the body's response to the invading parasites	166	36	34	4.12	1.15	High
	Cumulative Mean				**3.02**	**1.0**	**High**

B**enchmark: Mean ≥3.0 = High Level; Mean < 3.0= Low Level**

Table 1 shows that the cumulative mean of all the items is 3.02 which is higher than the benchmark mean of 3.0. This is an indication that there is a high awareness level among student mothers on parasitic worms in Zaria. Most respondents held the belief that undercooked meat can transmit parasitic worms such as tapeworms. Additionally, they reported seeking medical attention when suspecting parasitic worm infestations. Blood in faeces was associated with parasitic worms due to intestinal injury, and respondents acknowledged that parasitic worms could disrupt nutrient absorption, leading to unintended weight loss. Moreover, infections were believed to induce fever as the body's response to invading parasites. All these perceptions were rated above 3.0 on average.

Table 2: **Types of Worms affecting children of Biology student-mothers in Zaria**

S/N	TYPES OF WORMS (PARASITES)	A	UN	D	Mean	S.D	Remark
1	Roundworm (*Ascaris lumbricoides*)	125	67	44	3.69	1.01	Accepted
2	Whipworm (*Trichuris trichiura*)	68	32	136	2.42	0.71	Rejected
3	Hookworms (*Necator americanus*)	131	72	33	3.83	1.11	Accepted
4	Tapeworms (*Taenia solium*)	121	74	41	3.68	0.94	Accepted
5	Pinworms (*Enterobius vermicularis*)	54	13	169	2.03	1.20	Rejected

Benchmark: Mean ≥3.0 = Accepted; Mean < 3.0= Rejected

In Table 2, the predominant types of parasitic worms affecting children of biology student-mothers in Zaria are identified. Among these, roundworm, hookworm, and tapeworms emerge as the most prevalent, with mean ranks of 3.69, 3.83, and 3.68, respectively. These findings underscore the significant burden of these specific parasitic infections within the studied population and highlight the importance of targeted interventions to address their impact on child health and well-being.

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Table 3: K**nowledge Level on eradication and control of parasitic worms among Biology student-mothers in Zaria**

S/N	STATEMENTS	SA	A	UN	D	SD	Mean	SD	Remark
1	To avoid parasitic worm transmission from hands to food, mothers should ensure children wash their hands before eating.	54	36	0	115	31	2.86	1.10	Low
2	Worm eggs can be ingested by consuming raw or undercooked meat.	130	62	4	18	22	4.10	1.17	High
3	Wearing shoes can help minimize the risk of contracting soil-transmitted parasitic worm infections.	126	22	0	48	40	3.62	0.99	High
4	Mothers should ensure cleanliness in toilets to prevent the transmission of parasitic worms through the fecal-oral route.	52	41	0	122	13	3.91	1.14	High
5	To prevent parasitic worm eggs and cysts from spreading, mothers must ensure children wash their hands after defecation.	124	46	0	25	41	3.79	1.11	High
6	Preventive drugs can be administered to children multiple times.	124	21	2	42	47	3.56	0.84	High
7	Outdoor soil may be polluted with soil-transmitted parasitic worms, so children should wash their hands.	130	56	0	18	32	3.99	1.16	High
8	To prevent zoonotic parasitic worm illnesses from animals to people, children must wash their hands after playing with birds and pets.	133	32	3	38	30	3.85	1.09	High
	Cumulative Mean						**3.71**	**0.86**	**High**

Benchmark: Mean ≥3.0 = High; Mean < 3.0= Low

Table 3 indicates a comprehensive understanding of the eradication and control of parasitic worms among Biology student-mothers in Zaria, with a cumulative mean of 3.71, surpassing the benchmark mean of 3.00 and a standard deviation of 0.86. This suggests a high level of knowledge among respondents. Specifically, the majority of respondents recognize that consuming undercooked or improperly cooked meat can lead to the ingestion of worm eggs. They also understand the importance of wearing shoes to reduce the risk of soil-transmitted parasitic worm infections. Furthermore, there is a strong awareness of the necessity to maintain cleanliness in toilets to prevent the transmission of parasitic worms through the faecal-oral route. Additionally, respondents acknowledge the significance of ensuring children wash their hands after defecation to prevent the spread of parasitic worm eggs and cysts. They also recognize the importance of administering preventive drugs to children multiple times and emphasize the need for children to wash their hands after playing outdoors, as soil may be contaminated with soil-transmitted parasitic worms. Moreover, respondents demonstrate an understanding of the risk of zoonotic parasitic worm infections from animals to people and emphasize the importance of children washing their hands after interacting with birds and pets. These findings underscore the importance of education and awareness campaigns in promoting preventive measures against parasitic worm infections among children.

Discussion

The findings in Table 1 indicate a high awareness level among student-mothers in Zaria regarding parasitic worms aligns with the importance of parasitology as a course. The significance of a course: Parasitology learnt by the students cannot be overstated, especially in regions prone to parasitic infections. The study's results resonate with the findings of previous research emphasizing the pivotal role of awareness in disease prevention and control (Gyorkos et al., 2023). They argue that raising awareness is a fundamental step in breaking the cycle of parasitic infections, as it empowers individuals to take preventive actions and seek appropriate healthcare when needed. Moreover, the high awareness level may be attributed to successful lectures delivered in the parasitology course

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learnt by the students. The work of Mwandawiro et al. (2020) supports this idea, highlighting the positive impact of community-based health education in creating awareness and influencing health behaviour related to parasitic infections. Moreso, El-Aal et al. (2022) posited that examined mothers had limited knowledge of intestinal parasites, and few of them followed the recommended precautions. The overall awareness score and the overall practice score of prophylactic measures against intestinal parasite infection among mothers of pre-schoolers correlated positively.

Results in Table 2 revealed the identification of roundworm, hookworm, and tapeworm as the predominant types of worms affecting children of biology student-mothers in Zaria providing valuable insights into the specific health challenges faced by this demographic. This finding corroborates studies conducted in similar settings, such as the research by Bethony et al. (2016), which emphasizes the global prevalence and health impact of these parasitic infections. The prevalence of whipworm, hookworm, and tapeworm infections among children underscores the need for targeted interventions addressing environmental hygiene, sanitation, and health education tailored to these specific parasitic diseases. Bethony et al. (2016) argue that the control of whipworm, hookworm, and tapeworm infections requires multifaceted approaches, including improved sanitation infrastructure, access to clean water, and community-based health education. Therefore, the identification of these specific worms in Zaria suggests that interventions should be designed to address the unique challenges associated with each type of parasitic infection. Table 3 revealed that there is high awareness regarding the eradication and control of parasitic worms among biology student-mothers. This is quite promising for biology student-mothers. This aligns with the awareness regarding the eradication and control of parasitic worms. This awareness could be attributed to several factors, including the curriculum content and educational initiatives aimed at promoting an understanding of parasitology. The study's results resonate with the work of Nyantekyi et al. (2021) and Freeman et al. (2018), where they emphasize the importance of awareness in the success of deworming programs. Freeman et al. (2018) argued that raising awareness about the benefits of deworming and the availability of effective medications is crucial for the participation and compliance of individuals in mass deworming campaigns. The high awareness among biology student-mothers in Zaria may indicate the success of similar awareness campaigns or health education programs in the region.

Conclusion

The findings of this study illuminate a positive landscape of awareness and knowledge among biology student-mothers in Zaria concerning parasitic worms. The high awareness levels demonstrated by the study participants underscore the success of the parasitology course in disseminating critical information about parasitic infections. The identification of roundworm, hookworm, and tapeworm as the major types affecting the children of biology student-mothers provides valuable insights into the specific health challenges faced by this demographic. The prevalence of these parasitic worms suggests the need for targeted interventions that address environmental hygiene, sanitation, and health education tailored to these specific parasitic diseases. This awareness is essential for the success of deworming programs and emphasizes the importance of continued health education initiatives.

Recommendations

Based on the findings, the researcher proposes the following recommendations:

1. Management of FCE, Zaria and the Department of Biology should provide targeted educational interventions and public health awareness campaigns on managing parasitic infections for all members of the College community and Zaria at large.
2. Management of FCE, Zaria and the Department of Biology in collaboration with other health practitioners should provide capacity-building training for all students on managing parasitic infections.
3. Lecturers of parasitology courses should endeavour to re-emphasize identification techniques of parasitic worms and methods of eradicating them, especially timely deworming during classes.

References

Ahmed, H. M., & Abu-Sheishaa, G. A. (2022). Intestinal parasitic infection among school children in Dakahlia Governorate, Egypt: A cross-sectional study. *Egypt Pediatric Association Gaz*, 70(6), 234-241.

Andres, P. K. (2021). Two faces of a mom: Student-mothers' lived experiences in a state university. *International Journal of Multidisciplinary: Applied Business and Education Research*, 2(5), 406-412.

Bethony, J., Brooker, S., Albonico, M., Geiger, S. M., Loukas, A., et al. (2016). Soil-transmitted helminth infections: Ascariasis, trichuriasis, and hookworm. *The Lancet*, 367(9521), 1521-1532.

Brooks, R. (2022). Student-parents and higher education: A cross-national comparison. *Journal of Education Policy, 12*(3). https://www.tandfonline.com.

Deng, Y., Wang, W., Qian, Y., Zhu, H., & Liang, Y. (2019). Publication output of the new integrated strategy for schistosomiasis japonica control in China: A PubMed-based bibliometric assessment. *Global Health Journal*, 3(1), 4-8.

El-Aal, A. G. B., Nady, E. S., Shokr, A. E., & Shokr, W. M. (2022). Awareness and practices of preventive behaviours toward intestinal parasitic infection among mothers of preschool children. *Journal of Positive School Psychology*, 6(8), 6290-6305.

Esia-Donkoh, K. (2014). Child-rearing practices among student-mothers. *Society & Biology & Human Affairs*, 78(1&2), 20–38. https://www.researchgate.net.

Freeman, M. C., Akogun, O., Belizario Jr, V., Brooker, S. J., Gyorkos, T. W., et al. (2018). Challenges and opportunities for control and elimination of soil-transmitted helminth infection beyond 2020. *PLOS Neglected Tropical Diseases*, 7(12), e2187.

Gall, S., Müller, I., Walter, C., Seelig, H., & Steenkamp, L. (2017). Associations between selective attention and soil-transmitted helminth infections, socioeconomic status, and physical fitness in disadvantaged children in Port Elizabeth, South Africa: An observational study. *PLOS Neglected Tropical Diseases*, 11, e0005573.

Gyorkos, T. W., Maheu-Giroux, M., Blouin, B., Casapia, M., & Impact Research Team. (2023). Impact of health education on soil-transmitted helminth infections in schoolchildren of the Peruvian Amazon: A cluster-randomized controlled trial. *PLOS Neglected Tropical Diseases*, 7(9), e2397.

Hotez, P. (2018). Hookworm and poverty. *Annals of the New York Academy of Science*, 1136, 38–44.

Hotez, P. J., & Ehrenberg, J. P. (2020). Escalating the global fight against neglected tropical diseases through interventions in the Asia Pacific region. *Advance Parasitology*, 72, 31–53.

Husin, N., Pasaribu, P. A., Ali, M., Suteno, E., Wijaya, W., & Pasaribu, S. (2022). Comparison of albendazole and mebendazole on soil-transmitted helminth infections among school-aged children. *Open Access Macedonian Journal of Medical Sciences*, 10(8), 1264-1270.

Kamboj, S., Gupta, N., Bandral, D. J., Gandotra, G., & Anjum, N. (2020). Food safety and hygiene: A review. *International Journal of Chemical Studies*, 8(1), 358-368.

Kasimayan, P., Kasirajan, A. K. T., Rajan, D. R., Sankaralingam, S., & Harinathan, B. (2021). Knowledge and practice on prevention of intestinal parasitic infection among mothers of under-five children in Bule Hora Town, Oromia Region, Southern Ethiopia. *Research Square*, 1-24.

Lyonette, C., Atfield, G., Behle, H., & Gambin L. (2015). Tracking student mothers' higher education participation and early career outcomes over time: Initial choices and aspirations, HE experiences and career destinations. *Warwick IER*. https://www.researchgate.net.

Mealy, M. A. A., Ismaiel, Y. N., Saif, A. S. H., & Hablas, R. W. (2018). Study of parasitic infestation and its effect on the health status of primary school children in Tanta City. *Al-Azhar Journal of Paediatrics*, 22(43), 37-56.

Moreau, M. P., & Kerner, C. (2022). Supporting student parents in higher education: A policy analysis. *Nuffield Foundation*. www.nuffieldfoundation.org.

Mwandawiro, C. S., Nikolay, B., Kihara, J. H., Ozier, O., Mukoko, D. A., et al. (2020). Monitoring and evaluating the impact of national school-based deworming in Kenya: Study design and baseline results. *Parasites & Vectors*, 8(1), 1-10.

Nisa, F., Aviani, K. J., Agrianfanny, N. Y., & Siti, N. F. (2022). Intestinal parasitic infection and nutritional status in children under five years old: A systematic review. *Tropical Medicine and Infectious Disease*, 7(371), 1-26.

Nyantekyi, A. L., Legesse, M., Belay, M., Tadesse, K., Manaye, K., Macias, C., & Erko, B. (2021). Intestinal parasitic infections among under-five children and maternal awareness about the infections in Shesha Kekele, Wondo Genet, Southern Ethiopia. *Ethiopia Journal of Health Development*, 24(3), 186-190.

Okoli, C., Okoli, I., Uguru, M., Okeibunor, J., & Onwujekwe, O. (2017). Health care seeking patterns and determinants of health care seeking behaviour among mothers in Enugu state, Nigeria. *BMC Health Services Research*, 17(1), 1-10.

Pabalan, N., Singian, E., Tabangay, L., Jarjanazi, H., Boivin, M. J., & Ezeamama, A. E. (2018). Soil-transmitted helminth infection, loss of education and cognitive impairment in school-aged children: A systematic review and meta-analysis. *PLOS Neglected Tropical Diseases*, 12(1), 523-526.

Sharma, J., & Dhar, R. L. (2017). Factors influencing job performance of nursing staff: Mediating role of affective commitment. *Personnel Review*, 45(1), 161-182.

Stoll, N. R. (2017). This wormy world. *Journal of Parasitology*, 33, 1-18.

Taukeni, S. (2020). The main challenges student mothers experience in managing their dual roles. *International Journal of Advances in Psychology, 3*(3) http://doi: 10.14355/ijap.2014.0303.04.

World Health Organization. (2017). Technical report series 749: Prevention and control of intestinal parasitic infections. WHO, Geneva.