

Assessment of the Knowledge Levels of University Students in Health Sciences Regarding Parasitic Diseases

Sağlık Alanındaki Üniversite Öğrencilerinin Paraziter Hastalıklar ile İlgili Bilgi Düzeylerinin Değerlendirilmesi

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ABSTRACT

Objective: A comprehensive understanding of parasitic diseases, which affect both human and animal health, is crucial for university students in health sciences as they prepare for their future roles as healthcare professionals. This study aims to assess the knowledge levels of university students in health sciences regarding parasitic diseases.

Methods: This descriptive study was conducted with 498 students from the faculty of health sciences and the vocational school of health services at a state university in the Marmara Region. Data were collected using a questionnaire that included socio-demographic information and questions assessing students' knowledge of parasitic diseases. Statistical analyses were performed using SPSS 26.0®, with a significance level set at $p \leq 0.05$.

Results: The participants had a mean age of 20.84 ± 2.63 years, and 82.3% were female. A total of 80.9% of the students lived with their parents, and 73.7% reported a moderate family income. Nearly half (44.2%) were first-year students, 30.1% were enrolled in the department of physiotherapy and rehabilitation, and 68.1% resided in state dormitories. Most students (92.4%) recognized the importance of hand hygiene in preventing parasitic diseases, and 71.3% acknowledged that the location of household toilets could contribute to the occurrence of such diseases. However, 70.1% reported not receiving specific training or certification on hygiene. Female students demonstrated the highest awareness of hand hygiene benefits in preventing parasitic infections, while nursing students had the most extensive hygiene training (course/certificate) ($p < 0.05$).

Conclusion: Our findings indicate that a significant proportion of students lack specialized courses or certifications on hygiene practices and have limited knowledge of parasitic diseases. Therefore, integrating scientific meetings and training sessions on parasitic diseases and preventive measures into the health sciences curriculum is essential.

Keywords: University students, health sciences, infection, parasitic diseases, hygiene

ÖZ

Amaç: Hem insan hem de hayvan sağlığını etkileyen paraziter hastalıkların kapsamlı bir şekilde anlaşılması, gelecekte sağlık profesyoneli olacak sağlık bilimleri öğrencileri için büyük önem taşımaktadır. Bu çalışma, sağlık bilimleri öğrencilerinin paraziter hastalıklar konusundaki bilgi düzeylerini değerlendirmeyi amaçlamaktadır.

Yöntemler: Bu tanımlayıcı çalışma, Marmara Bölgesi'nde bulunan bir devlet üniversitesinin sağlık bilimleri fakültesi ve sağlık hizmetleri meslek yüksekokulundan 498 öğrenci ile gerçekleştirilmiştir. Veriler, öğrencilerin sosyo-demografik bilgilerini ve paraziter hastalıklarla ilgili bilgi düzeylerini değerlendiren bir anket kullanılarak toplanmıştır. İstatistiksel analizler SPSS 26.0® programı ile yapılmış olup, anlamlılık düzeyi $p \leq 0,05$ olarak kabul edilmiştir.

Bulgular: Katılımcıların yaş ortalaması $20,84 \pm 2,63$ yıl olup, %82,3'ü kadındır. Öğrencilerin %80,9'u ailesiyle yaşamakta ve %73,7'si ailesinin gelir düzeyini orta seviyede olarak tanımlamaktadır. Katılımcıların neredeyse yarısı (%44,2) birinci sınıf öğrencisi olup, %30,1'i Fizyoterapi ve Rehabilitasyon Bölümünde öğrenim görmektedir ve %68,1'i devlet yurtlarında kalmaktadır. Öğrencilerin büyük bir çoğunluğu (%92,4), el hijyeninin paraziter hastalıklara karşı korunmada önemli olduğunu belirtirken, %71,3'ü evdeki tuvaletin konumunun paraziter hastalıkların oluşumuna katkıda bulunabileceğini kabul etmiştir. Ancak, öğrencilerin %70,1'i hijyen

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konusunda özel bir eğitim veya sertifika almadığını bildirmiştir. Kadın öğrenciler, el hijyeninin paraziter enfeksiyonları önlemedeki faydaları konusunda en yüksek farkındalığa sahipken, hemşirelik bölümü öğrencileri hijyen konusunda en fazla eğitimi (ders/sertifika) almıştır ($p<0,05$).

Sonuç: Bulgularımız, öğrencilerin önemli bir kısmının hijyen uygulamaları konusunda özel bir ders veya sertifika almadığını ve paraziter hastalıklar konusunda sınırlı bilgiye sahip olduklarını göstermektedir. Bu nedenle, sağlık bilimleri müfredatına paraziter hastalıklar ve korunma yöntemleri ile ilgili bilimsel toplantılar ve eğitim programlarının entegre edilmesi gerekmektedir.

Anahtar Kelimeler: Üniversite öğrencileri, sağlık bilimleri, enfeksiyon, paraziter hastalıklar, hijyen

INTRODUCTION

Evaluating the knowledge levels of university students regarding parasitic diseases is of significant importance for increasing their awareness and developing educational approaches on this topic. Furthermore, it is crucial for students aspiring to become healthcare professionals to have a comprehensive understanding of parasitic diseases affecting both humans and animals, as this is vital for public health. Parasitic infections remain a global health issue, affecting millions of people worldwide, particularly in developing and underdeveloped countries. Over 300 identified helminth species and more than 70 protozoan species directly impact humans. In tropical and subtropical regions, parasitic diseases with zoonotic characteristics often transmitted from animals to humans are common (1). Additionally, such diseases are more prevalent in areas with inadequate infrastructure, low socio-economic and educational levels, contaminated water and food, poor adherence to hygiene practices, respiratory infections, blood transfusions, and organ transplants (1-3).

The prevalence of these diseases varies depending on the region, local conditions, and the implementation of public health protective measures. Knowledge about these diseases and their transmission pathways to humans and animals is critical for the prevention and control of infections (2,3). The competence of students who will be employed in the healthcare sector regarding parasitic diseases is particularly important for raising societal awareness and actively participating in the fight against these diseases. Raising awareness about the prevention and reduction of parasitic disease transmission can be achieved through health education (4).

This study aims to assess the knowledge levels of university students in the health field regarding parasitic diseases.

METHODS

Type of Study

This study was conducted as a descriptive research study.

Population and Sample

The population of this descriptive study consisted of students enrolled in the faculty of health sciences (departments of nursing, health management, and physiotherapy and rehabilitation) and the vocational school of health services (programs of first and emergency aid, medical laboratory techniques, physiotherapy, health institutions management, and health tourism management) at a university. Since the study aimed to include the entire population, no sampling method was applied. The research was completed with 498 students who met the inclusion criteria and voluntarily agreed to participate ($n=498$).

Inclusion Criteria

Students were eligible to participate if they met the following criteria:

- Enrollment in the faculty of health sciences or the vocational school of health services.
- Voluntary participation in the study.
- Proficiency in Turkish.
- Not currently employed in any healthcare field.

Data Collection Tools

Data were collected using a structured questionnaire designed to assess students' personal characteristics and knowledge levels regarding parasitic diseases and their transmission routes. Students' responses were scored (1 point for each correct answer). The questionnaire consisted of 30 questions evaluating various aspects of parasitic diseases, including transmission routes, risk factors, the effectiveness of vaccines in prevention, hand hygiene, water disinfection, and the importance of balanced nutrition.

Implementation of Data Collection Tools

Data collection took place during the spring semester of the 2023-2024 academic year. The questionnaire was administered online, and the link was shared with student groups in their respective classes. Participation was voluntary, and students completed the self-reported questionnaire at their convenience.

Statistical Analysis

The research data were analyzed using the SPSS 26.0 software package. Descriptive statistics, including frequencies, percentages, arithmetic means, and standard deviations, were used for data analysis. Students' knowledge scores were categorized into two clusters using K-Means Clustering Analysis, and cluster characteristics were assessed through receiver operating characteristic (ROC) analysis. Scores ranged from 0 to 30, with a score of ≥ 24.5 considered indicative of sufficient knowledge of parasitic diseases based on ROC analysis. The chi-square test was used for the analysis of categorical data, and a p -value <0.05 was considered statistically significant in all analyses.

Ethical Considerations

Ethical approval for the study was obtained from The Ethics Committee of Sakarya University of Applied Sciences (E-26428519-050.99-123583-43/06-2024) along with institutional permission from the university where the research was conducted. Informed consent was obtained from all students who participated in the study.

RESULTS

Most participants were female, and a large proportion were enrolled in the physiotherapy and nursing departments (Table 1). An examination of the sources from which students obtained information about parasitic diseases revealed that 28.1% reported health-related courses at school, 8.4% newspapers and magazines, 10.0% television, 11.0% friend groups, 38.0% the internet, 11.8% healthcare professionals, and 6.8% family members.

As shown in Table 2, knowledge adequacy levels differed significantly across certain characteristics. Nursing students

had the highest proportion of adequate knowledge compared to other departments ($p=0.001$). Higher adequacy was also observed among students who reported reading about parasitic diseases (46.1% compared to 32.9%, $p=0.002$), had taken health-related courses at school (48.6% compared to 33.8%, $p=0.002$), received hygiene training (55.0% compared to 30.7%, $p=0.001$), and refrained from sharing personal items (51.5% compared to 35.8%, $p=0.010$). No significant associations were found with gender ($p=0.243$) or living arrangements ($p=0.285$).

Table 1. Distribution of students' socio-demographic and descriptive characteristics

Characteristic	Mean $\pm$ SD	
Age (mean $\pm$ SD)	20.84 $\pm$ 2.63	
	Number	%
Gender		
Female	410	82.3
Male	88	17.7
Department/program		
Nursing	117	23.5
Physiotherapy and rehabilitation	150	30.1
Health management	71	14.3
First aid and emergency care	40	8.0
Health institutions management	25	5.0
Medical laboratory techniques	45	9.0
Health tourism management	32	6.4
Physiotherapy	18	3.6
Income status		
Income less than expenses	14	2.8
Income equal to expenses	367	73.7
Income more than expenses	117	23.5
Family structure		
Nuclear family	403	80.9
Extended family	95	19.1
Living arrangements		
With family	104	20.9
In a state dormitory	339	68.1
In a student house	35	7.0
In a private dormitory	20	4.0
Number of household members		
1-4 people	238	47.8
5-8 people	247	49.6
9-12 people	13	2.6
Mother's education level		
Illiterate	28	5.6
Primary school	217	43.6
Middle school	104	20.9
High school	98	19.7
Bachelor's degree	28	5.6
Associate degree	16	3.2
Postgraduate degree	7	1.4

Table 1. Continued

Characteristic	Mean $\pm$ SD	
Father's education level		
Illiterate	5	1.0
Primary school	132	26.5
Middle school	108	21.7
High school	171	34.3
Bachelor's degree	52	10.4
Associate degree	17	3.4
Postgraduate degree	13	2.6
Total	498	100
SD: Standard deviation		

Table 2. Distribution of students' knowledge levels on parasitic diseases based on various characteristics

Characteristic	Knowledge level						Statistical analysis
	Successful		Unsuccessful		Total		
	n	%	n	%	n	%	
Gender							
Female	159	38.8	251	61.2	410	100	p=0.243 X ² =0.468
Male	30	34.1	58	65.9	88	100	
Department							
Nursing	62	53.0	55	47.0	117	100	p=0.001 X ² =31.455
Physiotherapy and rehabilitation	52	34.7	98	65.3	150	100	
Health management	22	31.0	49	69.0	71	100	
First aid and emergency care	18	45.0	22	55.0	40	100	
Health institutions management	3	12.0	22	88.0	25	100	
Medical laboratory techniques	22	48.9	23	51.1	45	100	
Health tourism management	8	25.0	24	75.0	32	100	
Physiotherapy	2	11.1	16	88.9	18	100	
Living arrangements							
With family	39	37.5	65	62.5	104	100	p=0.285 X ² =3.789
In a state dormitory	134	39.5	205	60.5	339	100	
In a student house	8	22.9	27	77.1	35	100	
In a private dormitory	8	40.0	12	60.0	20	100	
Reading information on parasitic diseases							
Yes	88	46.1	103	53.9	191	100	p=0.002 X ² =8.678
No	101	32.9	206	67.1	307	100	
Health-related courses at school							
Yes	68	48.6	72	51.4	140	100	p=0.002 X ² =9.327
No	121	33.8	237	66.2	358	100	
Receiving hygiene training (course/certificate)							
Yes	82	55.0	67	45.0	149	100	p=0.001 X ² =26.345
No	107	30.7	242	69.3	349	100	
Sharing personal items							
Yes	35	51.5	33	48.5	68	100	p=0.010 X ² =6.112
No	154	35.8	276	64.2	430	100	
Total	189	38.0	309	62.0	498	100	

DISCUSSION

This study is significant in assessing the knowledge levels of university students in the health field regarding parasitic infections (e.g., their importance and transmission routes) and in increasing their awareness of infection control measures while implementing more innovative educational approaches.

Nursing students were found to have higher knowledge levels about parasitic diseases compared to students from other departments ($p < 0.05$) (Table 2). This may be attributed to the greater emphasis on Parasitology courses in their curriculum. A previous study highlighted that specific teaching methods could significantly enhance students' understanding of parasitic diseases (5). Another study in the literature reported that students generally had insufficient knowledge of parasitic diseases, with significant differences in knowledge levels between academic programs, particularly in terms of prevention and treatment (6).

A study conducted in Morocco revealed that university students had a moderate understanding of leishmaniasis vectors but lacked adequate preventive practices (7). Raising awareness about parasitic diseases and implementing innovative educational programs are critical to addressing knowledge gaps and improving students' ability to recognize and prevent these diseases (6,8).

A study in São Paulo, Brazil, demonstrated that didactic interventions, such as using booklets on soil-transmitted helminths, significantly improved students' knowledge, attitudes, and practices regarding parasitic infections (9). Furthermore, research on healthcare professionals' knowledge about mandatory disease diagnoses revealed that only a small percentage had adequate knowledge (10). In the present study, students who had previously read about parasitic diseases and received hygiene education exhibited higher levels of knowledge adequacy, as expected ($p < 0.05$) (Table 2). In line with previous research indicating that students who received formal education on parasitic diseases within health-related courses demonstrated significantly higher levels of knowledge and preventive practices (6,11), our findings support the integration of parasitology content into university curricula as an effective approach to addressing knowledge gaps and promoting infection control behaviors. Nevertheless, a study conducted in Xexéu-PE found that, despite awareness of parasitic diseases, many students lacked basic hygiene practices, such as washing hands before meals (12). Several studies have consistently highlighted deficiencies in students' understanding of parasitic diseases, emphasizing the need for enhanced scientific education interventions (6,13,14).

The Turkish Ministry of Health's 2019-2023 strategic program for infection prevention included the development of a "national infection prevention and control curriculum". This strategy emphasized collaboration with local academic institutions to develop and adapt curricula based on national needs and resources. The program also called for the integration of infection prevention and control education into continuous medical, nursing, and allied health professional training, along with periodic curriculum updates in collaboration with the Council of Higher Education, the Medical Specialization Board, and the Ministry of National Education (15).

This study also found that students who avoided sharing personal items had higher knowledge adequacy regarding parasitic diseases ($p < 0.05$) (Table 2). While the direct relationship between sharing

personal items and knowledge of parasitic diseases has not been widely explored in the literature, many studies collectively emphasize students' general knowledge and awareness of parasitic diseases. This suggests that behaviors such as avoiding sharing personal items may indirectly reflect a better understanding of transmission routes and preventive measures (16). Students who refrained from sharing personal items likely demonstrated greater awareness of parasitic disease prevention due to their understanding of these concepts.

Although students were generally aware of parasitic diseases, gaps in knowledge regarding transmission and prevention remain, along with certain misconceptions. Addressing these gaps and ensuring the practical application of knowledge necessitate a reformulation of teaching and learning processes (17).

CONCLUSION

Our study revealed that a significant number of students had not read about parasitic diseases and had not received a dedicated course or certification on hygiene. According to the findings, students from the Medical Laboratory Techniques program demonstrated greater knowledge about parasitic diseases. Additionally, students who read about parasitic diseases, received hygiene training, and avoided sharing personal items were found to have a higher level of knowledge regarding parasitic diseases.

The results of this study underscore the importance of education in enhancing students' knowledge levels about parasitic diseases and influencing their behaviors. While knowledge levels may vary, consistent educational efforts can bridge the gap between awareness and practical application, leading to improved health outcomes. Integrating hygiene education with parasitic disease awareness is crucial to promoting better health outcomes among students. In this context, it is essential to comprehensively integrate these topics into curricula across all levels of education and to organize training sessions and seminars. Such initiatives not only educate students but also highlight the need for comprehensive educational strategies that motivate behavioral changes.

However, it is important to acknowledge that knowledge alone does not necessarily lead to behavioral change. It is equally critical to train more healthcare professionals with expertise in accurately diagnosing and treating parasitic diseases, managing infection control, and preventing further spread. Ensuring the widespread employment of such experts in all regions will play a key role in improving public health outcomes.

*Ethics

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Footnotes

This study was presented as an oral presentation at the 3rd International Eurasian Health Sciences Congress on August 28-29, 2024.

*Authorship Contributions

Concept: C.B.O., Design: C.B.O., Data Collection or Processing: C.B.O., F.C., Analysis or Interpretation: C.B.O., F.C., Literature Search: C.B.O., F.C., Writing: C.B.O., F.C.

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