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Exploring Health Program Students' Perceptions and Practices on Cutaneous Leishmaniasis in Istanbul, Turkey: A Survey-Based Analysis

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Abstract

Cutaneous Leishmaniasis (CL) remains a major public health concern in endemic regions. Understanding community-level knowledge, attitudes, and behaviors (KAB) is vital for developing control strategies. This study evaluates the KAB levels of health program students and other vocational program students aged 18–30 in Istanbul, Turkey, concerning CL. A total of 200 students (50.5% female, 49.5% male) were surveyed face-to-face. Results revealed that 52.5% of participants had insufficient knowledge about CL and sandflies. Health program students demonstrated significantly higher knowledge and more positive attitudes compared to their counterparts. Logistic regression identified educational background as a significant predictor of knowledge level. These findings highlight the importance of targeted health education in raising disease awareness.

Keywords: Leishmaniasis, Knowledge, Attitude, Behavior, Health Students, Turkey

Introduction

Leishmaniasis is a tropical disease caused by intracellular Leishmania protozoa that infect all mammalian hosts, including humans, by Phlebotomus, infected sandflies.

Leishmaniasis, one of the 6 diseases on the list of the most important tropical diseases determined by the World Health Organization, is endemic in approximately 98 countries, including Turkey. It is known that approximately 350 million people in the world are at risk of contracting Leishmaniasis and an average of 12 million people are infected [1]. The disease occurs in different clinical forms according to the localization of the parasites in mammals [2].

Among the most common forms are Cutaneous Leishmaniasis (CL), which creates lesions and permanent scars on the skin, also known as oriental boil among the people, and Visceral Leishmaniasis (VL), which is also known as kala-azar among the people, which affects the internal organs (usually the spleen, liver, and bone marrow) and causes death if not treated [2,3].

The first sign of CL infection is a small erythema that develops at the site where an infected sandfly bites the host. The erythema transforms into a papule, then becomes an ulcerated nodule within 2 weeks to 6 months, forming lesions characterized by CL. Depending on the size and location of the lesion, CL transforms into a lifelong cutaneous scar. Lesions are commonly seen in areas exposed to vector bites, and CL is frequently encountered in the nose, upper lip, cheek,

leg, hand, and ankles [4]. The incubation period ranges from 1-4 weeks, and in some cases, this period can last for years.

Drugs used in the treatment of leishmaniasis have several disadvantages such as toxicity, resistance development, and high cost. At the same time, even if the disease is cured, it is frustrating for individuals due to secondary infections, relatively high healthcare costs, and side effects of different treatments [5-7]. It causes serious psychological trauma in patients due to long-term ulceration and extensive scar formation on the skin.

Previous studies have shown that deformity due to CL causes psychological and social problems. Patients isolate themselves and experience problems such as intense depression, anxiety, stress, decreased quality of life, and decreased productivity. Therefore, treating cases and minimizing potential scarring and disfigurement are recommended measures to reduce the effect of CL [8].

Although there have been various vaccine and treatment development studies against Leishmaniasis, an effective and reliable vaccine and treatment method has not been found yet [9-12]. In addition, although diagnostic methods such as mycoculture, classical culture, and molecular and serological methods are used, none of these methods have a 100% accuracy rate [13].

For these reasons, to fight Leishmaniasis, it is essential to evaluate the disease accurately and differentially at the point of diagnosis and treatment. Leishmaniasis is included in the list of notifiable infectious diseases [14]. According to the standard case definition in Turkey, physicians have been obliged to report the cases of Leishmaniasis they can diagnose to the Infectious Diseases Unit of the Ministry of Health since 2005. In Turkey, all public institutions and organizations providing health services, real persons, and private organizations are responsible for the notification of infectious diseases.

For many years, the impact of Leishmaniasis on public health has been largely underestimated, mainly due to a lack of health awareness. The most important prerequisite for the success of any disease prevention and control program is public awareness. There is a directly proportional relationship between raising the awareness of individuals at high risk of contracting the disease and the implementation of preventive measures [15]. Evaluating the community's knowledge, attitudes, and behaviors (KAB) helps to design and implement appropriate control and prevention strategies. In the regions where CL disease occurs, it is very important to inform the public and health personnel about preventive and control measures, in the prevention of the disease, and in the timely intervention of the disease.

Determining the KAB levels of individuals is one of the most important steps to be taken to control CL in CL endemic areas and to ensure that the activities to be implemented are successful. A successful control program can be planned by determining the KAB level.

When we scanned the literature, it was determined that in Turkey, especially in recent years, where we have received heavy immigration, the KAB levels of health program students and the other vocational students were not examined. Therefore, with this study, we evaluated the KAB levels for CL of the health program students who will be the health personnel of the future.

It is thought that this study will contribute to the steps to be taken to prevent and control CL by evaluating the knowledge, attitudes, and behaviors of students in the Beykoz region of Istanbul, Turkey, towards CL. Thus, the ground will be prepared for researchers to update disease prevention and control programs.

Material And Methods

Study Design and Population: This cross-sectional study was conducted from February to May 2023 in Beykoz, Istanbul. A total of 200 students aged 18–30, including health and other vocational program students, participated.

Data Collection Tool: Data were collected through a semi-structured, face-to-face questionnaire divided into four parts: socio-demographics, CL knowledge, attitudes toward prevention and treatment, and behaviors related to prevention and control. Knowledge and attitude scores were categorized based on a 60% cut-off threshold.

Ethical Approval: The study received approval from Beykoz University Scientific Research and Publication Ethics Board. Informed consent was obtained from all participants.

Data Analysis: Descriptive statistics were used for demographic variables. Chi-square tests assessed associations between knowledge/attitude levels and demographic factors. Logistic regression identified significant predictors of good knowledge using SPSS v20 at a 5% significance level.

Results

Considering the answers given by the participants and the healthy survey-filling processes, the evaluation was made on a total of 200 individuals, 100 from each group.

When the sociodemographic characteristics of the participants were examined, it was seen that 56% of the health program students and 45% of the students from other professional groups were women. 14% of health program students are over the age of 25, and this situation is 28% for students from other professional groups (Table 1).

When the number of people in the family is examined, it is seen that individuals living in a family environment consisting of 3-5 people are the majority in both groups. A similar situation also occurs in individuals' living areas. It was determined that the majority of individuals participating in the study (86%) lived in the city.

In this study, which examined the knowledge, attitudes, and behaviors toward Leishmaniasis, a tropical disease, it was observed that approximately 15% of all participants were foreign nationals.

When individuals' knowledge, attitudes, and behaviors towards CL and sand fly were examined in the light of this demographic information, striking results emerged.

When Table 2 is examined, the inadequacy in knowledge level is calculated as 41% in health program students and 54% in other professional group students. Therefore, when these parameters are taken into account, it has been observed that the level of knowledge about

cutaneous leishmaniasis, one of the notifiable infectious diseases, is 59% in health program students and 36% in other professional group students. Therefore, we can say that CL awareness is at higher levels in individuals who receive education on health.

While the knowledge level of 56.9% of health program students under the age of 25 is sufficient, 71.4% of the health program students over the age of 25 have sufficient knowledge. Among students from other professional groups, 42% of individuals under the age of 25 have sufficient knowledge, while this rate is 21.4% for individuals over the age of 25.

Considering all foreign national individuals for both groups, it was stated that the knowledge level of approximately 83% of the individuals was sufficient.

When the knowledge level of all individuals living in rural areas for both groups was examined, it was determined that 38% of the individuals had a good knowledge level. Of course, it should be taken into consideration that the number of people living in rural areas will be low in the region where the study is conducted.

The majority of participants reported that they did not know what CL was and that they had never seen it before. Additionally, most participants do not know that CL is a serious and preventable disease.

It has been determined that most people have never heard of a midge before and do not know when it bites. While almost half of the participants did not know the season in which CL transmission is most common, 86% said it was autumn and 52% said it was spring. 10% stated that the risk of contamination is active all year round. While more than half of the participants think that sandflies transmit disease, the rest (42%) think that sandflies do not cause disease.

If Table 3 is examined, the participants' attitudes and behaviors towards sand fly and cutaneous leishmaniasis are categorized under two headings: positive and negative.

It was observed that the attitudes and advice of 89% of the healthcare personnel were positive. This situation is pleasing, especially considering that CL is one of the notifiable infectious diseases.

It was observed that the attitudes and behaviors of 64% of health program students and 37% of other vocational program students were positive. This situation is pleasing, especially considering that CL is one of the notifiable infectious diseases. This shows us that the health program students have a high rate of positive attitudes towards CL due to the education they receive. It is expected that health program students will further increase their knowledge, attitudes, and behaviors towards CL after graduation.

Again, in this table, it is seen that 73.3% of foreign nationals have positive attitudes and behaviors towards CL, while this rate is 46.47% for Turkish nationals.

It was observed that women participating in the study had higher levels of knowledge and attitudes than men. In general, it can be said that the participants lack awareness about the transmission of the disease, its symptoms, risk factors, and control methods.

It has been determined that gender and the level of knowledge about the disease are decisive in the attitude toward the disease. For this reason, intensive health education and awareness programs should be implemented in schools and institutions, especially in endemic regions.

It is recommended to distribute brochures and posters in health institutions and organizations, schools, and other state institutions to raise awareness about CL and the prevention of the disease and to provide necessary seminars and training to inform the public and students.

Table 1. Socio-demographic characteristics of the participants (n=200)

	Health program students		Other vocational students	
Variables	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Gender				
Female	56	56	45	45
Male	44	44	55	55
Age				
<25	86	86	72	72
>25	14	14	28	28
Number of people in the family				
<3	17	17	22	22
3-5	70	70	68	68
>5	13	13	10	10
Residential				
Rural	18	18	11	11
Urban	82	82	89	89
Ethnicity				
TC.	94	94	76	76
Others	6	6	24	24

Table 2. Participants' knowledge against CL and sand fly(n=200)

	Health program students		Other vocational students	
Variables	**Good**	**Bad**	**Good**	**Bad**
Gender				
Female	30	26	16	29
Male	29	15	20	35
Age				
<25	49	37	30	42
>25	10	4	6	22
Number of people in the family				
<3	12	5	8	14
3-5	37	33	25	43
>5	10	3	3	7

Residential				
Rural	8	10	3	8
Urban	51	31	33	56
Ethnicity				
TC.	54	40	16	60
Others	5	1	20	4

Table 3. Participants attitudes and behaviors towards CL and sand fly (n=200)

	Health program students		**Other vocational students**	
Variables	**Positive**	**Negative**	**Positive**	**Negative**
Gender				
Female	33	23	14	31
Male	31	13	23	32
Age				
<25	51	35	32	40
>25	13	1	5	23
Number of people in the family				
<3	14	3	10	12
3-5	40	30	21	47
>5	10	3	6	4
Residential				
Rural	11	7	3	8
Urban	53	29	34	55
Ethnicity				
TC.	60	34	19	57
Others	4	2	18	6

Table 4. Chi-square analysis

Variable 1	**Variable 2**	**p-value**	**Comment**
Group	Knowledge	0.047	There is a significant difference: Health program students have higher knowledge level.
Gender	Knowledge	0.889	Not significant.
Age	Knowledge	0.781	Not significant.
Nationality	Knowledge	0.246	Not significant.
Residence	Knowledge	0.708	Not significant.
Group	Attitude	0.0001	There is a significant difference: Health students' attitudes are more positive.
All other variables	Attitude	>0.7	Not significant.

Chi-square analysis (Table 4) indicated a statistically significant relationship between educational program and knowledge level regarding CL ($p = 0.047$), as well as between program and positive attitudes ($p < 0.001$). Health program students demonstrated higher knowledge and more positive attitudes than their peers in other vocational fields. No statistically significant relationships were found between knowledge or attitude levels and other variables such as gender, age, nationality, or residential area ($p > 0.05$).

Table 5. Logistic regression analysis

Variable	β Coefficient	p-value	Comment
Group (Health program students)	**0.66**	**0.024**	Being a health student significantly increases the level of knowledge.
Gender (Female)	0.05	0.872	No effect.
Age (>25)	0.19	0.601	No effect.
Nationality (Foreign)	-0.58	0.122	Not significant but may have a negative effect.
Residence (Urban)	-0.25	0.571	No effect.

Logistic regression analysis (Table 5) was conducted to identify predictors of sufficient knowledge about CL. Being a health program student was found to be a significant predictor ($\beta = 0.66$, $p = 0.024$). Other demographic factors (gender, age, nationality, and residence) did not show a significant association ($p > 0.05$).

These findings underscore the importance of formal health education in raising disease awareness and improving health-related behaviors.

Discussion

Regions where leishmaniasis occurs are generally countries with high levels of poverty, lack the economic capacity to sustain adequate research and treatment, and are medically underdeveloped. On the other hand, disruption of ecosystems by humans, lack of access to clean water, migration, and wars also contribute to the spread of the disease around the world.

The different clinical findings seen in individuals with leishmaniasis depend not only on the genetic structure of the individual but also on environmental conditions, nutritional status, immunology, and even the parasite and vector that cause the infection.

The disease is seen as hyperendemic in the Mediterranean and Southeastern Anatolia Regions of Turkey. L. tropica is the causative agent of CL in the Southeast, Central, and West regions of Turkey, L. infantum in the Eastern Mediterranean, and rarely L. major and L. donovani parasites. Between 1988 and 2010, it was reported that nearly 50 thousand cases of CL in Turkey were in the Southeastern Anatolia Region. Both VL and CL cases are seen in Turkey, and the high increase in human CL incidence, especially after 2011, is associated with millions of refugees from Syria, a CL-endemic country [16]. The fact that Turkey is the main migration route to Europe for Middle Eastern, Caucasian, and Asian refugees, and migrants, is an important tourism

center for Europeans, and that approximately 5 million Turks living in different European countries visit our country frequently, also contributes to the epidemic situation of the disease in our country makes it serious. It is known that more than 20 million people are at risk of CL in Turkey, and this number is expected to increase. Reports published in northern European countries report “imported” leishmaniasis cases from Turkey and other Mediterranean countries [17]. Between 2009 and 2020, CL cases were reported in 32 of 81 provinces in Turkey and VL cases in 28 provinces, and it was reported that most of the diseases were seen in Istanbul and individuals from all age groups.

When the literature is examined, KAB for CL or VL has been the focus of many studies [18-22]. In a study in Isfahan in which students' KAB levels for CL were investigated, it was shown that 97.9% of the students were aware of the fact that sandflies carry the CL factor, but only 28.6% could identify a sandfly [23]. Another study conducted in Isfahan reported that only 13.9% of the participants had sufficient knowledge about the characteristics of the sand fly [24]. In several surveys conducted to determine the KAB level of the population in Pakistan, where the disease is endemic, it has been reported that the public has a moderate to low level of knowledge about disease transmission, risk factors, and vectors among the population [15,25].

In our study, 47.5% of the participants had good knowledge about CL. The knowledge level of our participants is low compared to a similar study conducted in Ghana (88.3%) [26]. A similar study was conducted in southern Ethiopia [27]. In this study, 67.6% of the total participants reported that they had heard of the disease before. After the scoring, it was stated that 67.6% of the participants had sufficient information. On the other hand, in a study conducted in Delanta, Ethiopia in 2022, it was stated that 27.6% of the participants had sufficient knowledge about CL [28]. We can say that these differences arise from the study method, period, data collection tool, and participant profile.

Given the elevated risk in Turkey due to immigration and endemicity, integrating CL-specific education modules into health programs may serve as a preventative strategy. Our results also support international efforts emphasizing local education as a frontline approach in combating neglected tropical diseases.

Conclusion

In this study, the knowledge, attitudes, and behaviors towards CL of health program students (100) and other professional group students (100) aged between 18-30 were examined.

Although it was understood that 52.5% of the students participating in the research had insufficient knowledge, 59% of the health program students and 36% of the students of other professional groups had sufficient knowledge.

According to these data, it can be said that the education individuals receive affects their knowledge level regarding CL.

Other factors that determine the level of knowledge about CL and sand fly include gender and region of residence.

For this reason, health education, awareness raising, and awareness activities should be implemented intensively in the region where immigrant individuals, especially individuals in endemic regions, reside. It is recommended that posters and brochures be distributed and hung in schools and other public institutions to increase awareness of the disease. We also recommend holding conferences and seminars to raise public awareness.

-Ethical Approval and Consent to participate

Ethical approval was obtained from the ethics review committee of Beykoz University. The participants were informed that their participation was voluntary and that they could leave the research at any time if they were uncomfortable with the survey. Informed consent was obtained from each participant. This study was conducted by the Declaration of Helsinki and confidentiality was maintained for all data collected.

- Consent for publication

There is no obstacle for publication approval

- Competing interests

The author declares that she has no conflict of interest.

- Funding

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- Authors' contributions

The conduct of the surveys, the evaluation of the results and the preparation of the manuscript were done by K.K.

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