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Community awareness towards Cutaneous Leishmaniasis in Al-Jouf region, Saudi Arabia

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ABSTRACT

Background: Cutaneous leishmaniasis (CL) is a parasitic disease with variable clinical manifestations that usually end with disfiguring scars leading to social and psychological stigma. Saudi Arabia is considered one of the endemic countries and has established the leishmaniasis control program to control this disease. *Aim:* The study aimed to assess the community knowledge about Cutaneous leishmaniasis in Al-Jouf region, Saudi Arabia. *Participants and Method:* This study involves 540 participants and an online questionnaire distributed to all participants during 2022 and 2023. *Results:* All age groups participated in answering the questionnaire. It was noted that a high percentage of the participants were females (87%), have a Bachelor's degree in education (67%), live in Sakaka (56%), and work as a government employee (43.5%), and family members in the same house were ranging between 6 to 12 (60%). Results clarified that 30% of the participants had no idea about CL. More than half of the participants do not know Sandflies (92.4%), transmission of CL (70%), clinical manifestations of CL (65%), disease severity (73%), or if it can be prevented or not (70%). Fortunately, 95% have not been infected with CL and this indicates the presence of efficient prevention and control program. With respect to the infected participants (5%), they suffered from scares (1-6) in the face (3%), hands (1%), and feet (1%). *Conclusion:* There's a lack of community awareness about Cutaneous leishmaniasis, risk factors, transmission, and preventive measures in Al-Jouf region.

Keywords: Cutaneous Leishmaniasis, Community awareness, Al-jouf region, Saudi Arabia

1. INTRODUCTION

Cutaneous leishmaniasis (CL) is a parasitic disease that affects the skin and is transmitted to humans through the bite of an infected female sand-fly that is endemic in some tropical and subtropical regions, including North and East Africa, Middle East, the Mediterranean basin, and South America (Elmahallawy et al., 2021). CL is considered the commonest form of

leishmaniasis with varying clinical manifestations that usually end with disfiguring scars (WHO, 2010; Abuzaid et al., 2017; Tabbabi, 2019). In the Middle East and North Africa, there are two forms of cutaneous leishmaniasis which are the anthroponotic form caused by leishmania tropica (L. tropica) and the zoonotic form caused by leishmaniasis major (L. major) parasites (Tabbabi, 2019).

The sandfly vectors for L. major and L. tropica are Phlebotomus Papatasi and Phlebotomus Sergenti, respectively (Abuzaid et al., 2017). The metacyclic promastigotes that enter the blood are taken up by macrophages and neutrophils where they differentiate into dividing, flagellated amastigotes in the phagolysosome (Tabbabi, 2019; Basmaciyan and Casanova, 2019). Saudi Arabia was ranked among the top 10 endemic countries worldwide before the establishment of the Leishmaniasis Control Program (LCP), by the Saudi Ministry of Health in 1978 (Abuzaid et al., 2017). It is still the fourth most endemic area in Western Asia (Alvar et al., 2012).

Despite the great efforts by health authorities, CL still represents a major public health problem in Saudi Arabia as the disease is still endemic in many regions as Al-Qaseem, Riyadh, Al-Hassa, Aseer, Hail, Al-Bahah, Taif, and Al-Madinah (Shalaby et al., 2011; Amin et al., 2013; Khan and Zakai, 2014; Salam et al., 2014; Abuzaid et al., 2017; Haouas et al., 2017). Prevention and control of Cutaneous leishmaniasis in Saudi Arabia depend mainly on community awareness. Knowledge, attitude, and practices of the community towards CL are essential constituents of individuals' safety and quality care. Thus, the current study aimed to evaluate the level of community awareness about CL in Al-Jouf, to design the appropriate health education programs coping with their needs.

2. PARTICIPANTS AND METHODS

Study design and duration

The current study is a questionnaire-based cross-sectional study, conducted between June 2022 and April 2023. The questionnaire is an open-source and validated questionnaire on Cutaneous leishmaniasis (Alharazi et al., 2021). It involves 4 sections: Section 1 (participants' sociodemographic data as age, gender, education level, occupation, and number of household members), section 2 (questions about CL, manifestations, its vector, the peak period of incidence, treatment, and control measures), section 3 (questions on sand flies as how to differentiate them, breeding sites, time after biting to develop the disease), and section 4 (questions on the participants' attitudes towards CL).

Ethical approval

The research proposal was approved by the Local Committee of Bioethics (LCBE) on 3/4/2022 (approval number is 2-08-43).

Sampling

After taking ethical approval, the questionnaire was distributed online to 540 individuals representing all sectors of the community including employees, householders, university students, workers, and educated persons to avoid any bias. Inclusion criterion: Any person resident in Al-Jouf region was included in this study. Exclusion criterion: Any person resident outside Al-Jouf region was excluded from this study.

Statistical analysis of the data

Data were analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp). Qualitative data are expressed as numbers and percentages. Statistical significance was set at 5%.

3. RESULTS

Participants' demographic data

During the current study, 540 individuals answered the questionnaire (87% were females, and 13% were males). The sociodemographic characteristics including age, gender, educational level, residency, occupation, and the number of family members in the same house illustrated in (Table 1). It was noted that a high percentage of the participants were females (87%), had a Bachelor's degree in education (67%), lived in Sakaka (56%), and worked as a government employee (43.5%), and family members in the same house were ranging between 6 to 12 (60%) (Table 1).

Table 1 Sociodemographic characteristics

I. Sociodemographic data	No. (%)
Age (years)	
18-20 years	51 (10 %)
21-30 years	162 (30%)
31-40 years	163 (30%)
> 40 years	164 (30%)
Gender	
Female	473 (87%)
Male	67 (13%)
Educational level	
Non-educated	5 (0.01%)
High school	89 (16.49%)
Bachelor	360 (67%)
Diploma	74 (14%)
Postgraduate	12 (2.5%)
Residency	
Sakaka	302 (56%)
Qurayyat	80 (15%)
Dumat Aljandal	14 (2.59%)
Tabarjal	1 (0.01%)
Sawayr	143 (26.4%)
Occupation	
Student	116 (21.5%)
Not working	146 (27.5%)
Governmental employee	237 (43.5%)
Private work	41 (7.5%)
Number of family members in the same house	
From 6 to 12	324 (60%)
Less than 6	216 (40%)

By answering the general questions on CL, we noted that 30% of the participants had no idea about CL. Most of the participants do not know Sandfly (92.4%) or its common sites (62%), how CL be transmitted (70%), when CL is more common (71%), if it is a serious disease or not (73%), if CL is curable or not (67%), and if this disease preventable or not (70%). However, the good point is that 95% have not been infected with CL (Tables 2, 3).

Table 2 General Questions about Leishmaniasis.

General Question	Answer		
	Yes	No	Do not know
Have you heard of cutaneous leishmaniasis?	373 (70%)	167 (30%)	0 (0%)
Have you seen someone infected with cutaneous leishmaniasis?	27 (5%)	513 (95%)	0 (0%)
Have you ever had cutaneous leishmaniasis?	27 (5%)	513 (95%)	0 (0%)
Have you ever seen Sandfly?	40 (7.4%)	499 (92.4%)	1 (0.2%)
Is cutaneous leishmaniasis a serious disease	101 (19%)	47 (8%)	392 (73%)
Is cutaneous leishmaniasis curable?	175 (32%)	4 (1%)	361 (67%)

Can cutaneous leishmaniasis be prevented?	145 (26.5%)	19 (3.5%)	376 (70%)

Table 3 Specific questions on Cutaneous Leishmaniasis.

Questions	Frequency	Percent
When is cutaneous leishmaniasis more common?		
Autumn	7	1.3%
Spring	17	3.2%
Summer	59	11%
Winter	73	13.5%
Do not know	384	71%
What are the most common sites of sand flies?		
Beside swamps	105	19.4%
Desert	29	5.4%
Farms	42	7.7%
Gardens	30	5.6%
Do not know	334	61.9%
How cutaneous leishmaniasis can be transmitted?		
Direct contact	12	2.2%
Mosquito bite	40	7.1%
Sand mosquito bite	106	19.7%
Contaminated food	3	0.5%
Air born	3	0.5%
Do not know	376	70%
What are the symptoms of cutaneous leishmaniasis?		
Skin inflammation	71	13.2%
Skin inflammation and scar	103	19.1%
Difficulty in Breathing	12	2.1%
Do not know	354	65.6%
If you have been infected, how many scars do you have?		
Not Infected	513	95%
1-2	19	3.5%
3-4	5	0.9%
5-6	3	0.6%
If you have been infected, where are the scars located?		
Face	15	2.8%
Hands	6	1.1%
Feet	6	1.1%
not infected	513	95%

Regarding knowledge about the symptoms of CL, 65% of participants lacked any knowledge about the symptoms of CL, 19% chose skin inflammation and scar, and 13% chose skin inflammation only (Figure 1). With respect to the infected participants, they suffered from scares (1-6) mainly in the face (3%) then hands (1%) and feet (1%).

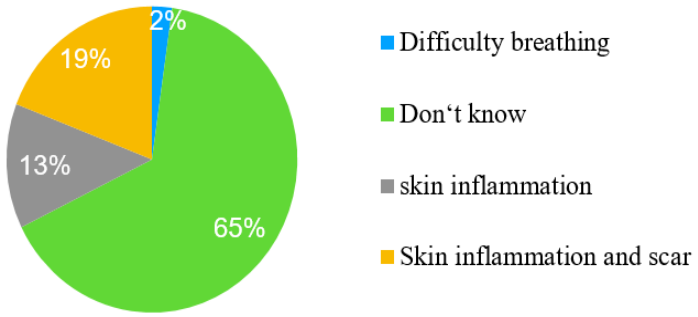

Figure 1 Knowledge of the symptoms of cutaneous leishmaniasis

4. DISCUSSION

World Health Organization (WHO) has estimated that 12 million people are infected with Leishmania, all over the world, and annually, there are 2 million new cases; most of them are diagnosed as cutaneous leishmaniasis (WHO, 2010; Tabbabi, 2019). After neglecting tropical diseases for a long time, CL has reached the priority in public health globally for different aspects such as the partially known parasite-host interactions, unclear infection dynamics, parasite persistence, and inability to find a way the eradicate this disfiguring disease. This knowledge may point to targets to develop measures to minimize morbidity and outcomes (Nandha et al., 2014).

Recent outbreaks of CL in many countries, like Pakistan, India, Yemen, Iran, and Ethiopia, make the disease of major public health concern (Sarkari et al., 2014; Akram et al., 2015; Kebede et al., 2016; Alharazi et al., 2021). In Saudi Arabia, it was reported that rapid urbanization and population movements may predispose to CL outbreaks and epidemics; particularly in Al-Hassa, Aseer, Al-Qaseem, Riyadh, Ha'il, and Al-Madinah (Abuzaid et al., 2017). Many researchers have suggested carrying out an analysis of the prevailing knowledge, attitude, and practice (KAP) of populations on CL. Thus, the current study which aimed to assess community awareness about CL in Al-Jouf region via the distribution of an online questionnaire to 540 participants.

It was noted that a high percentage of the participants were females (87%), with a Bachelor’s degree in education (67%), lived in Sakaka (56%), and worked as a government employee (43.5%), and family members in the same house were ranging between 6 to 12 (60%). In partial agreement with our study, Alharazi et al., (2021) evaluated the knowledge and attitude of 500 households in rural endemic communities in Taiz, Yemen towards CL using a pretested structured questionnaire. They noted that 62.7% of participants were males and 21.5% were non-educated. Regarding the community knowledge and attitudes toward CL, results clarified that about 30% of the participants had no idea about CL. Most of the participants do not know Sandfly (93%) or its common sites (62%), how CL be transmitted (70%), when CL is more common (71%) if it is a serious disease or not (73%), if CL is curable or not (67%), and if this disease can be prevented or not (70%).

Regarding knowledge about the symptoms of CL, 65% of participants lacked any knowledge about the symptoms of CL, 19% chose skin inflammation and scar, and 13% chose skin inflammation only. This indicates very poor knowledge of CL. This comes in accordance with Amin et al., (2013) who performed a cross-sectional descriptive survey in Al-Hassa region, including 1824 individuals. They found that 76% of participants knew the infectious nature of CL, however, their awareness regarding risk factors, transmission, manifestations, and preventive methods was very poor. Furthermore, Alharazi et al., (2021) have reported that 77.7% of participants had poor knowledge about disease transmission, clinical presentation, treatment, and prevention as very few percent knew the role of the sand fly in CL transmission (14.8%), and 36.6% supposed that it can be prevented.

In 2021, an outbreak of CL occurred in Asir province; particularly Khamis-Mushait and Abha governorates. CL affected all age groups in both genders, and 38.1% were under 13 years old. 90.7% of CL patients were Saudi citizens, and the majority of them had a single lesion located on the face. Phylogenetic analysis revealed that L. tropica was the main etiological agent with two seasonal peaks in March and in July-August (Alraey et al., 2022). In contrary to these results, Rasheed et al., (2019) have investigated the Leishmania species responsible for CL in Qassim, Saudi Arabia using quantitative and qualitative PCR. They found that 49.5% of biopsies were positive for L. major, while 28.6% and 3.9% of biopsies were positive for L. tropica and L. Infantum/ Donovani, respectively.

Also, Alzahrani et al., (2023) performed a cross-sectional survey in Hubuna, Najran, Saudi Arabia, from January to October 2022. They found a high level of CL endemicity as about 38.1% of participants stated having CL and being under treatment, especially those living in/around planted areas. A significant association was noted between CL and farming. The good point in the current

study is that 95% have not been infected with CL. This indicates the proper and efficient prevention and control program applied by the government. With respect to the infected participants (5%), they suffered from scares (1-6) mainly in the face (3%) then hands (1%) and feet (1%). This may indicate a lack of endemicity of CL in Al-Jouf region, Saudi Arabia.

Nearly all studies have recommended the establishment of effective management strategies against CL based on the community's knowledge of the infection, disease, vector, risk factors, and possible ways for prevention and control (Nandha et al., 2014; Sarkari et al., 2014; Akram et al., 2015; Kebede et al., 2016; Alharazi et al., 2021; Alraey et al., 2022; Alzahrani et al., 2023). Here too we recommend the planning of health education programs about CL and its preventive measures even if the disease is not endemic in Al-Jouf region. The main limitation of the current study is the low participation of males and the sample size was not high.

5. CONCLUSION

There's a decreased level of awareness about Cutaneous leishmaniasis, risk factors, vector, transmission, clinical manifestations, complications, and ways of prevention among the different sectors of the community in Al-Jouf region.

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Author contributions

Study design, conceptualization, data collection, formal analysis, funding acquisition, methodology, and writing and revision were performed all authors.

Ethical approval

The study was approved by the Local Committee of Bioethics (LCBE) on 3/4/2022 (Ethical approval code: 2-08-43). Informed consent: Written informed consent was obtained from all individual participants included in the study as the first partition in the questionnaire.

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This study has not received any external funding.

Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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