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Public Knowledge, Attitude and Practices to wards Cutaneous Leishmaniasis and Sand Flies in Attoud, Aseer Region, kingdom of Saudi Arabia .

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ABSTRACT

Background: Cutaneous leishmaniasis (CL) is a vector-borne disease transmitted by the bite of an infected sand fly. This disease is highly prevalent in Saudi Arabia. It aims to assess Knowledge, Attitude and Practices Related to Cutaneous Leishmaniasis and Sand Flies among 8th Female High school in Attoud, Aseer Region.. **Methodology:** This study was conducted at 8th Female High school with sample size 210 participants by used Questionnaire to assess the Knowledge, Attitude and Practices of Cutaneous leishmaniasis. The data was analyzed by SPSS Version (22) for analysis and presented of data . **Results:** The vast majority of the respondents (94.76 %) were live in Attoud area, (43.8%) of respondent's knowing about Cutaneous leishmaniasis. Nearly half of respondents (42.2%) were reported that Cutaneous leishmaniasis is presented with Skin infection (a cutaneous rash). (76.7%) of respondents stated the sand flies of insect transmitted Cutaneous leishmaniasis, but only 21% knew the vector of the disease of Cutaneous leishmaniasis. Only (24.8%) of respondents know about preventive measures. Regarding attitude, (34.8%) of respondent thoughts, insecticide are the best in avioding Cutaneous leishmaniasis followed by Insect repellents (27.6%) and few of them thoughts Sanitation (3.3%) .Nearly half of the respondents (42.4%) thought that insecticide were spray more than a year and (12.4%) of the respondents do not thought any things. **Conclusions:** In the study, insufficient knowledge of the students about Cutaneous leishmaniasis infection, vector, mode transmission and preventive measures of CL, also the attitude and practice of students like preventive measures of CL were found not satisfactory, and the study found the High education of parents lead to high knowledge of their kids of disease. Highpoints the needs for a health education and promotion to enhance the awareness of students about CL. which will improve inhabitants' contribution in control program of CL in this area.

KEYWORDS: Knowledge, Attitude, Practices, Cutaneous Leishmaniasis, Sand fly, Saudi Arabia.

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I. INTRODUCTION

Leishmaniasis is a parasitic disease caused by the Leishmania parasite. This parasite typically lives in infected sand flies [1]. Cutaneous leishmaniasis (CL) is the most common form of leishmaniasis; a disease with varying clinical presentation and a mild dermal condition usually self-healing, but the resulting scaring could be extremely disfiguring leading to social and psychological stigma[2]. The main symptom of Cutaneous leishmaniasisis painless skin ulcers. Cutaneous symptoms may appear a few weeks after being bitten by an infected sand fly, sometimes symptoms won't appear for months or years [1]

The epidemiology of leishmaniasis depends on the characteristics of the parasite and sand fly species, the local ecological characteristics of the transmission sites, current and past exposure of the human population to the parasite, and human behavior. Some 70 animal species, including humans, have been found as natural reservoir hosts of Leishmania parasites [3].

Approximately, 0.7 to 1.2 million new cases of CL occur each year worldwide, with about one third of cases occurring in each of the following three regions: the Americas, the Mediterranean basin, and the western Asia from Middle East to central Asia . Currently CL is endemic in 87 countries worldwide [4].

Fatal epidemics have occurred in areas of Asia, East Africa, and South America. Affected regions are often remote and unstable, with limited resources for treating this disease [1]. Currently, KSA is no longer on the list of top 10 highest endemic countries worldwide, but it is still the fourth most endemic area in western Asia [5].Therefore, CL continues to be a major public health problem affecting the community and challenging the national health authorities [6].

According to the Saudi Ministry of Heath seven-year reports (2006–2012), Hail Province, Northwestern Saudi Arabia, is reported as the fifth most infected region among the 20 Saudi provinces after El Qassim, Al- Madinah Al-Munawarah, El Hassa and Riyadh [7]. Leishmania parasites are transmitted through the bites of infected female phlebotomine sandflies, which feed on blood to produce eggs [3]. The sand fly adults are small flies – only about 3 mm long – and are golden, brownish or gray colored, have long, piercing mouthparts that are well adapted for sucking blood from their selected host, hairy-looking wings in a vertical V-shape when at rest, a characteristic that distinguishes them from some other small flies. Also, the six legs on the adults are extremely long, being longer than the insect's body [8]. Three ways of detecting sand fly breeding places: the use of emergence traps placed over potential sources to catch newly emerged adult sandflies; flotation of larvae and pupae from soil, etc., and desiccation of media to drive out the larvae. [9].

The diversity of leishmania strains involved in cutaneous leishmaniasis and unavailability of universally acceptable, safe, and effective vaccine make the treatment of patients difficult [10].

Before considering treatment, the first step is to make sure the diagnosis is correct. The treatment depends in part on the Leishmania species; the geographic area in which infection was acquired; the natural history of infection; the parasite's drug susceptibilities in the pertinent setting; and the number, size, location, evolution, and other clinical characteristics of the patient's skin lesions, [11].

Current Treatment options of cutaneous leishmaniasis: Thermotherapy, Cryotherapy, Surgery, Electrotherapy, Paromomycin, Ketoconazole+ Dimethylsulfoxide, Miconazole,Clotimazole, IL Pentavalent antimony , Bleomycin [11]. The adoption of preventive measures strongly depends on the attitudes and behaviors of the population at risk. Therefore, in order to control leishmaniasis, it is essential to know the risk factors associated with it, and to understand the disease-related knowledge, attitudes, and practices (KAP) of the population [12].

Determining people's awareness about different features of cutaneous leishmaniasis is important for planning control programs. Deficiency of information about population KAP about illness like leishmaniasis delays the implementation of preventive actions. Considering this point, findings of this study can be suitably used for proper accomplishment of preventive plans for cutaneous leishmaniasis.

II. MATERIALS AND METHODS

A Cross-Sectional, descriptive study in 8TH Female High school in Attoud Aseer region, Kingdom of Saudi Arabia .

The study was carried out in Attoud 8TH Female High School, Khamis Mushait localities in Aseer region. Aseer is a province of Saudi Arabia located in the southwest of the country region of 81,000 km² population of 1,563,000 borders with Yemen. The average annual rainfall in the highlands probably ranges from 300 to 500 millimeters (12 to 20 inches) falling in two rainy seasons, the chief one being in March and April with some rain in the summer. Temperatures are very extreme, with diurnal temperature ranges in the highlands the greatest in the world. It is common for afternoon temperatures are over 30 °C (85 °F), while mornings can be extremely frosty and fog can cut visibility to near zero percent.

Sample size (210 participant) was calculated based on total coverage of the students in the school. The sampling was continued till completing all students on the school.

A semi -structured KAP questionnaire was used for data collection. The questionnaire composed of the necessary questions of four main parts: socio-demographic characteristics, Knowledge of the respondents related to sand flies, Knowledge of the respondents related to cutaneous leishmaniasis and Attitudes and practices of the respondents related to leishmaniasis. The questionnaire was validated first by conducting a pre-testing on a small group of target population. Then the survey was extending from 10/2018 to 11/2018 excluding predestining group.

The ethics committee of King Khalid University faculty of applied science Medical Sciences, department of public health approved the study and written informed consent of the interviewee was taken after explaining the objectives of the study then the school administration to distribute the questionnaire. Confidentiality of the details of the participants was guaranteed. Collected data were analyzed with SPSS, version 22 and P< 0.05 was considered statistically significant.

III. RESULT

The vast majority of the respondents (94.76%) were live in Attoud and (35.24%) were in 2nd grade while (33.8 %) in grade 1st and (30.95 %) in 3rd grade.

Regarding to level of father's education (52.4%) was in University and above and (29%) were in high school, few of them were Illiterate and Primary school (4.8%).

While the mother's education (34.3%) were in University and above and (28.6%) were in high school , Illiterate (19%) and few of them in Primary and middle school (9%). Table 1

The study revealed that only 4.8% of the respondents were able to differentiate sand flies from common house flies, whereas 95.2% had no idea of identification. When the respondents were asked "do sand flies transmit diseases? Most of the respondents (76.7%) answered "yes", that sand flies transmit leishmaniasis while 23.3% answered that "I don't know", 36.2% of the respondents said that sand flies transmit Skin disease, but 22.4% answered that "I don't know".

For the breeding places of sand flies, 33.8% thought that moist places are suitable breeding places, whereas 27.6% ,11.9 % and 10% said Trees, Unhygienic conditions and fresh water , respectively. However, 15.7% had lack of information regarding breeding places of sand flies. Regarding the biting time of sand flies, 30.5% thought that it bites during dusk and dawn, followed by During midnight (29%), Sunset (11.9%), At any time (10%), whereas the (23.1%) of respondents were unaware. For the control measures of sand flies, 28.6% were in the opinion that sand flies can be controlled by Fly paper. The use of insect repellents, sanitation and insecticide sprays were also answered by some of the respondents, whereas 15.7% were unaware about the control measures. Table 2

Nearly half of the respondents (43.8%) konwing about leishmaniasis and have a history of leishmaniasis diseases. While few of respondents (37.6%) reported that coetaneous leishmaniasis it's a diseases transmitted from man to man.

Nearly quarter of respondents (21%) said the correct answer that the Sand fly transmitted Cutaneous leishmaniasis, , few of them (18.1%) do not know vector of leishmaniasis.

Regarding to the question about the symptoms of Cutaneous leishmaniasis the nearly half (45.2%) of respondents reported the correct answer that is Skin infection.

Furthermore the most of the respondents (85.6%) reported cutaneous leishmanias is curable, while (26.7) reported that the peak incidence time for cutaneous leishmaniasis in summer and few of them said in winter (9.5). Table 3

Regarding to the question what to do if a family member is infected with leishmaniasis the nearly half of the respondent (40.5%) said (Admission to Hospital) it is true answer and (10.5%) said the (Admission to doctor Herbalists).

Regarding to the preventive (avoid) of cutaneous leishmaniasis (43.8%) thought insecticide which is the true answer followed by Insect repellents(27.6%) and bed net(22.4%) and few of them thought Sanitation (3.3%) .

Nearly half of the respondents (42.4%) thought that insecticide were spray more than a year and (12.4%) of the respondents do not thought the. The most common method of source information is teacher (31%). Table 4

The table (5) showed significant relationship between heard of cutaneous leishmaniasis and parent's educational level while other socio-demographic data like residence, father and mother jobs are found not statistically significant

Table 1- Socio-demographic characteristics of studied sample in 8th Female High school in Attoud ,Aseer region, Kingdom of Saudi Arabia(n = 210).

Characteristics	Categories	Number	%
Grade of Education	1st highschool	71	33.8
	2nd high school	74	35.24
	3rd high school	65	30.95
Residence	Attoud	199	94.76
	Non Attoud	11	5.21
Level of Father Education	Illiterate	10	4.8
	Primary school	10	4.8
	Middle school	19	9
	High school	61	29
	University and above	110	52.4
Level of Mother Education	Illiterate	40	19
	Primary school	19	9
	Middle school	19	9
	High school	60	28.6
	University and above	72	34.3
Father's Job	work	194	92.4
	Not work	16	7.6
Mother's Job	work	98	46.7
	Not work	112	53.3

Table 2: Knowledge of the respondents related to sand flies (n = 210).

Characteristics	Categories	Number	%
Can you identify/differentiate sand flies	Yes	10	4.8
	No	200	95.2
Do you expose to sand fly bites?	Yes	1	0.5
	No	209	99.5
Do sand flies transmit diseases?	Yes	161	76.7
	No	49	23.3
Name the disease transition by sand flies	Fever	27	23.3
	Diarrhea	24	11.4
	Malaria	36	17.1
	Skin disease	76	36.2
	I don't know	47	22.4
Do you know breeding places of sand flies?	Fresh water	23	10
	Unhygienic conditions	25	11.9
	Moist places	71	33.8
	Trees	58	27.6
	I don't know	33	15.7
Do you know biting time of sand flies?	During dusk and dawn	64	30.5
	Sunset	25	11.9
	During midnight	61	29
	At any time	21	10
	I don't know	29	23.1
Do you know the control methods of sand flies?	Fly paper	60	28.6
	Insecticide sprays	41	19.5
	Insect	41	19.5
	Sanitation	35	16.7
	I don't know	33	15.7

Table 3- Knowledge of the respondents related to cutaneous leishmaniasis (n = 210).

Characteristics	Categories	Number	%
Do you know Leishmaniasis disease?	Yes	92	43.8
	No	118	56.2
Did you ever see a leishmaniasis patient or have a history of leishmaniasis?	Yes	92	43.8
	No	118	56.2
Do you know symptoms of the disease?	Fever	3	1.4
	Anemia	11	6.7
	Skin infection	95	45.2
	Itch	18	8.6
	I don't know	83	39.5
Can it be transmitted from man to man?	Yes	79	37.6
	No	131	62.4
Do you know the vector of the disease?	Mosquito	57	27.1
	Sand fly	44	21
	Bees	2	0.9
	House fly	69	23.9
	I don't know	48	18.1
Peak incidence time?	Summer	56	26.7
	Winter	20	9.5
	Spring	53	25.2
	Autumn	32	15.2
	I don't know	39	23.4
Is leishmaniasis curable?	Yes	123	85.6
	No	87	41.5

Table 4: Attitude and practices of the respondents related to cutaneous leishmaniasis (n = 210).

Characteristics	Categories	Number	%
What to do if a family member is infected with leishmaniasis	Cleanliness	8	3.8
	Admission to doctor Herbalists	22	10.5
	Admission to Hospital	85	40.5
	Isolation of patient with bed Net	74	35.2
	I don't know	21	10
What to do to avoid leishmaniasis	Sanitation	7	3.3
	Bed net	47	22.4
	Insect repellents	58	27.6
	Insecticide	72	34.8
	I don't know	25	11.9
What is the source of information you have about Cutaneous Leishmaniasis?	Television	11	5.2
	Publication	17	8.1
	Social media	25	11.9
	Teacher	65	31
	I don't know	92	43.8
When is the insecticide were spray	A year ago	27	12.9
	Six months	64	30.5
	Less than a month	4	1.9
	More than a year	89	42.4
	I don't know	26	12.4

Table 5: Relationship between socio-demographic data & Do you know leishmaniasis disease

Characteristics	Categories	Do you know leishmaniasis disease?		P value
		yes	No	
Residence	Attoud	3(27.3%)	8(72.7%)	0.185
	Outside Attoud	95(47.7%)	104(52.3%)	
Level of Father Education	Illiterate	2(20.0%)	8(80.0%)	0.009
	Primary school	2(20.0%)	8(80.0%)	
	Middle school	4(21.1%)	15(78.9%)	
	High school	30(49.2%)	31(50.8%)	
	University and above	60(54.5%)	50(45.5%)	
Level of Mother Education	Illiterate	16(40.0%)	24(60.0%)	0.044
	Primary school	4(21.1%)	15(78.9%)	
	Middle school	7(36.8%)	12(63.2%)	
	High school	30(50.0%)	30(50.0%)	
	University and above	41(56.9%)	31(43.1%)	
Father's Job	work	92(47.4%)	102(52.6%)	0.444
	Not work	6(37.5%)	10(62.5%)	
Mother's Job	work	52(53.1%)	46(46.9%)	0.082
	Not work	46(41.1%)	66(58.9%)	

IV. DISCUSSION

Considerate the Knowledge attitude and practices of population is important a stage in the effective implementation of CL control activities in CL-endemic areas. It is essential to know the level of KAP of a community and improve it to a satisfactory level before introducing any control program to the community.

The study found nearly half of therespondents knowing about leishmaniasis and were aware that CL is presented with a cutaneous rash and damage the skin tissue, that is means the knowledge about disease not satisfactory, this is not agreement with study by [13] conducted in Southern Iran, the majority of the study population (83%) had knowing about Cutaneous and most of these respondents (91%) were aware that CL is presented with a cutaneous lesion.

Our study found few of respondents know that Cutaneous leishmaniasis sit is an infectious disease that is mean the knowledge about the disease was not satisfactory. This was not agreement with [13] study in Iran, reported that the general awareness of participant regarding the CL was not satisfactory since about two-third of respondents knew that CL is an infectious disease in Southern Iran.

Regarding Knowledge of respondents toward Cutaneous leishmaniasis transmitted by bite of an insect nearly half of respondents were aware that Cutaneous leishmaniasis transmitted by bite of an insect, this agreement with study in Syrian [14]

In this study only quarter of respondents could identify sand fly as the vector of Cutaneous leishmaniasis this finding in keeping with similar studies conducted in Saudi Arabia by [5]. Also it is in the same line in Syrian Arab Republic found the a little under half of the respondents implicated sandflies [14].also the same study in Isfahan, reported that only 13.9% of respondents had enough information about characteristics of sand fly and it is vector of Cutaneous leishmaniasis [15].

Regarding knowelge of respondents about the symptoms and complication of Cutaneous leishmanias the study found only half of respondents reported correct answer which it (rash and tissue demage rescpectively), while other respondents did not knew the symptom and complication of disease ,this is not agreement with study conducted in Pakistan [16] found little more than quarter of respondents said skin infection is the main symptom of leishmaniasis. Some of the respondents also answered fever, enlargement of liver and spleen and anemia as the symptoms, whereas the majority of the respondents (56%) were unaware.

Respondents awareness about preventive measures of Cutaneous leishmanias and its vector is important that is lead to take proper action to protect themselves from diseases .In our study knowledge of respondents for preventive measures was considered low. These finding in the same line with results of [15] where they reported that the lowest knowledge of study population was about preventive measures.

The respondents regarding the treatment of Cutaneous leishmaniasis was not satisfactory since only (40.5%) believed that CL can be treated by Drug therapy.

This study found significant relationship between heard of cutaneous leishmaniasis and parent's educational level. High education of parents lead to high knowledge of their kid's, this support study in Palestine which demonstrated that lower incidence of cutaneous leishmaniasis related to higher education level of the head of households [17].

V. LIST OF ABBREVIATION

CL Cutaneous leishmaniasis.

LCP leishmaniasis control program.

WHO World health organization.

VI. CONCLUSION

The study found nearly half of respondents knowing about Cutaneous leishmaniasis and most of the respondents did not know CL transmitted by sand fly while few of them know sand fly is a vector of CL. Attitude and practice about disease like, treatment and preventive measures of CL were found not satisfactory. Also the study found significant relationship between knowing of cutaneous leishmaniasis and parent's education.

VII. RECOMMENDATIONS

High schools need a lot of health education about cutaneous leishmaniasis disease and sand fly vector in Attued area, Aseer region. . Further studies are needed to determine the KAP of cutaneous leishmaniasis in Aseer region.

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IX. REFERENCES

[1] **Jacquelyn Cafasso. (2017).**Leishmaniasis. health line ,Available at: https://www.healthline.com/health/leishmaniasis.

[2] **Alvar J, Yactayo S, Bern C.** Leishmaniasis and poverty. Trends Parasitol 2006; 22:552–557 [PubMed].

[3] **WHO. (14 March 2018).** Leishmaniasis, U.S. Available at: http://www.who.int/news-room/fact-sheets/detail/leishmaniasis.

[4] **WHO .** Manual for case management of cutaneous leishmaniasis in the Eastern Mediterranean region (2014). WHO Regional Publications, Eastern Mediterranean Series; 35.https://apps.who.int/iris/handle/10665/120002 .

[5] **Abuzaid A. Abuzaid, 1 Abdalmohsin M. Abdoon,1 Mohamed A. Aldahan,1 Abdullah G. Alzahrani,1 Raaft F. Alhakeem,1Abdullah M. Asiri,1 Mohamed H. Alzahrani,1 and Ziad A. Memish, (2017).** Cutaneous Leishmaniasis in Saudi Arabia: A Comprehensive Overview.

[6] **Alvar J, Vélez ID, Bern C, Herrero M, et al.** Leishmaniasis worldwide and global estimates of its incidence. PLoS One 2012; 7:e35671. [PMC free article] [PubMed], internet access.

[7] **MOHSA, 2006-2012.** Statistical books for the years 2006–2012. Ministry of health of Saudi Arabia. Available at: http://www.moh.gov.sa/en/Ministry/Statistics/book/Pages/defa ult.aspx (accessed on March 2014).

[8] **Orkin.9(2019).** Facts ,identification ,control of Sand Flies. Available at: https://www.orkin.com/flies/sand-flies.

[9] **Feliciangeli, et al. (2004).** Natural breedingplaces of phlebotomine sand flies. Medical and veterinary entomology. 2004 Dec;18(4):453 Available at: https://www.ncbi.nlm.nih.gov/pubmed/15009450

[10] **Okwor I, Mou Z, Liu D, Uzonna J (2012)** Protective Immunity and Vaccination Against Cutaneous Leishmaniasis. Front Immunol .3: 128. Available.

[11] **CENTER FOR DESEASE CONTROL AND PREVENTION (CDC), Jul 26, 2018,** parasites leishmaniasis, U.S. Department of Health & Human Services,Available at: https://www.cdc.gov/parasites/leishmaniasis/index.html

[12] **Lo´pez-Perea N, Sordo L, Gadisa E, Cruz I, Hailu T, Moreno J et al. (2014)** Knowledge, Attitudes and Practices Related to Visceral Leishmaniasis in Rural Communities of Amhara State: A Longitudinal Study in Northwest Ethiopia. PLoSNegl Trop Dis 8(4): e2799.

[13] **Sarkari B, Qasem A,, Shafaf MR. (2014),** Knowledge, attitude, and practices related to cutaneous leishmaniasis in an endemic focus of cutaneous leishmaniasis, Southern Iran, Asian Pacific journal of tropical biomedicine, volume 4, Pages 566-569.

[14] **Abazid N, Jones C, Davies CR.(2012)** ,Knowledge, attitudes and practices about leishmaniasis among cutaneous leishmaniasis patients in Aleppo, Syrian Arab Republic,EastMediterr Health J. ,18(1):7-14.

[15] **Hejazi SH, Hazavei SM, ShiraniBidabadi L, Shademani A, Siadat AH, Zolfaghari-baghbaderani A, et al.** Evaluation of knowledge, attitude and performance of the mothers of children affected by cutaneous leishmaniasis. Infect Dis Res Treat. 2010 doi: 0.4137/IDRT.S3786. [CrossRef] [Google Scholar].

[16] **Ayesha A,Hafiz A ,Abdul Q ,Arshad M .(2015)** , A Cross-Sectional Survey of Knowledge, Attitude and Practices Related to Cutaneous Leishmaniasis and Sand Flies in Punjab, Pakistan,PLoS One, v.10(6); 2015,PMC4474799.

[17] **Al-Jawabreh A, Barghuthy F, Schnur LF, Jacobson RL, Schonian G, Abdeen Z.** Epidemiology of cutaneous leishmaniasis in the endemic area of Jericho, Palestine. East Mediterr Health J. 2003;9:805–815.[PubMed] [Google Scholar].

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