



## Indigenous Knowledge, Attitude and Practices (KAP) of People about Leishmaniasis and Its Vector Sand Fly (Phlebotominae: Psychodidae: Diptera) Living in an Urban Settlement in South Punjab, Pakistan

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### Abstract

Densely populated cities in the world are facing serious health concerns vectored by insects and other arthropods. The same has been true for Multan, where Leishmaniasis has become a regularly reported disease. A total of 203 patients were reported from OPD of Civil Hospital, Multan in 2015. For the study, a cross sectional survey was conducted in Multan city. Total 496 household-respondents were selected by using the simple random sampling technique. Respondents included 73.4%, 26.2% and 0.4% males, females and she-males, respectively, whose knowledge about the vector of the disease was very poor and only 2.4% told that the disease was vectored by an insect, but no one could tell the name (sand fly). The data so collected is thus considered of significant importance as it would be utilized in management programs against the disease and its vector sand fly.

**Keywords:** KAP; Leishmaniasis; Local people; Multan; Sand fly

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### Introduction

Leishmaniasis is a vector-borne parasitic disease that is spread by the biting of female sand fly. Sand flies are members of insect family Psychodidae and subfamily Phlebotominae. Genus *Phlebotomus* is reported to cause the disease in old world and *Lutzomyia* is responsible for disease spread in new world. Protozoan parasites of the genus *Leishmania* of the family Trypanosomatidae are causal organisms of the disease [1]. Globally, Leishmaniasis is at the 9<sup>th</sup> number in parasitic and infectious diseases [2,3]. Mostly, the children under the age of 15 years are reported to suffer from the disease, while in the case of Disability-Adjusted Life Years (DALYs), it is the third common cause of morbidity [4]. Leishmaniasis is known for hundreds of years. Alexander Russel was the first one who made the simple descriptions of Leishmaniasis in 1756. This group of diseases was known by various names in various countries of the world like Kala-Azar (Visceral Leishmaniasis), Espundia (Mucocutaneous Leishmaniasis) and Dum-dum fever [5].

In the world, nearly 12 million peoples are infected with the disease with annual occurrence of about 1.3 million new cases [6] and about 350 million individuals are living at the risk of getting infection [7]. In the past, number of infected peoples has increased in endemic areas due to co-infection with HIV, while the disease has also spread to non-endemic areas such as Southern Europe. Although it is one of the most neglected diseases in the world but has been affecting mainly the poor people with the unhygienic living conditions mostly in the developing countries (72) than in the developed nations (16) out of the total 88 infected ones [1,8,9]. The disease is represented in three major clinical forms i.e., Visceral Leishmaniasis (VL), Cutaneous Leishmaniasis (CL) and Mucocutaneous Leishmaniasis (MCL) [5]. VL can be fatal [10,11] when left untreated while CL is the simplest and common form. All three major forms exist in Pakistan. VL is sporadic and mainly present in Azad Jammu and Kashmir (AJ&K) and Baltistan. Qutbuddin reported Hance's findings about first reported cases of leishmania from the areas (Kohat) Pakistan. Noor et al. [12] recorded the first case of VL from Multan [12]. Rab et al. [13], witnessed 22 patients of VL from National Institute of Health, Islamabad, out of which 15 were from AJ&K, 3 from Gilgit and 4 from bordering areas of KPK and Punjab [13]. Hassan et al. [14] reported in 1995 that 38 cases of visceral

leishmaniasis were detected from Medical College, Rawalpindi. Out of these patients, 2 were from Gilgit, 4 from Murree and Abbotabad vicinities and rest were from Poonch and nearby areas in AJ&K [14]. Rab and Evans [15] studied the record of 10 years and they observed 239 cases from Rawalpindi, Islamabad, Gilgit and Muzaffarabad hospitals. They found 52% were under the age of 2 years while 86% of all the cases were below the age of 5 years. This shows that it is mainly present in small or teen agers [15].

CL is more common in Pakistan and found in all four provinces (Punjab, Sindh, KPK and Baluchistan) [16]. The disease starts as an abnormal redness of the skin due to local congestion, as an inflammation where the sand fly bites such as the exposed body parts like hands or nose etc. The swelling on the skin increases in diameter and becomes an abnormal part. The border is usually raised up and becomes prominent (Figure 1). There can be more than one lesion on a person when attacked by the group of sand flies. Lesions are large and painless unless infection of bacteria or fungi [17].

This disease is also known as rural leishmaniasis [18] and more likely to occur in males rather than in females [16] and is divided into two categories i.e. Anthroponotic Cutaneous Leishmaniasis (ACL) and Zoonotic Cutaneous Leishmaniasis (ZCL) [19]. First is transmitted from humans to humans and the latter is transmitted from animals to humans. ACL is present in northern hilly areas such as Azad Kashmir and in the extreme southern parts like in Lasbella and Makran [20]. It is endemic in Baluchistan, Interior Sindh and Multan, with more concentration in Chakwal and Mangla in the Punjab [21,22].

Although, MCL is uncommon form but is also present in Pakistan. Irrespective of age or gender, all people are at risk of getting MCL. A study conducted in Quetta, revealed that 33 out of 200 children having Leishmaniasis were infected with MCL [23].

Above quoted works prove that Leishmaniasis is known to be present in various regions of Pakistan. For the successful control of CL, it is important to understand the Knowledge, Attitudes and Practices (KAP) of the people of the area. The KAP studies always provide a baseline data to design a successful control program for various vector-borne diseases like Leishmaniasis in many countries. Keeping above facts in view, the present study was proposed. The data collected in the work, will help the health administration to plan strategies against the disease in the area studied.

## Materials and Methods

### Study area and design

The study was carried out in the Union Council (UC) number 34 Multan City (30°11' 44" North, 71°28' 31" East) in August 2016. Multan is located at 129 m above sea level with arid climate having very hot summer and cold winters. The annual temperature ranges from 2°C to 48°C and average rainfall is 127 mm. The city itself is amongst the largest cities in Pakistan, as area of the district is 3,721 sq. km with the population of 4.75 million (2017) census. The settlements surveyed in UC34 are Rehman Abad, Jangla Chowk, Fazal Kareem Town, Liaqat Abad and Islam Pura. The total population of UC34 was 35,804 with total number of houses 6,300 having 5 to 6 persons. Majority of the houses were made of brick and were either with or without cement plaster while the rest were kacha made of mud. About 20% of the houses had domesticated animals like goats, buffaloes, donkeys and cows. Besides that, total 15 number of cattle sheds was

present near to their residences. As for as the health facilities are concerned, no qualified medical practitioner is available in whole of the UC except the quacks which were 25 that were playing with the lives of the residents. The area of the UC was peri-urban, and houses were constructed without town planning having poor civic facilities like sewerage and drinking water supply. Some farming fields were also located adjacent to houses and irrigated by polluted sewerage water. Most people living in the area were from lower socio-economic strata i.e., shopkeepers, rickshaw drivers, cart runners and laborers generally engaged at Bhattas (Brick Kilns).

The study was conducted by use of cross sectional survey from inhabitants of the UC mentioned earlier. A pre-tested semi-structured questionnaire was used for interview from the people. The survey form was prepared in English and was then translated into Urdu. But questions were asked in native languages like Saraiki, Punjabi and Urdu, of the respondents. Randomized sampling technique was adopted for the survey [24]. The reason to study the district and the UC was that many cases of Cutaneous Leishmaniasis had been reported from that site for last many years. The interviews were conducted on the bases of convenience sampling and willingness of the participants [25]. A total of 496 respondents were interviewed one member from each house, 30 houses didn't open their door while people from 10 houses refused to give interview. The questionnaire consisted of four parts i.e. socio-demographic characteristics, knowledge, attitude and practices adopted for Leishmaniasis prevention.

Data so collected were statistically analyzed using SPSS version 16, and results on cross tabulation between education and income with different questions on knowledge, attitude and practices, were obtained.

## Results

### Under the present study, results of interviewed people are discussed below

A total of 496 peoples were interviewed out of which 364 (73.4%) were males while 130 (26.2 %) were females and only 2 (0.4%) were she-males. The respondents were divided with respect to age into 4 groups; 171 (34.45%) respondents were from teen-agers (15 to 22 years), 169 (34.1%), 73 (14.72%) and 83 (16.7%) were from younger's (23 to 32 years), middle-aged (33 to 42 years) and elders (>42 years), respectively. As for as the educational status of the respondents is concerned, majority belongs to illiterate 249 (50.2%) and only 20 (4.0%) respondents were up to graduation. Monthly income of 73.4%, 26.2%, and 0.4% respondents were below Rs. 14,000, between Rs. 14,000 to Rs. 50,000 and more than Rs. 50,000, respectively (Table 1).

### Questions related to knowledge

In response to questions about the transmission of Leishmaniasis, the knowledge of the respondents was very poor. In this regard, among the illiterate people (249), only 5.4% and people earning <14,000 (310), only 6.7% told that it is through air. Some illiterate people (2%) replied that it is through insect. Similarly, groups with earnings between <14,000 to >50,000, as shown in the Table 2 was also same, however none could tell the name of sand fly. Interestingly, persons with education higher than matriculation did not reply the correct answer about the breeding place (soil) of sand fly and same was in case of people falling in high income group (>50,000). However, individuals interviewed had good knowledge about cure of Leishmaniasis as mentioned in Table 2.



**Figure 1:** CL infections on various parts of human body clicked during the sampling period by the oral consent of the people.

**Table 1:** Socio demographic characteristics of the respondents of the study.

Gender	Age (year)				Education			Monthly Income (Rs.)		
	15-22	23-32	33-42	>42	Illiterate	Up to Matric	Up to Graduation	<14,000	14,000-50,000	>50,000
Male	130	119	52	63	165	181	18	218	144	2
Female	39	50	21	20	83	45	2	90	40	0
She-male	2	0	0	0	1	1	0	2	0	0

**Table 2:** Relation between Education and Income with the questions about Knowledge and Attitude.

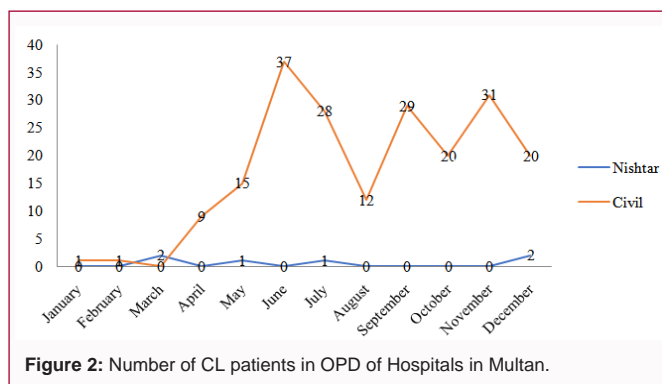
Variables		Association of Education with Various Questions						Association of Income with Various Questions					
		Illiterate		Up to Matric		Up to Graduation		<14,000		14,000-50,000		>50,000	
		N	%	N	%	N	%	N	%	N	%	N	%
Mode of transmission of CL	Air	27	5.4	23	4.6	7	1.4	33	6.7	24	4.8	0	0
	Body contact	29	5.8	21	4.2	1	0.2	34	6.9	16	3.2	1	0.2
	Blood transfusion	11	2.2	18	3.6	2	0.4	17	3.4	14	2.8	0	0
	Insect	5	1	7	1.4	0	0	9	1.8	3	0.6	0	0
	Don't know	177	35.7	158	31.9	10	2	217	43.8	127	25.6	1	0.2
Breeding place of sand fly	Soil	16	3.2	18	3.6	0	0	25	5	9	1.8	0	0
	Stagnant water	78	15.7	62	12.5	6	1.2	89	17.9	57	11.5	0	0
	Clean water	30	6	23	4.6	2	0.4	38	7.7	16	3.2	1	0.2
	Don't know	125	25.2	124	25	12	2.4	158	31.9	102	20.6	1	0.2
CL; cured or not	Yes	193	38.9	170	34.3	17	3.4	235	47.4	143	28.8	2	0.4
	No	56	11.3	57	11.5	3	0.6	75	15.1	41	8.3	0	0
More dangerous	Dengue	178	35.9	156	31.5	13	2.6	213	42.9	133	26.8	1	0.2
	Leishmaniasis	15	3	19	3.8	3	0.6	25	5	12	2.4	0	0
	Malaria	20	4	28	5.6	2	0.4	31	6.3	18	3.6	1	0.2
	Don't know	36	7.3	24	4.8	2	0.4	41	8.3	21	4.2	0	0
Control by community involvement	Yes	227	45.8	197	39.7	18	3.6	275	55.4	165	33.3	2	0.4
	No	22	4.4	30	6	2	0.4	35	7.1	19	3.8	0	0
Care of patient	Cleanliness	201	40.5	181	36.5	17	3.4	242	48.8	155	31.3	2	0.4
	Bed nets	12	2.4	14	2.8	1	0.2	18	3.6	9	1.8	0	0
	Don't know	36	7.3	32	6.5	2	0.4	50	10.1	20	4	0	0

Table 2 depicts the results on attitude of interviewed people towards the disease. For example, most of respondents answered dengue as more dangerous than Leishmaniasis when asked about dangerous insect borne diseases of human. A considerable segment

of the interviewed people was of the opinion that the disease can be controlled through community participation. Likewise, majority believed that care of the patients could be carried more efficiently, by cleanliness of surroundings.

**Table 3:** Relation between Education and Income with the questions about Practices.

Variables		Association of Education with Various Questions						Association of Income with Various Questions					
		Illiterate		Up to Matric		Up to Graduation		<14,000		14,000-50,000		>51,000	
		N	%	N	%	N	%	N	%	N	%	N	%
Source of Information about CL	Print media	12	2.4	11	2.2	0	0	12	2.4	10	2	1	0.2
	Social media	3	0.6	7	1.4	2	0.4	8	1.6	4	0.8	0	0
	TV, Radio	11	2.2	18	3.6	3	0.6	22	4.4	10	2	0	0
	Other	223	45	191	38.5	15	3	268	54	160	32.3	1	0.2
Preferred hospital	Govt. hospital	158	31.9	152	30.6	11	2.2	197	39.7	122	24.6	2	0.4
	Private hospital	65	13.1	53	10.7	6	1.2	77	15.5	47	9.5	0	0
	Don't know	26	5.2	22	4.4	3	0.6	36	7.3	15	3	0	0
Treatment good for CL	Ayurvedic	65	13.1	49	9.9	3	0.6	72	14.5	45	9.1	0	0
	Allopathic	134	27	121	24.4	12	2.4	158	31.9	107	21.6	2	0.4
	Don't know	50	10.1	57	11.5	5	1	80	16.1	32	6.5	0	0



**Figure 2:** Number of CL patients in OPD of Hospitals in Multan.

**Questions related to practice**

Table 3 reveals the results of practices about the disease adopted by the population under study. The majority of respondents preferred treatment of Leishmaniasis by Allopathic medicines over other alternative therapies like Ayurvedic and others. Likewise, most responding people preferred public hospitals for treatment over private ones. Some others simply answered as don't know.

When the respondents were asked about how they got information about Leishmaniasis, majority of them said from other sources like friends or from relatives and it is mostly same for the illiterate, highly qualified or for rich or poor people.

Data regarding outdoor patients infected with CL in 2015 was also collected from two major hospitals in Multan viz. Nishtar Hospital and Civil Hospital. The data is shown below in the Figure 2. From the figure, it was observed that the cases reported in Nishtar Hospital were much less as compared to the patients in Civil Hospital. It is possibly because of less response of hospital staff to the patients or less confidence of the patients on Nishtar Hospital. It was felt that reported cases were far below the expected patients in the society. It is mainly because of lack of awareness about the disease, lack of confidence to the public hospitals (Figure 2), and poverty of the people residing in slums like the area under study.

**Discussion**

Results obtained during current study depicts that overall perception of people about CL and its vector is much poor as compared to those present in the study conducted in Colombia, where

more than 85% of the interviewed peoples have good knowledge [26].

A similar study was carried out in the Musian District, Iran [27] in which percentage of right answers in response to question about transmission of CL from person to person was 39.5%. While in the present study, the percentage of right answered people was very low (2.4%) that is because of higher literacy rate in the area of earlier study. The results about the knowledge of breeding place of sand fly in a previous study (46.5% of the respondents don't know) conducted in Lapui District, South of Iran [28] are almost at par with those present in current study (52.6% of the respondents don't know).

The current study showed no positive relationship exists between income and education with the different queries about the knowledge for the disease and its vector as depicted in the tables. The lack of knowledge leads to spreading of the disease from person to person and limiting its eradication. So, awareness among the people about the disease and its vector is very important to take proper measurements or actions against sand fly biting [29-31].

**Conclusion**

With the increase in human populations and lack of employment and civic facilities in rural areas, migration to large urban hubs is increasing not only in developing countries but it is well established problem for governments in developed nations as well. The situation leads to decrease in agricultural lands, uncontrolled urbanization with poor to no facilities of sewerage and hygiene consequently increasing breeding places of insects and onset of arthropod borne health issues. Further, with increasing facilities of travelling, many pests and pathogens travelled far from their origins and are the causes of disease introduction to new areas. So, it is an alarming condition for public agencies and town planners all around the world especially in Pakistan to plan and develop small towns and cities where all modern living facilities can be provided so that migration of people from rural to urban areas can be minimized and thus spread of vector borne diseases can be controlled.

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