International Journal of Business, Human and Social Sciences
ISSN: 2517-9411
Vol:9, No:6, 2015

Attitude and Knowledge of Primary Health Care Physicians and Local Inhabitants about Leishmaniasis and Sandfly in West Alexandria

Randa M. Ali, Naguiba F. Loutfy, Osama M. Awad

***Abstract*—** Leishmaniasis is the collective name for a number of diseases caused by protozoan flagellates of the genus *Leishmania*, which is transmitted by Phlebotomine sandfly, the disease has diverse clinical manifestations and found in many areas of the world, particularly in Africa, Latin America, South and Central Asia, the Mediterranean basin and the Middle East. This study was done to assess primary health care physicians' knowledge (PHP) and attitude about leishmaniasis and to assess awareness of local inhabitants about the disease and its vector in four areas in west Alexandria, Egypt. It is a cross sectional survey that was conducted in four PHC units in west Alexandria. All physicians currently working in these units during the study period were invited to participate in the study; only 20 PHP completed the questionnaire. 60 local inhabitants were selected randomly from the four areas of the study, 15 from each area; Data was collected through two different specially designed questionnaires. Results showed that 11 (55%) percent of the physicians had satisfactory knowledge; they answered more than 9 (60%) questions out of a total 14 questions about leishmaniasis and sandfly. On the other hand when attitude of the primary health care physicians about leishmaniasis was measured, results showed that 17 (85%) had good attitude and 3 (15%) had poor attitude. The second questionnaire showed that the awareness of local inhabitants about leishmaniasis and sandfly as a vector of the disease is poor and needs to be corrected. (90%) of the interviewed inhabitants had not heard about leishmaniasis, Only 3 (5%) of them said they know sandfly and its role in transmission of leishmaniasis. Thus we conclude that knowledge and attitudes of physicians are acceptable. However, there is, room for improvement and could be done through formal training courses and distribution of guidelines. In addition to raising the awareness of primary health care physicians about the importance of early detection and notification of cases of leishmaniasis, health education for raising awareness of the public regarding the vector and the disease is necessary because related studies have demonstrated that for inhabitants to take enough protective measures against the vector, they should perceive that it is responsible for causing a disease.

***Keywords*—**Attitude, knowledge, PHP, leishmaniasis, sandfly, local inhabitants, inside and outside housing conditions.

I. Introduction

PHLEBOTOMINE sandflies of the genus *Phlebotomus* transmit the protozoan parasites responsible for leishmaniasis and a number of viruses known to cause human illness. Leishmaniasis is a worldwide disease, affecting 88 countries, it is estimated that about 350 million people are at risk of leishmaniasis. Overall prevalence is 12 million people with annual mortality of about 60,000. Annual incidence is 1,500,000 cases of cutaneous leishmaniasis (CL) worldwide and half million cases of visceral Leishmaniasis (VL) [1], [2].

Leishmaniasis includes two major diseases, cutaneous leishmaniasis which causes skin ulcers and visceral leishmaniasis which causes a severe systemic disease that is usually fatal without treatment. Mucocutaneous leishmaniasis is a rare but severe form affecting the nasal and oral mucosa [3].

Epidemics of visceral leishmaniasis have occurred in East Africa since the Second World War, and in recent years the disease has appeared in new areas for example the north of Kartoum, in which deadly epidemics of VL periodically flare up but go mostly unnoticed in spite of case–fatality rates as high as 10% or more. In the 1990s Sudan suffered a crisis with an excess mortality of 100 000 deaths among people at risk. The disease is highly endemic in north-eastern Brazil where small scattered outbreaks occur periodically [4], [5].

Development projects in progress in many endemic areas of the Old and New World may introduce non-immune individuals into the region which can result in an alarming number of new infections. The self-healing lesions of cutaneous leishmaniasis caused by *L.major* and *L. tropica* limit their public health importance, but the working time lost and the costs of treatment can be significant socio-economically. The estimated global burden of disease is believed to be inaccurate due to the passive case detection data used to estimate the disease prevalence in many endemic countries [6].

Both VL and CL occur in Egypt although the prevalence is relatively low, it is primarily a disease of rural populations, but in some areas urban transmission exists. VL was found near Alexandria, in El Agamy in the eighties while CL was primarily identified in northern Sina [7], [8]. According to the unit of *leishmania*, *filaria* and *malaria* of ministry of health, the vector is present but there are no recorded cases of visceral leishmaniasis in Alexandria since 1996 till now.

Official data frequently underestimates the real problem of leishmaniases since most of the official data are obtained exclusively through passive case detection. Numerous cases are undiagnosed, misdiagnosed or unreported due to several factors, including the scarcity or absence of diagnostic capabilities, poor accessibility by patients to medical facilities,

R. A. Mahran and N. F. Loutfy are with the High Institute of Public Health, Alexandria University, Egypt (phone: +203 4285575-6; e-mail: randamahran@alexu.edu.eg, nloutfy@link.net).

O. M. Awad is with the Tropical Health Department, University of Alexandria, on leave from the High Institute of Public Health, Alexandria, Egypt (e-mail: osamamohawad@yahoo.com).

and the presence of subclinical forms of the disease. Leishmaniasis is not a notifiable disease in the majority of endemic countries in the world [9].

Awareness of households and health workers about both sandfly and leishmaniasis needs to be enhanced**,** previous studies showed that they were not having an in-depth awareness about the disease and the vector, which strongly suggest the need of proper leishmaniasis health education program, it has already been documented by various studies that health education would offer promise of influencing individuals to adopt preventive measures.

II. Subjects and Methods

A cross-sectional study was done to determine local inhabitants' awareness about leishmaniasis and sandfly and to assess the knowledge and attitude of primary health care physicians in primary health care facilities present in four demographically different provinces in west Alexandria about leishmaniasis.

A. Study Setting

Alexandria is an elongated coastal city, bordered from the northern side by the Mediterranean Sea, and Lake Mariout from the south-Western side. It extends along the sea-shore from Abo-Kir to 71 km away of Alexandria Cairo desert road, with width not more than 5km south to the sea. Alexandria is considered the second largest city in Egypt and is one of the best summer resorts on the Mediterranean Sea, with its beaches extending to the length of 40 km. In summer, Alexandria is overpopulated bythose who come to enjoy their summer holidays on the beach, most of them prefer the north-western coast. However there is always a threatening of increase in the prevalence of diseases especially those transmitted by vectors.

The study area is located at West of Alexandria governorate. Four different areas representing different demographic situations were chosen, the chosen locations are: Al-Agamy, Marakia, old King Mariout and the fourth area is also in King Mariout and is called Al- Hawareya.

a. **Al-Agamy:** Samples were collected either from El Bitash or Abo youssef. In El Bitash urbanization is obvious, the whole area is over populated, crowded with high buildings, the main streets are paved and there is drainage system, however the selected streets for sticky traps application were narrow, covered with sand, some of the buildings in which traps were applied consist of few floors only and surrounded by a yard in which some trees are cultivated. On the other hand in Abo-youssef the randomly selected streets for the study consist of villas of modern and beautiful appearance, those villas are closed most of the year and among those villas, there are pockets of Bedouin living in randomly built houses with poor sanitary conditions which are a suitable microclimate for breeding of sand flies including poultry houses, cracks and burrows which most probably is a shelter for rodents, in addition, there are cats and stray dogs which may act as a reservoir host for sand fly. These houses usually have a garden or a yard in which vegetations and trees are cultivated. The soil is cement covered with sand and the construction material is limestone.
b. **Old King Mariout**: It represents the area where Bedouin live in poor houses with poor hygienic measures. Most of the houses are surrounded by a yard with a sandy soil, in which they raise cattle and poultry and sometimes dogs are present.
c. **Al-Hawareya**: which is the new King Mariout, it is considered an area of higher social standards andricher population than the old King Mariout, it consists of villas, some of them are inhabited all the yearlong, but most of the villas are inhabited few months a year and the rest of the year it is guarded by one of the Bedouins.
d. **Marakya:** It's an attractive summer resort; located about 51 kilometers away from Alexandria, its area is about 240 feddans. It consists of a beach, housing units and public service units. The beach is 1500 m long and there's a pedestrian road that separates it from the housing units. The middle of the resort and its main entrance, including administrative, emergency, communication, commercial and entertainment services. The houses are inhabited by summer visitors. The entertainment facilities including restaurants, cinemas, clubs, four swimming pools and an open theater.

B. Data Collection

Predesigned questionnaire sheet was done for primary health care doctors and local inhabitants of the area of study, it includes detailed information about:

i. Personal data: age, sex, level of education and residence.
ii. Awareness of the public about the disease and the vector.
iii. Medical knowledge of primary health care physicians about leishmaniasis and their ability to diagnose cases of the disease, and where to refer suspected cases of leishmaniasis.

III. Results

A. Questionnaire of Primary Health Care Physicians

The total interviewed physicians in the primary health care facilities of the selected areas were 20; of which 15(75%) were females and 5(25%) were males. The total knowledge about leishmaniasis and sandfly was satisfactory in 9 (60%) of the females and 2 (40%) of the males; this result is statistically insignificant (p 0.617)

The age of the interviewed physicians varied from > 20 and < 50. Out of the total; 6 were in the age group 20-<30, 7 were in the age group 30-<40 and 7 were in the age group 40- 50. The knowledge was satisfactory in 4 (66.7%) of the first group, in the second the knowledge was satisfactory in 3 (42.9%) and in the third group the knowledge was satisfactory in 4 (57.10%). This result is statistically insignificant (x2= 0.76, p0.849).

As regards the years of experience of the interviewed doctors, it ranged from < 5 and > 20 years. Out of the total; 8 were in the group of < 5 years of experience, 5 were in the

group of 5-<10 years of experience, another 5 were in the group of 10-<15 years of experience and lastly 2 were in the group of 15-> 20 years of experience. The knowledge was satisfactory in 5 (62.5%) of the first group, in the second the knowledge was satisfactory in 2 (40%), in the third group the knowledge was satisfactory in 3(60%) and in the fourth knowledge was satisfactory in 1 (50%). This result is statistically insignificant (x2= 0.71, p 0.915).

As for the duration of practice in the field of family medicine, it varied from < 1 year and > 3 years. Out of the total; 3 were in the group of < 1 year, 4 were in the group of 1-<2 years, 2 were in the group of 2-< 3 years, and 11 were in the group of > 3 years practice in the field of family medicine. The knowledge was satisfactory in 3 (100%) of the first group, in the second the knowledge was satisfactory in 2 (50%), in the third group the knowledge was satisfactory in 1(50%) and in the fourth knowledge was satisfactory in 5 (45.5%). This result is statistically insignificant (x2= 2.9, p 0.555).

When it comes to the post-graduate studies in the interviewed physicians; 13 of them did not receive any post-graduate studies. On the other hand, 4 have diploma and 3 have fellowship of family medicine. The knowledge of those with no post-graduate studies was satisfactory in 5 (38.5%), while that of those with diploma was satisfactory in 4 (100%) and the knowledge of those with fellowship of family medicine was satisfactory in 2 (66.7%). This result is statistically significant (x2= 4.9, p 0.050)

Out of the 7 who received post-graduate studies, the specialty of their degree was as follows; 4 specialized in MCH and the other 3 specialized in family medicine. The knowledge of those specialized in MCH was satisfactory in 4 (100%) and the knowledge of those specialized in family medicine was satisfactory in 2 (66.7%). This result is statistically significant (p 0.047) (Table I).

TABLE I
DISTRIBUTION OF THE TOTAL KNOWLEDGE AMONG THE STUDY SAMPLE

Socio demographic data	Total	Knowledge				X^2	P
		Unsatisfactory		Satisfactory			
		No	%	No	%		
Age							
20-<30	6	2	33.3	4	66.7	0.76	0.849$
30-<40	7	4	57.1	3	42.9		
40-50	7	3	42.9	4	57.1		
Sex							
Male	5	3	60.0	2	40.0	-	0.617!
Female	15	6	40.0	9	60.0		
Years of experience							
< 5 years	8	3	37.5	5	62.5		
5-<10 years	5	3	60.0	2	40.0	0.71	0.915$
10-<15 years	5	2	40.0	3	60.0		
15->20 years	2	1	50.0	1	50.0		
Duration of practice in the field of family medicine							
<1 year	3	0	0.0	3	100.0		
1-<2 years	4	2	50.0	2	50.0	2.9	0.555
2-<3 years	2	1	50.0	1	50.0		
> 3 years	11	6	54.5	5	45.5		
Post-graduate studies							
None	13	8	61.5	5	38.5	4.9	0.050*
Diploma	4	0	0.0	4	100.0		
Fellowship of family medicine	3	1	33.3	2	66.7		
Specialty of degree							
FM	3	1	33.3	2	66.7	-	0.047*!
MCH	4	0	0.0	4	100.0		

$ P value based on Mont Carlo exact method
! P value based on Fisher exact method
* P < 0.05 (significant)

As regards the attitude of the interviewed primary health care physicians about leishmaniasis, it was as follows; out of the total 5 males and the total 15 females; 3 (60%) and14 (93.3%) had positive attitude respectively. This observation is statistically insignificant (p 0.140).

As for age and attitude, out of the 6 physicians who belong to the age group 20-<30; 5 (83.3%) had positive attitude, out of the 7 physicians in the group from 30-<40; 5 (71.4%) had positive attitude while all the 7 physicians who fell in the age group40- 50 had positive attitude. This observation is statistically insignificant (x2=2.2, p 0.479).

As for years of experience and attitude, out of the 8 physicians with years of experience < 5 years; 7 (87.5) had positive attitude, out of the 5 physicians with years of experience from 5-<10 years; 3 (60%) had positive attitude, while all the 5 physicians with years of experience from 10-<15 years and the 2 physicians with years of experience 15->20 years had positive attitude. This observation is statistically insignificant (x2=3.7, p 0.389).

As regards the duration of practice in the field of family medicine, out of the 3 physicians with duration of practice <1 year; 2 (66.7%) had positive attitude, all the 4 physicians with duration of practice 1-<2 years and the 2 physicians with duration of practice 2-<3 years had positive attitude, and out

of the 11 physicians with duration of practice > 3 years 9 (81.8) had positive attitude. This observation is statistically insignificant (x2=1.9, p 0.690).

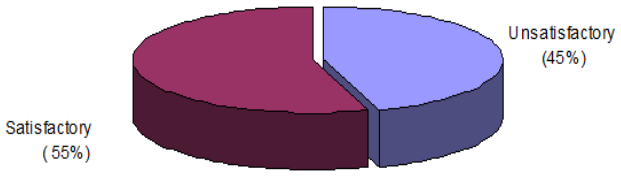

Fig. 1 Distribution of the total knowledge among the study sample

As regards the post-graduate studies and attitude, out of the 13 physicians with no post-graduate studies; 11 (84.6%), out of the 4 physicians with diploma 3 (75%) had positive attitude, and all the 3 physicians with fellowship in family medicine had positive attitude. This observation is statistically insignificant (x2=0.85, p 0.996).

As regards specialty of degree, all the 3 physicians with fellowship in family medicine had positive attitude while out of the 4 physicians with MCH specialty; 3 (75%) had positive attitude. This observation is statistically insignificant (p 0.997) (Tables II, III).

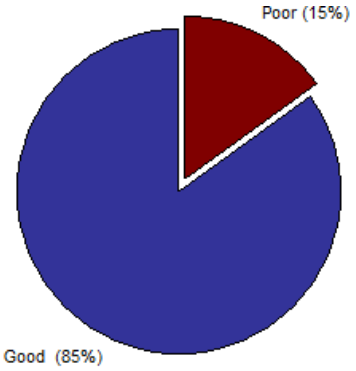

Fig. 2 Distribution of the good attitude among the study sample

TABLE II
DISTRIBUTION OF THE GOOD ATTITUDE AMONG THE STUDY SAMPLE

Attitude	Disagree		Undecided		Agree	
	No	%	No	%	No	%
1. Do you believe that leishmaniasis a disease of public health problem in Egypt?	12	60	5	25	3	15
2. Do you believe that leishmaniasis is a preventable disease?	0	0	0	0	20	100
3. Do you believe that leishmaniasis is a treatable disease?	0	0	1	5	19	95
4. Do you believe that the public health impact of leishmaniasis has been grossly underestimated	2	10	11	55	7	35
5. Do you believe that the actual number of cases of leishmaniasis is not recorded?	7	35	4	20	9	45
6. Do you believe that leishmaniasis is a notifiable disease in Egypt?	12	60	5	25	3	15

TABLE III
ATTITUDE OF PHC PHYSICIANS

Socio demographic data	Total	Attitude				X^2	P
		Poor		Good			
		No	%	No	%		
Age						2.2	0.479[$]
20-<30	6	1	16.7	5	83.3		
30-<40	7	2	28.6	5	71.4		
40-50	7	0	0.0	7	100.0		
Sex						-	0.140[†]
Male	5	2	40.0	3	60.0		
Female	15	1	6.7	14	93.3		
Years of experience						3.7	0.389[$]
< 5 years	8	1	12.5	7	87.5		
5-<10 years	5	2	40.0	3	60.0		
10-<15 years	5	0	0.0	5	100.0		
15->20 years	2	0	0.0	2	100.0		
Duration of practice in the field of family medicine						1.9	0.690[$]
<1 year	3	1	33.3	2	66.7		
1-<2 years	4	0	0.0	4	100.0		
2-<3 years	2	0	0.0	2	100.0		
> 3 years	11	2	18.2	9	81.8		
Post-graduate studies						0.85	0.996[$]
None	13	2	15.4	11	84.6		
Diploma	4	1	25.0	3	75.0		
Fellowship of family medicine	3	0	0.0	3	100.0		
Specialty of degree						-	0.997[†]
FM	3	0	0.0	3	100.0		
MCH	4	1	25.0	3	75.0		

[$] P value based on Mont Carlo exact method
[†] P value based on Fisher exact method

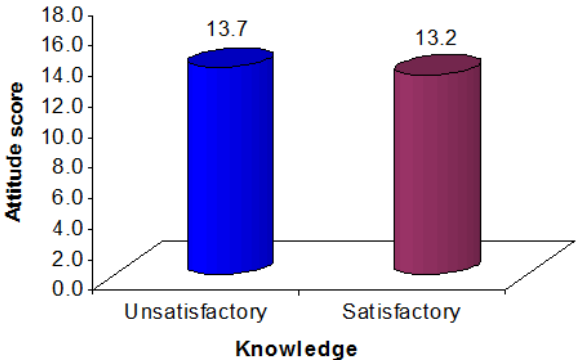

Fig. 3 Association between knowledge and attitude of the study sample

B. Questionnaire of Inhabitants of the Selected Areas

60 inhabitants of the four selected areas of the study were interviewed, 15 from each area. Their age varied from 20 to above 50, out of the total 16 (26.7%) were in the age group 20- 30; 6 (40%) in Al- Agamy, 2 (13.3%) in old King Mariout, 8 (53.3%) in Marakya.18 (30%) were in the age group 30-40; 4 (26.7%) in Al-Agamy, 6 (40%) in old King Mariout, 5 (33.3%) in Al-Hawareya and 3 (20%) in Marakya. 14 (23.3%) were in the age group 40-50; 3 (20%) in Al-Agamy, 4 (26.7%) in old King Mariout, 6 (40%) in Al-Hawareya and 1 (6.75%) in Marakya. 12 (20%) were in the age group above 50 years; 2 (13.3%) in Al-Agamy, 3 (20%) in old King Mariout, 4 (26.7%)%) in Al-Hawareya and 3 (20%) in Marakya. This result is statistically insignificant (x2= 15.5, p 0.076).

As regards the gender, out of the total, 42 (70%) were males; 8 (53.3%) in Al-Agamy, 8 (53.3%) in old King Mariout, 15 (100%) in Al-Hawareya and 11 (73.3%) in Marakya. On the other hand 18 (30%) were females; 7 (46.7%) in Al-Agamy, 7 (46.7%) in old King Mariout, 4 (26.7%) in Marakya. This result is statistically significant (x2=10.5, p 0.017).

As for the education level, out of the total, 8(13.3%) were Illiterate; 4 (26.7%) in Agamy and 4 (26.7%) in Old King Mariout, 7 (11.7%) were Read and write; 4(26.7%) in Agamy and 3(20%) in Old King Mariout, 2 (3.3%) were Primary in Old King Mariout, 1(1.7%) was Preparatory in Agamy, 7 (11.7%) were Secondary; 2 (13.3%)in Agamy,1 (6.7%) in Old King Mariout and 4 (26.7%) in Marakya and lastly 35 (58.3%) were University; 4 (26.7%) in Agamy, 5 (33.3%) in Old King Mariout, 15 (100%) in Hawareya and 11 (73.3%) in Marakya. This result is statistically significant (x2=38.5, p 0.000) (Table IV).

TABLE IV
SOCIO DEMOGRAPHIC DATA OF THE STUDY SAMPLE

Socio demographic data	Region								Total		X^2	P
	Agamy		Old King Mariout		Hawareya		Marakya					
	No	%	No	%	No	%	No	%	No	%		
Age												
20 -<30	6	40.0	2	13.3	0	0.0	8	53.3	16	26.7		
30-<40	4	26.7	6	40.0	5	33.3	3	20.0	18	30.0	15.5	0.076$
40-<50	3	20.0	4	26.7	6	40.0	1	6.7	14	23.3		
50+	2	13.3	3	20.0	4	26.7	3	20.0	12	20.0		
Gender												
Male	8	53.3	8	53.3	15	100.0	11	73.3	42	70.0	10.5	0.017*$
Female	7	46.7	7	46.7	0	0.0	4	26.7	18	30.0		
Education level												
Illiterate	4	26.7	4	26.7	0	0.0	0	0.0	8	13.3		
Read and write	4	26.7	3	20.0	0	0.0	0	0.0	7	11.7		
Primary	0	0.0	2	13.3	0	0.0	0	0.0	2	3.3	38.5	0.000*$
Preparatory	1	6.7	0	0.0	0	0.0	0	0.0	1	1.7		
Secondary	2	13.3	1	6.7	0	0.0	4	26.7	7	11.7		
University	4	26.7	5	33.3	15	100.0	11	73.3	35	58.3		

$ P value based on Mont Carlo exact test
* P < 0.05 (significant)

As for the questions about leishmaniasis, the randomly selected inhabitants of the four areas of the study were asked if they know leishmaniasis, they answered as follows; out of the total, 6 (10%) said Yes; 4 (26.7%) in Agamy, 1 (6.7%) in Old King Mariout and 1 (6.7%) in Hawareya. On the other hand 54 (90%) said No; 11 (73.3%) in Agamy, 14 (93.3%) in Old King Mariout, 14 (93.35) in Hawareya and 15 (100%) in Marakya. This result is statistically insignificant (x2= 6.7, p 0.142). They were asked if they know a previously diseased person, they answered as follows; out of the total, 5 (8.3%) said Yes; 4 (26.7%) in Agamy and 1 (6.7%) in Old King Mariout. On the other hand 55 (91.7%) said No; 11 (73.3%) in Agamy, 14 (93.3%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. This result is statistically significant (x2= 9.4, p 0.048). They were asked if there are any campaigns to educate about the disease, they answered as follows; out of the total, 1 (1.7%) said Yes in Al-Agamy. On the other hand 59 (98.3%) said No; 14 (93.3%) in Agamy, 15 (100%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. This result is statistically insignificant (x2= 3.1, p 0.997). They were asked if there is a periodic medical examination done for children by the doctor of Malaria, leishmaniasis and filariasis unit of the ministry of health, they answered as follows; out of the total, 8 (13.3%) said Yes; 4

(26.7%) in Al-Agamy and 4 (26.7%) in Old King Mariout. On the other hand 52 (86.7%) said No; 11 (73.3%) in Agamy, 11 (73.3%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. This result is statistically significant (x2= 9.2, p 0.019).

As for the questions about sandfly as a vector of leishmaniasis, the inhabitants were asked if they know about sandfly, they answered as follows; out of the total, 3 (5%) said Yes; 2 (13.3%) in Agamy and 1 (6.7%) in Hawareya. On the other hand 57 (95%) said No; 13 (86.7%) in Agamy, 15 (100%) in Old King Mariout, 14 (93.35) in Hawareya and 15 (100%) in Marakya. This result is statistically insignificant (x2= 3.9, p 0.606). They were asked if there is periodic painting done by Malaria, leishmaniasis and filariasis unit of the ministry of health, they answered as follows; out of the total, 9 (15%) said Yes; 5 (33.3%) in Al-Agamy and 4 (26.7%) in Old King Mariout. On the other hand 51 (85%) said No; 10 (66.7%) in Agamy, 11 (73.3%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. This result is statistically significant (x2= 10.9, p 0.021). They were asked if an annual sandfly survey was done by Malaria, leishmaniasis and filariasis unit of the ministry of health, they answered as follows; out of the total, 8 (13.3%) said Yes; 4 (26.7%) in Al-Agamy and 4 (26.7%) in Old King Mariout. On the other hand 52 (86.7%) said No; 11 (73.3%) in Agamy, 11 (73.3%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. This result is statistically significant (x2= 9.2, p 0.019) (Table V).

TABLE V
AWARENESS OF THE INHABITANTS ABOUT THE DISEASE AND VECTOR

Region / Disease and vector	Region: Agamy No	Agamy %	Old King Mariout No	Old King Mariout %	Hawareya No	Hawareya %	Marakya No	Marakya %	Total No	Total %	X^2	P
Do you know about leishmaniasis												
Yes	4	26.7	1	6.7	1	6.7	0	0.0	6	10.0	6.7	0.142$^{\$}$
No	11	73.3	14	93.3	14	93.3	15	100.0	54	90.0		
Do you know previously diseased person												
Yes	4	26.7	1	6.7	0	0.0	0	0.0	5	8.3	9.4	0.048$^{*\$}$
No	11	73.3	14	93.3	15	100.0	15	100.0	55	91.7		
Periodic medical examination												
Yes	4	26.7	4	26.7	0	0.0	0	0.0	8	13.3	9.2	0.019$^{*\$}$
No	11	73.3	11	73.3	15	100.0	15	100.0	52	86.7		
Do you know about sand fly												
Yes	2	13.3	0	0.0	1	6.7	0	0.0	3	5.0	3.9	0.606$^{\$}$
No	13	86.7	15	100.0	14	93.3	15	100.0	57	95.0		
Are there any campaigns to educate people about the disease?												
Yes	1	6.7	0	0.0	0	0.0	0	0.0	1	1.7	3.1	0.997$^{\$}$
No	14	93.3	15	100.0	15	100.0	15	100.0	59	98.3		
Periodic painting												
Yes	5	33.3	4	26.7	0	0.0	0	0.0	9	15.0	10.9	0.021$^{*\$}$
No	10	66.7	11	73.3	15	100.0	15	100.0	51	85.0		
Annual fly survey												
Yes	4	26.7	4	26.7	0	0.0	0	0.0	8	13.3	9.2	0.019$^{*\$}$
No	11	73.3	11	73.3	15	100.0	15	100.0	52	86.7		

$^{\$}$ P value based on Mont Carlo exact test
* P < 0.05 (significant)

The second part of the questionnaire inquired about possible breeding and resting places and reservoir hosts for sandfly. Questions were fulfilled either by asking the inhabitants directly or by the observation of the researcher. Both inside and outside housing conditions were checked.

As regards inside housing conditions, cracks in the walls or the floors were observed, out of the total, 30 (50%) have cracks in either the walls or the floors; 13 (86.7%) in Agamy, 9 (60%) in Old King Mariout and 8 (53.3%) in Hawareya. On the other hand 30 (50%) do not; 2 (13.3%) in Agamy, 6(40%) in Old King Mariout and 7(46.7%) in Hawareya and 15 (100%) in Marakya. This result is statistically significant (x2= 23.8, p 0.000).

As regards the roof of the houses, out of the total, 56 (93.3%) have cement roof; 15 (100%) in Agamy, 11(73.3%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. On the other hand, 4 (6.7%) have roofs made from material other than cement in Old King Mariout. This result is statistically significant (x2= 12.9, p 0.012).

Out of the total 60 interviewed inhabitants; 45 (76%) use window nets; 7 (46.7%) in Agamy, 8 (53.3%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. On the other hand, 15 (25%) do not use them; 8 (53.3%) in Agamy, and 7(46.7%) in Old King Mariout. This result is statistically significant (x2= 20.2, p 0.000).

Out of the total 60 interviewed inhabitants, only 4(6.7%) use bed nets in Al –Agamy. On the other hand 56 (93.3%) do not use them; 11 (73.3%) in Agamy, 15(100%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. This result is statistically significant (x2= 12.9, p 0.011) (Table VI).

As for the outside housing conditions, the presence or absence of a garden around the house was recorded, out of the total, 44 (73.3%) have gardens; 8 (53.3%) in Agamy, 6 (40%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. On the other hand 16 (26.7%) do not; 7 (46.7%) in Agamy and 9(40%) in Old King Mariout. This result is statistically significant (x2= 22.5, p 0.000).

The floor of the garden varied from sandy, mud, cement and ceramic. Out of the total 44 gardens; 17(38.6%) have sandy floor; 7 (87.5%) in Agamy, 6 (100%) in Old King Mariout and 4 (26.7%) in Hawareya, 15 (34.1%) have muddy floor in Marakya, 1 (2.35%) has cement floor in Al-Agamy and lastly 11 (25%) have ceramic floor in Hawareya. This result is statistically significant (x2= 71.2, p 0.000).

The presence of trees and plants in the gardens was variable. Out of the total 44 gardens, 40(90.9%) have plants and trees; 15 (100%) in Agamy, 11(73.3%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. On the other hand, 4 (6.7%) have roofs made from material other than cement in Old King Mariout. This result is statistically significant (x2= 12.9, p 0.012).

In the 44 garden, the presence or absence of playing children was recorded, Out of the total 44 gardens, 21(47.4%) have playing children; 4 (50%) in Agamy, 3(50%) in Old King Mariout, 10 (66.7%) in Hawareya and 4 (26.7%) in Marakya. On the other hand 23 (52.3%) do not have playing children; 4 (50%) in Agamy, 3(50%) in Old King Mariout, 5 (33.3%) in Hawareya and 11(73.3%) in Marakya. This result is statistically insignificant (x2= 4.9, p 0.182).

None of the 21(100%) playing children; 4 (100%) in Agamy, 3(100%) in Old King Mariout, 10 (100%) in Hawareya and 4 (100%) in Marakya show any signs of leishmaniasis.

Inhabitants were asked about presence of a dump place or wastes around the house, out of the total, 40 (66.7%) said Yes; 10 (66.7%) in Al-Agamy, 15 (100%) in Old King Mariout and 15(100%) in Hawareya. On the other hand 20 (33.3%) said No; 5 (33.3%) in Agamy and 15 (100%) in Marakya. This result is statistically significant (x2= 45, p 0.000).

As for poultry breeding, 30% of the interviewed inhabitants breed poultry. This result is statistically significant (x2= 26.3, p 0.000).

As for the presence of animals such as dogs, cats and cattle inside or outside the house, out of the total, 31 (51.7%) have animals inside or around the house; 7 (46.7%) in Agamy, 11 (73.3%) in Old King Mariout and 13 (86.7%) in Hawareya. On the other hand 29 (48.3%) do not; 8 (53.3%) in Agamy, 4(26.7%) in Old King Mariout and 2(13.3%) in Hawareya and 15 (100%) in Marakya. This result is statistically significant (x2= 26.4, p 0.000).

Inhabitants were asked about the presence of rodents inside or around the house, out of the total, 37 (61.7%) said Yes; 9 (60%) in Al-Agamy, 14 (93.3%) in Old King Mariout and 14 (93.3%) in Hawareya. On the other hand 23 (38.3%) said No; 6 (40%) in Agamy, 1 (6.7%) in Old King Mariout, 1 (6.7%) in Hawareya and 15 (100%) in Marakya. This result is statistically significant (x2= 36.9, p 0.000) (Table VII).

IV. Discussion

Globally, 350 million people are at risk of *Leishmania* infection with an incidence of 1,500,000 cases of cutaneous disease worldwide. A half million severe clinical cases of visceral Leishmaniasis (VL) are reported yearly worldwide primarily in Brazil, Sudan and India [6].

Leishmaniasis includes two major diseases, cutaneous leishmaniasis and visceral leishmaniasis, caused by more than 20 different *leishmania* species. Cutaneous leishmaniasis, causes skin ulcers, while Visceral leishmaniasis causes a severe systemic disease that is usually fatal without treatment. Mucocutaneousleishmaniasis is a rare but severe form affecting the nasal and oral mucosa [10].

TABLE VI
Inside Housing Conditions of the Study Sample

Region / Inside Housing conditions	Region								Total		X^2	P
	Agamy		Old King Mariout		Hawareya		Marakya					
	No	%	No	%	No	%	No	%	No	%		
Cracks in walls / floors												
Yes	13	86.7	9	60.0	8	53.3	0	0.0	30	50.0	23.8	0.000*
No	2	13.3	6	40.0	7	46.7	15	100.0	30	50.0		
Roof type												
Cement	15	100.0	11	73.3	15	100.0	15	100.0	56	93.3	12.9	0.012*
Others	0	0.0	4	26.7	0	0.0	0	0.0	4	6.7		
Windownets												
Yes	7	46.7	8	53.3	15	100.0	15	100.0	45	75.0	20.2	0.000*$
No	8	53.3	7	46.7	0	0.0	0	0.0	15	25.0		
Bed nets use												
Yes	4	26.7	0	0.0	0	0.0	0	0.0	4	6.7	12.9	0.011*$
No	11	73.3	15	100.0	15	100.0	15	100.0	56	93.3		

TABLE VII
OUTSIDE HOUSING CONDITIONS OF THE STUDY SAMPLE

Region / Outside housing conditions	Region								Total		X^2	P
	Agamy		Old King Mariout		Hawareya		Marakya					
	No	%	No	%	No	%	No	%	No	%		
Gardens												
Yes	8	53.3	6	40.0	15	100.0	15	100.0	44	73.3	22.5	0.000*$
No	7	46.7	9	60.0	0	0.0	0	0.0	16	26.7		
Floor of garden												
Sandy	7	87.5	6	100.0	4	26.7	0	0.0	17	38.6		
Mud	0	0.0	0	0.0	0	0.0	15	100.0	15	34.1	71.2	0.000*$
Cement	1	12.5	0	0.0	0	0.0	0	0.0	1	2.3		
Ceramic	0	0.0	0	0.0	11	73.3	0	0.0	11	25.0		
Trees and plants												
Yes	4	50.0	6	100.0	15	100.0	15	100.0	40	90.9	19.8	0.000*
No	4	50.0	0	0.0	0	0.0	0	0.0	4	9.1		
Children at garden												
Yes	4	50.0	3	50.0	10	66.7	4	26.7	21	47.7	4.9	0.182$
No	4	50.0	3	50.0	5	33.3	11	73.3	23	52.3		
If yes, did theyshow signs of leishmaniasis												
No	4	100.0	3	100.0	10	100.0	4	100.0	21	100.0	NA	NA
Wastes outside house												
Yes	10	66.7	15	100.0	15	100.0	0	0	40	66.7	45	0.000*
No	5	33.3	0	0.0	0	0.0	15	100	20	33.3		
Poultry breeding												
Yes	10	66.7	8	53.3	0	0.0	0	0	18	30.0	26.3	0.000*$
No	5	33.3	7	46.7	15	100.0	15	100	42	70.0		
Animals inside / around house												
Yes	7	46.7	11	73.3	13	86.7	0	0	31	51.7	26.4	0.000*
No	8	53.3	4	26.7	2	13.3	15	100	29	48.3		
Rodents inside / around house												
Yes	9	60.0	14	93.3	14	93.3	0	0	37	61.7	36.9	0.000*
No	6	40.0	1	6.7	1	6.7	15	100	23	38.3		

$ P value based on Mont Carlo exact test
* P < 0.05 (significant)
NA: Not applicable

Both VL and CL occur in Egypt although the prevalence is relatively low. Visceral leishmaniasis due to *L. infantum* was not confirmed in Egypt until 1983. It is primarily a disease of rural populations, but in some areas urban transmission exists. The disease has been found near Alexandria, in El Agamy [11]. On the other hand, VL due to *L. donovani*is less frequent and is usually imported from Sudan [12]. The proven or suspected vectors of *L. infantum* are *P. ariasi*, *P. longicuspis*, *P. pernicious*, *P. perfiliewi* and *P. langeroni* [13]. *P. langroni* was reported within many Mediterranean basin countries where VL caused by *L. infantum* are prevalent. Human *Leishmania infantum* infection is a zoonosis with dogs acting as the main reservoir: only *P. langroni* males were observed in Morocco, Algerja and Lebanon, whereas *P. langroni* females were first described in Egypt and then in Spain and Libya. In Tunisia both males and females were reported [14].

A. Primary Health Care Physicians Questionnaire

The knowledge and attitude of PHC physicians in the PHC facilities of the four areas of the study was tested by an questionnaire with close-ended questions about leishmaniasis and sandfly, a random sample of 20 PHC physicians were interviewed, 11(55%) percent of the physicians had satisfactory knowledge, they answered more than 9 (60%) questions out of a total 14 questions about leishmaniasis and sandfly.

All (100%) the interviewed doctors knew leishmaniasis is a parasitic disease. Only 11 (55%) knew that leishmania is a protozoa, while 14 (70%) knew that leishmaniasis is a vector-borne disease caused by insect bite. In addition only 1 (5%) of the interviewed physicians answered the question about" what is a vector" correctly, and 9 (45%) knew that sandfly is the vector of leishmaniasis.

3 (15%) doctors knew that according to the WHO, there are four forms of leishmaniasis; visceral, cutaneous, diffuse cutaneous and mucocutaneous. Reference [15] knew that the clinical presentation differs according to the form of the disease, and 9 (60%) knew the common signs and symptoms of the disease. On the other hand 20(100%) of the PHC physicians agreed that drug therapy is the first line of treatment of leishmaniasis, 14 (70%) agreed that Leishmaniasis/HIV co-infection can occur, 9 (60%) believed that *leishmania* affects mainly children, and 8 (40%) only knew that PHC physicians have a role in educating the public about leishmaniasis.

Our research showed that 13 (65%) of the interviewed physicians answered the question about "what to do if you suspect a case of leishmaniasis", by referral to university hospitals. This proves that primary health care physicians, like general practitioners in other studies, rely on referrals to specialists to initiate treatment, regardless of experience, specialty or knowledge [16], [17].

In the present study, the knowledge of those with no post-graduate studies was satisfactory in 5 (38.5%), while that of those with diploma was satisfactory in 4 (100%) and the knowledge of those with fellowship of family medicine was satisfactory in 2 (66.7%).

The 7 physicians who have postgraduate studies 4 MCH diplomas and 3 fellow ship of family medicine, fell in the age group 20-<30 and 30 – <40, their years of experience were <5 years and 5-<10 years, and the duration of practice of family medicine is < 3 years.

Regression techniques identified association between physician post-graduate studies and knowledge. Most authors in previous studies agreed that there is an inverse relationship between knowledge and physician age [18], [19]. Moreover, [20] as well as [21] assessed the knowledge of practicing physicians, and all studies reported a negative association between knowledge and experience, Y. D. van Leeuwen reported in 1995 that doctor's knowledge is reduced after 10 years of experience [22], this matches well the result of our study, as all the 7 physicians with postgraduate studies which had a significant effect on their knowledge have<10 years of experience and their age is < 40. In addition, Ayanian and colleagues surveyed physicians to assess their beliefs about the survival benefit of therapies for acute myocardial infarction; and found out that specialists were more knowledgeable than generalists, On the contrary in our study, 3 of the physicians with post-graduate studies were specialized in family medicine, only 2 of them showed satisfactory knowledge, while the other 4 were non specialist in family medicine, they had diplomas in MCH and surprisingly they all showed satisfactory knowledge.

As for the relationship between knowledge and duration of practice in the field of family medicine, out of the total; 3 had been in the practice of family medicine for < 1 year, 4 had been in practice for 1-<2 years, 2 had been in practice for 2-< 3 years, and 11 had > 3 years practice in the field of family medicine. The knowledge was satisfactory in 3 (100%) of the first group, in the second the knowledge was satisfactory in 2 (50%), in the third group the knowledge was satisfactory in 1(50 %) and in the fourth knowledge was satisfactory in 5 (45.5%).

Salem-Schatz and colleagues found a highly significant negative association between knowledge and the number of years the physicians had been in practice, this matches well our results.

The second part of the questionnaire is concerned with attitude of the primary health care physicians about leishmaniasis, 17 (85%) had good attitude and 3 (15%) had poor attitude.

Three only which represents 15% agreed that leishmaniasis is a disease of public health problem in Egypt, 7 (35%) agreed that the public health impact of leishmaniasis has been grossly underestimated and 9 (45%) agreed that the actual number of cases of leishmaniasis is not recorded. This relatively poor attitude among PHC physicians in Alexandria is probably because cutaneous leishmaniasis is a public health problem in Sinai due to the movement of temporary laborers and visitors from the neighboring endemic areas [23].

Among the Bedouins living in the Sinai Peninsula, cutaneous leishmaniasis is a common problem. Reportedly, Bedouin mothers expose their babies' buttocks to sandflies, the vectors of leishmaniasis, to infect them, thereby inducing immunity and preventing subsequent lesions and scars on more conspicuous body parts. In 1987 over 100 cases of cutaneous leishmaniasis have been reported among the Multinational Force and Observers stationed in the north Sinai [24]. Moreover, in 1989 Mansour reported a rise in the incidence of cutaneous leishmaniasis recorded among personnel of the United Nations peace-keeping forces in east Sinai [25]. On the other hand, in Alexandria cases of visceral leishmaniasis are sporadic and uncommon, apparently the attitude of the PHC physicians was affected to some extent by the number of cases they encounter during the duration of their practice due to lack of knowledge about leishmaniasis. On the contrary, all the interviewed physicians (100%) agreed that leishmaniasis is a preventable disease and 19 (95%) agreed that leishmaniasis is a treatable disease, which is considered a good attitude.

Three (15%) only agreed that leishmaniasis is a notifiable disease in Egypt, which reflects either malpractice in the investigated PHC facilities as they actually do not notify cases of leishmaniasis, which is considered one of the reasons why the number of cases of leishmaniasis in Egypt is underestimated, or it reflects lack of knowledge of the working physicians about the routine procedures that should be followed once a case of leishmaniasis is discovered.

B. Inhabitants Questionnaire

In recent years increasing emphasis has been laid on the active participation of individuals and communities in successful disease control programs. Presently, vector-borne disease control programs primarily rely on controlling the vector; diagnosis and treatment have often been overlooked the importance for the target population. It has also been documented for infectious diseases (e.g., TB, malaria) that low levels of knowledge and awareness apparently influence initial health care seeking behavior after the onset of symptoms.

Many studies have been conducted to assess the knowledge and awareness towards diseases. To best of our knowledge, no studies have previously been conducted to assess the awareness of the community in Alexandria about leishmaniasis and sandfly. The present study was, therefore, undertaken to study respondents' awareness towards leishmaniasis and sandfly with the aim of using the data collected in a practical way to control leishmaniasis at the individual and community levels. This is done through a questionnaire which is divided into three parts, one to check the inhabitants awareness about the disease and the vector and also check the performance of the Malaria, Filariasis and Lieshmaniasis unit which is under supervision of the ministry of health and is responsible for annual sandfly survey using sticky traps, in addition to application of control program for sandfly through periodic painting of houses by residual insecticides, plus periodic medical examination of children under five for any signs of visceral leishmaniasis and

notification of any recorded cases, the second part of the questionnaire asses the inside housing conditions and the third part asses the outside housing conditions to search for possible resting and breeding habitats for sandfly.

60 inhabitants of the four selected areas of the study were interviewed, 15 from each area. Their age varied from 20 to above 50, 70% were males and 30% were females, our results showed that the education level varied form University to Read and Write. All the respondents form Hawareya were University graduates which matches the character of Hawareya as an area of high social standard and inhabited by highly educated individuals. As well as this 73.3% in Marakya were University graduates, this is explained by the fact that Marakya is a touristic village and a summer resort, attended by rich society, even the interviewed workers in the village are mostly university graduate, while Old King Mariout and Al-Agamy showed a majority of low education among the respondents.

Education is an important factor that affects knowledge and awareness about diseases. Educated people tend to be more aware of health issues and activities, low educational status can be considered a risk factor for acquiring leishmaniasis. It is likely that, when the head of household is highly educated, it influences the personal hygiene of family members and cleanliness of the dwelling place and he makes economic decisions such as using window nets, and avoiding sleeping out-of-doors [26].

Most of the respondents (90%) had not heard about leishmaniasis. Unlike other studies in India, Nepal, and Bangladesh, almost all (98%) of respondents reported their awareness of Kala-Azar, in a study done in Muzaffarpur district in the Indian state of Bihar, 97.4% of the respondents were aware of the disease, in addition a study in a highly endemic rural area of India, 90% of the respondents were aware of the disease. Gama MEA, in Maranhao Brazil also recorded that 93.8% of those interviewed had heard of Kala-Azar [27]. This high awareness about leishmaniasis is probably because these are endemic areas; inhabitants of these areas had seen many cases of the disease, unlike Alexandria where leishmaniasis is not considered a common disease. Accordingly, the majority of the respondents who heard about leishmaniasis 5 (8.3%) knew a previously diseased person.

Only 3 (5%) of the interviewed inhabitants said they know sandfly and its role in transmission of leishmaniasis, a lot of the interviewed inhabitants perceived sandfly as a smaller mosquito, our result agrees with a study about Knowledge, attitudes, and practices about kalaazar and its sandfly vector in rural communities of Nepal that found that most of the villagers perceived that mosquitos rather than sandflies were responsible for transmission of the disease. Only a few villagers recognized the role of sandflies in the transmission of kala-azar, but when these individuals were asked to identify and describe sandflies many failed to do so correctly [28].

The awareness about the disease and sandly as a vector of the disease needs to be corrected because related studies have demonstrated that if the inhabitants do not perceive mosquitos to be responsible for diseases such as malaria they do not take enough measures to protect themselves against the vector[29], [30]. Also in the current questionnaire the performance of the Malaria, Filariasis and Lieshmaniasis unit which is under supervision of the ministry of health was found to be poor, considering the poor awareness of the community about any of the activities that should be done by the unit, only 9 (15%) of the inhabitants said that periodic painting is done to the houses, 8 (13.3%) agreed that periodic medical examination is done by doctors for children, 8 (13.3%) said that annual sandfly survey by using sticky traps is done while only 1 (1.7%) confirmed that campaigns are done by the ministry of health to educate about the disease. Accordingly, the performance of the ministry of health unit should be improved for control of sandfly and prevention of leishmaniasis.

Previously, very little work has been done at household level and they have mentioned poor housing construction as characteristics of the study area where leishmaniasis is prevalent vector density is high. [31], [32] To our best knowledge, no previous study in Alexandria has assessed risk factors based on inside and outside housing conditions in areas that are vulnerable to disease.

Thirty (50%) of the surveyed houses have cracks in either the walls or the floors; 13 (86.7%) in Agamy, 9 (60%) in Old King Mariout and 8 (53.3%) in Hawareya. Cracks and crevices provide more microhabitats for sand flies to retreat to during daylight hours. The female sandfly lays its eggs in cracks in house walls [33]. David Pochéetetal studied the bionomics of phlebotomine sandfly from three villages in Bihar, India; he collected sandfly from cracks and crevices between mud bricks used in the construction of houses [34].

Fourty-five (76%) use window nets; 7 (46.7%) in Agamy, 8 (53.3%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya, sandflies are only about 1/16 of an inch, they can easily fly through window screens unless they have very fine mesh which will prevent the entry of sandfly. Impregnated window and bed nets provide better protection against sandfly [35].

In 1991 Maroli M et al. in Italy found out that indoor use of wide-mesh cotton curtains around windows impregnated with permethrin 1 g/m2 almost completely eliminate the occurrence of endophilic sandfly species [36].

As for the outside housing conditions, 44 (73.3%) of the surveyed houses have gardens; 8 (53.3%) in Agamy, 6 (40%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. The floor of the garden varied from sandy, mud, cement and ceramic. Out of the total 44 gardens; 17(38.6%) have sandy floor; 7 (87.5%) in Agamy, 6 (100%) in Old King Mariout and 4 (26.7%) in Hawareya, 15 (34.1%) have muddy floor in Marakya, 1 (2.35%) has cement floor in Al-Agamy and lastly 11 (25%) have ceramic floor in Hawareya. Out of the total 44 gardens, 40(90.9%) have plants and trees; 15 (100%) in Agamy, 11(73.3%) in Old King Mariout, 15 (100%) in Hawareya and 15 (100%) in Marakya. As mentioned before vegetations act as attractive sugar bait for sandfly populations which is proven by many investigators to be important for resting habitat of sandfly [37], [38] so the presence of gardens in which trees and plants are cultivated

makes the area of the study a possible micro-habitat for sandfly.

Thirty-one (51.7%) of the respondents have animals such as dogs, cats and cattle inside or around the house, 18 (30%) breed poultry and 37 (61.7%) of the respondents said they have rodents either inside or around their houses, *P. papatasi* is proved to be anthropophilic but beside human blood, it feed also on animals, rodents and poultry. Many authors agreed to this, among them Milena Svobodová who found that *P. papatasi* feed on domestic animals and wild rodents and to lesser extent on poultry blood. Also in 2005 Mohammad R. Yaghoobi-Ershadi in Iran tested 520 *P. papatasi blood* meals by ELISA to detect their source and the result was human, sheep, cow, goat, rodent, and bird respectively [39], [40]. He also examined 388 blood meals of *Phlebotomus papatasi* in 1995 from six villages in rural district in Iran and the results was as follows; 29.6-44.6% was human blood, 8.4% dogs' blood and 0.6% cows' blood, indicating a strong preference for man [41]. This proves that *Phlebotomus papatasi* is predominantly anthropophilic.

Forty (66.7%) of the surveyed houses had a dump place or wastes around the house. Waste is considered a breeding place for sandfly [17], several authors agreed that poor housing conditions and unsuitable waste management was suspected to provide ideal conditions for sand fly breeding [42]-[45].

V. Summary and Conclusion

Phlebotomine sandflies of the genus Phlebotomus transmit the protozoan parasites responsible for leishmaniasis and a number of viruses known to cause human illness. Leishmaniasis includes two major diseases, cutaneous leishmaniasis which causes skin ulcers and visceral leishmaniasis which causes a severe systemic disease that is usually fatal without treatment. Mucocutaneous leishmaniasis is a rare but severe form affecting the nasal and oral mucosa. Both VL and CL occur in Egypt although the prevalence is relatively low, it is primarily a disease of rural populations, but in some areas urban transmission exists. VL was found near Alexandria, in El Agamy in the eighties while CL was primarily identified in northern Sinai.

Four different areas representing different demographic situations in West Alexandria, with history of leishmaniasis were selected.

Predesigned questionnaire was prepared for primary health care physicians and local inhabitants of the area of study, it included information regarding; personal data, knowledge and attitude of PHC physicians in the PHC facilities of the selected areas about leishmaniasis, awareness of the public about the disease and the vector

Among the twenty PHC physicians who were interviewed in the PHC facilities of the area of the study, 55% of the physicians had satisfactory knowledge; regarding the disease there is a negative association between knowledge and the number of years the physicians had been in practice.The physicians with post-graduate studies showed more satisfactory knowledge than those with no post-graduate studies. Regression techniques identified association between physician post-graduate studies and knowledge; there is an inverse relationship between knowledge and physician age and a negative association between knowledge and years of experience. In general Eighty five percent of the PHC physicians showed good attitude about leishmaniasis, however 15% only agreed that leishmaniasis is a disease of public health problem in Egypt, 15% agreed that leishmaniasis is a notifiable disease in Egypt, 35% agreed that the public health impact of leishmaniasis has been grossly underestimated and 45% agreed that the actual number of cases of leishmaniasis is not recorded.

Among the sixty inhabitants of the four selected areas of the study were interviewed, 15 from each area, 90% had not heard about leishmaniasis. The present study recorded the poor awareness of the community about any of the activities of the malaria, filariasis and leishmaniasis unit which is under supervision of the ministry of health which are periodic painting of houses with insecticides, periodic medical examination, annual sandfly survey by using sticky traps, and campaigns to educate about the disease.

By examining the inside and outside housing conditions of the four areas of the study, they were found to be a suitable microclimate for sandfly breeding, 50% of the surveyed houses have cracks in either the walls or the floors; 86.7% in Al-Agamy,60% in old King Mariout and 53.3% in Al-Hawareya, 51.7% of the respondents have animals such as dogs, cats and cattle inside or around the house, 30% raise birds and 61.7% of the respondents said they have rodents either inside or around their houses.

Seventy three percent (73.3%) of the surveyed houses have gardens; 53.3% in Al-Agamy, 40% in old King Mariout, 100% in Al-Hawareya and 100% in Marakya, of which 90.9% grew plants and trees and 66.7% of the surveyed houses had a dump place or wastes around the house; 66.7% in Al-Agamy, 100% in old King Mariout and 100% in Al-Hawareya.

References

[1] Desjeux P. Worldwide increasing risk factors for leishmaniasis. Med MicrobiolImmunol(Berl) 2001; 190: 77-9.
[2] World Health Organization. Report on the regional consultation on the control of Leishmaniasis. WHO (Amman, Jordan) 1997.
[3] World Health Organization. "Control of the leishmaniases: report of a meeting of the WHO Expert Commitee on the Control of Leishmaniases, Geneva, 22-26 March 2010." (2010).
[4] Desjeux P. leishmaniasis: current situation and new perspectives. *Comp ImmunolMicrobiol Infect Dis* 2004; 27(5): 305-18.
[5] Desjeux P. leishmaniasis. Nat Rev Microbiol2004; 2(9):692.
[6] Desjeux P. The increase in risk factors for leishmaniasis worldwide. Trans R Soc Trop Med Hyg2001; 95(3): 239-43.
[7] WHO Technical Report Series, No. 701, 1984. The leishmaniases, report of a WHO Expert Committee. 1984; 140.
[8] World Health Organization. Report on the regional consultation on the control of Leishmaniasis. WHO (Amman, Jordan) 1997.
[9] World Health Organization. Report of the Scientific Working Group meeting on leishmaniasis. WHO (Geneva) 2004.
[10] Doha SA, SamyAM. Bionomics of phlebotomine sand flies (*Diptera:Psychodidae*) in the province of Al-Baha, Saudi Arabia.MemInstOswaldo Cruz (Rio de Janeiro) 2010;105(7): 850-6.
[11] Awadalla HN, Mansour NS, Mohareb EW. Further characterization of *Leishmania*isolates from children with visceral infection in Alexandria area, Egypt. Trans R Soc Trop Med Hyg 1987; 81: 915-7.
[12] Mohareb EW, Mikhail EM, Youssef FG. *Leishmaniatropicu*in Egypt: an undesirable import. Trop Med Int Health 1996; 1: 251-4.

[13] Regional Disease Vector Ecology Profile, North Africa (2000). Defense Pest Management analysis Center, Armed Forces Pest Management Board, Walter Reed Army Medical Center. Available from: www.afpmb.org/pubs/dveps/nort_afr.pdf-.
[14] Guerbouj S, Chemkhi J, Kaabi B, Rahali A, Ben Ismail R, Guizani I. Natural infection of *Phlebotomus* (*Larroussius*) *langeroni* (Diptera: Psychodidae) with *Leishmaniainfantum* in Tunisia. Transactions of the 92-Royal Society of Tropical Medicine and Hygiene 2007; 101(4): 372-7.
[15] Morsv TA, Musallam RA, El Shabrawy MN, Hassan HI. Parasitic infections in IsmailiyaGovernate, Egypt. Journal of the Egyptian Society of Parasitology1982; 11: 147-56.
[16] Sawhney IM, Lekra OP, Shashi JS, Prabhakar S, Chopra JS. Evaluation of epilepsy management in a developing country: a prospective study of 407 patients. ActaNeurolScand 1996; 94(1): 19-23.
[17] Müller VT, Gomes MM. Questionnaire study of primary care physicians' referral patterns and perceptions of patients with epilepsy in a Brazilian city 200., Public Health 2007;14(4):177-83.
[18] Heath K, Hogg RS, Singer J, Schechter MT, O'Shaughnessy MV, MontanerJS.Physician concurrence with primary care guidelines for persons with HIV disease.IntJ STD AIDS 1997; 8(10): 609-13.
[19] Choudhry NK, Fletcher RH, Soumerai SB. Systematic Review: The Relationship between Clinical Experience and Quality of Health Care.Ann Intern Med2005; 142: 260-73.
[20] Ayanian JZ, Hauptman PJ, Guadagnoli E, Antman EM, Pashos CL, McNeil BJ. Knowledge and practices of generalist and specialist physicians regarding drug therapy for acute myocardial infarction. N Engl J Med 1994; 331: 1136-42.
[21] Salem-Schatz SR, Avorn J, Soumerai SB. Influence of clinical knowledge, organizational context, and practice style on transfusion decision making. Implications for practice change strategies. JAMA 1990; 264: 476-83.
[22] Van Leeuwen YD, Mol SS, Pollemans MC, Drop MJ, Grol R, Van der Vleuten CP. Change in knowledge of general practitioners during their professional careers. Family Practice 1995; 12(3): 313-7.
[23] Hamadto HA, El-Fkahany AF, Morsy TA, Farrag AB, Abdel Maksoud MK. Re-evaluation of zoonotic cutaneous leishmaniasis status in North Sinai Governorate, Egypt. J Egypt SocParasitol 2003; 33: 687-94.
[24] Mansour NS, Youssef FG, Mohareb EW, Dees WH, Karuru ER. Cutaneous leishmaniasis in North Sinai. Trans R Soc Trop Med Hyg 1987; 81:747.
[25] Mansour NS, Youssef FG, Mohareb EW, Dees WH, Karuru ER. Cutaneous leishmaniasis in the peace keeping force in East Sinai. J Egypt SocParasitol 1989; 19: 725-32.
[26] *Barghuthy AF, Schnur LF, Jacobson RL, Schönian G, Abdeen Z.* Epidemiology of cutaneous leishmaniasis in the endemic area of Jericho, Palestine. *Eastern Mediterranean Health Journal 2003; 9(4): 805-15.*
[27] Gama ME, Barbosa JS, Pires B, Cunha AK, Freitas AR, Ribeiro IR, et al. Evaluation of the level of knowledge about visceral leishmaniasis in endemic areas of Maranhao, Brazil. Cad SaudePublica1998; 14(2): 381-90.
[28] Koirala S, Parija SC, Karki P, Das ML. Knowledge, attitudes, and practices about kala-azar and its sandfly vector in rural communities of Nepal. Bull World Health Organ. 1998;76(5):485-90.
[29] Agyepong IA. Malaria: ethnomedical perceptions and practice in an Adengbe farming community and implications for control. Social Sciences and Medicine 1992; 35: 131-7.
[30] Yeneneh H. Antimalarial drug utilization by women in Ethiopia: a knowledge-attitude-practice study. Bulletin of the World Health Organization 1993; 71: 763-72.
[31] Dhiman RC, Sen AB. Epidemiology of Kala-azar in rural Bihar (India) using village as a component unit of study. Indian J Med Res1991; 93:155-60.
[32] Thakur CP. Socio-economies of visceral leishmaniasis in Bihar (India). *Trans R Soc Trop Med Hyg*2000; 94: 156-7.
[33] The disease and its epidemiology. Available from: http: // www.who.int/ leishmaniasis/ disease_ epidemiology/en/ index.html
[34] Poché D, Ingenloff K, Garlapati R, RemmersJ,Poché R. Bionomics of phlebotomine sand flies from three villages in Bihar, India. Journal of Vector Ecology 2011; 36: 106-17.
[35] Desjeux P. Leishmaniasis: public health aspects and control. *ClinDermatol* 1996; 14: 417-23.
[36] Maroli M, Majori G. Permethrin-impregnated curtains against phlebotomine sandflies (*Diptera: Psychodidae*): laboratory and field studies. Parassitologia 1991; 33(Suppl l): 399-404.
[37] Schlein Y, Muller G. Assessment of plant tissue feeding by sand flies (*Diptera*: *Psychodidae*) andmosquitoes (*Diptera:Culicidae*). J Med Entomol 1995; 32:882-7.
[38] Schlein Y, Jacobson RL. Sugar meals and longevity of the sandfly *Phlebotomuspapatasi* in an arid focus of *Leishmania major* in the Jordan Valley. Med Vet Entomol 1999;13: 65-71.
[39] Svobodova´M, Sa´ Dlova´ J, Chang K-P. Petrvolfshort report: distribution and feeding preference of the sandflies *phlebotomussergenti* and *P. papatasi* in a cutaneous leishmaniasis focus in Sanliurfa, Turkey AM. J Trop Med Hyg 2003; 68(1): 6-9.
[40] Yaghoobi-Ershadi1 MR, Akhavan1 AA, Zahraei-Ramazani AR, Jalali-Zand AR, PiazakN.Bionomics of *Phlebotomuspapatasi*(*Diptera: Psychodidae*) in an endemic focus of zoonotic cutaneous leishmaniasis in central Iran.Journal of Vector Ecology2005; 30(1): 115-8.
[41] Yaghoobi-Ershadi MR, Javadian E, Kannani A. Host preference pattern of phlebotomine sandflies of Borkhar rural district, Isfahan province, Iran. Acta Trop 1995; 60(3): 155-8.
[42] Killick-Kendrick, R, Killick-Kendrick M, Tang Y. Anthroponotic cutaneous leishmaniasis in Kabul, Afghanistan: the high susceptibility of *Phlebotomussergenti*to*Leishmaniatropica*. Trop Med Hyg 1995; 89: 477.
[43] Tayeh A, Jalouk L, CairncrossS.Twenty years of cutaneous leishmaniasis in Aleppo, Syria. Trop Med Hyg 1997; 91: 657-9.
[44] Ergin M, Erdogan S, Gumurdulu D, Tuncer I. Cutaneous leishmaniasis: evaluation by polymerase chain reaction in the Cukurova region of Turkey. J Parasitol 2005; 91: 1208-11.
[45] Noble ER, Nable GA, Schad GA, Macinnes AJ. In: Parasitology - The History of Animal Parasites. Introduction to the protozoan group; Phylum zoomastigina. Sand fly. 6th ed. Lea and Febiger Publication, 1989. 401-2.