Jordan Medical Journal

ORIGINAL ARTICLE

Assessment of Health Professionals' Knowledge Regarding Leishmaniasis in Centre of Morocco

Mounia Amane[1,3*], Zuhair Dardona[1], Mohamed Echchakery[1,2], Mohamed Hafidi[1], Samia Boussaa[1,4]

[1] Microbial Biotechnologies, Agrosciences and Environment Laboratory (BioMAgE), Research Unit Labelled CNRST N°4, Faculty of Sciences Semlalia, Cadi Ayyad University, Marrakech, Morocco.

[2] Epidemiology and Biomedical Unit, Laboratory of Sciences and Health Technologies, Higher Institute of Health Sciences, Hassan First University of Settat, Morocco.

[3] ISPITS-Higher Institute of Nursing Professions and Health techniques of Marrakech, Morocco

[4] ISPITS-Higher Institute of Nursing and Technical Health Occupations, Ministry of Health and Social Protection, Rabat, Morocco

*Corresponding author:

mouniaamane9@gmail.com

Received: August 20, 2023

Accepted: February 5, 2024

DOI:
https://doi.org/10.35516/jmj.v59i2.1644

Abstract

Methods: The present study aimed to evaluate Moroccan health professional's knowledge regarding National Leishmaniasis Control Program. This was a cross-sectional exploratory study performed in the Marrakech Safi region. Data were collected from 402 doctors, nurses, midwives, and health technicians working in public sector healthcare institutions by questionnaire. This self-administered questionnaire derived from the national leishmaniasis control program assessed: (i) fundamental knowledge of leishmaniasis and its clinical manifestations; (ii) the transmission cycle; and (iii) prevention and case management strategies. The results were analyzed by SPSS version 26 using bivariate and multivariable logistic regression model.

Results: Overall knowledge related to leishmaniasis was insufficient. This study claimed that health professional's better knowledge of management and prevention was positively associated to doctors [crude odds ratio (COR) = 5.02, 95% confidence interval (CI) (1.07-23.54)], endemic province [adjusted odds ratio (AOR) = 2.30, 95% CI (1.48-3.53)], and experience of health workers with leishmaniasis [AOR = 6.11, 95% CI (3.31-11.41)]. However, midwifes risk not having [AOR = 0.30, 95% CI (0.09-0.97)] a good level of knowledge in this category. Furthermore, doctors [AOR = 3.19, 95% CI (1.01-10.81)] and professionals working in endemic provinces [AOR = 1.75, 95% CI (1.14-2.68)] were more likely to have good basic knowledge towards leishmaniasis, contrary to midwifes [AOR = 0.30, 95% CI (0.09-0.97)]. Good knowledge regarding transmission was positively associated with continuous training [AOR = 4.65, 95% CI (1.92-11.99)].

Conclusions: This research suggested the need to develop an initial and continuous training program adapted to the needs of health professionals.

Keywords: Leishmaniasis, health professional, knowledge, experience, training, Morocco.

INTRODUCTION

Leishmaniasis is a parasitic ailment that presents significant public health concerns, with an incidence of seven hundred thousand to one million cases reported annually. This vector-borne disease is attributed to the *Leishmania* parasite, with sand flies serving as vectors [1]. It is worthwhile highlighting that the disease can be categorized into two types: cutaneous and visceral. Cutaneous Leishmaniasis (CL) is the most prevalent type of the disease, causing skin lesions, principally plaques, nodules and ulcers, on exposed parts of the body, leading to permanent scarring, severe disability and significant stigmatization. On the other hand, visceral leishmaniasis (VL) is the most serious, and is fatal in over 95% of cases if untreated. It is characterized by irregular attacks of fever, weight loss, hepatosplenomegaly and anemia, and affects all ages and both sexes [2]. Furthermore, the disease is now widespread in 98 countries and has three regions across five continents [3].

The World Health Organization has suggested several strategies to control its dissemination. These strategies include early diagnosis, prompt and effective treatment, and vector control using various methods such as insecticide spraying, insecticide-treated nets, and finally environmental management and personal protection [4]. In addition, it is critical to keep track of epidemics. Besides animal reservoir management, it is necessary to enlist community support and launch educational initiatives to change behavior through effective interventions [1]. The World Health Organization (WHO) provides financial support to the Eastern Mediterranean Region (EMR), to ministries of health through a strategic plan that focuses on the training of program managers and health workers in diagnosis and case management [5]. Interestingly, the Moroccan Ministry of Health has implemented a National Leishmaniasis Control Program (NLCP), which operates under the central management of the department of parasitic diseases control [6].

The implementation and success of this program still depends heavily on health professionals. Despite the fact that the vector control component is still only partially implemented, one study conducted in Morocco highlighted the active involvement of medical staff in patient identification and care [7]. Indeed, the primary structural variables impacting cutaneous leishmaniasis management plan execution were human. These variables included indifference, lack of enthusiasm, and lack of understanding among healthcare workers. Furthermore, organizational problems such as limited resources and training impede the control plan's execution [8]. Likewise, there are also substantial gaps in the execution of the visceral leishmaniasis eradication projects in Bihar, India. These gaps are notably in monitoring therapy and treatment results, and are caused by health professionals' lack of awareness [9]. Health education is crucial to leishmaniasis prevention. Individuals may make educated decisions to protect themselves and their communities by learning about causes, symptoms, and preventive measures. Furthermore, enhancing health education can raise knowledge, attitudes and practice in health volunteers [10].

In this context, the current study intended to evaluate health workers' awareness of the NLCP to optimize a future training program. The evaluation measured health workers' current knowledge and awareness of the NLCP. This allowed the identification of any

gaps or areas for development to establish an effective training program appropriate to their specific requirements.

MATERIAL AND METHODS

1- Study design

This cross-sectional exploratory study took place in the Marrakech Safi region of central Morocco and targeted health professionals working in public sector healthcare institutions. The primary objective was to assess their NLCP knowledge. Data collection occurred between April and August 2020.

2- Setting

The current study was carried out in the Marrakech-Safi region, which had 17 hospitals with a total capacity of 3,687 beds. There were also 114 rural dispensaries (nonmedicalised health facilities), 94 urban centers, and 128 rural centers in the area. The region's hospital capacity was comparable to the national standard, with 1,259 residents per bed compared to the national average of 1,373 inhabitants per bed. Healthcare professionals in the region have roughly 2,400 doctors, distributed evenly between the private and public sectors. This is for a ratio of 5.2 doctors per 10,000 people. As of January 2018, there were 2,688 nurses, equivalent to 5.6 nurses per 10,000 residents [11]. It is worth emphasizing that the Marrakech - Safi region is at high risk of leishmaniasis disease because of its semi-arid environment, the occurrence of the disease vector, and active leishmaniasis foci, with 43% urban and 57% rural areas [11-13].

3- Population and sample size

Due to the availability of the total population list of health workers in the regional department of the Ministry of Health and Social Protection, the research population was selected randomly using a stratified probabilistic sampling method, including public health employees such as doctors, nurses, midwives, and health technicians (hygiene and laboratory technicians) involved in primary health care or hospital activities. The sample consisted of those who agreed to participate in the study. The researchers utilized OpenEpi version 3.01 [14] to calculate the required sample size. Since the level of leishmaniasis knowledge in health workers was unknown in the center of Morocco, a knowledge level of 50% was considered, with a confidence level of 95% and a significance level of 5%. At least 323 distinct individuals were included in the calculated sample size. The researchers disseminated the questionnaire to 400 participants to account for probable refusals to answer and partial replies. This high sample size contributed to sufficient data gathering for the study's aims.

4- Ethical Approval

This study was conducted with the approval of the regional directorate of the Ministry of Health and Social Protection of the Marrakech Safi region. This is indicated by the administrative authorization (Ref. 1080/2020) and the ethical committee approval (N10/REC/22) obtained for the study. Furthermore, the questionnaire statement was designed to assure participants that their names and replies would remain strictly anonymous. The study's objectives were clearly articulated, with a focus on emphasizing that the goal was not to evaluate individual performance or assign blame for shortcomings. However, the goal was to gather information and views that could potentially improve the main issue tackled by the research. Following the questionnaire statement, the first question offered professionals the opportunity to consent or withdraw from participation in the research. The study was limited to health professionals who accepted the invitation and

responded to the questionnaire. At the end of the study, participants were sincerely thanked for their valuable participation. They were encouraged to answer all questions honestly and candidly.

5- Data collection tool

Structured questionnaires were used to collect data for this investigation. The data collection questionnaire was developed from prior investigations, notably drawing on the methodology and question forms utilized in earlier studies [15-17]. The study employed a self-administered quantitative questionnaire containing closed-ended and open-ended questions derived from data provided by the national leishmaniasis control program. The questionnaire was divided into five sections that focused on key concepts: (1) socio-professional characteristics of participant; (2) experience and training; (3) fundamental knowledge of leishmaniasis and its clinical manifestations; (4) the transmission cycle (including vectors, reservoirs, and modes of transmission); and (5) prevention and case management strategies. To assess healthcare workers' knowledge of NLCP and prevention and case management strategies, statistical analysis was performed following the same method as in prior research [18, 19]. As a consequence, knowledge scores were determined by assigning 1 to the right answer and 0 to the incorrect one of each participant's total knowledge scores from each section. Good knowledge was defined as responding correctly above the mean of the items, whereas inadequate knowledge was defined as incorrectly answering below the mean of the items.

Three hundred and sixty-seven out of four hundred participants answered our questionnaire, a response rate of 91.75%. The degree of knowledge was evaluated using several sets of questions regarding leishmaniasis. These included seven about clinical symptoms, six about transmission, and six about prevention and case management. Each respondent received a score based on their responses to these questions. The mean scores of 3.5 for questions relating to the first knowledge category and 3 for the six questions relating to the other knowledge categories were used to distinguish between good and poor knowledge. Each respondent's score was derived from the questions. Their knowledge level was categorized as good or poor depending on whether their score was above or below the corresponding mean values.

6- Data collection procedures and quality control

The study's data collectors were health experts who had no relationship with designated health institutions, ensuring an unbiased approach to data gathering. Due to COVID-19 constraints, data collection was conducted from April to December 2020, both directly and remotely via email. To ensure data quality, the questionnaire was pre-tested with twenty Marrakech Safi area health professionals who had socio-professional characteristics within the research population. The responses of these individuals were excluded from the final study. Following the pre-testing phase, the questionnaire was verified by a team of expert research professionals for content validity, especially with regard to the questions in each knowledge category. A new test was conducted with the same people after one month of the first test to check the external validity of the data collection instrument. Cronbach's alpha coefficient, was applied to assess the questionnaire's reliability, verifying its robustness and accuracy for the study's aims [20]. Initially, each category grouped together 7 questions after the validity and reliability check, two questions were eliminated to leave only six questions in the transmission category and

six for the care category. Thus, Cronbach's alpha coefficient reached 0.76.

7- Data analysis

The questionnaire was thoroughly reviewed for completeness, and any necessary modifications or revisions were implemented. Items with complete answers were coded and inserted into Statistical Packages for the Social Sciences (SPSS) version 26 software for analysis. The findings were presented in the form of numbers, percentages, and tables after descriptive statistics were employed to investigate the characteristics of the research population. These characteristics were investigated in relation to pertinent factors. The data was analyzed using binary and multivariable logistic regressions to assess the impact of various factors (training, experience, and professional data) on the outcome variables (knowledge) and optimize for any confounding factors. All variables with a p value <0.25 from the bivariate analysis were entered into the multivariable logistic regression model. To determine the strongest indicator variable among participant characteristics and knowledge domains. Potential associations were measured using an adjusted odds ratio (AOR) with a 95% confidence interval (CI), and a p value less than 0.05 was considered statistically significant.

RESULTS

1- Socio-professional data

Among the total sample, women constituted 55.7%. The vast majority of respondents (n = 182; 77% of those polled) were under forty. In terms of professions, the majority of participants (n = 274; 74.9%) were nurses, followed by 27 doctors (9.8%). Furthermore, 68 respondents (22.7%) identified themselves with public health facilities in Essaouira, while 39 (19.1%) were associated with public health facilities in Chichaoua. Primary health care facilities were provided to 200 participants (54.6%), provincial hospitals to 105 respondents (28.7%), regional hospitals to 26 respondents (6.8%), and university hospitals to 31 respondents (8.5%). More than half of the health workers (54.6%) had worked for less than five years, and 105 participants (28.7%) had worked for six to ten years (see table 1).

Table 1: Health worker' socio-professional characteristics

Variable	Criteria	Frequency	%	Variable	Criteria	Frequency	%
Profil	Nurse	274	74.9	**Gender**	Female	204	55.7
	Medwife	28	7.7		Male	161	44.3
	Doctor	27	7.4	**Age (years)**	Under 40	182	77
	Technicien	36	9.8		Between 40 and 60	40	10.9
Province	Youssoufia	52	14.2		Up to 60	43	11.7
	Safi	32	8.7	**Health structure**	Primary health care	200	54.6
	Marrakech	37	10.1		Provincial hospital	105	28.7
	Elhaouz	35	9.6		Regional hospital	25	6.8
	Essaouira	68	22.7		University hospital	31	8.5
	Chichaoua	39	19.1	**Duration work (years)**	Under 5 years	96	26.2
	Rhamna	13	3.6		Between 6 and 10	69	18.9
	Elkalaa	43	11.7		Between 11and 20	148	40.4
					Up to 20	52	14.2

2- Training and experiment of health workers in leishmaniasis

The current study's findings clearly revealed that, more than half of respondents (n = 202; 55.2%) had previously observed a case of leishmaniasis during their professional career, on the other hand, merely sixty-two (16.9%) had been active in raising population knowledge about the disease. Even though the overwhelming number of participants (n = 334; 91.5%) did not receive continuous leishmaniasis control training, three hundred thirteen (85.5%) were willing to be taught (see table 2).

Table 2: Health worker's training and experience regarding leishmaniasis in Marrakech Safi region

Variables	Criteria	Frequency	%
Treat or nurse a case of leishmaniasis:	Yes	202	55.2
	No	98	44.9
The involvement to raise awareness of this disease among the population:	Yes	62	16.9
	No	303	82.8
Continuous training in the control of leishmaniasis:	Yes	31	8.5
	No	334	91.5
The need to training in the management of leishmaniasis:	Yes	313	85.5
	No	52	14.2

3- Knowledge of health workers toward leishmaniasis and the clinical manifestations of each form

Out of the three hundred and sixty-seven participants, two hundred and twelve (57.9%) had good knowledge, in contrast the rest (n = 154; 42.1%) had poor knowledge of leishmaniasis and the clinical manifestations of each form. In fact, the overwhelming majority of health workers (n = 352; 96.2%) knew about leishmaniasis disease; three hundred thirty-two (88%) were aware that it is a notifiable disease; two hundred ninety-eight respondents (81.4%) were aware that leishmaniasis is a parasitosis common to humans and animals; and one hundred ninety-nine (54.4%) knew that it is diagnosed by parasitological testing. Nonetheless, only thirty (8.2%) of respondents were aware of all three forms of leishmaniasis. Furthermore, 44.3% knew CL and VL together. While one hundred and ninety participants (51.9%) mentioned correctly the symptoms of cutaneous leishmaniasis, just ninety-eight (26.8%) mentioned correctly those of VL (see table 3).

Table 3: Health worker's knowledge toward leishmaniasis and the clinical manifestations of each form

Variable	Criteria	Frequency	%
Heard of leishmaniasis:	Yes	352	96.2
	No	14	3.8
Notifiable disease:	Yes	332	88
	No/ I don't know	43	11.7
Forms of leishmaniasis:	Cl	86	23.5
	Vl	31	8.5
	CL and VL	162	44.3
	CL, MCL and VL	30	8.2
	I don't know	56	15.3
The disease detection:	Clinical test	68	18.6
	Parasitological test	199	54.4
	Bacteriological test	61	16.7
	I don't know	37	10.1
Leishmaniasis is:	Parasitosis common to humans and animals	298	81.4
	Viruses common to humans and animals	2	0.5
	Parasitoses that affect only humans	39	10.7
	I don't know	26	7.1
Symptoms of cutaneous leishmaniasis:	Skin lesion/ Papules/ nodular plaques/open ulcers	190	51.9
	I don't know	175	47.8
Symptoms of visceral leishmaniasis:	Fever (sometimes cyclic)/ fatigue/ hepatosplenomegaly	98	26.8
	I don't know	267	73.2
Total	Good knowledge (score >3.5)	212	57.9
	Poor knowledge (score ≤3.5)	154	42.1

4- Health professionals' knowledge regarding leishmaniasis transmission cycle

The awareness of leishmaniasis prevention and case management among the health workers included in this study was evaluated using six questions. The number of participants who exhibited sufficient awareness did not surpass one hundred thirty-six (37.2%). Indeed, the bulk of respondents (n = 316; 86.6%), (n = 205; 88.7%), and (n = 310; 84.7%) were unaware of the GILAV committee, its primary activities, and the information system utilized in the NLCP. However, three hundred twenty-eight participants (89.6%) knew that an epidemiological investigation was mandatory for any confirmed case. Furthermore, nearly half (n = 165; 45.1%) of respondents answered correctly to the question about the intervention periods against the vector and the medical treatment for leishmaniasis (see table 4).

Table 4: Health professionals' knowledge of the vector, reservoirs and mode of transmission

Variables	Criteria	Frequency	%
The vector of the disease is:	Female sand fly	240	65.6
	I don't know	125	34.2
Leishmaniasis vector species in Morocco:	At least one vector species	10	2.7
	I don't know	355	97.3
The reservoir of the infectious agent of leishmaniasis:	Water	52	14.2
	Cat	61	16.7
	Mammals	62	16.9
	Insects	166	45.4
	I don't know	24	6.6
The principal reservoir of leishmania infuntum parasite:	I don't know	51	13.9
	Dog	138	35.0
	Other response	177	48.4
The principal reservoir of leishmania tropica parasite:	I don't know	51	13.9
	Homme	102	27.9
	Other response	121	58.2
The principal reservoir of leishmania major parasite:	I don't know	51	13.9
	Rodent	100	27.3
	Other response	215	58.7
Total	Good knowledge (score >3)	50	14.0
	Poor knowledge (score ≤ 3)	316	86.0

5. Health workers' knowledge toward leishmaniasis prevention and case management

The knowledge of health workers involved in this study regarding leishmaniasis prevention and case management was assessed with six questions. It was generally observed that participants with good knowledge did not exceed one hundred thirty-six (37.2%). It turns out that the majority of respondents (n = 316; 86.6%), (n = 205; 88.7%), and (n = 310; 84.7%) ignored, respectively, the GILAV committee, the main actions of the committee, and the NLCP information system. Nevertheless, 328 (89.6%) participants were aware that if a confirmed case is found, an epidemiological investigation would be required. Furthermore, almost half (n = 165; 45%) of respondents correctly answered the question about the time frame of interventions against the vector and the treatment of leishmaniasis (see table 5).

Table 5: Health workers knowledge toward leishmaniasis prevention and case management

Variables	Criteria	Frequency	%
Hear about GILAV committee:	Yes	49	13.4
	No	316	86.6
The main actions of GILAV committee:	Fight against vectors	26	11.3
	I don't know	205	88.7
The periods of intervention against the vector:	Hot period	165	45.1
	I don't know	200	54.9
The obligatory of epidemiological investigation in front to case:	Yes	328	89.6
	I don't know	38	10.4
Medical treatment for leishmaniasis:	Glucantime	198	54.1
	I don't know	168	45.9
The information system used in the NLCP:	At least one document	55	15.0
	I don't know	310	84.7
Total	Good knowledge (score >3)	136	37.2
	Poor knowledge (score ≤3)	229	62.6

6. Associated factors to good knowledge of health workers

The relationship between professional characteristics and extensive leishmaniasis knowledge was evaluated in this section. The study illustrated that doctors were more likely than biologists and technicians to have extensive knowledge of leishmaniasis [AOR = 3.19, 95% CI (1.01–10.81)]. Midwives, on the contrary, were less likely to have a thorough fundamental knowledge of leishmaniasis, including case management and prevention [AOR = 0.30, 95% CI (0.09–0.97)].

Professionals working in endemic regions, on the other hand, were more likely to have a strong awareness of case management and disease prevention [AOR = 2.30, 95% CI (1.48–3.53)], as well as an adequate basic awareness of leishmaniasis [AOR = 1.75, 95% CI (1.14–2.68)].

Furthermore, the duration of work variable remained substantially related to health workers' expertise. As a consequence, individuals with work durations between 6 and 10 years [AOR = 0.26, 95% CI (0.08-0.74)] had lower probabilities of having strong knowledge than those who were older. Meanwhile, individuals with work experience ranging from 11 to 20 years [AOR = 0.31, 95% CI (0.12-0.82)] were 0.31 times less likely to be knowledgeable about leishmaniasis transmission than those with maximum experience (up to 20 years). Furthermore, the category with the length of employment between 6 and 10 had the opportunity to have a thorough knowledge of healthcare and prevention, four times more than the older professionals (up to 20) [AOR = 4.18, 95% CI (3.36-11.44)] (see table 6).

Table 6. Associated factor to good knowledge of health workers

Factor	characteristics	Good basic knowledge on leishmaniasis					Good knowledge on transmission					Good knowledge on case management and prevention				
		N	%	P value	COR (95% CI)	AOR (95% CI)	N	%	P value	COR (95% CI)	AOR (95% CI)	N	%	P value	COR (95% CI)	AOR (95% CI)
Profil	Nurse	158	74.5	0.95	1.02(0.45-2.31)	-	34	68	0.86	1.10(0.39-3.06)	-	107	78.7	0.51	0.75(0.32-1.75)	-
	Midwife	11	5.2	0.04*	0.31(0.09-1.06)	0.30(0.09-0.97)	4	8	0.62	0.63(0.15-3.16)	-	3	2.2	0.04*	1.14(0.34-3.86)	0.14(0.04-0.83)
	Doctor	20	9.4	0.04*	3.34(1.02-10.86)	3.19(1.01-10.81)	5	10	0.49	0.60(0.14-2.63)	-	9	6.6	0.04*	5.02(1.07-23.54)	0.54(0.23-1.22)
	Biologist	23	10.8	REF	REF	REF	7	14	REF	REF	REF	17	12.5	REF	REF	REF
Structure	Primary centre	125	59	0.89	1.07(0.43-2.64)	-	34	68	0.81	1.17(0.31-4.39)	-	84	61.8	0.32	1.72(0.59-4.98)	-
	Provincial H	58	27.4	0.29	1.67(0.64-4.35)	-	7	14	0.15	3.00(0.67-13.42)	0.33(0.07-1.49)	34	25	0.13	2.39(0.78-7.28)	0.41(0.58-1.27)
	Regional H	10	4.7	0.45	0.60(0.14-2.61)	-	4	8	0.88	0.88(0.17-4.63)	-	9	6.6	0.16	2.96(0.64-13.57)	0.37(0.07-1.58)
	University H	19	8.9	REF	REF	REF	5	10	REF	REF	REF	51	37,5	REF	REF	REF
Province	Endemic	36	17	0,002*	1.26(1.09-1.49)	1.75(1.14-2.68)	15	30	0.14	1.46(0.88-2.45)	0.64(0.35-1.17)	85	62.5	0.000*	1.67(1.28-2.18)	2.30(1.48-3.53)
	Non-endemic	176	83	REF	REF	REF	35	70	REF	REF	REF	33	24.3	REF	REF	REF
Work duration	Under 5 years	53	25	0.83	1.09(0.47-2.55)	-	10	20	0.06	3.08(0.99-9.60)	0.32(0.10-1.01)	33	24.3	0.18	1.81(0.75-4.35)	0.55(0.23-1.32)
	Between 6 and 10	38	17.9	0.81	0.90(0.36-2.20)	-	8	16	0.01*	3.90(1.35-11.25)	0.26(0.08-0.74)	16	11.8	0.000*	3.99(01.49-10.69)	4.18(3.36-11.44)
	Between 11and 20	87	41	0.46	0.75(0.34-1.63)	-	17	34	0.02*	3.18(1.21-8.40)	0.31(0.12-0.82)	53	39	0.13	1.85(0.82-4.18)	0.54(0.23-1.22)
	Up to 20	34	16.1	REF	REF	REF	15	30	REF	REF	REF	34	25	REF	REF	REF
Experience in L	Yes	126	59.4	0.28	0.75(0.45-1.27)	-	33	66	0.78	1.11(0.50-2.46)	-	105	77.2	0.000*	0.16(0.08-0.31)	6.11(3.31-11.41)
	No	86	40.6	REF	REF	REF	17	34	REF	REF	REF	31	22.8	REF	REF	REF
Training	Yes	21	9.9	0,78	1.13(0.46-2.77)	-	12	24	0.000*	0.21(0.08-0.55)	4.65(1.92-11.99)	17	12.5	0.66	1.21(0.50-2.91)	-
	No	191	90.1	REF	REF	REF	38	76	REF	REF	REF	119	87.5		REF	REF

REF: reference modality, H: Hospital, L: Leishmaniasis, AOR: Adjusted odds ratio, COR: Crude odds ratio, CI: confidence interval, *: significance value, N: Number, %: Percentage

DISCUSSION

The current study assessed health professionals' knowledge of NLCP activities to highlight the gap between their current and desired status. In general, this study revealed that a high proportion of health workers had relatively poor overall knowledge. Surprisingly, health workers' knowledge of leishmaniasis transmission was significantly inadequate. In the present study, vectors and reservoirs were mentioned by only 14% of professionals. These results were consistent with other studies, such as the one conducted in El Hajeb Province, Morocco, where a review of knowledge revealed poor knowledge of sand flies [21], as well as misconceptions about the actual vector, reservoir, and mode of transmission of the disease among health professionals [17]. Furthermore, the findings revealed that participants who had good knowledge of leishmaniasis prevention and case management did not surpass 37.2%. This low level of knowledge in these two areas could suggest subpar practices employed by healthcare professionals in dealing with leishmaniasis cases. This is further exacerbated by insufficient preventive measures adopted by the general public, as evidenced by numerous previous investigations on this topic [22, 23].

Indeed, in several regions around the world where leishmaniasis is prevalent, misunderstandings in knowledge are likely the main cause of numerous incorrect approaches (practice) to handling cutaneous leishmaniasis. Therefore, health workers necessitate a standardized and shared preparation of diagnostic and treatment strategies for leishmaniasis [24, 25]. Interestingly, a noteworthy number of healthcare professionals (57.9%) exhibited remarkable essential knowledge of leishmaniasis, recognizing its different clinical manifestations. These findings were consistent with the findings of a study conducted out in El Hajeb region, which revealed robust awareness among healthcare workers concerning the symptoms and signs associated with distinct forms of leishmaniasis [26].

Accurate information was mainly derived from sources such as mandatory reporting of diseases and transmitted parasites between humans and animals. In addition, knowledge originated from diagnosis responses, particularly parasitological diagnoses. Moreover, some participants highlighted the value of clinical diagnosis as an effective approach, even though its reliability has not yet been verified in the existing literature [27]. Simultaneously, it enables more efficient case detection and timely referrals for more precise diagnostic processes. Concerningly, a mere 8.2% of the participants were aware of all three forms of leishmaniasis. 51.9% accurately identified CL symptoms, and only 26.8% correctly identified VL symptoms. This bias could be attributed to the presence of VL cases in the corresponding region [6, 28], compared to CL cases [29].

Furthermore, this study revealed that knowledge levels were linked to various societal and professional groups. In particular, occupational group had a significant correlation with health workers' leishmaniasis awareness. As a result, doctors could gain a thorough understanding of leishmaniasis background, clinical manifestations, and prevention and management. As a result, midwives are at risk of not having enough knowledge in both categories (leishmaniasis/clinical manifestations and prevention/case management). This finding seems plausible given that Moroccan doctors' initial training includes practical experience in

the Department of Infectious Diseases, rural health centers, and a course in parasitology related to leishmaniasis [30]. However, midwives' initial training does not cover leishmaniasis. Nonetheless, they occasionally participate in case management, particularly in rural regions where employees are scarce. In a parallel context, it is worth noting that in Europe, a substantial percentage of medical students (67.7%) and doctors (79.1%) expressed that the Tropical Medicine training they had received was deemed 'inadequate' or insufficient [31]. Hence, there is a pressing need to enhance ongoing training, particularly for involved professionals, irrespective of their level. The findings also affirmed that professionals working in endemic provinces are more likely to possess an understanding of basic knowledge and management of leishmaniasis cases. This outcome could be associated with the effective prevention of leishmaniasis. This is where the control program for leishmaniasis should be utilized and the emphasis should be on ongoing training [7].

From this perspective, engagement with leishmaniasis was observed to have a positive relationship with a thorough knowledge of prevention and case management. Consistent with this, a study investigating clinical competence characteristics among newly recruited therapists recommended that postgraduate education should focus on technical elements, especially those that encompass numerous tasks. The study also highlighted that experience aids in personal advancement and growth, notably in teamwork [32, 33].

Generally, experience or duration of career in healthcare was also significantly linked to health workers' knowledge. Thus, participants with a career period between 6 and 20 years were less likely to have a thorough understanding of leishmaniasis transmission than more experienced professionals (up to 20 years). However, professionals with a career length of 6 to 10 years had a chance to have a good awareness of prevention and case management four times more than older professionals. This phenomenon can be attributed to seasoned professionals' instability. In fact, human resources instability negatively impacts leishmaniasis control measures [7].

Ultimately, proper knowledge transmission was significantly related to training. This finding is consistent with previous research, which revealed that the proportion of professionals who were aware of the proper etiological agent and transmission route of VL increased after training [15]. The findings demonstrated that the majority of participants (91.5%) had never received training for leishmaniasis disease; nevertheless, the majority of them (85.5%) were willing to receive such training. In fact, following a single training session in India, the referral rate jumped from less than 10% to over 27%, and social health activists' total understanding of VL significantly improved [34]. Moreover, this study revealed that approximately 62 (16.9%) participants had participated in increasing public awareness about the disease. In Iran, an educational program altered health workers' behavior, and ultimately, their trained behavior resulted in preventive measures for the families they served [35]. Consequently, health education can be viewed as a straightforward and cost-effective method to significantly enhance KAP among health professionals [10]. As a result, all patients could be provided with basic information to boost community awareness.

CONCLUSION

There were two main limitations in this study. Firstly, other regions of Morocco were

not taken into consideration, despite being linked to the variables of the study. Secondly, the study did not include attitudes and practices to describe skills evaluation. However, the current research provided a significant opportunity to evaluate knowledge in relation to experience and training. It also assessed training requirements among healthcare workers concerning the Leishmaniasis Control Program in Morocco prior to development of a training module. In addition, the study revealed that to prevent leishmaniasis, it is crucial to reassess the initial training of healthcare professionals. It is also crucial to establish ongoing training programs for staff, and to administer standardized pre- and post-training assessment tests. The doctor category and the most experienced professionals must assist novice staff in the care of patients and the fight against this parasitosis. Continuous training programs must also cover non-endemic areas. Knowledge alone is insufficient to develop skills. Therefore, it is vital to scrutinize the staff practices in the prevention and handling of leishmaniasis cases.

Statements and Declarations

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Submission Declaration

The work described has not been published previously, or under consideration for publication elsewhere.

Author Contribution

Amane Mounia: Prepared the article; Analyzed and interpreted the data; Wrote the paper. Boussaa Samia: Conceived and designed the research; Analyzed and interpreted the data and revised the manuscript. Echchakery Mohamed: revised the manuscript. Hafidi Mohamed: revised the manuscript.

Acknowledgments

Authors thank warmly Nadia Hachoumi for English revision.

REFERENCES

1. W. H. O. world health organization. Leishmaniasis. https://www.who.int/news-room/fact-sheets/detail/leishmaniasis. Accessed in 19/8/2023.
2. Ruh E, Ozkan AT. Leishmaniasis in Northern Cyprus. Eur J Ther. 2019 ;25(1):1–5. https://doi.org/10.5152/EurJTher.2019.18077.
3. Desjeux P. Leishmaniasis: current situation and new perspectives. Comp. Immunol. Microbiol. Infect. Dis... 2004 ;27(5):305-18. https://doi.org/10.1016/j.cimid.2004.03.004.
4. Kishore K, Kumar V, Kesari S, Dinesh DS, Kumar AJ, Das P, et al. Vector control in leishmaniasis. Indian J Med Res. 2006;123(3):467–72.
5. Postigo JA. Leishmaniasis in the world health organization eastern Mediterranean region. Int J Antimicrob Agents. 2010;36: S62-5. https://doi.org/10.1016/j.ijantimicag.2010.06.023.
6. Ministry of Health and social protection. Bulletin 2020 of Epidemiology and Public Health. Vol. 38. MOROCCO; 2021. Available from: https://www.sante.gov.ma/Publications/Bullten_pidmiologique/BESP%20N%C2%B0%2079%20-%20DELM.pdf. Accessed in 19/8/2023
7. Boussaa S, Daoudi M, Ouzennou N. Assessment of the implementation of action plan against cutaneous leishmaniasis in Morocco: case of Essaouira focus. J

Biomed Res Health Econ. 2020;1(3):4–8.

8. Rhajaoui M, Maaroufi A. Evaluation of the implementation of the response plan against cutaneous leishmaniasis (Leishmania Tropica) at provincial level. Rabat, Morocco: National Institute of Health Administration; 2012. p. 24.
9. Malaviya P, Hasker E, Singh RP, Van Geertruyden JP, Boelaert M, Sundar S. Village health workers in Bihar, India: an untapped resource in the struggle against kala-azar. Trop Med Int Health. 2013;18(2):188–93. https://doi.org/10.1111/tmi.12031
10. Zeinali M, Mohebali M, Mahmoudi M, Hassanpour GR, Shirzadi MR. Study on knowledge, attitude and practice of health workers of East Azerbaijan, Ilam and Khorasan Razavi provinces about leishmaniasis during 2015-2016: a comparative study before and after intervention. Archives of Clinical Infectious Diseases. 2019, 28;14(1). DOI: https://doi.org/10.5812/archcid.64282
11. Regional Monograph Region of Marrakech - Safi. presentation de la region de marrakech-safi, presentation generale de l'espace regional. https://www.hcp.ma/region-marrakech/PRESENTATION-DE-LA-REGION-DE-MARRAKECH-SAFI_a248.html. Accessed in 19/8/2023.
12. Boussaa S. Épidémiologie des leishmanioses dans la région de Marrakech, Maroc : Effet de l'urbanisation sur la répartition spatio-temporelle des phlébotomes et caractérisation moléculaire de leurs populations [Internet] [thesis]. Strasbourg 1; 2008 [cited 2019 Dec 28]. Available from: https://www.theses.fr/2008STR13037.
13. Zougaghi L, Bouskraoui M, Amine M, Akhdari N, Amal S. Leishmaniose cutanée à Leishmania tropica dans la région de Marrakech (Maroc) : un foyer rebelle ! Rev Francoph Lab. 2011;2011(429):35–9. https://doi.org/10.1016/S1773-035X(11)70765-1
14. OpenEpi - Toolkit Shell for Developing New Applications [Internet]. Available from: https://www.openepi.com/SampleSize/SSPropor.htm. Accessed in 21/5/2022.
15. Carvalho AG de, Alves I, Borges LM, Spessatto LB, Castro LS, Luz JGG. Basic knowledge about visceral leishmaniasis before and after educational intervention among primary health care professionals in Midwestern Brazil. Rev Inst Med Trop Sao Paulo. 2021;63:e56. https://doi.org/10.1590/S1678-9946202163056.
16. Carmo RF, Profeta da Luz ZM, Bevilacqua PD. Perceptions of the population and health professionals regarding visceral leishmaniasis. Cienc Saude Coletiva. 2016;21(2):621–8. https://doi.org/10.1590/1413-81232015212.10422015.
17. El-Mouhdi K, Fekhaoui M, Elhamdaoui F, Guessioui H, Chahlaoui A. Knowledge and Experiences of Health Professionals in the Peripheral Management of Leishmaniasis in Morocco (ELHajeb). J Parasitol Res; 2020:8819704. https://doi.org/10.1155/2020/8819704
18. Demissie Gizaw G, Aderaw Alemu Z, Kibret KT. Assessment of knowledge and practice of health workers towards tuberculosis infection control and associated factors in public health facilities of Addis Ababa, Ethiopia: A cross-sectional study. Arch Public Health. 2015;73(1):15. https://doi.org/10.1186/s13690-015-0062-3
19. Doylo T, Alemayehu T, Baraki N. Knowledge and Practice of Health Workers about Healthcare Waste Management in Public Health Facilities in Eastern Ethiopia. J Community Health. 2019;44(2):284–91. https://doi.org/10.1007/s10900-018-0584-z
20. Heo M, Kim N, Faith MS. Statistical power as a function of Cronbach alpha of instrument questionnaire items. BMC Med Res Methodol. 2015, 14;15:86. https://doi.org/10.1186/s12874-015-0070-6
21. El-Mouhdi K, Chahlaoui A, Boussaa S, Fekhaoui M. Sand Flies Control: A Review of the Knowledge of Health Professionals and the Local Community, Province of El Hajeb, Morocco. Int J Environ Res Public Health. 2020;17(22):E8448. https://doi.org/10.3390/ijerph17228448.
22. Saberi S, Zamani A, Motamedi N, Nilforoushzadeh MA, Jaffary F, Rahimi E, et al. The Knowledge, Attitude, and Prevention Practices of Students Regarding Cutaneous Leishmaniasis in the Hyperendemic Region of the Shahid Babaie Airbase. Vector-Borne Zoonotic Dis. 2012; 12(4):306–9.

https://doi.org/10.1089/vbz.2010.0259

23. Mounia A, Mohamed E, Mohamed H, Samia B. A Community Based Survey of Knowledge, Attitudes, and Practices Concerning Leishmaniasis in Central Morocco. J Community Health. 2022;1–11. https://doi.org/10.1007/s10900-022-01126-z
24. Alidosti M, Heidari Z, Shahnazi H, Zamani-Alavijeh F. Behaviors and Perceptions Related to Cutaneous Leishmaniasis in Endemic Areas of the World: A Review. Acta Trop. 2021; 223:106090. https://doi.org/10.1016/j.actatropica.2021.106090
25. Ruoti M, Oddone R, Lampert N, Orué E, Miles MA, Alexander N, et al. Mucocutaneous leishmaniasis: knowledge, attitudes, and practices among paraguayan communities, patients, and health professionals. J Trop Med. 2013;2013:538629. https://doi.org/10.1155/2013/538629
26. El-Mouhdi K, Fekhaoui M, Elhamdaoui F, Guessioui H, Chahlaoui A. Knowledge and Experiences of Health Professionals in the Peripheral Management of Leishmaniasis in Morocco (ELHajeb). J Parasitol Res. 2020;2020:8819704. https://doi.org/10.1155/2020/8819704
27. Sanchez J, Orozco L, Buendia J, Munoz G. The validity of a presumptive diagnosis of cutaneous leishmaniasis performed by community health workers in Colombia. Rev Panam Salud Publica-Pan Am J Public Health. 2007;21(6):335–44.
28. Rojas CA, Weigle KA, Barrera L, Collazos C. Surveillance and screening of American cutaneous leishmaniasis by Colombian primary health care workers using a clinical prediction rule. Trans R Soc Trop Med Hyg. 2002;96(4):405–10. https://doi.org/10.1016/S0035-9203(02)90375-5
29. Boussaa S, Pesson B, Boumezzough A. Faunistic study of the sandflies (Diptera: Psychodidae) in an emerging focus of cutaneous leishmaniasis in Al Haouz province, Morocco. Ann Trop Med Parasitol. 2009 ;103(1):73–83. https://doi.org/10.1179/136485909X384910
30. Formation initiale – Doctorat en médecine – Faculté de Médecine. Available from: https://medecine.um6ss.ma/formation-initiale. Accessed in 13/8/2022.
31. Schneitler S, Seebacher J, Matos FB, Aktar I, Lantwin P, Archodoulakis A, et al. Awareness and perceptions of medical students and doctors regarding Tropical Medicine education and training in Europe: An international, online-based survey. Travel Med Infect Dis. 2022;48:102323. https://doi.org/10.1016/j.tmaid.2022.102323
32. Motoya I, Takeda K, Koyama S, Kojima R, Hirakawa Y, Sakurai H, et al. The Characteristics of the Clinical Competence of Novice Physical Therapists and Occupational Therapists at the Time of Hiring in a Single Institution in Japan. Health Prof Educ. 2020;6(4):538–51. https://doi.org/10.1016/j.hpe.2020.04.005
33. Yaghmaei S, Raiesdana N, Nobahar M. Novice nurses' experiences from teamwork in the emergency department: A qualitative content analysis. Int Emerg Nurs. 2022; 61:101116. https://doi.org/10.1016/j.ienj.2021.101116
34. Das VNR, Pandey RN, Pandey K, Singh V, Kumar V, Matlashewski G, et al. Impact of ASHA training on active case detection of visceral leishmaniasis in Bihar, India. PLoS Negl Trop Dis. 2014;8(5):e2774. https://doi.org/10.1371/journal.pntd.0002774
35. Kashfi SM, Khani Jeihooni A, Rezaeianzade A. Effect of health workers' training programs on preventive behavior of leishmaniosis based on BASNEF model. J Res Health Sci. 2012 ;12(2):114–8.

تقييم معرفة المهنيين الصحيين بشأن داء الليشمانيا في وسط المغرب

مونية امان [1*]، زهير دردونة [1]، محمد الشكيري [1.2]، محمد الحافظي [1]، سامية بوساع [1.3]

[1] مختبر التكنولوجيا الحيوية الميكروبية والعلوم الزراعية والبيئة، كلية العلوم السملالية، (BioMAgE)، وحدة البحث المسمى CNRST N°جامعة القاضي عياض، مراكش، المغرب

[2] وحدة الوبائيات والطب الحيوي، مخبر العلوم وتقنيات الصحة، المعهد العالي للعلوم الصحية، جامعة الحسن الأول سطات، المغرب

[3] المعهد العالي للمهن التمريضية وتقنيات الصحة، وزارة الصحة والحماية الاجتماعية، الرباط، المغرب.

Received: August 20, 2023

Accepted: February 5, 2024

DOI: https://doi.org/10.35516/jmj.v59i2.1644

الملخص

الخلفية والاهداف : تهدف هذه الدراسة إلى تقييم معرفة المهنيين الصحيين المغاربة فيما يتعلق بالبرنامج الوطني لمكافحة داء الليشمانيا.

منهجية الدراسة : هذه دراسة استكشافية مقطعية أجريت بمنطقة مراكش آسفي. تم جمع البيانات من 402 شخص موزعين بين أطباء, ممرضين, قابلات وتقنيي الصحة العاملين في مؤسسات الرعاية الصحية في القطاع العام. من خلال استبيان تم إجراؤه ذاتيًا مستمد من المعارف المتعلقة بالبرنامج الوطني لمكافحة داء الليشمانيا حول: أ) المعرفة الأساسية بداء الليشمانيا ومظاهره السريرية؛ ب) دورة التنقل؛ وج) استراتيجيات الوقاية ومواكبة الحالات. تم تحليل النتائج بواسطة برنامج SPSS الإصدار 26 باستخدام نموذج الانحدار اللوجستي ثنائي المتغير ومتعدد المتغيرات.

النتائج: على العموم، كانت المعارف المتعلقة بداء الليشمانيا غير كافية. أوضحت هذه الدراسة أن المعارف الجيدة للعاملين في مجال الصحة حول المواكبة والوقاية كانت مرتبطة بشكل إيجابي بالأطباء، والعمل في المناطق التي تعتبر بؤرا للوباء ، ثم خبرة العاملين الصحيين علاقة بداء الليشمانيا ، بينما يواجه القابلات خطر عدم الحصول على مستوى جيد في هذه الفئة من المعارف. علاوة على ذلك، كان الأطباء والمهنيون العاملون في المناطق الموبوءة أكثر عرضة لامتلاك معارف أساسية جيدة بشأن داء الليشمانيا، على عكس القابلات. وأخيرا ارتبطت المعارف الجيدة فيما يتعلق بانتقال العدوى بشكل إيجابي بالتدريب المستمر.

الاستنتاجات: يقترح هذا البحث تطوير برنامج تدريب أولي أساسي وتدريب مستمر يتكيف مع احتياجات المهنيين الصحيين.

الكلمات الدالة: داء الليشمانيا، المهنيون الصحيون، المعرفة، الخبرة، التدريب، المغرب.