International Journal of Public Health Science (IJPHS)
Vol. 14, No. 3, September 2025, pp. 1210~1220
ISSN: 2252-8806, DOI: 10.11591/ijphs.v14i3.25942

Bacterial meningitis knowledge, attitude, and practice study among parents: a cross-sectional study

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Article Info

Article history:

Received Sep 23, 2024
Revised Jan 20, 2025
Accepted Mar 6, 2025

Keywords:

Bacterial meningitis
Infection
KAP study
Morocco
Public perception
Purulent

ABSTRACT

In Morocco, bacterial meningitis has consistently posed a significant public health challenge. Addressing this issue requires a deeper understanding of public perceptions to enhance awareness and prevention efforts. This quantitative cross-sectional study, conducted in health facilities in the Marrakech-Safi region from May 2022 to January 2023, employed Cronbach's Alpha with a reliability score of 72% to analyze the association between knowledge levels and various factors. The research revealed that the majority of participants were aged between 20 and 30 years (51.8%) and female (64.4%). The term most commonly used by Moroccans to describe purulent meningitis was “bad fever” (Skhana lkhayba), with 68.8% using this term. Additionally, 82% of participants had an average level of knowledge about the disease. Analysis indicated that families with four children demonstrated a higher level of knowledge compared to those with fewer or more children ($p = 0.048$). Participants residing in structured housing had a lower level of knowledge than those in unstructured housing ($p = 0.017$). Furthermore, educational attainment at the primary and secondary school levels was significantly associated with knowledge levels ($p = 0.020$ and $p = 0.015$, respectively). Understanding public perceptions and vulnerabilities related to bacterial meningitis can significantly improve disease control and prevention strategies.

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1. INTRODUCTION

Meningitis is a contagious disease defined as an inflammation of the meninges with a human-to-human transmission that occurs as a result of different origins: viral, parasitic, or bacterial [1], [2]. Bacterial meningitis is the most worrying form, with three main bacteria: *Neisseria meningitidis* (meningococcus), *Streptococcus pneumoniae* (pneumococcus), and *Haemophilus influenzae*, which represents a double emergency problem, firstly, because of its high risk of contagion, which can cause epidemics anywhere in the world, making it a major public health problem [3], [4], and secondly, because of its high fatality rate, especially in infants and young children [5]-[7]. According to Global Burden Disease (GBD) in 2019, there were 2.51 million new cases of meningitis of all ages reported worldwide. Of these identified cases, children under 5 years of age are the most exposed to this disease, with an incidence of 1.28 million (51%) and a

mortality rate of 112,000 (47%) [8]. These figures vary according to country and socioeconomic level, which differ between developed and underdeveloped countries [8].

For countries in North Africa and the Middle East, the incidence was 129,000 per in 100,000, and mortality was 6280 per in 100,000 [8]. For Morocco in 2016, mortality was 586 with 46013 disability-adjusted life-years (DALYs) [9]. The latest publication from the Moroccan DELM shows an incidence of 1.8 per 100,000 in 2021 compared with 1.2 per 100,000 inhabitants in 2020 for all forms of meningitis (MTCF) [10], [11]. Similarly, a study carried out during the COVID period in Morocco showed that the incidence of meningitis was 6 times higher during confinement in the study area [12].

In Morocco, bacterial meningitis has always been a public health problem, with meningococcal meningitis in the first place. Since 1967, it has been a notifiable disease [13]. Purulent meningitis is the cause of a worrying annual mortality rate, especially in young children, as in 2020, the case-fatality rate for all forms of meningitis (MTFC) will be 11.2% [10].

In addition, purulent meningitis is more common in developing countries with a higher risk of mortality compared to developed countries [8] and [14]. Among the most important risk factors leading to invasive meningococcal disease are living in overcrowded environments, low socio-economic status, viral respiratory infections, and a particular climatic context (dry season, sandstorms) [15]-[17]. Effectively combating meningitis requires a comprehensive understanding of the disease, as incomplete knowledge significantly contributes to its mortality and morbidity rates [5], [18]. Additionally, parents' inadequate understanding of the disease can jeopardize their child's life and exacerbate the burden of this infection on both the family and society.

Limited research has explored the populations' beliefs and perceptions about the disease. A case-control study in Ghana assessed awareness of meningitis symptoms, health-seeking behaviors, and treatment knowledge [19]. Similarly, Mueller *et al.* [20] conducted a quantitative study in Bobo-Dioulasso, Burkina Faso, examining knowledge, beliefs, and preventive practices related to meningitis among young adults. A qualitative study in Kete-Krachi, Ghana, using the health belief model (HBM), explored participants' perceptions and actions within their specific context [21]. Building on Mueller's research, this study uniquely focuses on parents and is conducted outside the meningitis belt, addressing critical gaps in the literature. This focus is particularly relevant given the potential expansion of the African meningitis belt into new regions, prompting the need for revised health policies to strengthen prevention and treatment efforts [22].

A thorough understanding of the community's knowledge about the disease can help healthcare providers target interventions more effectively and address the influence of beliefs on health-seeking behaviors [23], [24]. This research aims to bridge gaps in the Moroccan population's understanding of bacterial meningitis and develop health plans tailored to community needs. These efforts are expected to reduce mortality and sequelae in children, ultimately improving their quality of life. Although official guidelines for diagnosing and treating meningitis in children and adults exist, there is no data on the Moroccan population's perceptions and beliefs about this disease. Therefore, the objective of this study is to evaluate the perceptions and knowledge of the population consulting health services about bacterial meningitis in Morocco.

2. METHOD

2.1. Study framework

The study was carried out in the Marrakech-Safi region, which is one of Morocco's 12 administrative regions in central-western Morocco. The region covers an area of 44,301 km² and has a population of 4,520,569 according to the latest population census in 2014 [25]. The study was chosen because of its originality, as it has never been carried out in Morocco, particularly in the Marrakech-Safi region.

2.2. Study design

The present study is a quantitative cross-sectional study that was carried out in health facilities in the Marrakech-Safi region, particularly in rural health centers, communal health centers, and the pediatric emergency department of the Mohamed VI University Hospital, between May 2022 and January 2023, to determine and evaluate the knowledge and perceptions of the population, and more specifically parents, in this region about bacterial meningitis.

2.3. Population and inclusion criteria

Participants were recruited using convenience sampling, which is most suitable for studying people's perceptions and attitudes [26] at different health establishments in the Marrakech-Safi region. However, the choice of population was focused on parents, given the high risk of mortality and morbidity for children, especially young children, due to bacterial meningitis. This study included all parents who visited to consult,

receive care, or administer a vaccine to their child and who voluntarily agreed to participate. Conversely, parents who declined to take part in the study were excluded.

2.4. Sampling and data collection

The data collection tool was a questionnaire with 2 sections: i) characteristics of the population, and ii) knowledge about meningitis in general, its clinical signs, and its risk factors. This tool was inspired by a validated questionnaire on knowledge and beliefs about bacterial meningitis in Africa [20] and adapted to the Moroccan context. This questionnaire was developed in French and then translated into Arabic and was tested with 20 people. However, the reliability of the questionnaire was verified using Cronbach's Alpha test, which is of the order of 72%.

The questionnaire was administered with the assistance of an illiterate person in the study area. A group of health professionals working in these establishments was able to collect the data.

Sampling: The total sample size was calculated using Cohen's D formula:

$$n = \frac{(t^2 \times p(1-p))}{m^2} \quad (1)$$

where n = required sample size, t = 95% confidence level (standard value 1.96), p = estimated prevalence, m = 5% margin of error (standard value 0.05). The recommended sample size is therefore about 384. It is important to note that during data processing, we eliminated incomplete questionnaires, which reduced our sample to 295.

2.5. Statistical processing and analysis

The data collected were entered and organized in an Excel file. They were then analyzed using descriptive statistics, using frequency, mean, and standard deviation to determine the perceptions and characteristics of the population. On the other hand, a bivariate analysis and an ordinal regression were used to assess the participant's level of knowledge. To determine the level of knowledge, we opted for the following method to adapt it to the Likert scale:

- Calculate the average (A) and the standard deviation (SD) of the scores obtained
- Calculate A-SD and A+SD
- Assign each participant the appropriate level (low, medium, or good), depending on:
- Score <A-SD ------> low knowledge
- A-SD Score A+SD ------> average knowledge
- Score > A+SD -----> good knowledge

Thus, the response variable in this study was knowledge of meningitis in participants. To assess knowledge, 10 questions were used in which a correct answer received a score from an incorrect answer received a score of zero. The scores were summed to give a total score. The highest scores indicate better knowledge. In addition, the SPSS statistical tool (Version 18) was used to study the association between the level of knowledge and the various factors in the study. A p-value was calculated with a significance level of $p = 0.05$.

2.6. Ethical considerations

Throughout the study period, ethical values were respected, mainly informed consent and respect for anonymity. Similarly, the study was conducted after obtaining authorization from local and regional health services. The study was conducted following the Helsinki Declaration.

3. RESULTS AND DISCUSSION

WHO, together with its partners around the world, has developed a roadmap to defeat meningitis by 2030, based on five pillars: epidemic prevention and control; diagnosis and treatment; disease surveillance; support and care for people affected by meningitis, and finally, awareness and dialogue. Thus, this study aligns with the WHO goals related to the fifth pillar [27].

3.1. Socio-demographic characteristics of participants

A total of 295 individuals participated in the study, with an average age of 36.8±16.2 years. The sociodemographic characteristics of the participants are detailed in Table 1. The findings indicated a notable predominance of females, comprising 64.4% of the sample. Nearly half (47.5%) of the respondents were married, while only 1.7% were single mothers. Single-parent families were more common (52.5%) compared to nuclear families (47.5%). The predominance of women (64.4%) highlights the significant responsibilities

they bear, particularly in child-rearing. Economic stability and partnership are crucial for better health outcomes, but single motherhood, especially among women, often exacerbates inequalities [28]-[30]. These mothers face the dual challenge of raising a child alone and managing all aspects of childcare [31], [32].

Furthermore, the most represented age group is 21 to 30 years with a percentage of 31.5% and the least represented is 41 to 51 years with a percentage of 11.9%. In terms of the study population, the results show that higher education is the most dominant, with a rate of 39.7%, while primary education is the least represented, with a rate of 14.9%. There is a significant illiteracy rate of 20% in our study. In terms of living conditions, over half (64.1%) were of urban origin, and 82.4% resided in structured housing. The majority of respondents were housewives (31.9%), while only 3% were retired as shown in Table 1. This urban predominance contrasts with data from the High Commission for Planning in 2020, which reported that the Marrakech-Safi region is predominantly rural, with 57% of the population living in rural areas compared to 43% in urban areas [25]. The province of Marrakech hosts the majority of the region's hospitals (47%) which could contribute to uneven healthcare access between urban and rural regions. The 2020 report from the Haut-Commissariat au Plan also highlighted that the rural population in the region faces significant challenges in accessing essential medical care [25]. In this research, higher education is the most common level of education (39.7%). However, when combining those with only primary education and those who are illiterate, a notable (34.9%) of the population has a low level of education.

In addition, there is a preponderance of non-earners (58.4%) (housewives, students, unemployed) and single parents. All these factors represent an important environmental risk factor for purulent meningitis, as many studies have shown that people with a low socio-economic status and a low level of education are at greater risk of contracting meningococcal disease than those with a high socio-economic status [16], [33].

Table 1. Characteristics of participants

Variable		N	%
Age (Moyen ± ET)	36.8 ± 16.2		
Gender	Female	190	64.4
	Male	105	35.6
Age range	<20 years	42	14.2
	21-30 years	93	31.5
	31-40 years	60	20.3
	41-51 years	35	11.9
	> 60 years	65	22.0
Level of education	Illiterate	59	20.0
	Primary	44	14.9
	Secondary	75	25.4
	Superior	117	39.7
Living environment	Urban	189	64.1
	Rural	106	35.9
Type of habitat	Structured	243	82.4
	Unstructured	52	17.6
Family situation	Married	140	47.5
	Single	110	37.3
	Widower	22	7.5
	Divorced	18	6.1
	Single mother	5	1.7
Professional activity	Housewife	94	31.9
	Student	74	25.1
	Civil servant	65	22.0
	Sales	55	18.6
	Without	4	1.4
	Retired	3	1.0

3.2. People's perceptions and knowledge of the disease, its severity, and symptoms

Analysis of the results concerning the population's perceptions and knowledge of the disease, its severity, and symptoms as shown in Table 2 reveals that the name most commonly attributed to meningitis in Morocco is "Skhana lkhayba", which in Arabic means "bad fever", with a rate of 68.8%. In addition, 90.5% of respondents viewed bacterial meningitis as a serious illness, and 87.5% described it as acute. The symptoms mentioned varied, but the most commonly recognized were fever, headache, and limb rigidity predominating (62.7%, 43.4%, and 43.1%, respectively). This study indicates that the Moroccan population often refers to meningitis using traditional terms. Specifically, 68.8% use the terms "Skhana lkhayba" (acute fever), "Chem" (contracted by the wind) (16.3%), "Al honk tayih" (stiff neck) (6.8%). We can therefore propose that this difference in naming stems from the clinical symptoms of purulent meningitis characterized by the triad (meningitis and stiff neck) [34]. For CHEM this aspect takes its source from the environment or

the incidence of bacterial meningitis which is the highest during the dry season when there is nasopharynx irritation [35], [36]. This coincides with Bouma's remarks in 2012, which states that the popular appointments of bacterial meningitis originate from several social interpretations related to the etiologies of meningitis [37]. Mueller et al add that in terms of social representations, the term Al Honk Tayih (stiff neck) is attributed specifically to pneumococcal and meningococcal meningitis [20]. 90.5% were aware of the seriousness of purulent meningitis and 87.5%. Identified it as an acute illness. Also, in another study conducted in Italy and Canada, most parents were aware of the risk of meningitis as a contagious infection, especially for their children [38], [39]. For knowledge of the symptomatology, most have spread correctly. This is due firstly to its contagiousness and its high risk of morbidity mortality because, despite its low incidence, it is fatal for children, as in 2018 it was the 10th leading cause of death among children under 5 years old [8], [40]. For this reason, it is crucial that parents are well-informed about this infection.

Our results show that more than half 164 (55.6%) believe bacterial meningitis can be contracted anywhere, while 203 participants (68.8%) perceive the risk to be similar in both urban and rural areas. The two factors revealed to be most responsible for the risk of bacterial meningitis are dirt and sunshine (47.8% and 40% respectively). In addition, 67.6% of participants identified poor hygiene as a contributing factor. Meningitis is a human-to-human transmission disease and contamination requires direct contact [2], [41], which makes the spaces congested and poorly ventilated, an environment conducive to the spread of the disease. At the level of our study, only 2 people (0.7%) identified it as a factor responsible for the transmission of the disease, while 67.8% stipulated hygiene as a source of transmission. This indicates a lack of sufficient awareness about the transmission of the disease, highlighting the need for increased educational efforts.

Table 2. Popular names for meningitis and what people know about it

Question	Answers	N	%
Popular names for meningitis	Skhana lkhayiba	203	68.8
	Chem	48	16.3
	Al honk tayih (Raideur de la nuque)	20	6.8
	IltihabSahaya	11	3.7
	I don't know	7	2.4
	Other	6	2.0
Do you think meningitis is a serious disease?	Yes	267	90.5
	No	28	9.5
What kind of disease do you think meningitis is?	Acute	258	87.5
	Chronicle	37	12.5
If yes, what are the symptoms of meningitis?	Fever	185	62.7
	Severe headaches	128	43.4
	Rigidity of the limbs	127	43.1
	Vomiting	105	35.6
	Stiff neck	97	32.9
	Loss of appetite	90	30.5
	Cyanosis	2	0.7
	Diarrhea	2	0.7
	Fatigue	2	0.7
	Photophobia	1	0.3
Where do you think people contract meningitis?	Moorish bath	71	24.1
	Closed areas	73	24.7
	Overcrowding	92	31.2
	All the places	164	55.6
Are there certain regions that are more at risk of meningitis?	Urban area	34	11.5
	Rural areas	58	19.7
	The two	203	68.8
Which of the following do you consider to be a direct factor in meningitis?	Dirt	141	47.8
	Sun	118	40
	Wind	31	10.5
	I don't know	5	1.7
In your opinion, meningitis is caused by:	Poor hygiene	200	67.8
	Lack of ventilation	71	24.1
	Type of power supply	59	20.0
	Polluted water (sewage)	48	16.3
	Exposure to the sun	10	3.4
	I don't know	8	2.7
	Viruses or bacteria and microbes	6	2.0
	Contact with a sick person	2	0.7
	Climate change	2	0.7
	Dentition	1	0.3
	Non-vaccination	1	0.3

Furthermore, only 0.3% of respondents mentioned non-vaccination as a risk factor, despite it being a primary and effective preventive measure against bacterial meningitis [23]. Vaccination has significantly altered the epidemiology of the disease and reduced its incidence, underscoring the importance of raising awareness about vaccines as a key preventive strategy. According to the research, the two factors most implicated in the risk of bacterial meningitis are dirt and sunshine (47.8% and 40%, respectively), which aligns with existing literature. High levels of dust, strong winds, elevated temperatures, and low humidity can damage the nasopharyngeal mucosa, increasing susceptibility to purulent meningitis [42], [43]. When combined with crowded living conditions, these factors can lead to an outbreak [40]. Thus, our population is aware of the impact of climatic conditions on the spread of infectious diseases like bacterial meningitis.

3.3. Assessment of the population's knowledge of meningitis disease

3.3.1. Level of public awareness of meningitis

Assessment of the level of knowledge in Figure 1 showed that the score ranged between 0 and 17, and the average knowledge score was 8.45. Furthermore, only 5% of respondents had a good knowledge of meningitis, compared with 82% of participants with an average level of knowledge of the disease and 13% with a low level, as shown in Figure 1.

Conversely, the assessment of the population's level of knowledge about meningitis showed that 82% had an average level of knowledge about the disease, and 13% had a low level. This lack of comprehensive understanding may be attributed to some inconsistent responses concerning prevention, transmission, and risk factors; for example, 20 respondents incorrectly classified purulent meningitis as a benign infection. Similarly, a study carried out in Italy on the evaluation of parental approaches to meningococcal serogroup B vaccines [44] showed that 71% of the parents questioned said they did not know about bacterial meningitis, while in another study only 34% said they had information about its etiology. Another study on parents' knowledge and attitudes towards meningococcal infections and vaccination in Turkey found that 27% of parents were aware of meningococcal diseases, and 25% knew about at least one meningococcal vaccine [45]. These factors highlight the fact that bacterial meningitis remains insufficiently understood, indicating a need for enhanced education and awareness.

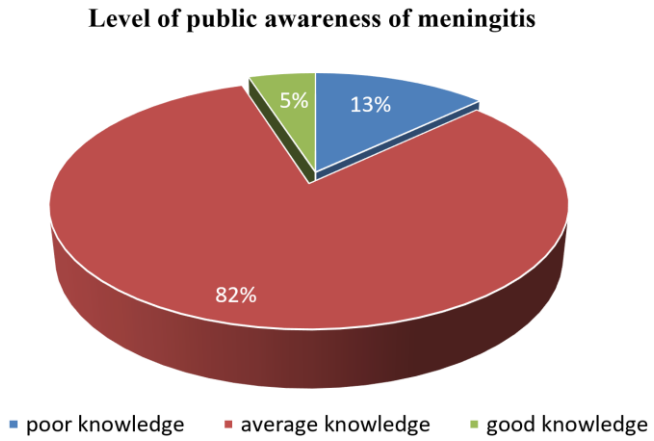

Figure 1. Level of knowledge of the population according to the Likert scale

3.3.2. Determining factors associated with people's knowledge

An analysis of the correlation between social factors and the level of knowledge indicates that age, sex, function, and family status were not associated with the level of knowledge, are shown in Table 3. However, the level of education, type of housing, and the number of children were associated with the level of knowledge, exhibiting a negative estimation value. Participants with 4 children had a higher level of knowledge than parents with fewer or more children ($p = 0.048$). This may be because families with multiple children are at a higher risk of encountering the disease or having a relative contract it. This increased risk of exposure likely leads to greater awareness. This finding aligns with studies indicating that overcrowded and poorly ventilated living conditions promote the rapid spread of purulent meningitis [46], [47].

Participants living in structured housing had a lower level of knowledge than those living in unstructured housing ($p = 0.017$). Housing type also impacts knowledge levels. Participants residing in structured housing had less knowledge about meningitis compared to those in unstructured housing

(p = 0.017). This is in line with the hypothesis of the family with 4 children since a structured home has good ventilation and better hygiene, which is associated with studies that have established that promiscuity in the home and a low socioeconomic level are important risk factors that weaken immunity and predispose people to be infected by bacterial meningitis [48], [49].

Both primary and secondary school levels have a significant association with knowledge level (p = 0.020, p = 0.015) and negative estimates. This suggests individuals with primary or secondary education tend to have more knowledge. This finding, where lower levels of education are linked to greater knowledge, contrasts with results from other studies conducted in Australia, Italy, and the United States. These studies show that higher educational levels correlate with better knowledge of bacterial meningitis [33], [38], [50]. Additionally, some research indicates that bacterial meningitis incidence is higher among individuals with lower socioeconomic status, which is often linked to lower educational levels [33]. This discrepancy can be explained by the fact that individuals with higher education levels are more likely to use information technology (IT) tools to access health information and manage disease risks effectively. This is supported by the belief that higher education enhances access to health information and motivation [51].

The study provided new insights by identifying, for the first time, the popular names used in Morocco to describe bacterial meningitis, which are rooted in the disease's symptomatology, consistent with Mueller's findings [20]. It also revealed an unexpected relationship between knowledge and educational level or housing conditions ($p<0.05$). Contrary to prevailing research [33], [38], [50], the study found that individuals with lower education levels, families with 4 children, and those living in informal housing had greater knowledge of the disease, likely due to experiential learning driven by their increased exposure to infection risks from socioeconomic challenges and overcrowding. Despite this awareness, significant gaps persist, particularly in understanding the role of vaccination in preventing the disease. These findings highlight the need for further research into public perceptions of the bacterial meningitis vaccine to inform targeted interventions.

Table 3. Ordinal regression study between level of knowledge and the various factors in the study

Parameter estimates		Estimate	Std. error	Wald	df	Sig.	95% confidence interval	
							Lower bound	Upper bound
School level	[Illiterate]	-0.866	0.762	1.293	1	0. 256	-2.359	0.627
	[Primary]	-1.431	0.613	5.446	1	0. 020	-2.632	-0.229
	[Secondary]	-1.364	0.558	5.974	1	0.015	-2.457	-0.270
	[University]	0[a]	.	.	0	.	.	.
Gender	[Female]	-0.096	0.391	0.060	1	0.806	-0.861	0.669
	[Male]	0[a]	.	.	0	.	.	.
Age	Under 0 to 30 years	22.765	4564.685	0.000	1	0.996	-8923.853	8969.382
	Over 30 years old	23.709	4564.685	0.000	1	0.996	-8922.909	8970.326
Environment	Rural	-0.117	0.431	0.073	1	0.786	-0.961	0.727
	Urban	0[a]	.	.	0	.	.	.
Type of habitat	Unstructured	-1.151	0.484	5.657	1	0.017	-2.099	-0.202
	Structured	0[a]	.	.	0	.	.	.
Number of children	No children	-0.385	1.778	0.047	1	0.829	-3.870	3.100
	1 or 2 children	-0.889	1.778	0.250	1	0.617	-4.374	2.595
	[Children = 2.00]	-1.025	1.759	0.339	1	0.560	-4.473	2.423
	[Children = 3.00]	-1.925	1.697	1.287	1	0.257	-5.250	1.401
	[Children = 4.00]	-2.531	1.751	2.090	1	0.048	-5.962	0.900
	[Children = 5.00]	-1.824	1.637	1.241	1	0.265	-5.033	1.385
	[Children = 6.00]	-0.370	1.591	0.054	1	0.816	-3.488	2.749
	[Children = 7.00]	1.249	2.208	0.320	1	0.572	-3.078	5.576
	[Children = 8.00]	-1.826	2.339	0.609	1	0,435	-6.410	2.758
	[Children = 9.00]	0[a]	.	.	0	.	.	.
Family status	Single	-1.265	1.058	1.431	1	0.232	-3.338	0.808
	Divorced	0.300	0.974	0.095	1	0.758	-1.610	2.209
	Married	0.440	0.860	0.262	1	0.609	-1.246	2.125
	Single mother	-0.607	1.564	0.151	1	0.698	-3.672	2.457
	Widow	0[a]	.	.	0	.	.	.
Occupation (function)	Student	20.530	4751.076	0.000	1	0.997	-9291.407	9332.468
	Housewife	20.583	4751.076	0.000	1	0.997	-9291.354	9332.521
	Civil servant	20.031	4751.076	0.000	1	0.997	-9291.907	9331.968
	Retired	18.816	4751.076	0.000	1	0.997	-9293.122	9330.754
	Without	19.758	4751.076	0.000	1	0.997	-9292.180	9331.696

4. CONCLUSION

This research showed that knowledge of meningitis was better among people with more than 4 children in the family, with a primary school education, and a non-structural dwelling with $p \leq 0.05$, which means that these people are more vulnerable to contracting this disease. In addition, 82% had an average level of knowledge about the disease. A good understanding of the population's perception of and vulnerability to bacterial meningitis will help control the disease and help healthcare providers target specific groups on which to focus. In this way, all future actions will be based on evidence, whether in terms of vaccination, surveillance, or the control of bacterial meningitis. In addition, the study showed that socio-economic and educational factors influence the knowledge of our population, hence the importance of combating social inequalities. Finally, the study identified several areas that warrant further exploration in future research.

This study has several limitations that could affect the validity and generalization of results. First, the elimination of incomplete questionnaires reduced the sample to 295 participants, which may introduce a non-response bias. The individuals who did not complete the questionnaire may have different characteristics, which could compromise the representativeness of the sample.

FUNDING INFORMATION

Authors state no funding involved.

AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration.

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
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I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

ETHICAL APPROVAL

Ethical values were respected, mainly informed consent and respect for anonymity. Similarly, the study was conducted after obtaining authorization from local and regional health services (reference No. 2692/21). The study was conducted following the Helsinki Declaration.

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [SJ], upon reasonable request.

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