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ORIGINAL ARTICLE

Knowledge about multiple sclerosis among Palestinian community dwellers in the West Bank

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Abstract

Aim Multiple sclerosis (MS) is a central nervous system degenerative disease that can lead to life-long disability. The global prevalence of the disease has risen significantly. However, there is a lack of studies to assess this problem in Arab countries, including Palestine. Thus, this study aimed to determine the Palestinian community dwellers' knowledge about MS in the West Bank.

Subjects and methods A cross-sectional, descriptive correlational design was conducted in Jenin Governorate in West Bank. The data were collected using the Multiple Sclerosis Knowledge Questionnaire (MSKQ-25) in addition to demographic characteristics. A total of 715 community dwellers responded to the study during the period from February to April 2022.

Results Findings demonstrated that Palestinian community dwellers reported a low level of knowledge about multiple sclerosis, in which 74.0% were within the poor knowledge range. There was a significant difference in knowledge about multiple sclerosis according to educational level ($p < 0.05$).

Conclusion Knowledge about multiple sclerosis was below normal among Palestinian community dwellers, thus there is a need to improve their knowledge about multiple sclerosis by implementing various strategies and interventions, including use of public awareness campaigns through various media ensuring reliable information reach the public regarding early detection and management of this serious disease.

Keywords Community dwellers · Knowledge · Multiple Sclerosis · Palestinian

Introduction

Multiple sclerosis (MS) is a long-lasting disease of the central nervous system (CNS). It is considered to be an autoimmune disorder characterized by CNS inflammation, demyelination, axonal injury, and axonal loss (Lemus et al. 2018; Tafti et al. 2022). MS is a progressive disease that affects individuals and leads to lifelong disabilities, which negatively influences productivity and quality of life, in which the physical, psychological, and social life of patients with MS and their families are significantly affected (Farran et al. 2021). Patients with MS presented with variable symptoms and presentation. Different episodes, including optic neuritis and spinal cord syndrome, are common that may lead to progressive disability and even death (Lemus et al. 2018; Tafti et al. 2022).

The exact cause of MS is unknown; however, there are risk factors associated with its occurrence (Tafti et al. 2022). The epidemiological data showed that both environmental and genetic factors play a vital role in the progress of MS; studies suggested that genetic factors increased the risk of developing MS (Parnell and Booth 2017). Additionally, gender has an influencing effect, in which females are twice as likely as males to develop MS (Ghasemi et al. 2017; Walton et al. 2020).

The prevalence of MS has increased globally in recent years, it was 2.1 million people (33 per 100,000) in 2013 (Browne et al. 2014) and 2.8 million people lived with MS worldwide (35.9 per 100,000 population) in 2020, which increased by 30% in comparison with 2013 (Walton et al.

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2020). The prevalence of MS is not evenly distributed across the globe. MS affects more than 2 million people around the world, with an estimated overall prevalence of 51.52/100000 in the Middle East alone (Heydarpour et al. 2015). Most countries from the MENA (the Middle East and North Africa) region fall in the low-to-moderate MS prevalence zone, with prevalence rates slightly lower than Southern Europe but much higher than sub-Saharan Africa (Yamout et al. 2020).

Despite increasing research and clinical attention, MS is a major health issue. There is no effective curable management of patients with MS. Current treatments are divided into two categories: drugs that control the disease progress and other treatment to manage the clinical symptoms (Ghasemi et al. 2017; Farran et al. 2021; Lemus et al. 2018). Several strategies are used to diagnose MS including detailed health history and careful neurologic investigations (Ömerhoca et al. 2018). Recent literature has shown that early treatment could delay the development of MS, slow its progression, and minimize the consequences of disability (Kavaliunas et al. 2020; Wiendl and Meuth 2015; Zarei et al. 2019).

MS is a significant health issue due to a deficiency of knowledge and understanding about the nature of this disease (Farran et al. 2021). Previous studies conducted internationally revealed that the Turkish community had poor knowledge and understanding of MS (Kabay et al. 2014). An Iranian study found that pregnant women had moderate knowledge of MS (Abbasi et al. 2018). Regarding Arab countries, a previous study conducted among the public Saudi Arabian population demonstrated that 74% of participants experienced inadequate knowledge about MS and health education (M = 8.74, SD = 2.7) (Amer et al. 2016). Another study conducted among the Saudi community found that people demonstrated poor knowledge of MS (M = 7.42, SD = 4.568) (Farran et al. 2021). Al-Hamdan et al. (2021) found that 68.3% of the Saudi community demonstrated poor knowledge of MS. Additionally, Hudaif et al. (2014) found that the Saudi population had poor knowledge of MS.

A lack of knowledge about MS may lead people to be slow about seeking assistance and miss the opportunity for the best disease results (Amer et al. 2016). Literature has suggested that health education about MS improves knowledge, which could assist in early detection and management (Al Wutayd et al. 2018; El-Sherbiny et al. 2020; Köpke et al. 2014). There are many factors correlated with knowledge levels about MS among the population, including gender (Al-Hamdan et al. 2021; Hudaif et al. 2014), educational level (Amer et al. 2016; Farran et al. 2021; Hudaif et al. 2014).

In Palestine, which is one of the Arab countries, the national reports suggested that there is an alarming incremental increase in the trend of MS, whereas the incidence of MS was 1.96 (95% CI = 1.55–2.36) cases per 100,000 in 2010, rising to 3.56 (95% CI = 2.82–4.29) cases per 100,000 in 2019 (2.47 for males and 4.66 for females) (Afifi et al. 2021). Recent epidemiological studies showed increasing rates of MS in Palestine and the number of cases continues to rise, which reflected the advances in diagnostic modalities and easier access to specialized centers (Abuawad et al. 2022; Afifi et al. 2021).

However, this disease is unrecognized among the Palestinian population due lack of awareness and knowledge about this disease. Additionally, due to cultural and religious beliefs, the population refers to religious management and interventions such as a Shaikh or a priest instead of advanced medical treatment. There is a lack of studies about MS related to knowledge, management, and treatment. This study will be one of the first studies examining knowledge about MS among Palestinian community dwellers, which could provide baseline data about this disease for decision-makers and healthcare professionals to develop interventions and strategies to enhance population knowledge about this disease that may assist in early intervention of MS and better health outcomes. Thus, this study aimed to determine the levels of knowledge about MS among Palestinian community dwellers and correlating factors of MS.

Methods

Design, setting, and sampling

A cross-sectional, descriptive correlational design was adopted to achieve this study during the period from February to April 2022. Jenin Governorate, which covers the northern part of the West Bank was selected. According to the Palestinian Central Bureau of Statistics 2021. The total population was 338,919 (Palestinian Central Bureau of Statistics 2021).

A cluster sampling method was used to perform this study, in which Jenin Governorate was divided into three zones (North, south, and rural areas). Then, two areas from each zone were selected according to the census. A convenience sampling method was utilized to recruit participants. G* power analysis software program version 3.0.10 was adopted to estimate the proper sample size, assuming an effect size of 0.1, $p = 0.05$, and power 0.85, so that the required sample size was 900. The sample was increased to 990 to account for missing and incomplete questionnaires.

The participants were invited to participate if their ages were above 18 years, able to read and write Arabic, able to provide informed consent, and live in the selected areas. The individuals who were experiencing MS and healthcare professionals were excluded.

Study measurements

A self-structured questionnaire was developed to collect data. The study utilized two questionnaires, demographic data and the MS Knowledge Questionnaire (MSKQ). The demographic information questionnaire was developed by the researchers based on the existing literature. It involved age, gender, residence, employment, and educational level.

MSKQ was developed by Giordano et al. (2010) and used to collect data about knowledge of MS. The data were collected through participants' responses using the 25 items distributed on the following areas: nature of the disease (7 items), prevalence and predisposing factors (4 items), causation and genetic factor (3 items), diagnostic method and procedure (7 items), and types and treatment (4 items). This questionnaire consists of multiple choice questions, in which the participants were provided instructions to choose one of the three possible answers which were considered/known as the correct answer. The score was attained by summing the number of correct answers, in which the correct answer was counted as one point and the scoring system ranged from 0 to 25. In the case of a missing answer, the response was considered incorrect, while in the case of two or more missing answers, the MSKQ score is not granted. The mean (M) and standard deviation (SD) for all scale was also calculated, whereas a higher mean reflected better knowledge. The original English tool is valid and reliable, whereas it has good validity and acceptable internal consistency (0.76) (Giordano et al. 2010). The Arabic version that is valid and reliable was used in this study (Farran et al. 2021). Internal reliability using Cronbach's alpha was calculated in the current study on the total sample, and it was 0.78.

Ethical considerations

The permission to perform this study was obtained from Arab American University at Palestine. Patients were requested to provide written consent and were assured that their information would be kept confidential. Participation was voluntary and participants were informed that they could withdraw at any time without any risks. Additionally, the participants were asked to complete the questionnaires in the selected study areas and put them in the boxes in the specified areas in the municipalities once completed.

Data collection procedure

The participants were recruited through brochures that were put in the reception areas in the municipalities of the selected areas. The brochures involved information about the study, a request for participants, and contact information for the principal researcher. Potential participants who met the eligibility criteria were invited to participate in this study after a full explanation of the study's aims. The questionnaires were distributed and collected by two researchers in the municipalities. The participants were asked to return the filled questionnaires back and put them in a small box placed at the center of each targeted location. The two researchers collected the completed questionnaires from the boxes by the end of each working day (daytime).

Statistical analysis

Statistical analysis was performed using IBM SPSS 23.0 Statistics. Descriptive statistics, including frequency, percentage, mean, and standard deviations, were utilized to describe study variables. Inferential tests involving ANOVA, independent t-test, and chi-square test were used to examine the differences between the knowledge scores of different participants according to demographic characteristics. The level of significance was set at a p-value < 0.05.

Results

A total of 990 questionnaires were distributed to the participants and 715 questionnaires were returned with a response rate of (72.2%). Approximately 63.0% of the participants were aged between 21 and 30 years, with a mean (SD) of 27.4 (10.8) years. A total of 52.4% of the sample was females, 52.4% of them live in a village, 60.0% were employed, and 50.8% had a bachelor's degree (Table 1).

Our study showed that the average score of the MSKQ was 8.84 (SD = 1.7) with a range of minimum to maximum was 3 to 21, where a higher value means better knowledge about MS. Out of the 715 participants, 74% (n = 529) were within the poor knowledge range whereas 26.0% (n = 186) reported adequate knowledge about MS.

Concerning the MSKQ, the answers were divided into three categories according to the score as follows: less than 50%, between 50% and 70%, and > 70%. The majority of the participants (82%, n = 586) scored less than 50%, while 4.0% (n = 29) scored > 70%. The most correctly answered questions were Q1 and Q20, while the least correctly answered questions were Q3, and Q17 (Table 2).

The knowledge about MS consisted of five areas, concerning the nature of the disease, our study demonstrated that most participants (52.7%) reported that MS is a disease influencing the CNS, while only 15.2% knew that MS is not a contagious disease. Regarding the prevalence and predisposing factors, 35.5% of the participants correctly answered that pregnancy could have an effect on MS, and 34.4% knew the most affected age. Furthermore, only 6.7% recognized the prevalence of MS in Palestine (Table 2).

With regard to causation and genetic factor, 34% of the participants knew the actual causes of MS, and 31.7% of

Table 1 Demographic characteristics of the participants (*N*= 715)

Variable	n (%)
Age (M = 27.4 Years, SD = 10.8)	
< 20 Years	102 (14.3)
21–30 Years	450 (62.9)
31–40 Years	54 (7.6)
41–50 Years	41 (5.7)
51–60 Years	48 (6.7)
> 60 Years	20 (2.9)
Gender	
Male	340 (47.6)
Female	375 (52.4)
Place of residence	
City	307 (42.9)
Village	375 (52.4)
Camp	34 (4.7)
Employment	
Employed	429 (60.0)
Not employed	286 (40.0)
Educational level	
Secondary or less	86 (12.0)
Diploma	150 (21.0)
Bachelor's degree	363 (50.8)
Higher than a bachelor's degree	116 (16.2)

n, number, %, percentage, M, mean, SD, standard deviation

the total participants knew that MS does not transmit to other family members. Additionally, 29.0% of the participants believed that MS transmits to offspring (Table 2).

Concerning diagnostic methods and procedures, 41.3 % of the participants knew the definite diagnosis of MS, and 39.4% agreed on the frequency of lumbar puncture to better MS disease follow-up. Only 11.4% of the participants confirmed the role of MRI on MS disease follow-up and 13.4% believed in the role of lumbar puncture in MS diagnosis (Table 2).

In regard to the types and treatment, 33.7% of the participants knew the characteristics of "relapsing-remitting" MS, and 23.9% knew that "relapsing-remitting" MS is described as repeated attacks at more or less frequent intervals. Of the total participants, only 13.7% recognized that disease-modifying drugs are effective in relapsing-remitting MS (Table 2).

Table 3 shows that there was a difference in knowledge scores according to educational levels, whereas higher educational levels increased the levels of knowledge about MS ($p < 0.05$). However, there were no differences in knowledge about MS according to other demographic factors ($p > 0.05$).

Discussion

This study is one of the first studies conducted in Palestine to assess the knowledge about MS among community dwellers. Generally, our study revealed a poor base of knowledge about MS among most Palestinian community dwellers. This study result is consistent with previous studies among the population using different measurements in Turkey (Kabay et al. 2014) and Saudi Arabia (Al-Hamdan et al. 2021; Amer et al. 2016; Farran et al. 2021; Hudaif et al. 2014). However, it is lower than a study conducted in Iran which revealed a moderate level of knowledge about MS (Abbasi et al. 2018). This finding might be related to the nature of MS disease in terms of clinical pictures of this disease which are usually invisible and unrecognizable by many people. Moreover, it might be related to Palestinian cultural factors associated with stigma as well as fear of social isolation emerging from social norms that lead patients with MS to deny their illness as well as not inform other people of their illness; therefore, few people know about this disease (Abuawad et al. 2022; Afifi et al. 2021). It may be due to a lack of awareness campaigns regarding this disease among the population.

Our study demonstrated no significant differences in knowledge about MS according to gender, age, employment, and residence, which is consistent with previous studies where no differences were found between knowledge about MS and age (Al-Hamdan et al. 2021; Amer et al. 2016; Farran et al. 2021; Hudaif et al. 2014), gender (Amer et al. 2016; Farran et al. 2021; Hudaif et al. 2014), and employment (Al-Hamdan et al. 2021; Farran et al. 2021). However, earlier studies found significant differences in knowledge about MS according to gender (Al-Hamdan et al. 2021) and employment (Hudaif et al. 2014). This study showed a significant difference in knowledge about MS and educational level, which is consistent with previous literature (Farran et al. 2021; Hudaif et al. 2014). This study's finding might be interpreted as the educational level is a basic factor of knowledge of any disease and its prevention, which encourages community efforts for enhancing knowledge and awareness by developing campaigns taking into consideration the level of education (Al-Hussami et al. 2022; Diaz-Quijano et al. 2018).

Limitations of the study

This study has the following limitations, it was performed in one governorate, which could not represent all Palestinian community dwellers; therefore, future studies should be conducted to include the entire population in different

Table 2 Levels of knowledge about MS among the participants (N= 715)

No	Items	MSKQ score < 50%	MSKQ Score50% to≤ 70%	MSKQ score > 70%	Correct answers n (%)	Level of knowledge
	Total scale	n = 586 (82.0)	n = 100 (14.0)	n = 29 (4.0)	715(100)	
Nature of the disease						
1	MS is a disease of the central nervous system	275 (47.0)	73(73.4)	29 (100)	377 (52.7)	Moderate
2	Composition of the central nervous system	166 (28.3)	60 (60.0)	29(100)	255 (35.7)	Low
4	MS significantly shortens lifespan	152 (25.9)	0 (0)	0 (0)	152 (21.2)	Low
5	MS is an immune system disease	173 (29.5)	40 (40.0)	0 (0)	213 (29.8)	Low
6	MS is a contagious disease	111 (18.9)	0 (0)	0 (0)	111(15.2)	Low
10	MS injures Myelin/axon	97 (16.5)	27(26.7)	12 (40.0)	136 (19.0)	Low
13	Function of Myelin	131 (22.4)	27 (26.7)	0 (0)	158 (22.0)	Low
Prevalence and predisposing factors						
3	Prevalence of MS in Palestine	41 (7.0)	7 (7.0)	(0)	48 (6.7)	Low
11	Age of onset of MS	186 (31.8)	40 (40.0)	23 (80.0)	249 (34.8)	Low
12	Sex difference in MS prevalence	47 (8.0)	40 (40.0)	23 (80.0)	110 (15.3)	Low
23	Pregnancy effect on MS	241 (41.2)	13 (13.3)	0 (0)	254 (35.5)	Low
Causation and genetic factor						
7	Causes of MS	173 (29.5)	47 (46.7)	23 (80.0)	243 (34.0)	Low
8	Transmission of MS to offspring	200 (34.2)	7 (6.6)	0 (0)	207 (29.0)	Low
9	Transmission of MS to other family members	158 (27.0)	40 (40.0)	29 (100)	227 (31.7)	Low
Diagnostic method and procedure						
14	Diagnostic tests of MS diagnosis	158 (27.0)	40 (40.0)	0 (0)	198 (27.7)	Low
15	Role of magnetic resonance imaging (MRI) in MS diagnosis	90 (15.3)	20 (20.0)	0 (0)	110 (15.3)	Low
16	Role of intravenous injection of contrast (Gadolinium) during MRI	62 (10.6)	47 (46.7)	6 (20.0)	115 (16.0)	Low
17	Role of MRI on MS disease follow-up	69 (11.8)	13 (13.4)	0 (0)	82 (11.4)	Low
18	Role of lumbar puncture in MS diagnosis	83 (14.2)	13 (13.4)	0 (0)	96 (13.4)	Low
19	Frequency of lumbar puncture to better MS diseases follow up	275 (47.0)	7 (6.6)	0 (0)	282 (39.4)	Low
20	Definite diagnosis of MS	200 (34.2)	73 (73.4)	23 (80.0)	296 (41.3)	Low
Types and treatment						
21	Characteristics of "relapsing-remitting" MS.	158 (27.0)	66 (66.0)	17(60.0)	241 (33.7)	Low
22	Characteristics of "benign" MS	111(18.9)	47 (46.6)	12 (40.0)	170 (23.8)	Low
24	Curative treatment of MS	145 (24.8)	13 (13.3)	0 (0)	158 (22.0)	Low
25	Types of MS Disease modifying drugs	1 (0.2)	80 (80.0)	17 (60.0)	98 (13.7)	Low

n, number, %, percentage

governorates to generalize findings. Additionally, a cross-sectional study was adopted, which did not examine the cause and effect of the study variables. A convenience sample method was used to recruit the participants which can limit the generalizability of the findings. Additionally, the study was based on self-reported opinions and beliefs during a specific time, which may reflect on the findings.

Conclusion

This study showed poor knowledge about MS among most Palestinian community dwellers. Also, knowledge about MS differed according to educational level. In Palestine where the prevalence of MS is rising, early detection and

Table 3 Differences in MS knowledge levels according to demographic characteristics

Variable	MSKQ score < 50% $n = 586$ (82%)	MSKQ score50% to ≤ 70% $n = 100$ (14%)	MSKQ score > 70% $n = 29$ (4%)	p -value
Age				
< 20 Years	70 (11.9)	27 (27.0)	6 (20.0)	0.84
21–30 Years	374 (63.8)	60 (60.0)	17 (60.0)	
31–40 Years	41 (7.0)	6 (6.3)	6 (20.0)	
41–50 Years	41 (7.0)	0 (0)	0 (0)	
51–60 Years	41 (7.0)	6 (6.3)	0 (0)	
> 60 Years	19 (3.3)	0 (0)	0 (0)	
Gender				
Male	340 (47.6)	289 (49.5)	43 (43.0)	0.41
Female	375 (52.4)	297 (50.6)	57 (57.0)	
Place of residence				
City	307 (42.9)	247 (42.4)	47 (46.6)	0.86
Village	375 (52.4)	304 (51.8)	53 (53.4)	
Camp	34 (4.7)	35 (6.0)	0 (0)	
Employment				
Employed	429 (60.0)	338 (57.7)	73 (73.4)	0.52
Not employed	286 (40.0)	248 (42.4)	27 (26.6)	
Educational level				
Secondary or less	86 (12.0)	75 (12.8)	20 (20.0)	0.04*
Diploma	150 (21.0)	108 (18.4)	33 (33.3)	
Bachelor's degree	363 (50.8)	319 (54.4)	33(33.4)	
Higher than a bachelor's degree	116 (16.2)	84 (14.4)	13 (13.4)	

n, number, %, percentage

*Correlation at $p < 0.05$

timely management of MS needs to be of crucial importance in any efforts to control the MS burden. Thus, health education programs and campaigns regarding MS are essential for enhancing the community awareness level of MS, early detection, etiology, and proper management with the aim of attaining better outcomes and improving the quality of life among patients with MS.

The study might help direct the efforts and plans of the health authorities for enhancing public knowledge about MS disease. Moreover, it highlights the need for further research regarding community awareness of MS to dissect the reasons for poor knowledge on a larger scale inclusive of the larger population.

Authors' contribution **Imad Abu Khader:** Conceptualization; Investigation; Methodology; Project administration; Supervision; Validation; Writing - original draft; Writing - review & editing.

Malakeh. Z. Malak: Conceptualization; Data curation; Methodology; Validation; Writing - original draft; Writing - review & editing.

Mohammed Jallad: Investigation; Validation; Writing - original draft; Writing - review & editing.

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Code availability Not applicable.

Declarations

Ethics approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee (Arab American University at Palestine).

Consent to participate Each participant provided informed consent before beginning the study.

Consent for publication Not applicable

Conflict of interest No potential conflict of interest is reported by the authors.

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