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Research Article

**MUSCULOSKELETAL PAIN IN MULTIPLE SCLEROSIS
PATIENTS IN AL-MADINAH AND JEDDAH CITIES OF SAUDI
ARABIA: A CROSS-SECTIONAL STUDY**Marwa M. Zalat, MD¹, Emad A Fallatah², Bedoor A Fallatah³

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Abstract

Introduction: There is a growing body of evidence that suggests an increased incidence of multiple sclerosis (MS) in Saudi Arabia. Pain is a common phenomenon in MS patients. The most common pain sites are the knees, wrist, and neck.

Objectives: The present study aimed to investigate the prevalence, severity and, distribution of musculoskeletal pain among MS patients in AL-Madinah and Jeddah cities of Saudi Arabia.

Subjects and Methods: A cross-sectional study among patients with an established diagnosis of MS was conducted from January 2016 to July 2017. Random sample selection technique was employed and data were collected by questionnaire and interview. The statistical analysis was carried out using SPSS version 24 for windows.

Results: We retrieved 155 responses from MS patients. Almost 90% of the patients had a relapsing/remittent MS and 59.4% of the included participants completed a university degree. Almost 72% of the included participants reported one or more episode of musculoskeletal pain. The most commonly reported site of pain was the lower back followed by leg and neck regions. The mean pain severity score was 12.67 ± 12.33 , with no statistically significant difference between different types of MS. our analysis showed that the pain severity score was not significantly correlated with any of the social-demographic factors.

Conclusions: The prevalence of musculoskeletal pain among MS patients from Saudi Arabia is high, regardless of the type of MS. Further large-scale studies are needed to investigate the potential predictors of pain in MS patients from Middle East.

Keywords: Multiple sclerosis; Musculoskeletal pain; Survey study; Prevalence.

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INTRODUCTION:

Multiple sclerosis (MS) is a chronic, inflammatory disorder of the central nervous system which associated with a large number of comorbid conditions [1]. According to recent statistics, MS is increasingly become the most common neurological disorder of young adults globally, with more than 400,000 patients in the United States and about 2.5 million MS patients worldwide [2]. In addition to its substantial physical impact, MS was reported to negatively affect the psychosocial and economic status of the patients [3]. Previous reports showed that MS significantly associated with low quality of life and a higher incidence of fatigue and depression [4,5]. Musculoskeletal pain is another important comorbid condition in MS.

Pain can significantly compromise the quality of life of MS patients and limit their daily activities [6]. Moreover, greater pain is associated with increased disability and higher risk of psychological disorders, including depression [7,8]. Regardless of its type, the prevalence of pain among MS ranged from 20% to 80% in the published literature [9]. Musculoskeletal pain is defined as involuntary, intermittent painful muscle contractions, which is not addressed as neuropathic pain [10]. There is a growing body of evidence that linked an increased risk of musculoskeletal pain in MS patients [11,12]. Although the exact mechanism of pain is still unclear, it is suggested that MS lesions affecting motor neurons may result in the muscle spasms, spasticity, and reducing mobility⁹. In a recent cross-sectional study by ShayestehAzar and their colleagues [13] reported a high prevalence of musculoskeletal pain in patients with MS, not relevant to sex or age.

Although the prevalence of MS in the Middle East was reported to be from low-to-medium [14], there is a scarcity in the published literature about the prevalence and severity of musculoskeletal pain among MS patients in the Middle East. The previous report from Iran suggested that 57.5% of MS patients experienced one or more episode of musculoskeletal pain. In the present cross-sectional study, we investigated the prevalence, severity and, distribution of musculoskeletal pain among MS patients in AL-Madinah and Jeddah cities of Saudi Arabia.

MATERIALS AND METHODS:

We followed the recommendations of the STROBE (Strengthening the Reporting of Observational Studies in Epidemiology Statement) guidelines during the preparation of the present study [15].

Study design and settings: A cross-sectional study in two university hospitals in Saudi Arabia was

conducted from January to July 2017.

Participants and Sampling: Random sample selection technique was used to include patients with an established diagnosis of MS in the hospitals under the study. One hundred and fifteen patients were involved in the study after taking their consent and assured them that their information would be held under legal obligations of confidentiality with permission to open their files and know their type of MS, onset symptom, and what medications are given to them currently. The studied subjects were questioned to determine the site and frequency of pain and the severity of the fatigue caused by the pain

Data collection: Data were collected by interview and questionnaire. The questionnaire is divided into four parts: (1) pain severity, (2) pain distribution, (3) pain frequency and (4) fatigue severity. Numeric rating scale questionnaire was used to measure the severity of the pain (from 0 to 4). Thereby, 0 means no pain and 4 the worst pain they could tolerate. Nordic musculoskeletal questionnaire (NMQ-E) was used to determine the distribution of the pain. NMQ consists of questions about the existence and duration of limb pain including neck, shoulders, elbow, wrist, upper back, back, hip, thigh, and knee [16]. To know how much the pain affects their daily activity, a fatigue severity scale that developed by Lauren Krupp [17] was used. We also add a question for pain frequency to correlate it with the pain severity and know if they're significant.

- Ethical approval:

The study was conducted in accordance with the International Conference on Harmonization Good Clinical Practice guidelines, the Declaration of Helsinki, and applicable local regulatory requirements and laws; the study was approved by the institutional review board of the King Fahad Hospital in Madinah and King Fahad and King Abdulaziz University Hospitals in Jeddah. Informed consents were obtained from all the participants after describing the aim of the study. Privacy and confidentiality was assured.

- Financial Support:

This research was funded totally by the authors. We did not receive any form of financial support.

Results:

In the present study, we retrieved 155 responses from MS patients. The mean age of the included patients was 33.9 ± 8.4 , while the majority of the patients (71%) were females. Almost half of the patients were

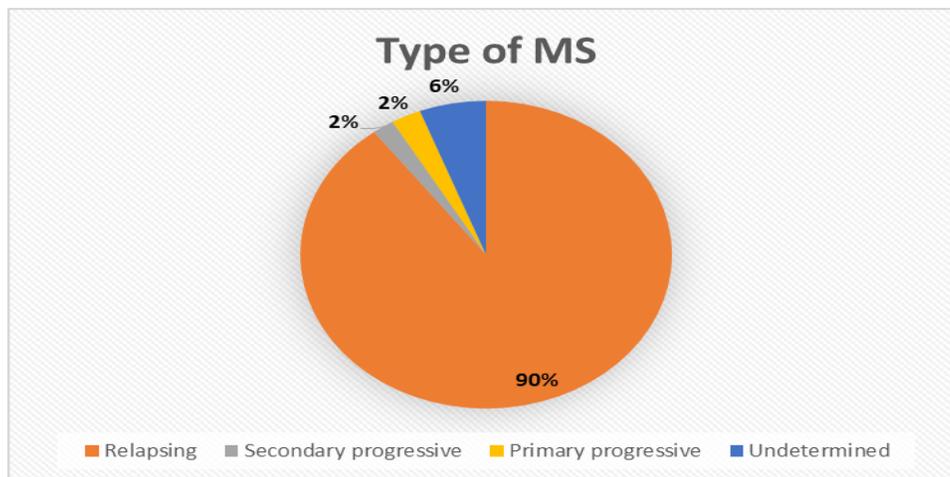
single, and 45% of them were residents of Madinah city. Regarding the educational level, 59.4% of the included participants completed a university degree.

While 90% of the patients had a relapsing/remittent MS (**Figure.1**). Table.1 shows the socio-demographic characteristics of the included participants.

Table 1: The socio-demographic characteristics of the studied subjects.

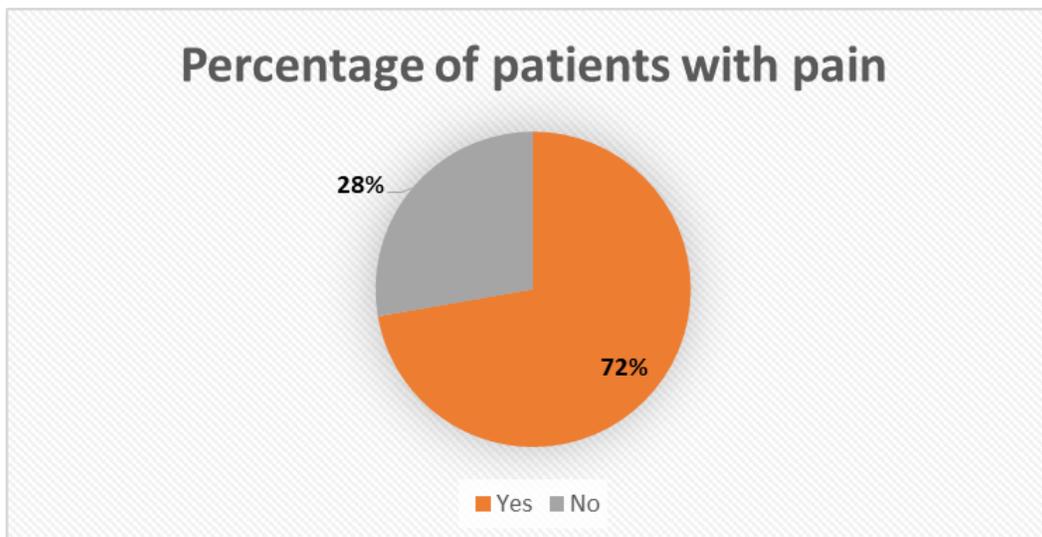
Sociodemographic characteristics	Number (n= 155)	%
Age: Mean (SD)	33.9 (8.4)	
Gender:		
-Male	45	29.0
-Female	110	71.0
Nationality		
-Saudi	144	92.9
-non-Saudi	11	7.1
Social Status		
-Single	75	48.4
-Married	23	14.8
-Divorced/Widow	57	36.8
Residency		
-Jeddah	62	40
-Madinah	71	45.8
-other	22	14.2
Career		
-yes	63	40.9
-no	91	59
Educational status		
- illiterate	3	1.9
-elementary	4	2.5
-intermediate	15	9.7
-secondary	34	21.9
-post-graduate	92	59.4
-higher degree	7	4.5
Total	155	100

Figure 1: Types of multiple sclerosis.



The most common type of MS was relapsing MS (90%) followed by undetermined types (6%) and primary, secondary progressive types (2% and 2% respectively).

Figure 2: Prevalence of musculoskeletal pain in MS patients



Almost 72% of the included participants reported one or more episode of musculoskeletal pain (**Figure.2**).

Table 2: Frequency of the pain among MS patients.

Region	No pain	Twice in year	Twice in month	Twice in week	Daily
Neck	78	21	12	22	22
Shoulder	84	14	16	16	25
Elbow	118	10	12	5	10
Hand	81	12	23	16	23
Upper back	88	16	15	18	18
Middle back	92	20	15	13	15
Lower back	69	16	28	16	26
Thigh	79	16	23	12	25
knee	81	19	17	17	21
Leg	74	14	21	14	32
Ankle	80	12	22	14	27
Chest	112	13	11	7	12
Abdomen	112	12	11	13	7

Table.2 shows the frequency of reported pain among MS patients. The most commonly reported site of pain was the lower back followed by leg and neck regions. Notably, abdomen and chest were the least commonly reported sites that experienced one or more episodes of pain.

Table 3: Pain severity among MS patients

Type of MS	No. of Patients	Mean	Median (IQR)	P-value
Relapsing	139	12.59 (12.16)	10 (2 – 20)	0.937
Secondary progressive	3	13.67 (14.57)	12 (0 -12)	
Primary progressive	4	11.25 (17.57)	4 (0 – 29)	
Undetermined	9	14.22 (14.29)	12 (0 -28)	
Total	155	12.67 (12.33)	10 (1 -21)	

Regarding the pain severity score, patients with undetermined MS had the highest pain score (14.22 ± 14.29), followed by the patients with secondary progressive disease (13.67 ± 14.57). While the patients with the primary progressive disease had the lowest score (11.25 ± 17.57). However, the difference in pain score among different types of MS was not statistically significant (Table.3).

Table 4: The relationship between pain severity and sociodemographic factors.

Variables	Severity Score (Median [IQR])	P value
Gender		0.16
1. Male	6 (0 – 16.5)	
2. Female	11.5 (2 – 23.25)	
Social Status		0.21
1. Single	12 (2 -23)	
2. Married	5 (0 -14)	
3. Divorced	9 (0- 29.5)	
Residency		0.43
1. Jeddah	12 (0 -23.250)	
2. Madinah	7 (2 -17)	
3. Other	16 (3 -25.5)	
Work		0.69
1. Yes	11 (2 -20)	
2. No	8 (0 -23)	
Duration of the disease	0.096*	0.232

* Correlation coefficient (r)

In addition, our analysis showed that the pain severity score was not significantly correlated with any of the social-demographic factors. The duration of the disease was not correlated with the pain severity score as well (Table.4).

DISCUSSION AND CONCLUSION:

In the present cross-sectional study, the prevalence of musculoskeletal pain among MS patients from Saudi Arabia was 72%. Moreover, the pain severity score was high regardless of MS type. The lower back, leg, and neck regions were the most commonly affected sites. None of the collected social-demographic variables in the present study was correlated with pain frequency and severity.

Pain in MS patients was found to affect the quality of life and negatively affect the physical and emotional functions. [6,18 -20]. The prevalence of pain in MS patients is varying widely between 20% to 80% [21-23]. Many studies were conducted to assess pain types and severity related to MS. However, there are various definitions of MS-related pain which vary according to the location, duration, and mechanism of the pain [9]. Musculoskeletal pain is an important comorbid condition in MS. In our study, the prevalence of musculoskeletal pain was strikingly high (72%). In their multicenter cross-sectional study, Solaro and colleagues [24] reported that 43%, of a total 1672 MS included patients, presented with musculoskeletal pain at the time of their assessment. Also, Stenager and colleagues [21] reported that the

prevalence of pain in recently hospitalized patients with MS which was 45%. Meanwhile, other studies assessed the presence of pain within one month of evaluation of MS patients. O'Connor and colleagues [9] reported in their systematic review that 75% (633 patients from a total of 854 of MS patients pooled in the analysis) reported one or more episodes of pain, whether neuropathic or musculoskeletal, throughout a follow-up period of one or more months.

The presence of musculoskeletal pain is not the mere complain of MS patients, the severity of the presenting pain may cause marked disability as well [9]. Previous studies measured the severity of MS associated musculoskeletal pain by numerical rating scales from 0 to 10. [7,25].The intensity of the pain was ranging from 4.8 to 5.8 which indicates that the pain is of moderate intensity [7,25,26]. In the present study, we used a numerical rating scale questionnaire from 0 to 4 to measure the severity of the pain with a total score ranged from 0 to 52. The mean pain severity score was 12.67 ± 12.33 .

In contrast to our study, Svendsen et al. [27] and Kalia et al. [20] reported that the intensity of the pain was only 2.8 which mean that it is mild or average pain respectively. In addition, Research Committee on MS (NARCOMS) survey which was conducted in North American; found that of total 7579 MS patients shared in the survey, 49% of the patients had severe pain, 24% of the patients had moderate pain, and 27% of the patients had mild pain [28]._There are several risk factors associated

with increased prevalence of pain in MS patients such as; prolonged duration of the pain, high severity of the disease, older age, depression, and mental health affection [7,24,25,27]. Although the risk of male and females to be affected by MS are comparable, females have a risk of higher pain severity. Forbes et al. showed that in MS patients there is an interdependent relationship between pain and depression [29]. However, in the present study, none of the collected social-demographic variables was correlated with pain frequency and severity.

MS disease affects badly motor neurons resulting in demyelination of the neurons which in turn leads to intermittent involuntary painful muscle contractions. Most of the patients develop muscle weakness and spasms. Painful tonic spasms is a common type of muscle spasm experienced by MS patients [30,31]. Back pain is a very common among MS patients with prevalence ranging from 10% to 16%. This pain is aggravated by prolonged standing or sitting [24,28]. back pain was found to be a central cause in some studies [12] and to be associated with scoliosis in one study [32]. In the present study, the lower back region was the most commonly affected site by the pain, followed by leg and neck regions. Similarly, ShayestehAzar and colleagues [13] reported that 38.3% of MS patients reported a backache. Another report showed that 45% of the MS patients suffered low back pain [27].

We acknowledge that the present study has a number of limitations. The sample size was relatively small in comparison to previous reports. Moreover, the study was a cross-sectional with no follow-up of MS patients.

The prevalence of musculoskeletal pain among MS patients from Saudi Arabia is high, regardless of the type of MS. Further large-scale studies are needed to investigate the potential predictors of pain in MS patients from Middle East.

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REFERENCES:

1. Marrie RA, Horwitz R, Cutter G, Tyry T, Campagnolo D, Vollmer T. Comorbidity, socioeconomic status and multiple sclerosis. *Mult Scler.* 2008;14(8):1091-1098. doi:10.1177/1352458508092263.
2. Pietrangelo A, Higuera V. Multiple Sclerosis by the Numbers: Facts, Statistics, and You. Healthline. 2015:1-6.

<http://www.healthline.com/health/multiple-sclerosis/facts-statistics-infographic%5Cnfiles/355/facts-statistics-infographic.html>.

3. Arnoldus JH, Killestein J, Pfenning LE, Jelles B, Uitdehaag BM, Polman CH. Quality of life during the first 6 months of interferon-beta treatment in patients with MS. *Mult Scler.* 2000;6(5):338-342. doi:10.1177/13524585000600508.
4. Chen K, Fan Y, Hu R, Yang T, Li K. Impact of depression, fatigue and disability on quality of life in Chinese patients with multiple sclerosis. *Stress Health.* 2013;29(2):108-112. doi:10.1002/smi.2432.
5. Amato MP, Ponziani G, Rossi F, Liedl CL, Stefanile C, Rossi L. Quality of life in multiple sclerosis: The impact of depression, fatigue and disability. *Mult Scler.* 2001;7(5):340-344. doi:10.1191/135245801681138059.
6. Jensen MP, Chodroff MJ, Dworkin RH. The impact of neuropathic pain on health-related quality of life: Review and implications. *Neurology.* 2007;68(15):1178-1182. doi:10.1212/01.wnl.0000259085.61898.9e.
7. Archibald CJ, McGrath PJ, Ritvo PG, et al. Pain prevalence, severity and impact in a clinic sample of multiple sclerosis patients. *Pain.* 1994;58(1):89-93. doi:10.1016/0304-3959(94)90188-0.
8. Buchanan RJ, Wang S, Tai-Seale M, Ju H. Analyses of nursing home residents with multiple sclerosis and depression using the Minimum Data Set. *Mult Scler.* 2003;9(2):171-188. doi:10.1191/1352458503ms872oa.
9. O'Connor AB, Schwid SR, Herrmann DN, Markman JD, Dworkin RH. Pain associated with multiple sclerosis: Systematic review and proposed classification. *Pain.* 2008;137(1):96-111. doi:10.1016/j.pain.2007.08.024.
10. Treede RD, Jensen TS, Campbell JN, et al. Neuropathic pain: Redefinition and a grading system for clinical and research purposes. *Neurology.* 2008;70(18):1630-1635. doi:10.1212/01.wnl.0000282763.29778.59.
11. Kalia L V, O'Connor PW. Severity of chronic pain and its relationship to quality of life in multiple sclerosis. *Mult Scler.* 2005;11(3):322-327.
12. Svendsen KB, Jensen TS, Hansen HJ, Bach FW. Sensory function and quality of life in patients with multiple sclerosis and pain. *Pain.* 2005;114(3):473-481. doi:10.1016/j.pain.2005.01.015.
13. ShayestehAzar M, Kariminasab MH, Saravi MS, et al. A Survey of Severity and Distribution of

- Musculoskeletal Pain in Multiple Sclerosis Patients; a Cross-Sectional Study. *Arch Bone Jt Surg.* 2015;3(2):114-118.
14. Al-Hashel J, Besterman AD, Wolfson C. The prevalence of multiple sclerosis in the middle east. *Neuroepidemiology.* 2008;31(2):129-137. doi:10.1159/000151514.
 15. Elm E Von, Altman DG, Egger M, et al. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement : Guidelines for reporting observational studies *. *Int J Surg.* 2014;12(12):1495-1499. doi:10.1016/j.ijso.2014.07.013.
 16. Dawson AP, Steele EJ, Hodges PW, Stewart S. Development and Test-Retest Reliability of an Extended Version of the Nordic Musculoskeletal Questionnaire (NMQ-E): A Screening Instrument for Musculoskeletal Pain. *J Pain.* 2009;10(5):517-526. doi:10.1016/j.jpain.2008.11.008.
 17. Krupp LB. The Fatigue Severity Scale. *Arch Neurol.* 1989;46(10):1121. doi:10.1001/archneur.1989.00520460115022.
 18. Mäkelä JT, Kiviniemi H, Laitinen S. Risk factors for anastomotic leakage after left-sided colorectal resection with rectal anastomosis. *Dis Colon Rectum.* 2003;46(5):653-660. doi:10.1007/s10350-004-6627-9.
 19. Telem DA, Chin EH, Nguyen SQ, Divino CM. Risk factors for anastomotic leak following colorectal surgery: A case-control study. *Arch Surg.* 2010;145(4):371-376. doi:10.1001/archsurg.2010.40.
 20. Kalia L V., O'Connor PW. Severity of chronic pain and its relationship to quality of life in multiple sclerosis. *Mult Scler.* 2005;11(3):322-327. doi:10.1191/1352458505ms1168oa.
 21. Stenager E, Knudsen L, Jensen K. Acute and chronic pain syndromes in multiple sclerosis. A 5-year follow-up study. *Ital J Neurol Sci.* 1995;16(8):629-632. doi:10.1007/BF02230913.
 22. Nick ST, Roberts C, Billioudaux S, et al. Multiple sclerosis and pain. *Neurol Res.* 2012;34(9):829-841. doi:10.1179/1743132812Y.0000000082.
 23. Clifford DB, Trotter JL. Pain in multiple sclerosis. *Arch Neurol.* 1984;41(12):1270-1272. doi:10.1212/WNL.39.7.1001.
 24. Solaro C, Bricchetto G, Amato MP, et al. The prevalence of pain in multiple sclerosis: a multicenter cross-sectional study. *Neurology.* 2004;63(5):919-921. doi:10.1212/01.WNL.0000137047.85868.D6.
 25. Ehde D, Gibbons L, Chwastiak L, Bombardier C, Sullivan M, Kraft G. Chronic pain in a large community sample of persons with multiple sclerosis. *Mult Scler.* 2003;9:605-611. doi:10.1191/1352458503ms939oa.
 26. Warnell P. The pain experience of a multiple sclerosis population: a descriptive study. *Axone.* 1991;13(1):26-28.
 27. Svendsen KB, Jensen TS, Overvad K, Hansen HJ, Koch-Henriksen N, Bach FW. Pain in patients with multiple sclerosis: a population-based study. *Arch Neurol.* 2003;60:1089-1094. doi:10.1001/archneur.60.8.1089.
 28. Hadjimichael O, Kerns RD, Rizzo MA, Cutter G, Vollmer T. Persistent pain and uncomfortable sensations in persons with multiple sclerosis. *Pain.* 2007;127(1-2):35-41. doi:10.1016/j.pain.2006.07.015.
 29. Forbes A, While A, Mathes L, Griffiths P. Health problems and health-related quality of life in people with multiple sclerosis. *Clin Rehabil.* 2006;20(1):67-78. doi:10.1191/0269215506cr880oa.
 30. Crayton H, Heyman R a, Rossman HS. A multimodal approach to managing the symptoms of multiple sclerosis. *Neurology.* 2004;63(11 Suppl 5):S12-8. doi:10.1212/WNL.63.11.SUPPL_5.S12.
 31. Beard S, Hunn A, Wight J. Treatments for spasticity and pain in multiple sclerosis: a systematic review. *Heal Technol Assess.* 2003;7(40):iii, ix-x, 1-111. doi:99-05-03 [pii].
 32. Moulin DE, Foley KM, Ebers GC. Pain syndromes in multiple sclerosis. *Neurology.* 1988;38(12):1830-1834.