

## Pattern of musculoskeletal pain among Christians and Islamic faithfuls in Obafemi Awolowo University, Ile-Ife, Nigeria

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**Abstract.** Prevalence of musculoskeletal pain among Muslim has been reported in several populations, but there is a dearth of knowledge on its prevalence and pattern in Nigeria. This study reported the pattern of musculoskeletal pain among Christians and Muslims in Obafemi Awolowo University, Ile-Ife. The survey instrument for this study was adopted Nordic Musculoskeletal Questionnaire. The study involved 240 participants (120 Christians & 120 Muslims) who are non-academic staff of Obafemi Awolowo University, Ile Ife, Nigeria. The data collected was analysed using descriptive and inferential statistics. Level of significance was set at 0.05. Result shows that musculoskeletal pain is more prevalent at low back in Muslims (92.5%) than that in Christians (89.2%); knee pain in Christians (79.2%) greater than that in Muslims (77.5%); neck in Muslims (26.7%) than that in Christians (21.7%); shoulder in Muslims (35.0%) than that in Christians (25.0%). Among Christians and Muslims there is association between pain intensity at  $p=0.001$  and each of sex (Christians,  $X^2 = 343.042$ , Muslims,  $X^2 = 12.644$ ), occupation (Christians  $X^2 = 28.897$ , Muslims  $X^2 = 364.850$ ) and marital status (Christians  $X^2 = 335.680$ , Muslims  $X^2 = 11.534$ ,  $p = 0.031$ ). In conclusion the study shows that all the participants in the study have had musculoskeletal pain in one or more body sites with low back pain and knee pain being the most prevalent among both the Christians and Muslims. More Muslims had pain in many body part than their counterpart Christian

**Key words:** Muslim, Christian, musculoskeletal pain, occupation, marital status.

### Introduction

Musculoskeletal Pain (MSP), especially in the chronic stage is a major public health problem (1) and it is associated with limitation in activity of daily living, loss of workplace productivity, high cost of unemployment compensation, disability and high frequency of health seeking (2). Musculoskeletal pain comprises a major health problem for the general population, affecting their quality of life, demanding increased health care and organization (3)

In Muslim populations, higher range of motion (ROM) is required as their religious and cultural activities demands greater flexion of the joints in the lower limbs (4). There are multiple physical and physiological benefits of *Salat*. Most of the body muscles and joints are exercised during *Salat*. In the most noteworthy movement of prostration besides the limb muscles, the back and perineum muscles as well, are exercised repeatedly (5). *Salat* results in moderate exercise to each part of the body. Although contraction of muscles depends on many factors like some muscles contract isotonicly i.e. with same tension and some muscles contract isometrically (same length) (6). Recently, it has been reported that a person, who offers *Salat* regularly has seldom chances of suffering from arthritis as due to *Salat*, almost all main bones and joints get exercised (7).

The body movement, the noises generated while clapping and the sights produced through dance and gesticulation are believed to be appealing to the object of worship and to God and Christ in Christianity (8). Dance is an integral mechanism of worship and about the spiritual significance of dance in African Indigenous Church, it is important to note that vigor may be exerted while dancing during worship (8). Frequent standing and sitting though on a chair or floor as the case may be are other activities that characterized both Muslim and Christian religion activities. In Christian religion, clapping has different meanings from what it signifies; it is used in worship as a means of expressing thankfulness to God for the good things He has done (8).

There is substantial evidence that ergonomic risk factors such as repetition, awkward posture, contact stress and force of worker's biomechanical capabilities may lead to work-related musculoskeletal disorders (WMSDs) (9). This characterized the activities of both Christian and Muslim faithful. It is said that WMSDs are leading causes of absenteeism and disability (10,11) .

A number of studies have found that the mechanisms leading to work-related musculoskeletal pain are multi-factorial (2). This pain can be attributed to numerous risk factors, including prolonged static postures, repetitive movements, suboptimal lighting, poor positioning, genetic predisposition, mental stress, physical conditioning, age and obesity (12). Postures outside of neutral position for a prolonged period are likely to cause musculoskeletal discomfort (13). This study determined the pattern of musculoskeletal pain among Christians and Islamic faithful in Ile Ife, Nigeria.

### Material and Method

*Participants.* The respondents included Christians and Muslims non-academic staff in Obafemi Awolowo University, Ile-Ife.

*Inclusion criteria.* The study included: individuals who are non-academic staffs (Administrative staffs, medical workers, technologists, security and drivers) in Obafemi Awolowo University, Ile Ife; individuals who are healthy and no apparent health or musculoskeletal challenge.

*Exclusion criteria:* individuals with history of surgery and hospitalization; pregnant women.

*Research design.* The research was cross-sectional survey.

*Sample size:* based on Eng Sample Size Formula (14):

$$n = \frac{Z^2 pq}{e^2}$$

where: n is the sample size; e is the desired level of precision (i.e. the margin of error); p is the (estimated) proportion of the population which has the attribute in question; q is 1 – p.

The z-value is found in a Z table. Z = 1.55, p = 0.5, q = 0.5 and e = 0.05, therefore,

$$n = \frac{((1.55)^2(0.5)(0.5))}{(0.05)^2} n = 240$$

A purposive sampling was used for the study. The survey instrument for this study will be standardized Nordic Musculoskeletal Questionnaire developed by Kuorinka, et al. (15).

The Nordic musculoskeletal questionnaire is a standardized questionnaire which allows comparison of musculoskeletal disorders affecting nine body sites namely: necks, shoulders, upper back, elbows, low back, wrist/hands, hip/thighs, knees, and ankle/feet.

The questionnaire had three sections:

- section A - assessed the socio-demographic data of the respondents like age, sex, profession, ethnicity, level of education and marital status;

- section B - it obtained information on pattern of musculoskeletal pain by anatomical body site. Such questions include: whether pain has been perceived at any time during the last 12 months in: neck, shoulder, elbow, wrist, upper back. Lower back, hip/thigh, knee, and ankle/feet.; whether such problem have prevented doing normal activities at home and work; whether pain has been perceived at any time during the last 7 days in: neck, shoulder, elbow, wrist, upper back, lower back, hip/thigh, knee, and ankle/feet. The questionnaire will be scored base on Yes or No: Yes = 1 and No = 2.

- section C - used for the assessment of pain. Numerical pain rating scale will be used for the assessment of pain (16). And the question asked will include: the pain intensity, onset of pain, duration of pain, pattern of pain, number of time pain was perceived, and if pain was linked to a particular activity.

The ethical approval for this study was obtained from the Research and Ethics Committee of Institute of Public Health, College of Health Sciences, Obafemi Awolowo University (OAU) Ile Ife.

The survey Questionnaire was distributed by hand among the participants and the purpose of the study and instruction on how to fill the questionnaire was explained to them.

*Data Analysis.* The data collected was analysed, organized and processed using IBM SPSS 23.0. The statistical analysis of mean, standard deviation, percentage and inferential statistical of Chi-square method was used to access the association between pain intensity and each of activity and socio-demographic factors.

Level of significance was set at 0.05.

## Results

### *Socio-demographic characteristics of participants*

Table 1 shows the percentage distribution of the participant's sex, marital status and educational level. According to the table, 55(45.8%) are male and 65(54.2%) are female among Christian and 80(66.7%) male and 40 (33.3%) females among Muslim.

Considering the educational level of the participants, 53.3% and 31.7% had secondary education among Christian and Muslim, respectively.

**Table 1** Socio-Demographic Characteristics of Participants

Variables	Christian		Muslim	
	Frequency	%	Frequency	%
<b>Sex</b>				
Male	55	45.8	80	66.7
Female	65	54.2	40	33.3
<b>Marital status</b>				
Married	101	84.2	100	83.3
Single	6	5.0	7	5.8
Widow	13	10.8	6	5.0
Widower	-	-	7	5.8
<b>Educational level</b>				
Primary			13	10.8
Secondary	64	53.3	38	31.7
Tertiary	56	46.7	69	57.5
<b>Total</b>	120	100.0	120	100.0

Revealed in table 2 is the occupational distribution of participants. Forty (33.3%) and 43 (35.8) participants were administrator among Christian and Muslim respectively while security personnel were 33 (27.5%) and 30 (25.0%), respectively.

**Table 2.** Occupational Distribution of Participants

Variables	Christian		Muslim	
	Frequency	%	Frequency	%
Admin	40	33.3	43	35.8
Driver	12	10	13	10.8
Librarian	12	10	13	10.8
Medical worker	11	9.2	9	7.5
Security	33	27.5	30	25.0
Technologist	12	10.0	12	10.0
<b>Total</b>	120	100.0	120	100.0

Displayed in table 3 is the pain distribution according to the site of the body considering the upper quarter of the body. Among participants, 89.2 %, and 92.5% had 12 months prevalence of pain among Muslim and Christian respectively.

Considering different body part, at the neck, 26 (21.7 %) and 32 (26.7%) had pain among Christian and Muslim respectively. At the shoulder joint, 30 (25.0 %) and 42 (35.0 %) reported pain among Christian and Muslim respectively. Considering the upper back among Christian there were 39 (32.5%) and 41 (34.2%) among Muslims

**Table 3.**Distribution of pain by site in the upper quarter of the body during the last twelve months

Variables	Christian		Muslim	
	Frequency	%	Frequency	%
Have you had joint pain, ach, or discomfort in the last 12 months				
Yes	107	89.2	111	92.5
No	13	10.8	9	7.5
Have you at anytime during the last 12 months had pain (ach, pain, discomfort at the:				
<b>Neck</b>				
Yes	26	21.7	32	26.7
No	94	78.3	88	73.3
<b>Shoulder:</b>				
Yes, at both	30	25.0	42	35.0
No, at both	90	75.0	78	65.0
Yes, right	59	49.2	61	50.8
No, Right	61	50.8	59	49.2
Yes, Left	32	26.7	43	35.8
No, Left	88	73.3	77	64.2
<b>Elbow</b>				
Yes, both	9	7.5	10	8.3
No, both	111	92.5	110	91.7
Yes, Right	24	10.0	13	10.8
No, Right	96	80.0	107	89.2
Yes Left	12	10.0	11	9.2
No, left	108	90.0	109	90.8
<b>Wrist</b>				
Yes, both	16	13.3	10	8.3
No, both	104	86.7	110	91.7
Yes, Right	31	25.8	13	10.8
No, Right	89	74.2	107	89.2
Yes Left	19	15.8	10	8.3
No, left	101	84.2	110	91.7
<b>Upper back</b>				
Yes	39	32.5	41	34.2
No	81	67.5	79	65.8

One hundred and seven (89.2%) had pain at the low back among Christians while 111 (92.5%) had low back pain among the Muslim faithful. At both hip, there were 43.3 % reported pain and 35.8% among Muslims. Among Christians, 95 reported knee pain but among Muslim there were 93 participants that reported pain. There was a significant association between duration of pain and sex ( $\chi^2 = 343.042$ ,  $p = 0.000$ ), marital status ( $\chi^2 = 335.680$ ,  $p = 0.000$ ), and occupation ( $\chi^2 = 28.897$ ,  $p = 0.001$ ) of Christian participants. There was a significant association between duration of pain and sex ( $\chi^2 = 12.644$ ,  $p = 0.002$ ), marital status ( $\chi^2 = 11.534$ ,  $p = 0.031$ ), and occupation ( $\chi^2 = 364.850$ ,  $p = 0.00$ ) of Muslim participants. This was shown in table 6.

**Table 4.** Distribution of pain by site in the lower quarter of the body during the last twelve months

Variables	Christian		Muslim	
	Frequency	%	Frequency	%
Have you at anytime during the last 12 months had pain (ach, pain, discomfort at the:				
<b>Low Back</b>				
Yes	107	89.2	111	92.5
No	13	10.8	9	7.5
<b>Hip</b>				
Yes, at both	52	43.3	43	35.8
No, at both	68	56.7	77	64.2
Yes, right	24	10.0	13	10.8
No, Right	96	80.0	107	89.2
Yes, Left	12	10.0	11	9.2
No, Left	108	90.0	109	90.8
<b>Knee</b>				
Yes, both	95	79.2	93	77.5
No, both	25	20.8	27	22.5
Yes, Right	59	49.2	61	50.8
No, Right	61	50.8	59	49.2
Yes Left	32	26.7	43	35.8
No, left	88	73.3	77	64.2
<b>Ankle</b>				
Yes, both	19	15.8	15	12.5
No, both	101	84.2	105	87.5
Yes, Right	13	10.8	31	25.8
No, Right	107	89.2	89	74.2
Yes Left	10	8.3	19	15.8
No, left	110	91.7	101	84.2

**Table 5.** Association between duration of the pain and each of sex, marital status and occupation of Christian Participants

Variables	Days	Week	Month	x <sup>2</sup>	P
<b>Marital status</b>					
Married	8	43	50	35.680	0.000*
Single	1	3	23		
Widow	0	6	7		
<b>Total</b>	9	52	59		
<b>Sex</b>					
Male	8	26	21	43.042	0.000*
Female	1	26	38		
Total	9	52	59		
<b>Occupation</b>					
Admin staff	3	23	17	28.897	0.001*
Librarian	0	1	12		
Driver	0	4	9		
Medical worker	0	1	8		
Security	4	5	21		
Total	7	34	67		

**Table 6.** Association between duration of the pain intensity and each of sex, marital status and occupation of Muslim participants

Variables	Days	Week	Month	x <sup>2</sup>	P
<b>Marital status</b>					
Married	5	34	61	11.534	0.031
Single	1	5	1		
Widow	1	1	11		
<b>Total</b>	7	40	73		
<b>Sex</b>					
Male	7	32	41	12.644	0.002*
Female	0	8	32		
Total	7	40	73		
<b>Occupation</b>					
Admin staff	7	8	25	64.850	0.000
Librarian	2	4	2		
Driver	0	2	0		
Medical worker	0	32	26		
Security	9	52	58		
Total	9	52	58		

### Discussion and Conclusion

This study evaluated the prevalence of MSP among Muslims in order to examine whether religious activity constituted to the prevalence of musculoskeletal pain, using the Christian participants as a control study. The study showed that for the Muslim participants male were more than the female maybe because of the Islamic believe that, women are tend to be restricted to house. While for the Christian participants female were more than the male. It may be inferred that in Christian religion, women may be more than men in number. Also more than 80% each of the Muslim and Christian participants were married. More than 50% of the Muslim and close to 50% of the Christian participants were graduates. The study also shows that larger percentages of the participants are administrative staffs (more than 30%).

The study also showed that the most affected body sites are the lower back and knee joint with the lower back more prevalent than the knee joint. For the Muslim participants prevalence of the lower back is more

than that of the Christian participants. Possibly due to repetitive bending posture during their Islamic prayer activity and for the knee joint prevalence is more in the Christians than the Muslims possibly because they stand for long during their prayers.

A typical Muslim will sit down on his feet with the lumbar region in kyphotic posture while praying or meditation. In sitting or flexion of the lumbar spine posture, intervertebral pressure increases, the gelatinous centre of the disc known as the nucleus pulposus is posteriorly displaced, the diameter of the spinal canal is widened, and the load on the zygapophyseal (facet) joints is decreased (17).

With standing or lumbar extension, the opposite effects occur (17). With sitting or standing in neutral posture with reference to the line of gravity, muscle activity in the lumbar spine is minimal (18). Studies have found that sitting in extreme postures, such as excessive kyphotic posture with flexion of the lumbar spine or excessive lordotic posture with extension of the lumbar spine in some people correlated with findings of low back pain (19). Analysis of the literature demonstrated that kyphosed seated postures when sustained are more harmful to the health of the lumbar spine than lordotic seated postures (20). Literature reviews have found that specific sub-classifications of spinal posture, particularly flexion, may aggravate back pain (21).

The study also show that there is significant association between pain intensity of both the Muslim and Christian participants and their sex, marital status and occupation. The inference from this is that each of marital status, occupation and either someone is male or female may have contribution with pain or not. Number of male is more than that of female among Muslim and vice versa. It is not out of statement to mention that some characteristics associated with male or female might have association with prevalence of pain. In this study, occupation was associated with prevalence of musculoskeletal pain, despite the fact that participants in the study were working at the university community, they belong to different profession and different work schedule and responsibility. Administrators may have a prolong sitting to do the responsibility while the technologist may need to carry equipment which may involve twisting of the body. All these may be associated with the prevalence of musculoskeletal pain.

It can be concluded from this study that all the 12 month prevalence of MSP is very high, but is higher among Muslim than Christian participants. Low back pain was more prevalence among Muslim and knee pain among Christian.

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