Original Article

Prevalence of Musculoskeletal Pain and its Correlation with Quality of Life Among Healthcare College Staff Members: A Questionnaire Based Cross-Sectional Study

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Abstract

Background: Musculoskeletal pain (MSP) is a leading occupational health problem worldwide and a major contributor to disability and reduced work productivity. Academic staff in healthcare institutions are at increased risk due to prolonged teaching hours, static postures, and suboptimal ergonomics.

Objective: To determine the prevalence of MSP and its correlation with quality of life (QoL) among healthcare college staff members.

Design: Questionnaire-based cross-sectional study.

Methods: A questionnaire-based cross-sectional study was conducted among 66 healthcare college staff members in Bengaluru, Karnataka. MSP was assessed using the Nordic Musculoskeletal Questionnaire and QoL using the SF-36 Health Survey. Descriptive statistics, independent t-tests, and Spearman correlation were applied using SPSS v27.

Results: The prevalence of MSP was high, with the lower back (80.3%), neck (69.7%), and shoulders (39.4%) most affected. Low back pain was significantly associated with lower Physical Component Summary ($p=0.002$) and Mental Component Summary ($p=0.006$) scores. Shoulder pain was significantly correlated with MCS ($p=0.016$). PCS scores were significantly associated with Body Mass Index, daily computer use, and teaching hours, while MCS was associated with designation. A moderate positive correlation was observed between PCS and MCS ($r=0.474$, $p<0.001$).

Conclusion: MSP is highly prevalent among healthcare college staff and significantly impacts both physical and mental QoL. Ergonomic interventions and workplace wellness programs are recommended to mitigate risks.

Keywords: Musculoskeletal pain, Quality of life, SF-36, Healthcare staff, Occupational health, Cross-sectional study

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Introduction

Musculoskeletal pain (MSP) is defined by the International Association for the Study of Pain (IASP) as an unpleasant sensory and emotional experience associated with actual or potential tissue damage or characterized in terms of such damage[1,2]. Musculoskeletal pain is defined as pain that is associated with the musculoskeletal system which includes the muscles, bones, joints, ligaments and tendons. It typically functions as the body's warning sign, indicating the risk of tissue damage or occurrence of such damage and also signals the need for tissue healing and recovery[4-6]. MSP results from multiple contributing factors, including physical attributes (such as height, weight, and sex), occupational conditions (like repetitive use of certain body parts, poor posture, and lack of breaks), and socio psychological elements (including high work demands and stress) [8,13-17].

The World Health Organization (WHO) has recognized musculoskeletal disorders as a leading contributor to the global burden of disease, especially among the working population[7-10]. MSP is one of the most common health complaints globally, contributing significantly to disability, reduced work productivity due to substantial impact on quality of life, frequent sick leave, functional impairment, absenteeism and also representing a significant medical and socioeconomic concern [10-15]. It is observed in all the age groups, gender and social groups[5,12].

Among various professional groups, health-care workers are particularly vulnerable to musculoskeletal pain due to the combined physical and psychological demands of their dual roles in clinical practice and academia[6,13,18]. Academic professionals in healthcare institutions not only provide university level education and conduct research but are also responsible for generating new knowledge, which often involves physically and mentally demanding tasks. These include standing for long periods during lectures, maintaining static postures while using computers for publication, course preparation, and administrative duties, as well as coping with psychological stress related to academic advancement and professional expectations[13,19-21,25, 26].

Additionally, several preventable factors further contribute to the development of MSP among academic staff. These factors include high workload, excessive paperwork, class preparation and students' evaluation, lifting heavy load, fixed posture, anxiety level, low peer support and poor mental status [13,19-20]. These activities, especially when performed in ergonomically poor environments, can predispose individuals to chronic MSP. Moreover, the combination of occupational stress, high workload, and limited physical activity during working hours serves to increase the severity and persistence of musculoskeletal conditions in this population [13].

Despite growing interest in occupational health, healthcare college staff remain underrepresented in the literature, with most research focusing on clinical professionals such as nurses, physicians, and physiotherapists, while limited attention has been given to the unique occupational risks faced by academic staff and the impact of musculoskeletal pain on their quality of life [21].

This study is particularly important as musculoskeletal pain is a common issue in healthcare professionals, and its impact on quality of life is a growing concern. By focusing on healthcare college staff members, this research aims to fill a gap in the literature and provide insights into how these conditions affect their overall well-being.

Methods

Study Design

A questionnaire-based cross-sectional study.

Study Setting

This cross-sectional study was conducted between 13/01/2025 - 30/03/2025 in healthcare colleges (allied and non-allied) in Bengaluru, Karnataka.

Healthcare college – Manjunatha college of Physiotherapy, Shantidhama Group of Institution, Karnataka College.

Participants

A total of 66 healthcare college staff members were recruited through snowball sampling. Inclusion criteria were: Full-time academic faculty engaged in clinical postings of both genders with more than one year of work experience were included. Exclusion criteria : part-time faculty, diagnosed neurological or rheumatological disorders, orthopaedic deformities, or cancer.

Sampling

Snowball sampling was used. Sample size was estimated as 66 using a prevalence rate of 77.8%, 95% confidence interval, and 10% margin of error.

Ethical Considerations

The study received ethical clearance from the Institutional Ethics Committee of [Yenepoya deemed to be university, Deralakatte, Mangaluru, Karnataka 575018] with **Protocol number YEC-1/2024/318**. Written informed consent was obtained from all participants.

Procedure

Ethical approval was obtained from the Yenepoya (Deemed to be University) Ethics Committee. Participants also provided demographic data and completed the questionnaires in approximately 15–20 minutes. Assistance was provided where clarification was required.

Instrument

1. **Adopted Nordic Musculoskeletal Questionnaire** – to identify MSP prevalence and affected body regions (http://dx.doi.org/10.1097/MD.0000000000026176).
2. **Short Form-36 (SF-36) –** to assess Physical Component Summary (PCS) and Mental Component Summary (MCS) scores (doi:10.3389/fpubh.2022.810036).

Statistical Analysis

The statistical analysis, was done using SPSS (version 27) software. The continuous variables were summarised as mean (standard deviation). The categorical variables were summarised as frequency (percentage). In mean comparisons, the t-test was used for parametric variables while the Wilcoxon's test was used for non-parametric variables. The Shapiro -Wilk test for testing the normality of the data. For correlation between the Musculoskeletal pain and Quality of life i.e PCS and MCS component the Spearman's correlation was used.

Results

Participant Characteristics

A total of 66 healthcare college staff members participated in the study. The mean age was 28.11 ± 4.06 years, with a slightly higher proportion of females (51.5%) compared to males (48.5%). The majority were lecturers (59.1%) and had less than five years of academic experience (87.9%). Detailed demographic characteristics are presented in Table 1.

Table 1. Demographic data of participants (n=66)

DEMOGRAPHIC VARIABLES	Category	n(%)
AGE	<=25 years	13(19.7%)
	26-30 years	43(65.2%)
	>30 years	10(15.2%)
GENDER	female	34 (51.5%)
	male	32(48.5%)
DESIGNATION	Assistant professor	10 (15.2 %)
	Associate professor	2(3 %)
	Clinical instructor	5 (7.6 %)

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	Lecturer	39(59.1 %)
	Nursing Staff	1(1.5%)
	Tutor	9 (13.6%)
QUALIFICATION	BOT	4 (6.1%)
	BPT	3(4.5%)
	BSC ANAESTHESIA	2(3%)
	BSC MLT	2 (3%)
	BSC NURSING	7 (10.6%)
	BSCRADIATIONTECHNOLOGY	1 (1.5%)
	BSC RENAL DIALYSIS	1 (1.5%)
	MLT	1(1.5%)
	MOT	2(3%)
	MPT	22 (33.3%)
	MPT (CARDIO)	1 (1.5%)
	MPT (NEURO)	1 (1.5%)
	MPT (ORTHO)	1 (1.5%)
	MPT MSK	2 (3%)
	MSC IMAGING TECHNOLOGY	2(3%)
	MSC MLT	7 (10.6%)
	MSC NURSING	5 (7.6%)
	MSC RADIATION THERAPY	1(1.5%)
	MSC RESPIRATORY THERAPY	1 (1.5%)
WORKING IN THE ACADEMIC FIELD	Between 5-9 Years	8 (12.1%)
	Less than 5 Years	58(87.9%)
MARITAL STATUS	Married	12 (18.2%)
	Unmarried	54 (81.8%)
BMI	Normal	55 (83.3%)
	Obese	1 (1.5%)
	Overweight	6 (9.1%)
	Underweight	4 (6.1%)
SLEEPING PER DAY (HOURS)	< 6	23 (34.8%)
	7-8 hours	43 (65.2%)
POSITIONING	Sitting	28(42.4%)
	Standing	38 (57.6%)
TEACHING PER DAY(HOURS)	<1	7 (10.6%)
	1-2 HOURS	21 (31.8%)
	3-4 HOURS	32 (48.5%)
	>=5	6 (9.1%)
COMPUTER USE PER DAY (HOURS)	<1	13 (19.7%)
	1-2 HOURS	29 (43.9%)
	3-4 HOURS	14(21.2%)
	>=5	10 (15.2%)

Overall Scores and Pain Prevalence

Normative values for PCS and MCS are standardized to a mean of 50 with a standard deviation of 10. In the present study, the average PCS (Physical Component Summary) score was 59.88 ± 11.67, and the average MCS (Mental Component Summary) score was 58.01 ± 12.03 (Table 2), both of which were higher than the normative values.

Table 2. Variables with Mean (SD)

Variables	**Mean ± SD**
AGE	28.11 ± 4.06
PCS SCORE	59.88 ± 11.67
MCS SCORE	58.01 ± 12.03
LOW BACK PAIN	3.52 ± 3.11
NECK PAIN	2.71 ± 2.00
SHOULDER PAIN	1.88 ± 3.28

Comparison of QoL Scores by Pain Presence

Independent-samples t-tests showed that participants with low back pain had significantly lower PCS (p = 0.002) and MCS (p = 0.006) scores compared to those without low back pain. Shoulder pain was significantly associated with lower MCS scores (p = 0.016) but not PCS scores. Neck pain was not significantly associated with PCS or MCS scores (**Table 3**).

Table 3. Comparison of PCS and MCS scores among individuals with and without pain in specific body regions, using independent-samples t-tests.

Pain Site	**Prevalence**	**Variable**	**Present (Mean ± SD)**	**Absent (Mean ± SD)**	**t-value**	p-value
Low Back Pain	80.3%	PCS Score	58.38 ± 12.28	65.98 ± 5.83	3.255	0.002
		MCS Score	56.02 ± 12.10	66.10 ± 7.85	2.850	0.006
Neck Pain	69.7%	PCS Score	59.60 ± 12.63	60.52 ± 9.38	0.330	0.743
		MCS Score	57.16 ± 12.13	59.96 ± 11.86	0.867	0.389
Shoulder Pain	39.4%	PCS Score	56.33 ± 12.86	62.18 ± 10.35	1.945	0.058
		MCS Score	53.62 ± 10.43	60.86 ± 12.26	2.484	0.016

Correlation Analysis

Spearman's correlation revealed a moderate positive relationship between PCS and MCS scores (r = 0.474, p < 0.001). Low back pain was negatively correlated with both PCS (r = –0.398, p = 0.001) and MCS (r = –0.466, p < 0.001). Shoulder pain was negatively correlated with PCS (p = 0.024) and MCS (p = 0.007), while neck pain showed a significant negative correlation only with MCS (p = 0.004). Detailed correlation values are provided in Table 4.

Table 4. Spearman's correlation matrix for PCS, MCS, and pain sites

Variables	**PCS Score**	**MCS Score**	**Low Back Pain**	**Neck Pain**	**Shoulder Pain**
PCS Score	1.000				
MCS Score	**0.474** (*p*< 0.001)	1.000			
Low Back Pain	**–0.398** (*p* = 0.001)	**–0.466** (*p*< 0.001)	1.000		
Neck Pain	–0.172 (*p* = 0.167)	**–0.354** (*p* = 0.004)	**0.355** (*p* = 0.003)	1.000	
Shoulder Pain	–0.277 (*p* = 0.024)	**–0.331** (*p* = 0.007)	0.302 (*p* = 0.014)	0.313 (*p* = 0.011)	1.000

Associations with Demographic Variables

PCS scores were significantly associated with BMI (p = 0.0066), daily teaching hours (p = 0.0051), and computer use per day (p = 0.0054). MCS scores were significantly associated with designation (p = 0.017). No significant associations were observed for age, gender, marital status, or sleeping hours. These comparisons are summarised in **Table 5**.

Table 5. PCS and MCS scores by demographic variable

Demographic Variables	Category	Count	PCS Mean (SD)	p- value	MCS Mean (SD)	p-value
AGE	<=25 years	13	53.9423 (14.7088)	0.1943	52.587 (12.737)	0.243
	26-30 years	43	61.5762 (10.8248)		58.901 (12.015)	
	>30 years	10	60.2778 (9.1592)		61.2 (9.878)	
GENDER	female	34	59.0891 (11.3956)	0.1281	55.272 (11.699)	0.108
	male	32	60.7118 (12.085)		60.91 (11.868)	
DESIGNATION	Assistant professor	10	59.625 (12.7412)	0.7667	51.537 (11.536)	0.017*
	Associate professor	2	62.7083 (13.2583)		55.5 (5.127)	
	Clinical instructor	5	48.6667 (13.8251)		56.075 (13.662)	
	Lecturer	39	61.5527 (11.4011)		60.292 (11.751)	
	Nursing Staff	1	66.1111 (.)		56.875 (.)	
	Tutor	9	57.7932 (9.2396)		57.042 (13.811)	
WORKING IN THE ACADEMIC FIELD	Between 5-9 Years	8	61.9618 (10.5914)	0.0729	59.266 (9.539)	0.882
	Less than 5 Years	58	59.5881 (11.8702)		57.832 (12.394)	
MARITAL STATUS	Married	12	62.1644 (9.3892)	0.8848	62.594 (9.346)	0.354
	Unmarried	54	59.3673 (12.1389)		56.986 (12.391)	
BMI	Normal	55	60.8662 (11.1229)	0.0066*	59.743 (11.555)	0.284
	Obese	1	48.6111 (.)		40.5 (.)	
	Overweight	6	59.0741 (13.2012)		51.542 (7.871)	

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	Underweight	4	50.2778 (15.8207)		48.188 (16.107)	
SLEEPING PER DAY (HOURS)	< 6	23	58.43 (11.645)	0.5833	55.832 (12.653)	0.391
	7-8 hours	43	60.6492 (11.7505)		59.169 (11.668)	
POSITIONING	Sitting	28	58.9583 (12.2175)	0.7352	58 (13.62)	0.501
	Standing	38	60.5519 (11.3722)		58.01 (10.902)	
TEACHING PER DAY(HOURS)	<1	7	62.7183 (6.7452)	0.0051*	68.536 (16.911)	0.080
	1-2 HOURS	21	58.5979 (12.2941)		58.458 (12.043)	
	3-4 HOURS	32	62.4349 (11.1458)		55.754 (9.956)	
	>=5	6	47.3843 (9.7224)		56.146 (12.28)	
COMPUTER USE PER DAY (HOURS)	<1	13	58.7607 (13.4436)	0.0054*	58.385 (16.081)	0.195
	1-2 HOURS	29	62.9071 (10.7732)		59.078 (11.581)	
	3-4 HOURS	14	58.5714 (11.2767)		58.491 (10.931)	
	>=5	10	54.3611 (11.4214)		53.725 (9.268)	

Discussion

The present cross-sectional study aimed to assess the prevalence of musculoskeletal pain (MSP) and its correlation with the quality of life (QoL) among healthcare college staff members in Bangalore, Karnataka. The findings revealed a notably high prevalence of MSP, with the lower back (80.3%) being the most frequently affected region, followed by the neck (69.7%) and shoulders (39.4%). These results align with the previous studies conducted among faculty members and academic professionals globally, which consistently highlight the burden of MSP due to long teaching hours, static postures, and inadequate ergonomics[4–6, 10].

The high prevalence of low back pain in this study is consistent with findings reported by Aldhafian et al. (2021) and Arshad et al. (2021), who also identified the lower back as the most commonly affected site among faculty members[4, 13]. The results of the present study reinforce the idea that poor ergonomic practices and high workload contribute significantly to MSP.

A statistically significant negative correlation was observed between MSP and QoL scores. Participants reporting low back and shoulder pain had significantly lower PCS and MCS scores, indicating that MSP has a detrimental impact on both physical and mental health. This observation is supported by the work of Hashem et al. (2024), which emphasized

that chronic musculoskeletal pain impairs daily function and well-being [5].

Additionally, significant associations were found between QoL (especially PCS scores) and work-related factors such as teaching hours, daily computer use, and body mass index (BMI). These findings suggest that longer periods of teaching or screen time and abnormal BMI may exacerbate MSP and thus reduce physical QoL. Such associations have been similarly documented in studies by Ozdinca et al. (2019) and Niciejewska et al. (2019), which highlighted the role of occupational demands and lifestyle in contributing to MSP[20,25].

Interestingly, while shoulder pain had a significant correlation with MCS scores, neck pain did not show a significant association with PCS scores. This might bedue to variability in individual pain thresholds, different coping strategies, or limitations in postural variability allowed by the job role[22].

Spearman's correlation analysis revealed that a moderate positive correlation between PCS and MCS scores (r = 0.474), indicating that both physical and mental health components are interdependent. Participants with poor physical health due to pain were also more likely to report decreased mental well-being. This bidirectional relationship is well-documented in psychosomatic research, where chronic pain often leads to psychological distress, and vice versa[5,9].

Overall, the study underscores the occupational hazards faced by healthcare educators who often juggle academic and clinical responsibilities. It also emphasizes the need for targeted ergonomic interventions, regular physical activity, stress management, and institutional policies to promote better health and quality of life [12,17].

Conclusion

The study highlights a high prevalence of musculoskeletal pain, particularly low back and neck pain, among healthcare college staff. These findings suggest that increased musculoskeletal pain in the back, neck, and shoulders is associated with poorer physical and mental health outcomes. The strongest negative associations were observed between MCS and low back pain (r = –0.466) and between PCS and low back pain (r = –0.398), highlighting the substantial impact of low back pain on both physical and mental well-being. Factors such as prolonged teaching hours, extended computer use, and abnormal BMI were found to negatively impact physical health.

Limitations

Despite its strengths, there are certain limitations in this study.

- The cross-sectional study design prevents in establishing causality between the musculoskeletal pain and quality of life.
- Additionally, self-reported data might introduce a recall or response bias.
- The sample size was relatively small, which might have reduced the statistical power and increase the margin of error in the findings.
- The samples collected were also limited to a specific academic institution, which might have restricted the generalizability of the study findings.

Suggestion for Future Studies

Future research can include long-term studies to understand the cause-and-effect relationship between musculoskeletal pain and quality of life. Studies can also test whether ergonomic changes, regular physical therapy, and wellness programs help reduce pain and improve the health of academic staff.

Declaration: Ethics Approval & Consent: The study was approved by **Yenepoya Ethics Committee-1** [Yenepoya deemed to be University] **Protocol number : YEC -1/2024/318,** Date of approval : **30-10-2024** Written informed consent obtained.

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