Central Medical College Journal
Vol 7 No 1 January 2023
DOI: https://doi.org/10.3329/cemecj.v7i1.70942

Original Article

Exploring the Prevalence, Risk Factors and Association with Physical Activity of Musculoskeletal Disorders among Patients Attending a Tertiary Teaching Hospital in Gazipur Bangladesh: A Cross-Sectional Study

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Abstract

Background: *Musculoskeletal disorders encompass a range of strain-related conditions affecting the musculoskeletal system. Physical activity has been recognized as a protective factor against numerous disabling diseases, including musculoskeletal disorders. This study aims to examine the prevalence of musculoskeletal disorders and investigate its correlation with physical activity in the context of Bangladesh.* ***Methods:*** *This cross-sectional study employed a robust methodology involving the use of standardized questionnaires to assess physical activity levels and musculoskeletal symptoms among 430 patients attending outpatient departments at Gazipur City Medical College. The study period spanned from December 2022 to March 2023, facilitating the collection of valuable data for analyzing the relationship between physical activity and musculoskeletal disorders in this specific population.* ***Results:*** *The study included 430 individuals, with a fairly equal distribution between males (41.9%) and females (58.1%). The majority fell within the 31-40 age range (34.9%). About 42.0% were overweight, while 39.0% had a normal weight. Urban residents constituted 69.8%, and the predominant occupational groups were office workers (23.3%) and garments workers (27.9%). Approximately 60.5% reported co-morbidities, and sedentary behavior was prevalent (70.0% sat for <4 hours). Lower back pain (52.56%) and knee pain (64.19%) were most commonly reported, impacting work for 32.89% and 46.71% of individuals, respectively. Significant associations were found between physical activity level and pain in multiple body regions. Lower physical activity levels were associated with a higher prevalence of pain. These findings emphasize the importance of promoting higher physical activity levels to reduce musculoskeletal pain.* ***Conclusion:*** *This study highlights the significant prevalence of musculoskeletal disorders (MSDs) and their impact on work among individuals attending outpatient departments. Promoting higher physical activity levels is crucial for reducing musculoskeletal pain and improving occupational outcomes.*

Keywords: *musculoskeletal disorders, physical activity, prevalence, work interference, Bangladesh*

Introduction: A musculoskeletal disorder is defined as pain or discomfort in one or more of the following bodily areas: the neck, shoulder, elbow, wrist/hand, upper back, lower back, knees/thigh, hip/thighs, or ankle/feet[1]. Musculoskeletal diseases (MSDs) are a prominent cause in Western nations such as Brazil, Canada, and Italy, where study has been undertaken before [2,3]. With prevalence rates ranging from 11 % [4], MSD are rather common. Worldwide, there were 632 million people with back pain in 2013, 332 million with neck pain, 251 million with knee osteoarthritis, and 561 million with other MSDs in 2013[5].

Regular physical activity has several advantages, especially for great and long-term health. Exercise helps soothe aching muscles, maintain function, and protect against cardiovascular problems[6]. Physical activity is any movement of the body caused by the skeletal muscles that requires the expenditure of energy, including work, play, domestic chores, travel,

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Received date: 15 July 2023
Accepted reviewed version date: 23 August 2023

and leisure pursuits[7]. Adults should exercise for at least 2.5 hours per week, equivalent to 600 metabolic equivalent (MET) minutes of overall physical activity, and 75 minutes of strenuous activity, as recommended by the WHO[8]. Muscles, nerves, ligaments, tendons, joints, cartilage, lesions, and discomfort in the spinal cord are all impacted by MSD[9]. Nine body parts are at risk for MSD: the shoulders, neck, elbows, hands/wrists, upper back, hips/thighs, lower back, knees, and ankles/feet[10].

In addition, PA reduces morbidity, mortality, and the chance of acquiring MSDs while enhancing musculoskeletal fitness, general health, and quality of life [11,1]. It has been demonstrated that musculoskeletal discomfort is more commonly connected with low levels of PA. However, it has been demonstrated that a more severe form of MSDs is linked to psychological and social aspects[13,14]. Numerous people's quality of life is impacted by this, including those who are different ages, professions, and ethnicities[14]. Additionally, PA improves overall health, quality of life, and musculoskeletal fitness while lowering mortality, morbidity, and the risk of acquiring MSDs [15,16]. It has been established that low levels of PA are more frequently associated with musculoskeletal discomfort.

Physical activity can be used to both prevent and lessen musculoskeletal issues in people of all ages [17–20]. But because musculoskeletal discomfort can limit a professional's ability and capacity to work, this is especially important[21,22]. As individuals become older, musculoskeletal diseases (MSD) which impact the neck and back support systems, muscles, ligaments, nerves, tendons, and joints become more prevalent[23]. The link between physical activity and musculoskeletal issues in the older age group needs to be specifically taken into account. Despite the use of a variety of methods, only a small number of research from Bangladesh[24–27] revealed musculo-skeletal illnesses and work related ergonomic risk factors. Although there hasn't been much study on MSD and exercise in Bangladesh. The purpose of this study was to ascertain if there was a correlation between physical activity and MSD, BMI, and sociodemographic characteristics among residents of Gazipur, a Bangladeshi industrial district.

The purpose of this research was to examine the relationship between risk factors for MSDs and the incidence of nine different types of MSDs in different parts of the body (the neck, shoulders, upper back, elbows, wrists/hands, lower back, hips/thighs, knees, and ankles/feet).

Materials and Methods

Study design:

The Institutional Ethical Review Committee of City Medical College, Gazipur, Bangladesh, approved this research. This cross-sectional study was done on 430 patients who visited the orthopedics, gynecology, and medicine outpatient departments at Gazipur City Medical College between December 2022 and March 2023. The research comprised participants who matched the inclusion criterion of being at least 21 years old, without a physical impairment, and who chose to take part. Those who were incapacitated, pregnant, refused to participate or did not finish the questionnaire were excluded from the research.

Self-administered and guided questionnaires with sociodemographic questions, the International Physical Activity Questionnaire (IPAQ)-short form, and the Nordic Musculoskeletal Questionnaire were distributed to the participants (NMQ). The participant who agreed to participate in the study signed a paper attesting to their informed consent.

Instruments and procedures:

Before being weighed, the subject was barefoot, wore light clothes, and had their pockets emptied. Weight was taken using an analog scale accurate to 0.1 kg. Using a portable height measuring instrument, the height is measured to the closest 0.5 centimeter. Body Mass Index (BMI) is computed by dividing weight in kilograms by height in metres squared (kg m-2) and is classed according to cut-off values for Asians as underweight (<18.5), normal (18.5–22.9), overweight (23.0–27.49), and obese (≥27.5).

During an interview, the International Physical Activity Questionnaire (IPAQ) short form was used to quantify physical activity (IPAQ). This part has seven questions on physical activity completed over the last week, including vigorous-intensity, moderate- intensity, walking, and sitting. During the interview, information was collected on the amount of time spent on weekdays and weekends engaging in physical activities[28].

During an interview, the Nordic Musculoskeletal Questionnaire (NMQ) was utilized to assess MSD. The NMQ is a comprehensive questionnaire

Received date: 15 July 2023
Accepted reviewed version date: 23 August 2023

consisting of forty closed multiple-choice questions . that identifies nine body areas associated with MSD problems [29]. The MSD examination utilized a binary response (yes/no) in the preceding 7 days and 12 months. Previous researchers have tested the reliability and validity of the NMQ questionnaire[30].

Statistical Analysis:
The data were gathered and put into Microsoft Excel 2016 before being analyzed with version 25 of the Statistical Package for the Social Sciences (SPSS) application. The prevalence and categorical variables were reported as frequencies and percentages, and the body mass index (BMI) was computed and classified. The link between MSDs and PA, as well as the relationship between MSDs and sociodemographic features of the study group, were evaluated using Chi-square and t tests. At $P < 0.05$, all statistical tests were deemed statistically significant.

Results:
Table 1 showed that this study included 430 individuals, with a fairly equal distribution between males (41.9%) and females (58.1%). The age groups were well-represented, with the largest proportion falling within the 31-40 age range (34.9%). The BMI distribution showed that 42.0% were overweight, while 39.0% were in the normal weight range. Urban residents constituted 69.8% of the population, and the majority had an upper secondary education level (42.1%). Office workers (23.3%) and garments workers (27.9%) were the predominant occupational groups. Approximately 60.5% reported having co-morbidities, and sedentary behavior was prevalent (70.0% sat for <4 hours). The majority reported a sleep duration of 6-8 hours (62.8%) and fair sleep quality (41.9%). Most participants worked 6-8 hours per day (58.1%), and non-smokers constituted 74.4% of the population.

Table 1.Characteristicsof the patients reporting musculoskeletal disorders (MSD) according to socio-demographic factors (n = 430)

Characteristics	n	Percentage (%)
Gender		
Male	180	41.9
Female	250	58.1
Age		
21–30	91	21.2
31–40	150	34.9
41–50	113	26.3
51–60	66	15.3
61 and above	10	2.3
BMI		
Underweight (<18.5)	30	7.0
Normal (18.5–22.9)	167	39.0
Overweight (23.0–27.4)	180	42.0
Obesity (≥27.5)	53	12.0
Residence		
Urban	300	69.8
Rural	130	30.2
Education Level		
Primary	72	16.7
Lower secondary	117	27.2
Upper secondary	181	42.1
Certificate and above	60	14.0
Work level		
Industrial Worker	75	17.4
Garments Workers	120	27.9
Office Worker	100	23.3
Vehicle Driver	50	11.6
Others	85	19.8
Co-morbidities		
Yes	260	60.5
No	170	39.5
Sedentary Behaviour		
Sit <4 hours	301	70.0
Sit >4 hours	129	30.0
Sleep Duration		
<6 hours	90	20.9
6-8 hours	270	62.8
>8 hours	70	16.3
Sleep Quality		
Poor	140	32.6
Fair	180	41.9
Good	110	25.6
Working Hours per Day		
<6 hours	100	23.3
6-8 hours	250	58.1
>8 hours	80	18.6
Smoking Status		
Non-smoker	320	74.4
Former smoker	50	11.6
Current smoker	60	13.9
Physical Activity Level		
Low	250	58.0
Moderate	150	35.0
High	30	7.0

Table-2. Shows the prevalence of pain in various body areas over the course of the last 12 months and assessed its impact on work. The findings revealed that a significant proportion of individuals experienced pain in different body areas. The most commonly reported areas of pain were the lower

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back, with over half of the participants (52.56%) reporting pain in this region, followed by knee pain, which affected nearly two-thirds of the participants (64.19%).In terms of work interference, knee pain emerged as the most impactful, with almost half of the individuals (46.71%) reporting that it affected their ability to work. Lower back pain was also found to have a notable impact on work, with approximately one-third of participants (32.89%) reporting work interference. Shoulder pain was another area that significantly affected work, with 15.13% of individuals reporting its interference. Similarly, upper back pain was shown to have a considerable impact on work for 26.32% of participants. On the other hand, elbow pain was found to have the lowest prevalence among the participants, and no individuals reported work interference due to elbow pain.

Table 2: Prevalence of Musculoskeletal disorders

variable	Number	Percentage
Pain during the last 12 months		
Neck	18	4.19%
Shoulder	46	10.70%
Elbows	15	3.49%
Wrists/hands	19	4.42%
Upper back	152	35.35%
Lower back	226	52.56%
Hips/thighs	42	9.77%
Knees	276	64.19%
Ankles/feet	30	6.98%
Pain interferes with work		
Neck	4	2.63%
Shoulder	23	15.13%
Elbows	0	0.00%
Wrists/hands	13	8.55%
Upper back	40	26.32%
Lower back	50	32.89%
Hips/thighs	11	7.24%
Knees	71	46.71%
Ankles/feet	8	5.26%

The study examined the prevalence of pain in various body areas over the last 12 months. (Fig 1). Among the participants, the highest prevalence of pain was reported in the knees, affecting 64.19% of individuals. This was followed by lower back pain, experienced by 52.56% of participants. Other commonly reported areas of pain included the upper back (35.35%), shoulders (10.70%), hips/thighs (9.77%), and ankles/feet (6.98%). The leastprevalent areas of pain were the neck (4.19%), elbows (3.49%), and wrists/hands (4.42%).

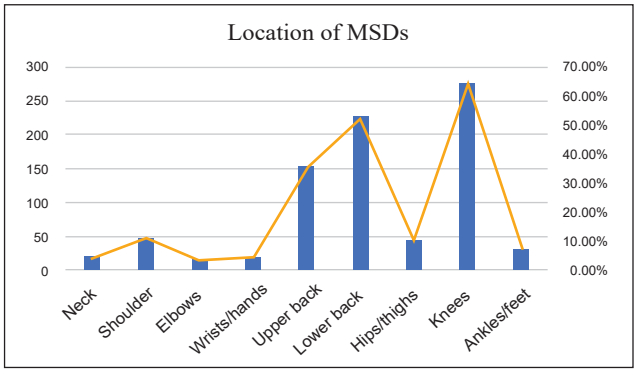

Fig-1: This graph shows the pain during the last 12 months according to the Presenting site.

Table-3, Shows associations between general characteristics and MSDs. Gender, age, BMI, Occupation, sedentary behavior, sleep quality and working hours per day Shows significance, as 65.0% of those suffering from MSDs were female, 31.0% were 41-50 years of age, 26.20% were overweight, 32% were garments worker, and 41.0% had a poor sleep quality.

Table 3: Association between general characteristics and musculoskeletal disorders

Variables		Pain during the last 12 months		Chi-square	*P*
		Yes	No		
Gender	Male	110 (35.0%)	70 (58.0%)	16.025	0.002*
	Female	200 (65.0%)	50 (42.0%)		
Age	21-30	81 (25.0%)	10 (9.0%)	18.825	0.000*
	31-40	90 (28.0%)	60 (55.0%)		
	41-50	100 (31.0%)	13 (12.0%)		
	51-60	40 (13.0%)	26 (24.0%)		
	≥61	10 (3.0%)	0 (0.0%)		
BMI	Underweight	24 (7.0%)	6 (6.0%)	11.436	0.010*
	Normal	100 (31.0%)	67 (65.0%)		
	Overweight	160 (49.0%)	20 (19.0%)		
	Obesity	43 (13.0%)	10 (10.0%)		
Work Level	Industrial Worker	45 (15.0%)	30 (25.0%)	11.384	0.013*
	Garments Worker	100 (32.0%)	20 (17.0%)		
	Office Worker	60 (19.0%)	40 (33.0%)		
	Vehicle Driver	30 (10.0%)	20 (17.0%)		
	Others	75 (24.0%)	10 (8.0%)		
Sedentary Behavior	Sit <4 hours	290 (74.0%)	11 (27.5%)	12.028	0.012*
	Sit >4 hours	100 (26.0%)	29 (72.5%)		
Sleep Quality	Poor	130 (41.0%)	10 (9.0%)	11.263	0.003*
	Fair	100 (31.0%)	80 (73.0%)		
	Good	90 (28.0%)	20 (18.0%)		
Working Hours Per Day	<6 hours	40 (15.0%)	60 (37.5%)	16.021	0.000*
	6-8 hours	150 (55.0%)	100 (62.5%)		
	>8 hours	80 (30.0%)	0 (0.0%)		

The level of physical activity was found to have a significant association with pain experiences during the last 12 months ($\chi^2 = 36.119$, $p < 0.001$). Individuals with low physical activity reported pain

Received date: 15 July 2023
Accepted reviewed version date: 23 August 2023

DOI: https://doi.org/10.3329/cemecj.v7i1.70942

in 28.0% of cases, while those with moderate physical activity reported pain in 54.0% of cases. Regarding pain interference with work, a significant association with physical activity level was observed (χ^2 = 21.431, $p < 0.001$). Among individuals with low physical activity, 39.0% reported pain interference with work. For pain experienced in the last 7 days, a significant association with physical activity level was found (χ^2 = 78.129, $p < 0.001$). In individuals with low physical activity, pain was reported in 28.0% of cases. These results highlight the importance of physical activity in relation to pain experiences and its impact on work-related activities. (Table:4)

Table 4: Association between musculoskeletal disorders and level of physical activity level

Level of physical activity	Pain during the last 12 months		Chi-square	P-value
	YES	NO		
Low	112 (28.0%)	6 (21.0%)	36.119	0.000*
Moderate	215 (54.0%)	15 (54.0%)		-
High	72 (18.0%)	7 (25.0%)		-
	Pain interferes with work			
Low	59 (39.0%)	75 (27.0%)	21.431	0.000*
Moderate	66 (44.0%)	173 (62.0%)		-
Hight	26 (17.0%)	31 (11.0%)		-
	Pain during the last 7 days			
Low	110 (28.0%)	8 (24.0%)	78.129	0.000*
Moderate	215 (54.0%)	18 (55.0%)		-
High	72 (18.0%)	7 (21.0%)		-

Table 5 presents the association between musculoskeletal disorders (MSD) in nine different body regions and the level of physical activity. Chi-square tests were conducted to examine the statistical significance of these associations. Significant associations were found between physical activity level and pain in the neck (χ^2= 10.072, p=0.008), shoulder (χ^2=10.783, p=0.006), elbows (χ^2=9.044, p=0.007), wrists/hands (χ^2= 9.305, p=0.006), upper back (χ^2=12.445, p= 0.004), lower back (χ^2=14.082, p=0.002), hips/thighs (χ^2 =10.453, p=0.008), knees (χ^2=14.370, p=0.003), and ankles/feet (χ^2=10.001, p=0.009) during the last 12 months. However, no significant associations were found between physical activity level and pain in the elbows, wrists/hands, and ankles/feet during the last 12 months ($p > 0.05$). The findings indicate that individuals with lower physical activity levels reported a higher prevalence of pain in most body regions compared to those with moderate or high physical activity levels. This suggests a clear relationship between physical activity level and the prevalence of MSD.These results highlight the importance of promoting and maintaining a higher level of physical activity to reduce the risk of musculoskeletal pain in various body regions.

Table-5: The association between MSD between 9 body parts with physical activity level.

Regions of MSD	Level of physical activity	Yes	No	Chi-square	P-value
Pain in the Neck during the last 12 months	Low	2 (11.0%)	244 (59.0%)	10.072	0.008
	Moderate	12 (67.0%)	140 (34.0%)	-	-
	High	4 (22.0%)	28 (7.0%)	-	-
Pain in the Shoulder during the last 12 months	Low	5 (11.0%)	125 (33.0%)	10.783	0.006
	Moderate	23 (50.0%)	190 (49.0%)	-	-
	High	18 (39.0%)	69 (18.0%)	-	-
Pain in the Elbows during the last 12 months	Low	1 (7.0%)	275(66.0%)	9.044	0.007
	Moderate	5 (33.0%)	115 (28.0%)	-	-
	High	9 (60.0%)	25 (6.0%)	-	-
Pain in the Wrist/Hand during the last 12 months	Low	1 (6.0%)	275(67.0%)	9.305	0.006
	Moderate	9 (47.0%)	115 (28.0%)	-	-
	High	9 (47.0%)	21 (5.0%)	-	-
Pain in the Upper Back during the last 12 months.	Low	18 (12.0%)	148 (53.2%)	12.445	0.004
	Moderate	55 (36.0%)	100 (36.0%)	-	-
	High	79 (52.0%)	30 (10.8%)	-	-
Pain in the Lower Back during the last 12 months	Low	95 (42.0%)	13 (6.0%)	14.082	0.002
	Moderate	121 (54.0)	163(80.0%)	-	-
	High	10 (4.0%)	28 (14.0%)	-	-
Pain in the Hips/Thighs during the last 12 months	Low	17 (40.0%)	125 (32.0%)	10.453	0.008
	Moderate	20 (48.0%)	215 (55.0%)	-	-
	High	5 (12.0%)	48 (13.0%)	-	-
Pain in the Knees during the last 12 months	Low	89 (32.0%)	24 (15.0%)	14.370	0.003
	Moderate	155 (56.0%)	112 (73.0%)	-	-
	High	32 (12.0%)	18 (12.0%)	-	-
Pain in the Ankles/Feet during the last 12 months	Low	9 (30.0%)	81 (20.0%)	10.001	0.009
	Moderate	15 (50.0%)	275 (69.0%)	-	-
	High	6 (20.0%)	44 (11.0%)	-	-

Discussion:

This study explored the relation between musculoskeletal diseases (MSD) in nine distinct body areas and physical activity levels. Multiple bodily areas, including the neck, shoulder, elbows, wrists/hands, upper back, lower back, hips/thighs, knees, and ankles/feet, exhibited significant relationships between physical activity level and pain, as determined by our findings.

Received date: 15 July 2023
Accepted reviewed version date: 23 August 2023

This study revealed a considerable incidence of musculoskeletal disorders, with at least one body site experiencing pain or discomfort. The most often reported site was the knee (64.19 %), followed by the lower back (52.56 %) and the upper back (33.35 %), which was frequently associated with job avoidance and was more prevalent in recent days, especially for knee pain.

The highest prevalence of MSDs was among 41-50 years of geriatrics age groups (31.0%), which was significantly higher than among 21-30, 31-40, 51-60 and more than 61 years of age groups ($p<0.05$).

In another research, the prevalence of back pain was 66% in men and 86% in women over 12 months. Pain in the extremities was prevalent in 63% of men and 78% of women, whereas back/extremity pain was prevalent in 75% of men and 91% of women[31]. In another research, the prevalence of osteoarthritis in females was 24.1% or higher. 14.6% of older citizens experienced musculoskeletal problems, with knee arthritis afflicting 8.42% of men and 17.3 percent of women and spondylitis impacting 2.6% of males and 2.7% of women [32].

Another research found that the low back had the lowest site-specific prevalence (70%), followed by the knee (46%), neck (44%), leg/calf (39%), and mid-back (39%). Females had a greater incidence of MSDs in our sample, which was significant, as it has been in many previous studies[33,34]. MSDs were shown to be more common in Females (65.0%) than males (35.0%) in our study, which was determined to be more significant.Muscle strains, instability caused by weak postural muscles, a lack of flexibility in the spinal joints, and spinal disc degeneration or herniation might all be contributory causes[35].

In this study, there was a significant link between the number of MSD and BMI. This finding is similar to one discovered in a study of war veterans, which discovered that the higher the BMI, the greater the pain intensity among participants[36]. In a prior research, it was discovered that BMI was strongly related with musculoskeletal problems of the low back, knees, ankles, and feet[37]. The increased risk of musculoskeletal problems associated with being overweight or obese is caused by the additional strain that being overweight or obese places on human muscles[38]. Overweight and obesity increased the prevalence of wide musculoskeletal problems during an 11-year period, according to another research[39]. Higher BMI increases the risk of metabolic syndrome, which is characterized by obesity, hypertension, hyperglycemia, and hypertriglyceridemia [40].

The onset of MSDs is influenced by physical inactivity. Numerous studies have cited low levels of physical exercise as a primary contributor to MSDs. In our study, just 7.0% of the participants exhibited high levels of physical activity, compared to 35.0% of moderately active and 58.0% of slowly active participants. Unpredictably, we discovered that the prevalence of Musculoskeletal disorders was higher in people with a moderate level of PA (54.0%), lower in people with a low level of PA (21.0%), and only 25.0% in people with a high degree of PA. In a separate research, physically active individuals reported less shoulder and ankle/foot musculoskeletal symptoms[41]. In a separate research that assessed the amount of leisure hours per week spent engaged in walking, mild, moderate, and intense physical activity at each of four assessment sites, a significant association was discovered between PA and the result of LBP. In a comparable study, we observed that women in India who seldom engaged in moderate physical activity were 29 percent more likely to experience back pain [42]. These studies indicate that a lower level of PA correlates with a greater incidence of MSDs.

In this study, the researchers recruited a diverse sample of individuals who were visiting the hospital as outpatients for various reasons. Data collection involved administering structured questionnaires to gather information on participants' physical activity levels, including the frequency, duration, and intensity of their exercise routines. Additionally, the researchers employed standardized assessment tools to diagnose and evaluate musculoskeletal disorders, such as joint pain, back pain, osteoarthritis, and other related conditions.

Using statistical analysis methods, the researchers examined the data to determine the relationship between physical activity and musculoskeletal disorders. The study explored potential associations between different levels of physical activity and the prevalence, severity, and types of musculoskeletal disorders observed in the outpatient population.

While this study provides valuable insights into the relationship between physical activity and musculoskeletal

Received date: 15 July 2023
Accepted reviewed version date: 23 August 2023

disorders, it is important to acknowledge its limitations. First, the cross-sectional design of the study restricts the establishment of causality between physical activity and musculoskeletal disorders. Future research using longitudinal designs could provide a clearer understanding of the temporal relationship between these variables. The study focused specifically on outpatients in a hospital setting, which may limit the generalizability of the findings to other populations, such as community-dwelling individuals or athletes. Future research should aim to include a broader range of participants from different settings to enhance the external validity of the findings. Based on the findings and limitations of this study, several suggestions for future research can be made. Firstly, conducting longitudinal studies that follow participants over an extended period would provide a better understanding of the long-term effects of physical activity on musculoskeletal disorders.

conducting better understanding of the long-term effects of physical activity. The activities of daily living frustrations (ADL) advices are also important for better outcome of musculoskeletal disorders. Additionally, incorporating objective measures of physical activity, such as wearable devices or activity monitors, would enhance the accuracy and reliability of data collection, reducing potential bias and providing more robust evidence.

Furthermore, expanding the study to include different populations, such as different age groups, occupational groups, or individuals with varying levels of physical fitness, would contribute to a more comprehensive understanding of the relationship between physical activity and musculoskeletal disorders across diverse populations.

Lastly, investigating the potential mechanisms through which physical activity influences musculoskeletal health, such as exploring the role of muscle strength, flexibility, or biomechanics, could provide valuable insights into the underlying mechanisms and help develop targeted interventions to prevent or manage musculoskeletal disorders effectively. Future research should include proper activities of daily living instruction along with long term physical activity.

Conclusion:
This cross-sectional study offers light on the association between physical activity and musculoskeletal problems among Bangladeshi hospital outpatients. The over whelming majority of them are physically inactive. Therefore, it is important to promote a healthy lifestyle while preventing musculoskeletal problems. It lays the groundwork for future research to study this association in greater depth and to guide methods for increasing musculoskeletal health via physical activity among persons with MSDs in Bangladesh.

Declarations

Conflict of Interest Statement
The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Funding statement
This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement
Data will be made available on request.

Ethical Approval
The ethical permission received from the ethics review committee of City Medical College, Gazipur, Bangladesh. Prior to data collection, patients were told about the project and consented, and anonymity was maintained throughout the study by removing their names and other personal identifiers. Confidentiality was strictly maintained during data processing and report writing.

Consent to participate
All procedures performed in this study followed the ethical standards of the institutional research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from all the enrolled patients.

Consent for Publication: Not applicable

Code Availability: Not applicable

Acknowledgements
We would want to express our gratitude to all of the patients. Additionally, we appreciate the research assistants and authors who supported with the data collection for this research.

Received date: 15 July 2023
Accepted reviewed version date: 23 August 2023

References:

1. Ghasemkhani M, Mahmudi E, Jabbari H. Musculoskeletal symptoms in workers. International Journal of Occupational Safety and Ergonomics. 2008. Jan 1;14(4):455–62. doi:10.1080/10803548.2008.11076784

2. Carugno M, Pesatori AC, Ferrario MM, Ferrari AL, Silva FJ, Martins AC, et al. Physical andpsychosocial risk factors for musculoskeletal disorders in Brazilian and Italian nurses. Cadernos desaudepublica. 2012. Sep;28(9):1632–42. doi: 10.1590/s0102-311x2012000900003

3. Mustard CA, Chambers A, Ibrahim S, Etches J, Smith P. Time trends in musculoskeletal disorders attributed to work exposures in Ontario using three independent data sources, 2004-2011.Occupational and environmental medicine. 2015. Apr 1;72(4):252–7. doi: 10.1136/oemed-2014-

4. Nazish N, Charles MJ, Kumar V. Prevalence of Musculoskeletal Disorder among House Wives and Working Women. Int J Health Sci Res. 2020;10:215–22.

5. Bihari V, Kesavachandran CN, Mathur N, Pangtey BS, Kamal R, Pathak MK, et al. Mathematically derived body volume and risk of musculoskeletal pain among housewives in North India. PloS one. 2013. Nov 6;8(11):e80133. doi: 10.1371/journal.pone.0080133

6. Søgaard K, Sjøgaard G. Physical activity as cause and cure of muscular pain: evidence of underlying mechanisms. Exercise and sport sciences reviews. 2017. Jul;45(3):136. doi: 10.1249/JES.0000000000000112

7. WHO. 2018. Physical Activity. https://www.who.int/news-room/fact-sheets/detail/physical-activity#:~:text=What%20is%20physical%20activity%3F,and%20engaging%20in%20recreational%20pursuits

8. World Health Organization (WHO) (2010) Global recommendations on physical activity for health. WHO, Geneva

9. Ghosh T, Das B, Gangopadhyay S. A comparative ergonomic study of work-related upper extremity musculo skeletal disorder among the unskilled and skilled surgical blacksmiths in West Bengal, India. Indian Journal of occupational and environmental medicine. 2011. Sep;15(3):127.

10. Descatha A, Roquelaure Y, Chastang JF, Evanoff B, Melchior M, Mariot C, et al. Validity of Nordic-style questionnaires in the surveillance of upper-limb work-related musculoskeletal disorders. Scandinavian journal of work, environment & health. 2007. Feb;33(1):58. doi: 10.5271/sjweh.1065

11. Warburton DE, Nicol CW, Bredin SS. Health benefits of physical activity: The evidence. CMAJ. 2006;174:801–9.

12. Garber CE, Blissmer B, Deschenes MR, Franklin BA, Lamonte MJ, Lee IM, et al. Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: Guidance for prescribing exercise. Med Sci Sports Exerc. 2011;43:1334–59.

13. Hauke A, Flintrop J, Brun E, Rugulies R. The impact of work-related psychosocial stressors on the onset of musculoskeletal disorders in specific body regions: A review and meta-analysis of 54 longitudinal studies. Work Stress. 2011;25:243–56.

14. Andersen JH, Haahr JP, Frost P. Risk factors for more severe regional musculoskeletal symptoms: A two-year prospective study of a general working population. Arthritis Rheum. 2007;56:1355–64.

15. Warburton DE, Nicol CW, Bredin SS,: Health benefits of physical activity: the evidence. CMAJ. 2006, 174:801-9. 10.1503/cmaj.051351

16. Garber CE, Blissmer B, Deschenes MR, et al.: Quantity and quality of exercise for developing and maintaining cardiorespiratory, musculoskeletal, and neuromotor fitness in apparently healthy adults: guidance for prescribing exercise. Med Sci Sports Exerc. 2011, 43(7):1334-59.

Received date: 15 July 2023
Accepted reviewed version date: 23 August 2023

17. Garcia-Pinillos F, Laredo-Aguilera JA, Munoz-Jimenez M, et al.: Effects of 12-week concurrent highintensity interval strength and endurance training programme on physical performance in healthy older people. J Strength Cond Res. 2019, 33(5):1445-1452. 10.1519/JSC.0000000000001895

18. Nawrocka A, Mynarski W, Powerska A, et al.: Health-oriented physical activity in prevention of musculoskeletal disorders among young polish musicians. Int J Occup Med Environ Health. 2014, 27:28-37. 10.2478/s13382-014-0224-5

19. Morken T, Mageroy N, Moen BE: Physical activity is associated with a low prevalence of musculoskeletal disorders in the royal norwegian navy: a cross sectional study. BMC MusculoskeletDisord. 2007, 8:56. 10.1186/1471-2474-8-56

20. Murata S, Doi T, Sawa R, et al.: Association between objectively measured physical activity and the number of chronic musculoskeletal pain sites in community-dwelling older adults. Pain Med. 2019, 20(4):717-723.

21. Moreira-Silva I, Santos R, Abreu S, et al.: The effect of a physical activity program on decreasing physical disability indicated by musculoskeletal pain and related symptoms among workers: a pilot study. Int J OccupSaf Ergo. 2015, 20:55-64.

22. Zhang L, Huang C, Lan Y, et al.: Impact of work-related musculoskeletal disorders on work ability among workers. Zhonghua Lao Dong Wei Sheng Zhi Ye Bing ZaZhi. 2015, 33(4):245-249.

23. Briggs AM, Cross MJ, Hoy DG, et al.: Musculoskeletal health conditions represent a global threat to healthy aging: a report for the 2015 World Health Organization World Report on Ageing and Health. Gerontologist. 2016, 56:243-255. 10.1093/geront/gnw002

24. Ahmad SA, Sayed M, Khan MH, Faruquee M, Yasmin N, Hossain Z, et al. Musculoskeletal Disorders and Ergonomic Factors among the Garment Workers. JOPSOM; 2007; 26(2): 97–110.

25. Sarder MB, Imrhan SN, Mandahawi N. Ergonomic workplace evaluation of an Asian garment-factory. Journal of human ergology. 2006;35(1/2):45–51.

26. Jahan N, Das M, Mondal R, Paul S, Saha T, Akhtar R, et al. Prevalence of Musculoskeletal Disorders among the Bangladeshi Garments Workers. SMU Medical Journal. 2015;2 (1): 102–13.

27. Habib MM. Ergonomic risk factor identification for sewing machine operators through supervised occupational therapy fieldwork in Bangladesh: A case study. Work (Reading, Mass). 2015;50(3):357–62.

28. IPAQ (2005) Guidelines for Data Processing and Analysis of the International Physical Activity Questionnaire (IPAQ)–Short and Long Forms, revised on November 2005.https:// docs.google.com/viewer?a=v&pid=sites&srcid=ZGVmYXVsdGRvbWFpbnxaGVpcGFxfGd4OjE0NDgxMDk3NDU1YWRlZTM

29. Crawford JO. The Nordic musculoskeletal questionnaire. Occupational medicine. 2007. Jun 1;57(4):300–1.

30. Pugh JD, Gelder L, Williams AM, Twigg DE, Wilkinson AM, Blazevich AJ. Validity and reliability of an online extended version of the Nordic Musculoskeletal Questionnaire (NMQ-E2) to measure nurses' fitness. Journal of clinical nursing. 2015. Dec;24(23–24):3550–63. doi: 10.1111/jocn.12971

31. Bang AA, Bhojraj SY, Deshmukh M, et al.: Epidemiology of pain in back and extremities in rural population: a community-based estimation of age- and sex-specific prevalence, distribution, duration and intensity of pain, number of painful sites and seasonality of pain during twelve months in rural gadchiroli, india. J Glob Health. 2021, 11:12002.

32. Kamble SV, Ghodke YD, Dhumale GB, et al.: Health status of elderly persons in rural area of india . Indian Medical Gazette. 2012, 8:295-299.

Received date: 15 July 2023
Accepted reviewed version date: 23 August 2023

33. Rodríguez-Romero B, Pérez-Valiño C, Ageitos-Alonso B, Pértega-Díaz S. Prevalence and associated factors for musculoskeletal pain and disability among spanish music conservatory students. Med Probl Perform Art. 2016;31:193–200.

34. Ng A, Hayes MJ, Polster A. Musculoskeletal disorders and working posture among dental and oral health students. Healthcare. 2016;4 pii: E13. doi: 10.3390/healthcare4010013.

35. Quittan M. Management of back pain. Disability and rehabilitation. 2002. Jan 1;24(8):423–34. doi: 10.1080/09638280110108850

36. Higgins DM, Buta E, Heapy AA, Driscoll MA, Kerns RD, Masheb R, et al. The Relationship Between Body Mass Index and Pain Intensity Among Veterans with Musculoskeletal Disorders: Findings from the MSD Cohort Study. Pain Medicine. 2020. Oct;21(10): 2563–72. doi: 10.1093/pm/pnaa043

37. Nag A, Vyas H, Nag PK. Gender differences, work stressors and musculoskeletal disorders in weaving industries. Industrial health. 2010;48(3) :339–48. doi: 10.2486/ indhealth. 48.339

38. Bihari V, Kesavachandran C, Pangtey BS, Srivastava AK, Mathur N. Musculoskeletal pain and its associated risk factors in residents of National Capital Region. Indian journal of occupational and environmental medicine. 2011. May;15(2):59. doi: 10.4103/0019-5278.90375

39. Mork PJ, Vasseljen O, Nilsen TI. Association between physical exercise, body mass index, and risk of fibromyalgia: longitudinal data from the Norwegian Nord-Trøndelag Health Study. Arthritis care & research. 2010. May;62(5): 611–7. doi: 10.1002/acr.20118

40. Manaf MR, Nawi AM, Tauhid NM, Othman H, Rahman MR, Yusoff HM, et al. Prevalence of metabolic syndrome and its associated risk factors among staffs in a Malaysian public university. Scientific Reports. 2021. Apr 14;11(1):1–1.

41. Nawrocka A, Niestrój-Jaworska M, Mynarski A, et al.: Association between objectively measured physical activity and musculoskeletal disorders, and perceived work ability among adult, middle-aged and older women. ClinInterv Aging. 2019, 14:1975-83. 10.2147/ CIA. S204196

42. Ghose B, Tang S, Yaya S, et al.: Participation in physical activity and back pain among an elderly population in south asia. J Pain Res.. 2017, 10:905-13.

Received date: 15 July 2023
Accepted reviewed version date: 23 August 2023