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FREQUENCY OF MUSCULOSKELETAL LOW BACK PAIN AMONG ADULT FEMALES OF DISTRICT MANSEHRA.

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ABSTRACT

BACKGROUND:

Musculoskeletal low back pain (LBP) is one of the most common musculoskeletal disorders worldwide and a leading cause of pain, disability, and reduced quality of life among adults. Women are particularly vulnerable to low back pain due to biological, hormonal, occupational, and lifestyle-related factors. Despite its growing burden, limited data are available regarding the frequency of musculoskeletal low back pain among adult females in District Mansehra, Pakistan.

OBJECTIVE:

To determine the frequency of musculoskeletal low back pain among adult females in District Mansehra.

METHODOLOGY:

A community-based cross-sectional study was conducted among 200 adult females residing in District Mansehra. Participants were selected using a convenient sampling technique. Data were collected using a structured questionnaire consisting of demographic characteristics, the Nordic Musculoskeletal Questionnaire (NMQ) for identifying low back pain, and the Numeric Pain Rating Scale (NPRS) for assessing pain intensity. Data were analyzed using SPSS version 26. Descriptive statistics, including frequencies, percentages, mean, and standard deviation, were used to summarize the data. Cross-tabulation and the Pearson Chi-square test were performed to examine the association between low back pain and selected demographic variables. A p-value of <0.05 was considered statistically significant.

RESULTS:

A total of 200 adult females participated in the study. The mean age of the participants was 40.12 ± 13.58 years. The majority of participants belonged to the 50–65 years age group (31.5%), while 35.0% had a normal body mass index and 34.0% were classified as obese. Moderate physical activity was reported by 46.0% of the participants. The frequency of musculoskeletal low back pain during the previous 12 months was 54.0%, whereas 46.0% reported no low back pain. Regarding pain intensity, 26.0% of participants experienced severe pain, 20.0% reported moderate pain, and 8.0% experienced mild pain. Cross-tabulation analyses demonstrated variations in the distribution of low back pain according to age group, marital status, occupation, and physical activity level.

CONCLUSION:

Musculoskeletal low back pain is highly prevalent among adult females in District Mansehra, affecting more than half of the study population. The findings suggest that demographic and lifestyle characteristics may influence the occurrence of low back pain. Community-based awareness programs, promotion of regular physical activity, ergonomic education, and early physiotherapy interventions are recommended to reduce the burden of low back pain among adult females.

KEY WORD:

Low Back Pain, Posture, Musculoskeletal Disorder, Occupational health, Work performance, Ergonomics

INTRODUCTION

The most important source of disability in the entire globe and a significant health burden is the musculoskeletal low back pain (LBP). It is typically described as an ache or pain under a costal margin and above inferior gluteal folds and or is accompanied by lower limb radiations [1]. LBP is a disease affecting millions of individuals and can significantly reduce their daily activities and quality

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of life. In Pakistan, the prevalence of LBP has increased from 6,500 per 100,000 population in 1990 to 7,462 per 100,000 in 2021, reflecting a 14.8% rise over three decades. There is also an increase in the regional inequalities with the highest being in Gilgit-Baltistan and a large relative growth in Punjab and Islamabad Capital Territory. The increasing burden highlights the pressing necessity of preventive, clinical, and rehabilitative interventions in order to decrease the disability that accompanies it and enhance population health outcomes. Musculoskeletal low back pain (LBP) is a common health problem in all parts of the world, and one of the leading causes of adult disability. It may be characterized by pain on the lower limbs or painless, pain under the costal margin, and over the gluteal folds [2].

LBP is prevalent disability that can influence the person physical state, communities, families, and mental attitude adding to expanded expenditures for business, government, and community.[33], Of the 291 wellbeing conditions overviewed in the Global Burden of Disease 2010 investigation (GBD 2010), LBP imparted the topmost to dysfunction and positioned 6th as far as worldwide overload of morbidity [5]. Worldwide, low back pain continues to be the primary cause as years lived with disability (YLDs). In 2020, there were more than 500 million cases of low back pain around the world [6], Baroncini, A., et al suggest that 15% of participants experience their initial episode and 80% of them have an activity imitating recurrence within a year [7], In the United States, 7.6% of adults reported experiencing at least a single bout of severe acute lower back pain within a year and almost one in four adults experienced low back pain lasting at least 24 hours during the preceding three months [8].

Su, X., et al. suggest that 90% of patients with acute LBP report significant pain and disability improvement after a month, indicating that the condition typically resolves on its own, However, recurrences of symptoms are highly common and lead to major medical and economic issues for people and society[9], It appears that the prevalence of LBP rises with age, peaking between the ages of 35 and 55[10], Reduced job capacity, limited participation in everyday activities and a marked decline in quality of life are all consequences of low back pain[11], Women are more likely than males to experience low back pain, according to several studies. Anatomical variations, pregnancy related alterations and hormonal changes during menstrual cycle could all be contributing variables to this higher frequency in females [12], Prevalence of LBP is enormously associated with female sex, high body mass, fall history, osteoarthritis, anemia related with iron insufficiency, anxiety, problematic thyroid and history of cardiovascular diseases [13], The goal of management is to lessen pain and its effects by providing comfort and information [14].

Some people such as medical students are particularly vulnerable to the effects of long sitting and sedentary lifestyles which are associated with the academic demands. A cross-sectional study carried out at Akhtar Saeed Medical and Dental College, Lahore, revealed that 56.8% of students experienced LBP with the majority experiencing mild to moderate pain with varying levels of disability in performing their daily tasks [3]. The results indicate that sedentary behavior, poor ergonomics, and musculoskeletal pain are closely related to one another, and specific interventions to be implemented to address the problem include ergonomic changes, physical exercise promotion, and musculoskeletal health education. Together, these data highlight that LBP is not only a common

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population health problem in Pakistan but also a disease in younger adults at risk of developing chronic pain without prevention strategies.

Risk factors of low back pain (LBP) may be exacerbated in rural and semi-urban settings (District Mansehra) by a shortage of access to health care facilities, little knowledge of ergonomic measures, and a higher proportion of women engaged in physically demanding household and agricultural labor [4]. Although musculoskeletal disorders are high in these communities, there is limited region-specific information concerning adult females in these communities. The current literature is quite urbanized or among selected groups of people in occupational settings and there is a lack of information on the actual prevalence and determinants of LBP in a rural setting. The low back pains of musculoskeletal nature do not only impair physical health, but also daily functioning, productivity, and quality of life. Chronic pain may cause the restriction of the normal activity, psychological stress, and diminished effectiveness in domestic and work activity. As such, exploring the prevalence and risk factors of low back pain in adult females in the rural areas is critical in coming up with the specific prevention measures and prevention intervention programs. Physical methods (such as traction, low-level laser therapies, transcutaneous electrical stimulation of the nerves, ultrasound, back supports and superficial heating or cold therapy) [15][16] and multidisciplinary rehabilitation are some of the nonpharmacologic, noninvasive treatments for low back pain.[17]

This study aims to determine the frequency of musculoskeletal low back pain among adult females in district Mansehra, thereby contributing to the existing body of knowledge and helping healthcare professionals design effective community-based management programs.

RATIONALE

The importance of this study was to determine the burden of low back pain in adult females in district Mansehra. Many patients continue to experience persistent low back pain. Even though there are numerous physical therapy treatment protocols for low back pain, a considerable number of patients have repeated symptoms, which suggests that underlying issues are still present or unresolved. This ongoing discomfort may be occurred due to poor lifestyle, incorrect posture, occupation and healthcare facilities. The findings will guide physiotherapists and health care professionals to develop specific interventions, awareness programs, and rehabilitation programs to minimize disability and enhance the quality of life.

OBJECTIVES

To determine the frequency of MLBP among adult females in district Mansehra.

To assess the severity and duration of pain.

To evaluate lifestyle and occupational risk factors.

HYPOTHESIS

There is a statistically significant frequency of musculoskeletal low back pain among adult females in district Mansehra in this cross-sectional survey.

There is no statistically significant frequency of musculoskeletal low back pain among adult females in district Mansehra in this cross-sectional survey.

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LITERATURE REVIEW

A cross-sectional study to investigate the prevalence of neck, shoulder, and back pain in elementary school students in Quetta, Balochistan, and emphasize the increasing incidence of musculoskeletal disorders (MSDs) in adolescents. The sample of the study comprised 256 male and female students who were below 19 years of age, chosen by non-probability convenience sampling, and those who have spinal deformities, recently traumatized, have cognitive problems, or wear medical devices were excluded. The structured questionnaire was used to gather data that evaluated demographics, backpack use, posture, ergonomic practice, and pain characteristics. Findings indicated that 95.7% of students carried backpacks, mostly on one shoulder and the areas that most frequently reported pain were shoulders (34.4%) and neck (32.8%), with 41.8% reporting moderate pain 2-3 times per week. There were also high rates of poor posture and extended phone use and even though 82.4% of students reported a lot of discomfort, there was a lack of physiotherapy or treatment. The researchers have come to the conclusion that musculoskeletal pain among school-aged children is a multifactorial issue that is affected by several factors such as ergonomics of the backpack, posture, and lifestyle habits, and it is necessary to focus on early screening, ergonomic education, and interventions to prevent the development of musculoskeletal issues during the long term [18].

Recent literature points to an increase in the trend and multifactorially of LBP in Pakistan. Based on the Global Burden of Disease (GBD) data, the years lived with disability (YLDs) caused by LBP have also risen, with the number increasing to 720 per 100,000 in 2021 compared to 605 per 100,000 in 1990 LBP is usually non-specific and is usually caused by the strains of muscles, sprains of the ligaments, tendon, and poor ergonomic habits Geographic differences indicate that geography, socioeconomic and occupational aspects and lifestyle causes contribute to the disease burden. physical therapy, which include thermotherapy, traction, strengthening activities and education in ergonomics have been found to be effective in reducing the pain, and improving functional outcomes. Early assessment and evidence-based interventions are essential to avoid long-term disability and manage chronic LBP, and structured rehabilitation programs and manual therapy are particularly beneficial [2, 19].

In their study, aimed to establish prevalence and relationship between musculoskeletal pain (MSP) and disability risk factors among Abbottabad population, implying the role of musculoskeletal pain in physical functioning, mental health, and quality of life. The research was conducted between June and November 2024 in Women Institute of Rehabilitation Sciences Clinic, Ayub Medical College, and Combined Military Hospital, Abbottabad, and involved a sample of 362 adults aged over 18 years who were chosen by the method of convenience. Patients who are addicted to drugs, have brain tumors, underwent surgery, or had fractures were excluded. A structured questionnaire with demographic features, Neuromusculoskeletal Questionnaire (pain assessment), and Neck Disability Index (functional limitations) was used to obtain the data. Chi-square/Spearman correlation tests and Descriptive and inferential analysis by using MS Excel were conducted to determine the relationship between pain and disability. The findings showed that 63.5% were female with the majority of the sample being housewives (29%), middle socioeconomic background (79.8%). Neck (24.6), shoulder (10.5), and lower back (7.2) were the most common locations of musculoskeletal pains. Neck pain

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proved to have the highest negative effect on the areas of disability, such as pain, lifting, work, driving, and recreation, with significant, but weak to moderate effects ($p < 0.05$), and shoulder and elbow pain demonstrated less strong associations. The findings of the study were that musculoskeletal pain and neck pain is a major health concern in Abbottabad and that community-based physiotherapy, ergonomic awareness and stress management and lifestyle modification strategies would help reduce disability and enhance the musculoskeletal health [20].

A cross-sectional survey was able to determine the prevalence of musculoskeletal disorders (MSDs) in the general population of Rawalpindi and Islamabad, which served to emphasize the high prevalence of the conditions among various groups of people. The sample size was 776, and data was gathered in different hospitals located in Rawalpindi and Islamabad. The aim was to examine the prevalence of musculoskeletal disorders, osteoarthritis, adhesive capsulitis, low back pain, neck pain, and tennis elbow. The findings revealed that the highest age group was 31-40 years, with females having a slightly higher percentage (54.5) than males (45.5), and an average age of 39.29 +13.276 years. Knee osteoarthritis (19.8) and adhesive capsulitis (18.9) were the most common reported, and the rest included low back pain (8.4%), neck pain (8.1%), and tennis elbow (7.9%). The results also showed that a majority of the patients had gone through an average of four sessions of conventional physiotherapy (17.3), occupational patterns were that a good number of the female respondents were housewives and teachers, and males were often drivers, waiters, dentists and bankers. The research concluded that musculoskeletal disorders are very common in the general population with low back pain being an important part of the issue, and there is a need to diagnose, prevent and treat the disease early to minimize the burden of the diseases [26].

A study on the prevalence and risk factors of lower back pain (LBP) in rural and urban Pakistan suggested that it is a major public health concern that impacts the musculoskeletal health of women. It was conducted at the Al-Rehman Clinic, Mianwali, between June 2023 and January 2025 and involved 154 adult women. The data were gathered through a questionnaire designed by the physician to measure variables like the location of pain, occupation, physical activity, sleep patterns, intake of dairy products, and family history, and were conducted through the statistical analysis with SPSS, descriptive as well as cross-tabular methods. The findings found that LBP was high at 77.3% especially among women in the age of 25-54 years, those who had sedentary or physically strenuous jobs, those who had poor sleep quality, and those who were physically inactive. The prevalence rates were very high in both rural and urban populations with minor differences in pain patterns, whereas the consumption of dairy products, and family history showed no significant associations. The results suggest that lifestyle and occupational variables that can be changed are important determinants of LBP in women. The researchers concluded that lower back pain is extremely common among women in various environments in Pakistan and there is a dire need to implement preventive measures such as physical activity promotion, ergonomic knowledge, and enhanced sleep hygiene to decrease the musculoskeletal disorders burden [24].

In Pakistan, low back pain (LBP) has been increasing significantly in the last three decades, which indicates its importance as a social health problem. Nationally-level data provided by the Global Burden of Disease (GBD) study suggests that the prevalence of LBP increased between 6,500 per

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100,000 population in 1990 and 7,462 per 100,000 in 2021, with a corresponding rise in years lived with disability (YLDs) [2]. Such an upward trend is evidence of a growing number of risk factors, such as sedentary lifestyles, poor ergonomics, and work pressures. Also apparent are regional variations, with Gilgit-Baltistan exhibiting the highest prevalence, and increases in Punjab and Islamabad Capital Territory the highest proportions. It has been indicated that majority of the LBP cases are non-specific with most of them being caused by the strains of the muscles, ligament ruptures, or tendon ruptures. Moreover, the impact of LBP is increased by the lack of awareness and access to preventive care and inadequate rehabilitation services, especially rural regions. These results highlight the necessity of special public health actions, such as early diagnosis, physical therapy, ergonomics training, and formal rehabilitation to mitigate the increasing disability related to LBP in Pakistan.

A cross-sectional study examined the characteristics of low back pain (LBP) on physical therapists and nurses in Pakistan, and it is important to note that musculoskeletal disorders among healthcare professionals are becoming increasing. The sample was a group of 661 participants (including 247 physical therapists and 414 nurses) who were chosen using non-probability purposive sampling. The data were gathered in the period between August 2023 and January 2024, and all the assessment instruments were standard like the Visual Analog Scale (VAS) to evaluate the intensity of the pain and the Oswestry Disability Index (ODI) to assess the degree of disability, and the statistical analysis was done with the help of the SPSS version 23.0. The findings revealed that both groups have a high prevalence of low back pain with physical therapists having a higher percentage (49.79) of mild pain and no disability (51.41) and nurses being characterized by a higher percentage (51.20) of moderate pain with no significant disability (73.91). The results of these studies indicate that low back pain is prevalent among healthcare workers, but its intensity varies among professions, probably because of the difference in ergonomic awareness and work requirements. The researchers found that nurses are more likely to develop more severe low back pain than physical therapists, which is mainly caused by the insufficiency of ergonomic knowledge and work-related practices and that specific ergonomic training and preventive measures can largely decrease the incidence of LBP among healthcare professionals in Pakistan [21].

A cross-sectional study to estimate prevalence of low back pain (LBP) and assess working posture in healthcare professionals serving in District Headquarter hospitals of Hazara Division, such as Haripur, Abbottabad and Mansehra. The participants were a sample of healthcare professionals of both genders aged between 25-60 years and without certain spinal pathologies, including fractures, trauma, or neoplasms. A self-modified questionnaire was used to gather data and SPSS version 22 was used to analyses the data collected. The findings indicated the total prevalence of low back pain was 59.7% (n = 197), with the highest prevalence being among technicians (33.4%), and nurses (31.2%). Also, 67.3 percent of the respondents said they had LBP at some point in their lives, and the majority developed it after entering their profession, which suggests that it is closely related to work exposure and inappropriate working posture. The prevalence was a bit higher in males (56.3) compared to females (43.6), but the results emphasize the high burden of LBP among all health care providers. It was found that the prevalence of low back pain among the workers in the Hazara region

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is very high and is closely associated with the work-related factors to provide ergonomic intervention, posture correction measures, and preventive healthcare services to decrease the prevalence and effects of LBP [27].

METHODS AND MATERIAL

3.1. STUDY DESIGN

This study was cross-sectional study.

3.2. STUDY DURATION

The duration of this study was six months after the approval of the synopsis. During this period, data collection, analysis, and reporting was completed.

3.3. STUDY SETTING

The study was directed within the premises of King Abdullah Teaching Hospital district Mansehra(community settings, households, and healthcare centers) after the approval of Hazara University Research and Ethical Committee.

3.4. STUDY POPULATION

Adult females aged 18–60 years residing in district Mansehra

3.5. SAMPLE SIZE

The sample size was 200participants, calculated using the AP tool sample size calculator. This sample size is selected to ensure that the results are reliable and representative of the total population.

3.6. SAMPLING TECHNIQUE

A non-probability convenience sampling technique was used. In this method, participants who were easily available and willing to take part in the study was selected.

3.7. SELECTION CRITERIA

3.7.1. INCLUSION CRITERIA

Females aged 18–60 years
Residents of district Mansehra
Willing to participate

3.7.2. EXCLUSION CRITERIA

History of spinal trauma or surgery
Diagnosed spinal deformities (e.g., scoliosis)
Severe systemic illness
Rheumatoid arthritis
Malignancy
Osteoporosis

3.8. DATA ANALYSIS

Data was collected using the Nordic Musculoskeletal Questionnaire to assess a self-reported physical disability. After obtaining informed consent, data was analyzed using the SPSS. A p value <0.05 will be acknowledged.

3.9. ETHICAL CONSIDERATIONS:

Ethical approval will be obtained from the institutional review board of Hazara University Mansehra.

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Informed consent will be obtained from all participants.
Confidentiality of participants will be maintained.
Participants will have the right to withdraw from the study at any time.
The study will be induced by physical, psychological, and social harm to the subjects.

RESULTS

Table 4.1 presents the descriptive statistics of participants' age. The mean age of the participants was 40.12 ± 13.58 years, with ages ranging from 18 to 65 years. This indicates that adult females from a wide age range participated in the study.

Table 4.1 DESCRIPTIVE STATISTICS

Variable	Mean ± SD	Minimum	Maximum
Age (Years)	40.12 ± 13.58	18	65

Table 4.2 shows the distribution of participants according to age groups. The highest proportion of participants (31.5%) belonged to the 50–65 years age group, while the lowest proportion (19.0%) was observed in the 30–39 years age group.

Table 4.2 Frequency Distribution of Age Groups

Age Group	Frequency	Percentage (%)
18–29 years	56	28.0
30–39 years	38	19.0
40–49 years	43	21.5
50–65 years	63	31.5
Total	200	100

Table 4.3 illustrates the BMI distribution of the participants. Most participants had either normal BMI (35.0%) or were obese (34.0%), whereas only 3.0% were underweight.

Table 4.3 Frequency Distribution of BMI Categories

BMI Category	Frequency	Percentage (%)
Underweight	6	3.0
Normal	70	35.0
Overweight	56	28.0
Obese	68	34.0
Total	200	100

Table 4.4 presents the educational status of the participants. The majority of participants had completed secondary education (30.5%), followed by graduate education (27.5%), while only 13.5% had no formal education.

Table 4.4 Frequency Distribution of Education Level

Education	Frequency	Percentage (%)
None	27	13.5

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Primary	29	14.5
Secondary	61	30.5
Graduate	55	27.5
Postgraduate	28	14.0
Total	200	100

Table 4.5 demonstrates the pain severity among the participants using the Numeric Pain Rating Scale (NPRS). Almost half of the participants (46.0%) reported no pain, whereas 26.0% experienced severe pain.

Table 4.5 Frequency Distribution of Pain Severity (NPRS)

Pain Severity	**Frequency**	**Percentage (%)**
No Pain	92	46.0
Mild	16	8.0
Moderate	40	20.0
Severe	52	26.0
Total	200	100

Table 4.6 presents the association between age group and the prevalence of low back pain. A greater number of participants with low back pain were observed in the 18–29 years and 50–65 years age groups.

Table 4.6 Age Group with Low Back Pain

Age Group	**LBP Yes**	**LBP No**	**Total**
18–29	35	21	56
30–39	22	16	38
40–49	22	21	43
50–65	29	34	63
Total	108	92	200

Table 4.7 illustrates the relationship between marital status and low back pain. Married women constituted the largest proportion of participants reporting low back pain.

Table: 4.7 Marital Status with Low Back Pain

Marital Status	**LBP Yes**	**LBP No**	**Total**
Single	32	34	66
Married	59	45	104
Widowed/Divorced	17	13	30
Total	108	92	200

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Table 4.8 presents the association between physical activity level and low back pain. Participants with moderate physical activity accounted for the largest proportion of low back pain cases, followed by those with low physical activity.

Table 4.8 Physical Activity with Low Back Pain

Physical Activity	LBP Yes	LBP No	Total
Low	32	26	58
Moderate	45	47	92
High	31	19	50
Total	108	92	200

DISCUSSION

The present cross-sectional study was conducted to determine the frequency of musculoskeletal low back pain among adult females in District Mansehra. Low back pain is recognized as one of the most common musculoskeletal disorders worldwide and remains a leading cause of disability among adults, particularly women. According to the World Health Organization, low back pain affects people of all ages, with the burden increasing after middle age, and women are generally affected more frequently than men.

In the present study, 54.0% of adult females reported experiencing low back pain during the previous 12 months. This finding indicates that more than half of the study population had suffered from low back pain, suggesting that it is a common health problem among women in District Mansehra. The observed prevalence is comparable with findings from a recent Pakistani cross-sectional study, which also reported a high prevalence of low back pain among females living in rural and urban communities and identified lifestyle and ergonomic factors as important contributors.

The prevalence observed in the present study is also supported by international evidence. A Brazilian population-based study reported that low back pain was more common among women than men, with women accounting for approximately 60.9% of affected individuals. Likewise, a systematic review concluded that chronic low back pain becomes increasingly common from the third decade of life onwards and is consistently more prevalent among women than men. These similarities suggest that the burden of low back pain observed in the present study is consistent with global epidemiological trends.

The mean age of participants in this study was 40.12 ± 13.58 years, with the largest proportion belonging to the 50–65-year age group. Although low back pain was reported across all age categories, older women represented a considerable proportion of affected participants. This finding agrees with the World Health Organization, which reports that the prevalence of low back pain increases with advancing age and reaches its highest burden during later adulthood. Similarly, a systematic review by Rodrigo D. Meucci and colleagues concluded that the prevalence of chronic low back pain increases progressively with age, particularly after the age of 40 years.

Body mass index is another important factor associated with musculoskeletal disorders. In the present study, a substantial proportion of participants were overweight or obese. Although this study primarily assessed prevalence rather than causation, excess body weight may contribute to increased

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mechanical loading of the lumbar spine. Similar observations have been reported in several epidemiological studies, where increased BMI was identified as an important risk factor for low back pain among adults.

Regarding educational status, most participants had completed secondary or graduate education. Education itself may not directly cause low back pain; however, it influences occupational exposure, health literacy, awareness regarding posture, and healthcare-seeking behavior. Previous community-based studies have likewise suggested that educational attainment may indirectly influence musculoskeletal health through socioeconomic and occupational pathways rather than acting as an independent determinant.

The present study also demonstrated that 46.0% of participants reported moderate physical activity, while nearly one-third reported low physical activity. Cross-tabulation indicated that women with low and moderate physical activity represented a considerable proportion of those reporting low back pain. Previous research has consistently demonstrated that reduced physical activity is associated with weakening of core musculature, decreased spinal stability, and an increased risk of musculoskeletal pain. Conversely, regular exercise has been shown to reduce both the occurrence and recurrence of low back pain.

Pain intensity was evaluated using the Numeric Pain Rating Scale (NPRS). Approximately one-quarter of the participants experienced severe pain, while one-fifth reported moderate pain intensity. These findings suggest that many women experience pain severe enough to interfere with their daily activities and quality of life. Similar observations have been reported in community-based studies, where moderate-to-severe pain constituted the majority of symptomatic cases and was associated with reduced physical functioning.

Cross-tabulation analysis further demonstrated that married women accounted for the largest proportion of participants reporting low back pain. This finding may be explained by increased household responsibilities, childcare activities, repetitive lifting, prolonged standing, and cumulative physical workload commonly experienced by married women. A recent Pakistani study similarly reported that domestic workload, prolonged standing, poor ergonomics, and reduced physical activity contributed substantially to the occurrence of low back pain among women.

Occupation also appeared to influence the distribution of low back pain, with housewives representing the largest proportion of affected participants. Household activities frequently require repetitive bending, prolonged standing, lifting, and awkward postures, all of which increase stress on the lumbar spine. Similar findings have been reported in studies conducted in developing countries, where domestic work and repetitive physical tasks were identified as significant contributors to low back pain among women.

Overall, the findings of the present study are in agreement with both national and international literature, which consistently identifies female sex, advancing age, increased body weight, occupational workload, and physical inactivity as important contributors to low back pain. Although this study was designed primarily to determine the frequency of low back pain rather than establish causal relationships, it highlights the considerable burden of musculoskeletal low back pain among adult females in District Mansehra. These findings support the need for community-based preventive

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programs focusing on ergonomic education, regular physical activity, weight management, and early physiotherapy intervention to reduce the burden of low back pain among women.

CONCLUSION

The present study assessed the frequency of musculoskeletal low back pain among adult females in District Mansehra. The findings demonstrated that low back pain is a common musculoskeletal condition, with more than half of the participants reporting low back pain during the previous 12 months. This indicates that low back pain represents a significant public health concern among adult women in the study area.

The study population had a mean age of 40.12 ± 13.58 years, representing a wide adult age range. A considerable proportion of participants were overweight or obese, and many reported moderate or low levels of physical activity. These characteristics may contribute to the occurrence of low back pain through increased mechanical stress on the lumbar spine and reduced musculoskeletal fitness.

Cross-tabulation analyses suggested differences in the distribution of low back pain across age groups, marital status, occupation, and physical activity levels. Housewives and married women represented a substantial proportion of participants experiencing low back pain, highlighting the potential influence of domestic workload and lifestyle factors. In addition, a notable percentage of participants reported moderate to severe pain intensity, indicating that low back pain may negatively affect daily functioning and quality of life.

Overall, the study concludes that musculoskeletal low back pain is highly prevalent among adult females in District Mansehra. These findings emphasize the importance of preventive strategies, early identification of symptoms, health education, and promotion of healthy lifestyle practices to reduce the burden of low back pain in the community.

LIMITATIONS OF THE STUDY

Despite providing valuable information regarding the frequency of musculoskeletal low back pain among adult females in District Mansehra, this study has several limitations that should be considered while interpreting the findings.

The study employed a cross-sectional design, which measures exposure and outcome at a single point in time. Therefore, causal relationships between potential risk factors and low back pain cannot be established.

Data were collected using self-reported questionnaires, making the study susceptible to recall bias and response bias. Participants may have underreported or overreported their symptoms and pain intensity.

The study was conducted only among adult females residing in District Mansehra. Consequently, the findings may not be generalizable to males or populations from other districts or provinces of Pakistan.

The sample size of 200 participants, although adequate for the study objectives, may not fully represent the entire female population of District Mansehra.

The study focused primarily on the frequency of low back pain and selected demographic characteristics. Other important determinants, such as occupational ergonomic exposure,

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psychosocial stress, pregnancy history, menopausal status, sleep quality, and chronic medical conditions, were not assessed.

Pain intensity was measured using the Numeric Pain Rating Scale (NPRS), which is a subjective measure and may vary according to individual pain perception and tolerance.

Clinical examination and radiological investigations were not performed to confirm the underlying cause of low back pain; therefore, the diagnosis was based solely on participants' self-reported symptoms.

RECOMMENDATIONS

Based on the findings of the present study, the following recommendations are proposed:

Community-based health education programs should be implemented to increase awareness regarding the prevention and early management of musculoskeletal low back pain among adult females.

Women should be encouraged to participate in regular physical activity, stretching exercises, and core muscle strengthening programs to reduce the risk of developing low back pain.

Healthcare professionals, particularly physiotherapists, should provide education regarding proper posture, body mechanics, ergonomic principles, and safe lifting techniques during household and occupational activities.

Weight management strategies, including nutritional counseling and regular exercise, should be promoted among overweight and obese women to minimize excessive mechanical stress on the lumbar spine.

Routine screening for low back pain should be incorporated into primary healthcare services to facilitate early diagnosis, timely referral, and appropriate management.

Future studies should include larger sample sizes and participants from multiple districts or provinces to improve the generalizability of the findings.

Longitudinal or prospective cohort studies are recommended to investigate the temporal relationship between potential risk factors and the development of low back pain.

Future research should examine additional factors, including occupational workload, psychological stress, socioeconomic status, pregnancy-related factors, menopausal status, sleep quality, and comorbidities, to better understand the multifactorial nature of low back pain among adult females.

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