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Comparison of Neck Pain Among Medical Lab Professionals Working in Government and Private Laboratories of Lahore, Pakistan; A Cross-Sectional Study

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KEYWORDS

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DECLARATIONS

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ABSTRACT

Background: Neck pain is the most common work-related musculoskeletal disorder among professional clinical and medical laboratory workers. The lab workers are at a higher risk of developing neck pain due to consistent exposure to microscopic for prolonged hours. **Objective:** To compare the prevalence of neck pain in the private and government sectors among laboratory workers of Lahore, Pakistan. **Methodology:** In this cross-sectional study, the sample size was calculated to be 279 by employing Rao Software. All the pathologists, technologists, technicians, microbiologists and biochemists, both genders, lab workers who had a minimum of five years of experience of full-time work experience and a minimum of 36 hours per week, aged between 25 to 45 years were recruited in the study. Those lab workers whose working hours were less than 36 or who worked part-time and not full-time, had a recent injury or accident in the previous six months, and any sort of systemic illness were excluded. The ethical approval was taken from the review panel of the ethical committee of Riphah International University, Lahore, before the commencement of this current study. Data was collected using a questionnaire including demographics and the neck disability index. Descriptive statistics of participants were presented as means and standard deviations. **Results:** The results of the study show the highest number of participants fell under the age group of 25 to 30 years of age. The results show us that out of 279 participants, 139 (49.8%) were males and 140 (50.2%) were females. This shows us that a higher number of respondents were females in this current study. About 25% lab workers reported having fairly severe neck pain at the moment. Results show that for lab workers working 12 hours per week 25% of them reported experiencing fairly severe pain. **Conclusion:** It concludes that the focused population tends to suffer less from neck pain. The intensity of pain has been observed to be linked to workplace and working hours. Those lab workers who worked in the private sector tend to suffer more from fairly severe pain, and those working for 12 hours experience more severe pain.

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INTRODUCTION

Musculoskeletal disorders have been observed to increase rapidly globally, which tends to affect the quality of life of every 3rd person.[1,2] The World Health Organization has reported that almost 70% to 80% people are known to suffer from spinal pain, most common are with neck and low back pain, mainly among young and older groups of people.[3] This might comprise various factors such as incorrect posture, incorrect ergonomics, workload, degenerative alterations, and trauma that tend to compromise the quality of life of the sufferer.[4] Musculoskeletal disorders tend to affect joints, muscles, ligaments, tendons, capsules, and nerves that eventually lead to the development of various conditions such as gout, osteoarthritis, neck pain, lower back pain, or frozen shoulder.[5]

Additionally, the Global Burden of Disease considers low back pain as the most prevalent musculoskeletal disorder, ranging from 22% to 65% same for pain in the neck, which tends to lead to certain severe underlying injuries and complaints.[6] The World Health Organization has declared Work-related Musculoskeletal Disorders as one of the major causes of health issues among laboratory workers because of the nature of their work environment. Their nature of work tends to include certain repetitive injuries that might develop over a certain period of time, while their routine laboratory work such as working with a microscope, pipetting, using cell counters, operating microtomes, and video displaying terminals.[7-9] Likewise, ergonomics at work, which is compromised, might also lead to work-related injuries and disorders. Numerous evidence have been reported which depicts a higher rate of prevalence of work related musculoskeletal disorders in at least one part or region of the body that tend to vary almost 40% to 95% in Asian population as compared to western population which affects 29% to 64% lower back, 34% to 63% neck and 17% to 75% shoulders.[10,11]

Lab workers who work at the pathology laboratories work with testing the specimens, which demands a lot of precision and prolonged focusing. The work of the lab workers working at the healthcare laboratories often comprises working within the field of pathology that engages them in repetitive tasks such as microscope operation, pipetting, microtome, management, and cell counting, which necessitates them to frequently adapt an uncomfortable and static posture for prolonged hours. Those professions and occupations that involve working for lengthy periods of static posture tend to exert an added strain on tendons and muscles, which often leads to discomfort and fatigue.[12,13] The higher rate of musculoskeletal disorders might be aggravated in females and those working for prolonged hours. Even after making a lot of efforts to compensate and address ergonomic concerns and improve the equipment and layout of the workplace, the lab workers continue to experience a substantial occurrence of injuries at the workplace.[14,15] Henceforth, it is imperative to identify the ergonomic hazards amongst the lab workers to alleviate any additional physical and environmental strain that stems from their work environment.[12]

Neck disorders and pain in the neck are often associated with the total time of fixed working postures.[16] A higher prevalence of work-related musculoskeletal disorders has been associated with occupations that tend to involve constant postures for prolonged hours, unnecessary use of specific movements, and lacking of corrective and preventive measures, like lab workers. The lab workers who employ the use of a microscope show a higher prevalence of neck pain, which leads to severe neck disorders.[16] Our current study aims at determining the association between neck disorders and pain in the neck of medical laboratory workers with their working hours and the setup where they work. Previously conducted research has consistently shown us a significant relationship between work-related musculoskeletal disorders and their nature of work and its work-related postures, focusing on physical factors, for example, incorrect and poor postures, excessive force, prolonged working hours and prolonged static work, repetitive movements, and exposure to vibration at work.[17,18]

In addition to these, some psychosocial factors are also included, like the stress at the workplace and the demands of the job. These have also been recognized as significant contributors to the gradual development and worsening of these disorders.[19] This study intends to create awareness among the medical laboratory workers regarding their work-related disorders, and our study will also pave down way for future researchers to explore ways to improve and enhance prevention strategies for this population of workers. After recognizing and identifying various gaps in the knowledge and the practices being done at the

workplace our current study intend to support the development and customization of effective and beneficial mechanism that tend to cope up with these disorders in lab workers and can eventually improve the long term health and wellbeing of the lab working wither working at government or private sector. By focusing and emphasising the significance of the nature of work, workplace environment, working hours and ergonomics in the context of medical laboratories, our current study intends to provide evidence-based recommendations for enhancing the conditions of the workplace and hence improving the well-being of lab workers.

METHODOLOGY

The required population of this cross-sectional study comprised medical lab professionals from hospitals in Lahore, Pakistan, of both private and government sectors. The sampling techniques employed for sampling the recruited participants were a convenience sampling technique. The data for our current study were collected by employing a questionnaire which was based on two portions. The first portion was solely based on the demographic portion, and the other was the Neck Disability Index.[20] The sample size was calculated to be 279 by employing Rao Software.[21] All the people who could perform the lab test were recruited for this current study. All the pathologists, technologists, technicians, microbiologists and biochemists, male and female both were recruited in this current study.[22] Only those lab workers were recruited who had a minimum of five years of experience of full-time work experience and a minimum of 36 hours per week. The age of the participants to be recruited in this study was set to be between 25 to 45 years of age.[23]

Those lab workers were excluded from our study whose working hours were less than 36 hours or who were working part-time and not full-time. Those lab workers were also excluded from this study who had a recent injury or accident in the previous six months and those with any sort of systemic illness were also not recruited in our study.[22] Ethical approval is very substantial for every study which tends to includes humans as a target.[24] Therefore, ethical approval was taken from the review panel of the ethical committee of Riphah International University, Lahore, Pakistan, before the commencement of this current study. Written informed consent in Urdu and English was taken from all the participants recruited in this study. All the recruited participants were assured that their data would be kept confidential. A written permission letter was also given to the owners of the labs for their permission, and they were assured that no harm would be caused to their labs and their workers because of our research. After the collection of the data, the data was analyzed by employing the Statistical Package of Social Sciences version 23. Descriptive statistics of participants were presented as means and standard deviations. The p-value ≤0.005 was considered statistically significant.

RESULTS

A total of 279 participants were included in this study, and their demographic and clinical characteristics are summarized in Table 1. The majority of participants, 190 (68.1%), were between 25-30 years of age, followed by 42 (15.1%) aged 31-35 years, 18 (6.5%) aged 36-40 years, and 29 (10.4%) aged 41-45 years. The largest proportion of participants thus belonged to the 25-30 year age group. Gender distribution was nearly equal, with 139 males (49.8%) and 140 females (50.2%). With regard to working hours, most laboratory workers reported working 6 hours per day, while the smallest proportion reported working 10 hours per day. Findings related to the Neck Disability Index (NDI) showed that 147 participants (52.7%) reported minimal neck disability, 106 (38.0%) reported moderate disability, and 26 (9.3%) reported severe disability.

Overall, the majority of laboratory workers reported only minimal disability associated with their occupation. Pain intensity at the time of assessment revealed that 63.4% of participants had no pain, 19.7% reported mild pain, 14.0% reported moderate pain, and 2.9% experienced fairly severe pain. When stratified by workplace setting, variations were observed. In government laboratories, 22.6% reported no pain, 27.3% mild pain, and 20.5% moderate pain, with no participants reporting severe pain. In contrast, in private laboratories, 31.1% reported no pain, 25.5% mild pain, 30.8% moderate pain, and 25% fairly severe pain. The relationship between pain intensity and daily working hours also demonstrated notable differences. Among those working six hours per day, 44% reported no pain, whereas 12.5% reported fairly severe pain. For participants working 8 hours per day, 37.5%

Table 1: Descriptive statistics of participants

Variables		Frequency (f)	Percentage (%)
Daily working hours	6	103	36.9
	8	81	29.0
	10	45	16.1
	12	50	17.9
Neck disability index	Minimal	147	52.7
	Moderate	106	38.0
	Severe	26	9.3
Pain intensity	No pain	177	63.4
	Mild	55	19.7
	Moderate	39	14.0
	Severe	8	2.9

reported fairly severe pain. Those working 10 hours per day reported 25% fairly severe pain. Similarly, 25% of those working 12 hours per day reported fairly severe pain.

DISCUSSION

The results of our current study show us that disorders of the neck and pain in the neck among lab workers are associated with the working hours of the lab workers and the nature of their workplace. The lab workers who tend to work for prolonged hours tend to have more severe pain in the neck, and the lab workers working in private setups reported suffering from more intense pain in the neck.

Pranita et al. conducted a study on determining the prevalence of pain in the neck among clinical laboratory workers in Mumbai.[16] The major objective of their study was to determine the prevalence of neck pain among laboratory workers. They aimed to identify the symptoms of neck pain which are experienced by laboratory workers working with a microscope for longer hours and to determine other musculoskeletal issues confronted by them. Their study was also a cross-sectional study like ours. They employed a self-made questionnaire, like ours, and their outcome tool was the neck disability index same as ours. Their study concluded that the prevalence of pain in neck pain in clinical laboratory workers was the highest, that is, 100%. Our current study agrees with their conclusion, as this also showed neck pain suffered by laboratory workers. Our current study and their study both attribute pain in the neck as one of the major contributing factors that contribute to increased functional disability.

Atheer and co-workers conducted a study determining the work-related musculoskeletal disorders among clinical laboratory workers.[25] The main objective of their research was to assess and estimate the prevalence and associated risk factors of work-related musculoskeletal problems among the laboratory workers. Their study concluded that clinical laboratory workers are at a higher risk of acquiring work-related musculoskeletal disorders. Our current study and their study both conclude that preventive measures and actions need to be taken to address this issue, and this population should be given special attention to save them and treat them for their work-related musculoskeletal disorders.

The results and findings of their study and our current study both agree to link the nature of the job to the affected parts of the body. The lab workers who performed tasks that were manual were more at risk for pain in the neck and shoulders. Pain in the neck might arise from the head being held too close to the work material; however, actions and movements that are repetitive and incorrect, and awkward posture, become the reason for pain in the shoulders.[26] Various studies conducted globally showed us that longer hours of standing promote pain back and foot pain. Reduction in work and leisure activities

was observed due to work-related musculoskeletal disorders.[27] Their study had some limitations, like our current study; they also employed a self-reported questionnaire to collect data without any clinical examination to confirm the presence of symptoms and neck pain. Both studies recommend that future researchers conduct studies in which proper clinical examinations are performed to identify the symptoms. Additionally, the sample size for both these studies was limited; it might not represent all the laboratory workers in Lahore, Pakistan, because of possible workload differences. Parul Raj and co-workers conducted a narrative review on determining the work-related musculoskeletal disorders among medical laboratory professionals.[15] Laboratory professional workers are a unique group of healthcare professionals who play a substantial part in diagnosis and therapy planning, and their work is often linked with certain potential hazards.[15]

Our current study agrees with these facts. The major aim of their study was to review previously conducted research that worked on determining the prevalence of work-related musculoskeletal disorders among medical and clinical laboratory professional workers. For their narrative review, they searched for various electronic databases and bibliographies and then identified research papers, which they then evaluated against their set inclusion criteria. Their narrative review reported a higher degree of heterogeneity among the studies they included in their review. The overall prevalence ranged from 40 to 60%. Concluding that the neck is the most prevalent for about 18 to 17%. Although their narrative review and our current study both suggest working on more studies of higher quality, focusing on this population of professional and clinical lab workers.

K. Vahur and co-workers researched determining the job-related risk factors and work-related musculoskeletal disorders in professional medical and clinical laboratory workers. Their results showed a substantial association between the nature of the work and shoulder and neck pain among the lab workers. Our current study agrees with this positively. Their results showed that the most commonly affected body regions were the neck and the lower back. Tasks at work tend to involve repetitive movements and certain forced positions for more than an hour was associated with pain in the neck, lower back and shoulders, in almost all the cases, $p<0.05$. Our current study coincides with this finding. Their study concluded that medical and clinical laboratory workers are at a higher risk of developing work-related musculoskeletal disorders. So both their study and our study suggest that improvements are required at the workplace and the ergonomics of work workplace. Both studies recommend that future researchers work on raising the risk awareness among this population.

One more limitation of our current study was that many private labs wouldn't allow for collecting any sort of data, which was a hindrance. The data of our current study were not normally distributed. The younger generation was recruited more as compared to the elderly population. Future researchers are recommended to work on conducting this study in other cities of Pakistan for more generalizable results. Future researchers are recommended to conduct randomized controlled and clinical trials on this population of lab workers in order to determine an economical and beneficial treatment for neck pain and work-related musculoskeletal disorders among them. Our current study advises future researchers to work and focus on the ergonomics of lab workers for ease in their work and to save them from work-related musculoskeletal disorders.

CONCLUSION

The major objective and purpose of our current study was to determine how pain in the neck of lab workers was related to their type of workplace and working hours. Our current study also intended to assess the self-reliant disability of lab workers with neck pain. The results of our study conclude that our focused population tend to suffer less from neck pain. The intensity of pain has been observed to be linked to workplace and working hours. Those lab workers who work in the private sector tend to suffer more from fairly severe pain, and those working for 12 hours tend to experience more severe pain. After applying the chi-square test, the p-value came out to be less than 0.00, which showed statistical significance between the intensity of pain and working hours and the type of set-up.

DECLARATIONS

Consent to participate: Written consent had been obtained from patients. All methods were performed following the relevant guidelines and regulations.

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