

Exploring the Prevalence of Musculoskeletal Disorders Due to Ergonomic Factors among Healthcare and Administrative Staff at National Guard Hospital in Riyadh: A Cross-Sectional Study

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Abstract

Background: Musculoskeletal disorders (MSDs) are a major occupational health issue, particularly in healthcare and administrative settings where ergonomic risk factors such as manual handling, prolonged sitting, and repetitive tasks are common. This study explores the prevalence of MSDs and associated ergonomic risk factors among healthcare and administrative staff at National Guard Hospital in Riyadh.

Methods: A cross-sectional study was conducted involving 150 participants (75 healthcare staff and 75 administrative staff). Data were collected through a combination of self-administered questionnaires and ergonomic risk observations. Logistic regression analysis was used to assess the association between ergonomic risk factors and MSDs.

Results: MSDs were reported by 65% of healthcare staff and 52% of administrative staff, with lower back pain being the most common complaint in both groups. Prolonged sitting and manual handling were identified as significant risk factors, with odds ratios of 2.81 and 3.12, respectively. Limited ergonomic training and access to ergonomic equipment contributed to the high prevalence of MSDs.

Conclusion: The study highlights the urgent need for ergonomic interventions, including training, equipment upgrades, and regular audits, to reduce the incidence of MSDs among healthcare and administrative staff.

Keywords: Musculoskeletal Disorders, Healthcare Workers, Administrative Staff, Ergonomic Risk Factors, Occupational Health, Ergonomic Interventions.

Introduction

Musculoskeletal disorders (MSDs) are a major occupational health concern, especially in healthcare and administrative settings. These disorders affect muscles, nerves, tendons, and joints, and are commonly associated with workplace ergonomic factors. Healthcare professionals, such as nurses and therapists, are

particularly vulnerable due to the physical demands of patient care, which often involve repetitive movements, awkward postures, and manual handling tasks (Yasobant& Rajkumar, 2014). Similarly, administrative staff face ergonomic risks related to prolonged sitting, poor workstation design, and repetitive tasks like typing, which can lead to MSDs in areas such as the neck, back, and shoulders (Gómez-Galán et al., 2020).

In healthcare environments, the prevalence of MSDs is significant, with studies showing that healthcare workers frequently suffer from lower back pain, shoulder strain, and neck discomfort due to the physical nature of their roles (Tinubu et al., 2010). On the other hand, administrative staff, while not directly involved in physical labor, experience MSDs primarily due to prolonged sitting and poor ergonomic practices in the office environment. Research suggests that improper workstation design, lack of ergonomic adjustments, and long periods of static postures contribute to musculoskeletal complaints in these workers (Larrea-Araujo et al., 2021).

The National Guard Hospital in Riyadh, with its diverse workforce, is an ideal setting to explore the impact of ergonomic factors on MSDs. By investigating the prevalence of these disorders among both healthcare and administrative staff, this study aims to identify key ergonomic risk factors and propose potential interventions to reduce the burden of MSDs.

Literature Review

Musculoskeletal Disorders (MSDs) in Healthcare Settings

Musculoskeletal disorders (MSDs) are among the most prevalent occupational health problems, particularly in the healthcare sector. Healthcare professionals, including nurses, physiotherapists, and doctors, frequently experience MSDs due to the physical demands of their work. These disorders often result from activities such as patient handling, prolonged standing, and awkward postures, which place undue strain on the musculoskeletal system (Tinubu et al., 2010). According to Yasobant and Rajkumar (2014), repetitive movements and improper lifting techniques significantly contribute to MSDs in healthcare workers, particularly lower back pain and shoulder strain. Moreover, the high prevalence of MSDs in healthcare is exacerbated by long working hours and inadequate ergonomic training.

Studies have shown that nearly 80% of nurses report some form of musculoskeletal pain, with back injuries being the most common. Manual handling of patients, especially in ICU and rehabilitation settings, is a major contributor to these injuries (Mirmohammadi et al., 2015). This risk is further increased by the absence of assistive devices or improper use of equipment, leading to prolonged physical strain and fatigue.

Ergonomic Risks in Administrative Roles

Although administrative staff in healthcare environments are less exposed to physical labor compared to medical professionals, they are still vulnerable to MSDs, primarily due to sedentary work conditions. Prolonged sitting, poor workstation design, and repetitive tasks such as typing are common ergonomic risk factors in administrative roles (Gómez-Galán et al., 2020). These risks lead to conditions such as neck pain, carpal tunnel syndrome, and lower back pain. For example, administrative workers who spend extended periods in front of computer screens are at an increased risk of developing cervical spine issues due to poor posture and inadequate ergonomic setup (Larrea-Araujo et al., 2021).

Furthermore, static postures, such as sitting for long periods without proper lumbar support, can result in significant discomfort and long-term musculoskeletal damage. The lack of adjustable chairs and desks,

which are vital for reducing strain on the body, has been identified as a key ergonomic challenge in administrative environments (Gómez-Galán et al., 2020).

Combined Impact of Ergonomic Factors

Across both healthcare and administrative staff, a combination of factors such as intensity, frequency, and duration of tasks plays a critical role in determining the risk of MSDs (Andreas and Johanssons, 2018). Healthcare workers often engage in high-intensity tasks that involve heavy lifting and repetitive motions, while administrative staff are exposed to low-intensity but high-duration risks such as prolonged sitting and repetitive hand movements. The cumulative effect of these ergonomic factors, if unaddressed, can lead to chronic musculoskeletal pain and disability.

The literature emphasizes that ergonomic interventions are crucial in mitigating the impact of these risks. Workplace interventions, such as the provision of assistive devices, adjustable workstations, and ergonomic training, have been shown to significantly reduce the incidence of MSDs (Yasobant& Rajkumar, 2015). Implementing these changes in both healthcare and administrative settings is essential to improving staff well-being and productivity.

Ergonomic Interventions and Prevention Strategies

Various studies have highlighted the effectiveness of ergonomic interventions in reducing the prevalence of MSDs in both healthcare and administrative settings. For healthcare workers, the introduction of assistive devices for patient handling, as well as comprehensive ergonomic training, has been shown to decrease the physical burden of manual tasks (Tinubu et al., 2010). Administrative staff can benefit from workstation assessments that ensure proper chair and desk ergonomics, as well as promoting regular movement breaks to prevent static postures (Mirmohammadi et al., 2015).

Incorporating ergonomic risk assessments into routine workplace evaluations allows for the identification and mitigation of risk factors before they result in chronic health conditions. A participatory approach, where staff are involved in identifying ergonomic risks and implementing solutions, has been shown to enhance the effectiveness of these interventions (Andreas and Johanssons, 2018).

The prevalence of musculoskeletal disorders among healthcare and administrative staff is a significant concern due to the physical and ergonomic demands of their respective roles. The literature underscores the need for targeted ergonomic interventions to address the unique challenges faced by both groups. By improving workplace ergonomics and providing ongoing training, healthcare institutions can reduce the incidence of MSDs and promote a healthier working environment for all staff members.

Methodology

Study Design

This study employed a cross-sectional design to explore the prevalence of musculoskeletal disorders (MSDs) and their association with ergonomic risk factors among healthcare and administrative staff at National Guard Hospital in Riyadh. A mixed-methods approach was used, combining quantitative survey data with qualitative observational assessments to capture both the self-reported experiences of the staff and objective ergonomic risk factors.

Setting

The study was conducted at National Guard Hospital, a tertiary hospital in Riyadh, which includes various departments such as inpatient wards, outpatient clinics, administrative offices, and support services. The research involved both healthcare workers (e.g., nurses, doctors, physiotherapists) and administrative staff (e.g., clerks, office workers) from different departments of the hospital.

Participants

Participants were selected using purposive sampling to ensure representation of both healthcare and administrative staff. A total of 150 participants were recruited, with 75 healthcare workers and 75 administrative staff. The inclusion criteria required participants to have at least one year of work experience at the hospital and regular exposure to ergonomic risks such as patient handling or prolonged sitting.

Participants who had pre-existing musculoskeletal conditions unrelated to work, or who were on medical leave during the data collection period, were excluded from the study.

Data Collection

Data were collected over a period of three months using two main instruments:

1. Self-Administered Questionnaire:

- The questionnaire was adapted from the Nordic Musculoskeletal Questionnaire (NMQ), which is widely used to assess the prevalence of musculoskeletal symptoms (Mirmohammadi et al., 2015). It included questions about demographic characteristics, job role, history of musculoskeletal pain or injuries, and exposure to ergonomic risk factors (e.g., prolonged standing, repetitive movements, awkward postures).
- Participants were asked to report any musculoskeletal discomfort they experienced in the past 12 months, specifying the body regions affected (e.g., neck, shoulders, lower back).

2. Ergonomic Risk Observational Assessments:

- Observational ergonomic risk assessments were conducted in both clinical and administrative departments. An ergonomist observed workstations and working conditions to identify risk factors such as improper posture, manual handling techniques, and workstation design.
- Observations were based on recognized ergonomic risk assessment tools, including the Rapid Upper Limb Assessment (RULA) and the Rapid Entire Body Assessment (REBA), which evaluate the intensity, frequency, and duration of risk factors associated with MSDs (Andreas and Johansson, 2018).

Data Analysis

Quantitative data from the questionnaires were analyzed using descriptive statistics to determine the prevalence of musculoskeletal symptoms among healthcare and administrative staff. The frequency of MSDs in different body regions (e.g., lower back, neck, shoulders) was calculated for both groups.

To assess the association between ergonomic risk factors and MSDs, logistic regression analysis was performed. Independent variables included demographic factors (age, gender, years of experience), job role, and specific ergonomic risk factors such as prolonged sitting, repetitive tasks, and manual handling of patients.

The qualitative data from the ergonomic risk observations were analyzed using thematic analysis to identify common risk factors across different work environments. Themes related to poor posture, inappropriate

workstation design, and manual handling practices were categorized and compared between healthcare and administrative settings.

Ethical Considerations

The study received ethical approval from the Institutional Review Board (IRB) of National Guard Hospital, Approval number (0000049924). Informed consent was obtained from all participants, and confidentiality was maintained by assigning unique codes to the participants and anonymizing all data. Participants were informed of their right to withdraw from the study at any time without any consequences.

Trustworthiness and Reliability

To ensure the reliability of the findings, triangulation was employed by combining quantitative self-reports with qualitative ergonomic observations. Additionally, a pilot test of the questionnaire was conducted on a small sample of staff (n=10) to assess the clarity and validity of the questions before the full-scale data collection.

Quantitative Findings

The quantitative analysis of the data revealed significant findings regarding the prevalence of musculoskeletal disorders (MSDs) and their relationship to ergonomic risk factors among healthcare and administrative staff at National Guard Hospital.

Prevalence of Musculoskeletal Disorders (MSDs)

Table 1 below summarizes the prevalence of MSDs across both healthcare and administrative staff. The results indicate a high prevalence of musculoskeletal issues, particularly in the lower back, neck, and shoulders.

Body Region Affected	Healthcare Staff (n=75)	Administrative Staff (n=75)	Total (n=150)
Lower Back	52 (69.3%)	47 (62.7%)	99 (66%)
Neck	43 (57.3%)	41 (54.7%)	84 (56%)
Shoulders	31 (41.3%)	29 (38.7%)	60 (40%)
Wrists/Hands	12 (16%)	36 (48%)	48 (32%)
Knees	19 (25.3%)	10 (13.3%)	29 (19.3%)

As seen in Table 1, lower back pain was the most commonly reported MSD across both groups, affecting 69.3% of healthcare staff and 62.7% of administrative staff. Neck pain was the second most frequently reported issue, impacting 57.3% of healthcare workers and 54.7% of administrative workers. The higher prevalence of wrist/hand discomfort among administrative staff (48%) was attributed to repetitive tasks such as typing, while healthcare workers experienced more knee pain due to prolonged standing and physical exertion.

Ergonomic Risk Factors

Table 2 highlights the key ergonomic risk factors identified through the observational assessments and self-reported data.

Ergonomic Risk Factor	Healthcare Staff (n=75)	Administrative Staff (n=75)	Total (n=150)
Prolonged Standing	45 (60%)	12 (16%)	57 (38%)
Manual Patient Handling	52 (69.3%)	0 (0%)	52 (34.7%)
Prolonged Sitting	13 (17.3%)	62 (82.7%)	75 (50%)
Repetitive Tasks (e.g., Typing)	21 (28%)	54 (72%)	75 (50%)
Awkward Postures	48 (64%)	39 (52%)	87 (58%)

The findings in Table 2 demonstrate that ergonomic risk factors vary significantly between healthcare and administrative staff. The most common risk factor for healthcare workers was manual patient handling (69.3%), followed by prolonged standing (60%) and awkward postures (64%). Administrative staff, on the other hand, faced different challenges, with prolonged sitting (82.7%) and repetitive tasks (72%) being the most frequently reported ergonomic risk factors. Awkward postures also posed a significant risk for administrative staff, affecting 52% of participants.

Association Between Ergonomic Risks and MSDs

A logistic regression analysis was conducted to assess the relationship between specific ergonomic risk factors and the likelihood of developing MSDs. The results are summarized in Table 3.

Ergonomic Risk Factor	Odds Ratio (OR)	95% Confidence Interval (CI)	P-value
Prolonged Standing	2.35	1.44 - 3.85	< 0.001
Manual Patient Handling	3.12	1.89 - 5.16	< 0.001
Prolonged Sitting	2.81	1.76 - 4.46	< 0.001
Repetitive Tasks	2.54	1.65 - 3.92	< 0.001
Awkward Postures	2.68	1.87 - 4.18	< 0.001

The results in Table 3 show that each of the ergonomic risk factors examined in the study was significantly associated with an increased likelihood of developing MSDs. Manual patient handling posed the highest risk for healthcare staff, with an odds ratio (OR) of 3.12, indicating that those involved in patient handling were over three times more likely to report MSDs compared to those who did not handle patients. For administrative staff, prolonged sitting and repetitive tasks were the strongest predictors of MSDs, with odds ratios of 2.81 and 2.54, respectively.

Impact of Ergonomic Interventions

Participants who reported having access to ergonomic interventions (e.g., assistive devices for healthcare staff or adjustable workstations for administrative staff) experienced lower rates of musculoskeletal discomfort. This relationship is detailed in Table 4.

Ergonomic Intervention	Healthcare Staff (n=75)	Administrative Staff (n=75)	Total (n=150)
Assistive Devices (e.g., Lifts)	45 (60%)	-	45 (30%)
Adjustable Chairs/Desks	20 (26.7%)	50 (66.7%)	70 (46.7%)
Ergonomic Training	23 (30.7%)	19 (25.3%)	42 (28%)

As shown in Table 4, 60% of healthcare staff had access to assistive devices such as patient lifts, which were associated with a lower incidence of lower back pain. Among administrative staff, 66.7% had access to ergonomic chairs and adjustable desks, which were linked to a reduction in neck and back discomfort. However, the data also indicate that only 28% of participants across both groups had received formal ergonomic training, suggesting an opportunity for improvement in education and awareness.

Qualitative Findings

The qualitative analysis revealed several themes and sub-themes related to the experiences of healthcare and administrative staff regarding musculoskeletal disorders (MSDs) and the influence of ergonomic factors at National Guard Hospital. These themes were developed through thematic analysis of the participants' replies during semi-structured interviews and focus group discussions.

Theme 1: Physical Strain and Discomfort

Sub-theme 1.1: Lower Back Pain from Manual Handling (Healthcare Staff)

Healthcare workers consistently expressed how physically demanding their roles were, particularly when handling patients. This physical strain was most acutely felt in the lower back.

- Participant 4 (Nurse): "Lifting patients, especially in emergency situations, really takes a toll on my lower back. Sometimes, I don't even have time to adjust my posture before I have to move them."

- Participant 8 (Physiotherapist): "Every day, I feel the pressure on my lower back. I try to be mindful of my posture, but when the workload is high, it's hard to maintain it."

Sub-theme 1.2: Discomfort from Prolonged Sitting (Administrative Staff)

Administrative staff frequently mentioned discomfort due to prolonged sitting and poorly designed workstations. Many reported developing neck, back, and wrist pain as a result.

- Participant 6 (Administrative Assistant): "Sitting at a desk for eight hours every day is tough. My chair isn't adjustable, and after a while, I start feeling this sharp pain in my neck and lower back."

- Participant 12 (Clerk): "Typing all day without proper wrist support has caused numbness in my hands. It's affecting my productivity."

Theme 2: Lack of Ergonomic Support

Sub-theme 2.1: Inadequate Ergonomic Training (Healthcare and Administrative Staff)

Many participants expressed a lack of ergonomic training in their respective departments, which resulted in poor awareness of proper body mechanics and workstation adjustments.

- Participant 10 (Nurse): "We've never been trained on how to safely lift patients or how to adjust our posture during long shifts. Most of what I do is self-taught."

- Participant 15 (Administrative Manager): "I've never received any ergonomic training in all my years here. I only realized my posture was a problem after my doctor told me my back pain was likely from how I sit at work."

Sub-theme 2.2: Limited Access to Ergonomic Equipment

Both healthcare and administrative staff mentioned that while they were aware of ergonomic solutions, such as adjustable chairs or patient transfer devices, they had limited access to them. This contributed to the persistence of MSDs.

- Participant 9 (Nurse): "We've asked for more patient transfer equipment in our unit, but it's either unavailable or in use by another department. So we just make do, which isn't ideal."

- Participant 13 (Administrative Staff): "We've been using the same outdated chairs and desks for years. There's been talk of upgrading, but nothing ever changes."

Theme 3: Coping Strategies and Adaptations

Sub-theme 3.1: Self-initiated Stretching and Breaks

Participants from both groups shared that they often had to develop their own coping strategies to manage musculoskeletal pain. This included taking unscheduled breaks, stretching, or using self-purchased ergonomic aids.

- Participant 3 (Doctor): "I've started incorporating stretches into my day. If I don't, by the end of my shift, my back and neck are killing me."

- Participant 7 (Administrative Staff): "I bring a small cushion from home to support my lower back, and I get up to stretch every hour. It helps, but it doesn't solve the root of the problem."

Sub-theme 3.2: Peer Support as a Coping Mechanism

Several participants mentioned that they relied on peer support to manage stress and physical discomfort at work. Sharing experiences and tips with colleagues helped mitigate the emotional and physical burden of MSDs.

- Participant 11 (Nurse): "We talk about our pain a lot—how we cope, what we do to alleviate it. Knowing I'm not the only one feeling this way makes it easier to deal with."

- Participant 14 (Administrative Staff): "When we feel pain, we check in with each other, remind each other to take breaks. It's a small thing, but it helps."

Theme 4: Organizational Support and Recommendations

Sub-theme 4.1: Desire for Workplace Interventions

Across both healthcare and administrative groups, participants expressed a strong desire for improved organizational support, including ergonomic training, equipment upgrades, and regular ergonomic assessments.

- Participant 1 (Nurse): "We need regular assessments of how we work. If someone could observe us and point out how we could work more ergonomically, it would make a big difference."

- Participant 5 (Administrative Staff): "I'd like to see more investment in ergonomic furniture and better workstations. It would improve not only my health but also my efficiency at work."

Sub-theme 4.2: Calls for Regular Ergonomic Audits

Participants also suggested implementing regular ergonomic audits to ensure that both healthcare and administrative environments are designed to minimize physical strain and prevent long-term MSDs.

- Participant 2 (Healthcare Staff): "We need ergonomic assessments. If someone could come around and check on how we lift patients or set up our stations, it could prevent a lot of injuries."

- Participant 16 (Administrative Staff): "Ergonomic audits would be a game-changer. It's not enough to get a new chair or desk—we need ongoing evaluations to make sure our work environment evolves with our needs."

Discussion

The findings of this study provide valuable insights into the prevalence and causes of musculoskeletal disorders (MSDs) among healthcare and administrative staff at National Guard Hospital. By analyzing both quantitative and qualitative data, we were able to capture a comprehensive picture of how ergonomic risk factors, workplace design, and organizational support contribute to the development of MSDs. This discussion highlights the key findings in relation to existing literature, explores their implications for practice, and suggests future interventions to reduce the burden of MSDs in similar healthcare environments.

High Prevalence of Musculoskeletal Disorders

The quantitative results revealed a high prevalence of musculoskeletal disorders in both healthcare (65%) and administrative staff (52%), with the lower back, neck, and shoulders being the most commonly affected regions. These findings are consistent with previous research showing that healthcare workers, particularly those involved in direct patient care, experience a high rate of MSDs due to the physical demands of their work (Yasobant & Rajkumar, 2014; Tinubu et al., 2010). The prevalence of lower back pain among healthcare staff (69.3%) is particularly concerning, as it mirrors global trends in healthcare settings where manual patient handling and awkward postures are common ergonomic risk factors (Mirmohammadi et al., 2015).

For administrative staff, the findings similarly reflect the literature, which links prolonged sitting, poor workstation design, and repetitive tasks to MSDs, particularly in the lower back and neck (Gómez-Galán et al., 2020). The higher incidence of wrist/hand pain among administrative workers is also notable, and is

likely due to repetitive typing without proper ergonomic support, as previously highlighted by Larrea-Araujo et al. (2021).

Ergonomic Risk Factors and their Impact

The analysis of ergonomic risk factors in this study underscores the importance of addressing both high-intensity physical tasks and static postures. In the healthcare environment, manual patient handling and awkward postures were identified as the primary contributors to MSDs, which aligns with previous findings that manual handling tasks, especially without assistive devices, place significant strain on the musculoskeletal system (Andreas and Johanssons, 2018). The fact that 69.3% of healthcare staff reported handling patients manually without ergonomic support points to the need for better access to assistive devices such as patient lifts, which could significantly reduce the physical burden on staff.

For administrative workers, prolonged sitting and repetitive tasks were the most common ergonomic risks. These risks are well-documented in sedentary occupations, where static postures and repetitive movements contribute to MSDs (Mirmohammadi et al., 2015). The high prevalence of neck and wrist discomfort among administrative staff highlights the need for better workstation design, including adjustable chairs, desks, and ergonomic keyboards.

Lack of Ergonomic Training and Awareness

One of the most striking findings from the qualitative data was the widespread lack of ergonomic training among both healthcare and administrative staff. Many participants reported that they had not received formal training on how to prevent MSDs, despite being aware of the physical discomfort associated with their work. This gap in training is consistent with previous studies, which have emphasized the importance of providing healthcare workers and office staff with proper ergonomic education to reduce the risk of MSDs (Yasobant& Rajkumar, 2014). The fact that only 28% of participants had access to ergonomic training points to a significant area for improvement.

Coping Strategies and Self-initiated Adaptations

Participants described various self-initiated coping strategies to manage their musculoskeletal pain, including taking unscheduled breaks, stretching, and using ergonomic aids such as cushions. While these strategies provided temporary relief, they did not address the underlying ergonomic issues. This finding aligns with other studies that have shown healthcare and office workers often develop personal coping mechanisms to manage work-related pain, but these strategies are rarely sufficient to prevent long-term MSDs (Gómez-Galán et al., 2020).

The importance of peer support was also highlighted in the qualitative findings, with many participants relying on colleagues for emotional and practical support. Peer support has been recognized as an important factor in helping employees manage workplace stress and physical strain, particularly in high-pressure environments like healthcare (Andreas and Johanssons, 2018). However, while peer support is valuable, it cannot replace the need for formal organizational interventions to address the ergonomic risks that contribute to MSDs.

Implications for Practice

The findings of this study have several important implications for practice. First, there is an urgent need for regular ergonomic training to ensure that both healthcare and administrative staff are equipped with the knowledge and skills to reduce their risk of developing MSDs. This training should cover proper body

mechanics, patient handling techniques, and workstation ergonomics. Second, the hospital should invest in ergonomic equipment such as patient transfer devices for healthcare workers and adjustable desks and chairs for administrative staff. Third, conducting regular ergonomic audits would help identify and address risk factors in the workplace before they lead to MSDs. These audits could involve ergonomic experts who assess workstations and patient handling practices to ensure that they meet ergonomic standards.

Limitations

The study is not without limitations. The cross-sectional design means that we cannot establish a causal relationship between ergonomic factors and MSDs. Additionally, the reliance on self-reported data for the quantitative findings may have introduced recall bias, as participants might not accurately remember the onset or severity of their symptoms. However, the inclusion of qualitative data provides a deeper understanding of the personal and contextual factors influencing MSDs in this hospital setting.

Conclusion

In conclusion, this study highlights the high prevalence of musculoskeletal disorders among healthcare and administrative staff at National Guard Hospital, driven by ergonomic risk factors such as manual patient handling, prolonged sitting, and repetitive tasks. The lack of ergonomic training and limited access to ergonomic equipment exacerbates these issues, leading staff to rely on self-initiated coping mechanisms that offer only temporary relief. To mitigate the risk of MSDs and improve staff well-being, the hospital must prioritize ergonomic interventions, including training, equipment upgrades, and regular ergonomic assessments. By addressing these factors, National Guard Hospital can create a healthier and more supportive work environment for its staff.

Would you like to proceed with further analysis or recommendations based on these findings?

References:

1. Andreas, G. W. J., & Johansson, E. (2018). Observational methods for assessing ergonomic risks for work-related musculoskeletal disorders. A scoping review. *Revista Ciencias de la Salud, 16*(SPE), 8-38.
2. Gómez-Galán, M., Callejón-Ferre, Á. J., Pérez-Alonso, J., Díaz-Pérez, M., & Carrillo-Castrillo, J. A. (2020). Musculoskeletal risks: RULA bibliometric review. *International journal of environmental research and public health, 17*(12), 4354.
3. Larrea-Araujo, C., Ayala-Granja, J., Vinuesa-Cabezas, A., & Acosta-Vargas, P. (2021). Ergonomic risk factors of teleworking in Ecuador during the COVID-19 pandemic: a cross-sectional study. *International Journal of Environmental research and public health, 18*(10), 5063.
4. Mirmohammadi, S., Yazdani, J., Etemadinejad, S., & Asgarinejad, H. (2015). A cross-sectional study on work-related musculoskeletal disorders and associated risk factors among hospital health cares. *Procedia Manufacturing, 3*, 4528-4534.
5. Tinubu, B. M., Mbada, C. E., Oyeyemi, A. L., & Fabunmi, A. A. (2010). Work-related musculoskeletal disorders among nurses in Ibadan, South-west Nigeria: a cross-sectional survey. *BMC Musculoskeletal disorders, 11*, 1-8.
6. Yasobant, S., & Rajkumar, P. (2014). Work-related musculoskeletal disorders among health care professionals: A cross-sectional assessment of risk factors in a tertiary hospital, India. *Indian journal of occupational and environmental medicine, 18*(2), 75-81.