



Occupational Health Risks among Healthcare Workers in the Kingdom of Saudi Arabia

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Abstract

In Saudi Arabia, occupational health and safety (OHS) risks have raised crucial concerns for healthcare workers due to their frequent exposure to a variety of hazards which comprise of biological, chemical, physical, ergonomic, and psychosocial risks. This paper explores the primary occupational dangers faced by these professionals and discusses strategies to improve workplace safety and resilience. The findings highlight significant exposure to blood-borne infections; needlestick injuries; chemical agents; radiation; musculoskeletal disorders; burnout—all exacerbated by workforce shortages and extended working hours. Additionally, psychosocial stressors combined with poor ergonomic conditions negatively impact both well-being and patient care quality. The study underscores the necessity of ongoing professional education in OHS practices along with improvements in ergonomics, infection control measures, and mental health support services as vital steps towards safeguarding worker protection. Enhancing OHS systems is integral part of fulfilling the objectives set forth by Saudis Vision 2030—fostering workforce sustainability, institutional resiliency, and delivering high-quality healthcare services provision overall.

Introduction

The occupational health hazards of the healthcare workers (HCWs) are an increasingly popular public health issue on a global scale, and they have specific implications in the Kingdom of Saudi Arabia (KSA). Medical workers often face medical and chemical, physical, ergonomic, as well as psychosocial dangers that can jeopardize their health and the quality of patient care (Masood et al., 2024). Through the vision 2030, transformation in the Saudi healthcare system has been tremendous in terms of the capacity of hospitals with more hospitals being built, modernization of medical infrastructure, and an augmented healthcare workforce. But at the same time, such a fast growth has increased occupational health issues (Qassim & Abdelrahim, 2024). It has been found that Saudi healthcare workers are at a significant risk of work-related injuries, musculoskeletal conditions, being exposed to infections, and experiencing psychological stress (Alqithami et al., 2024; Alanazi et al., 2024).



This paper discusses the significant types of occupational health hazards among healthcare professionals in Saudi Arabia by combining the results of the recent empirical research and reviews. It reviews 5 primary dimensions, which are biological and infection-related hazard, musculoskeletal and ergonomic hazards, psychosocial and fatigue-related hazards, chemical and physical exposures, and organizational resilience and policy implications. In every section, the prevalence, contributing factors, and possible mitigation strategies are pointed out to enhance occupational health safety and sustainability in Saudi health institutions.

Main causes of Occupational Health Risk Among Saudi Arabia Health workers

The biological and Infection-Related Hazards.

One of the most crucial occupational risks in Saudi Arabia is biological hazard among healthcare workers (HCW) in the country. Infection prevention has become a key issue in the field of occupational safety since these professionals are regularly exposed to infectious agents in contact with blood, bodily fluids, and respiratory or secretions. AlJohani et al. (2021) state that Saudi medical personnel are at the risk of more than 20 blood-borne pathogen types, such as hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV). Whereas, the level of knowledge among HCWs is usually high as to infection control, the adherence to prophylactic measures like safe needle handling and the regular use of personal protective equipment (PPE) is not consistent. The research indicated a moderate positive relationship between the knowledge of infection control and compliance to safe practice indicating that long-term training and supervision by the institution may significantly increase conformity.

The COVID-19 pandemic also demonstrated the biological threats to Saudi medical workers. According to Kharyef et al. (2024), the proportion of healthcare workers reported as positive of COVID-19 was about 25% in their study, and over 80% of them worked extended hours, which were longer than eight hours a day. Long exposure, workload, and tiredness were highly associated with more susceptibility to infection. In addition, there were physical and health outcomes to HCWs like skin discomfort, facial irritation, and headaches caused by prolonged use of PPEs. These results show that the demands related to the pandemic made the situation with occupational exposure worse, and it was necessary to be able to cope with the workload and infection control materials better.

Work related stress is also another factor that pose health risk health among the Saudi health professionals. According to a study by Thirunavukkarasu et al. (2021) which was done by Thirunavukkarasu et al. (2021) in the North region of Saudi Arabia around 70 percent of the interviewed workers reported to have experienced work-related stress. Some of the exposure risks that may trigger work related stress include smoking, lack of sleep and the working



environment in hospitals. Workers who are stressed are highly likely to be at risk of infection because they might be careless when handling hospital equipment. In this regard, the risk of infection among the healthcare workers is a complex issue that can be caused by a combination of factors that include behavioral, environmental, and systemic factors. The exposure can be reduced by strengthening stress management practices, introducing regular training on stress control, and developing robust surveillance and reporting systems.

Ergonomic as well as Musculoskeletal Hazards

Musculoskeletal disorders (MSDs) can be considered as one of the health problems in Saudi Arabia. Monotony, prolonged handling of patients, and prolonged standing positions, coupled with awkward poses, put healthcare professionals at risk of chronic musculoskeletal tension, pain, and exhaustion, as well. The systematic review by Alanazi et al. (2024) showed that among Saudi nurses, the prevalence of work-related musculoskeletal disorders (WRMSDs) is shocking: it was 79.7%. This high rate was explained by frequent movements, ineffective design, and long hours of work, in particular in high-demand units like emergency and intensive care units. It was also found that female nurses are overly impacted, which is indicative of gendered labor division and inequalities in physical workloads in medical facilities.

One of the most debilitating and common outcomes of these ergonomic risks has been observed to be low back pain (LBP). In a review of 13 studies, Woodman et al. (2020) concluded that nurses, dentists, and emergency medical workers are the most commonly affected groups. Professionals dealing with patients usually complain of chronic pain relating to lifting patients and standing or bending over them. Likewise, Al Amer (2020), emphasized that the combination of physical and psychological stressors leads to the development of LBP, and occupational stress increases physical fatigue. Such ergonomic and psychosocial strains not only diminish the health and performance of health care workers, but also endanger the safety of the patient as they elevate risks of human error and low efficiency of care.

Masood et al. (2024) also corroborated these findings by conducting a review of occupational health in the Gulf Cooperation Council (GCC) and found MSDs to be the most prevalent ergonomic risk in the region. They highlighted that job role, environmental factors and lack of access to ergonomic tools and training is acute risk determinant. To deal with these problems special interventions are necessary, such as provision of adjustable equipment, mechanical lifting aids and periodical work ergonomic examination.

The Saudi hospitals need to engage in an active and comprehensive process of reducing the burden of MSDs by incorporating ergonomic design into work planning and employee education. The prevention of long term injuries can be achieved by introducing early physiotherapy support, encouraging regular movement breaks and setting up wellness



programs. By putting the concept of ergonomics into the policy of the occupational health and practice, healthcare institutions can offer a greater sustainability of the workforce, lower the number of absenteeism, and better the quality of the services provided to the patients.

Fatigue-Related Hazards and Psychosocial Hazards.

The chemical and physical exposures are still a continuous occupational health risk in the healthcare setting, and they are very dangerous in both the short-term and the long-term of the healthcare workers (HCWs) in Saudi Arabia. Chemical agents which include disinfectants, sterilizing solutions, and cytotoxic drugs that nurses, laboratory technicians, and other frontline professionals work with frequently lead to respiratory irritation, dermatitis, and even carcinogenic effects. Al-Osaimi et al. (2024) have mentioned that Saudi nurses are especially susceptible to various toxic substances, such as formaldehyde, glutaraldehyde, and ethylene oxide, commonly used in the sterilization process and in laboratory work. Lack of proper ventilation, handling and protective equipment can result in chronic respiratory illness, allergic reactions and chronic systemic toxicity of these substances. In addition, cleaning substances and aerosolized drugs may aggravate asthma and skin sensitivities in HCWs, and it is a significant challenge to address the issue of improved environmental and occupational hygiene practices.

Another severe chemical hazard is cytotoxic drugs that are utilized in chemotherapy and pharmacological studies. Medical staff that deals with the preparation and delivery of drugs is also exposed to the risk of inhalation or skin contact or even spillages. Extended use of these agents has been associated with problems of reproductive health, liver and kidney toxicity and possible carcinogen effects. Al-Osaimi et al. (2024) pointed out that despite the improvement of awareness of the dangers of chemicals in Saudi hospitals, the level of adherence to safety measures, including working with biological safety cabinets, closed-system transfer devices, and special PPE, remains low. This deficiency underscores the necessity of compulsory occupational health training and development of standardized processes of chemical storage and labeling and waste disposal.

Physical hazards are also of crucial importance, which involves factors like ionizing radiations, noise pollution and thermal stress. Masood et al. (2024) identified that radiation exposure and needlestick injuries are the most common physical risk factors in all the Gulf Cooperation Council (GCC) countries with Saudi Arabia showing significantly high rates of these incidences as the country is associated with high rates of radiological imaging and interventional procedures. Frequent checks of radiation and the ALARA (As Low As Reasonably Achievable) principle and personal dosimeters are essential in the minimization of exposure. Also, fatigue, musculoskeletal stress, and sensory discomfort may be a result of long exposure to high-decibel alarm, mechanical vibrations, and uncontrolled temperature in the



hospitals. These physical stresses have not only an impact on the health of the HCWs, but they also impair their concentration and efficiency in the critical care provision.

Workplace violence is another emerging physical threat in the Saudi healthcare institutions. According to Kharyef et al. (2024), almost a third of the healthcare professionals reported having been victims of workplace violence during the COVID-19 pandemic with most incidents happening in the emergency unit and intensive care unit. Both instantaneous physical outcomes and long-lasting psychological outcomes, such as anxiety, burnout, and post-traumatic stress, are the result of such violence, either verbal or physical. Such incidents are commonplace which underscores the importance of comprehensive prevention approaches that can be inclusive of effective hospital security systems, training of the staff members on the principles of de-escalation and conflict management and enacting stringent legal remedies to ensure that HCWs are not abused.

All in all, chemical/physical exposures constitute a complex occupational hazard, which requires systemic remedy. Saudi healthcare institutions need to invest in better safety facilities, frequent risk evaluation, and continuous education to reduce the exposure risks. The good occupational health surveillance systems, adherence to international safety standards, and safety accountability culture creation are important steps in protecting the health of healthcare workers and providing sustainable healthcare services in the Kingdom.

Organizational resilience, policy implications and future directions.

Occupational health and safety (OHS) are not single factors but key pillars of organizational sustainability and healthcare sustainability. By providing a safe and friendly work environment, not only do healthcare workers (HCWs) feel safe and healthy, but also more engaged, motivated, and more productive in the long-run. Qassim and Abedelrahim (2024) in the study managed to explain how high standards of OHS can contribute to high level of engagement among the employees. It also contributes to hospital stability as well as job satisfaction. It through these outcomes that hospitals can realize high quality of patient care together with improved organizational performance which align with Vision 2030 which emphasizes on general occupational and patient safety.

Although initiatives are being undertaken, there are still systematic challenges that do not allow the achievement of comprehensive occupational health management in Saudi Arabia. Alsadaan et al. (2021) and Aljabri et al. (2024) found out that chronic shortages of the workforce, overwhelming workloads, and overreliance on expatriate personnel were the key impediments to effective safety standards. Such environments usually cause burnouts, exhaustion and neglecting safety measures, especially in the emergency and intensive care units which are highly stressful departments of a hospital. Also, the low level of the development of local workforce limits the long-term capacity building, and health care institutions become



more susceptible to external shocks, including pandemic or staffing shortages. The authors recommend effective workforce localization policies, continuous professional development, and organized process of occupational health monitoring, which provides the presence of preventive and curative actions and activities, to overcome them.

The necessity of the specific policy reform is supported by empirical evidence. Such results demonstrate the need to introduce national policies controlling the order of shifts, introducing the obligatory rest, and creating credible injury-reporting and compensation mechanisms (Alqithami et al. 2024). Frequent risk assessment and audits must be introduced to discover hazards in time and monitor compliance by the institution. Moreover, transparency of the safety management systems in terms of data and objectivity can facilitate responsibility across the board. Additionally, emotional well-being and turnover rates among healthcare professionals could be improved with the institutionalization of psychological support systems which include counseling services, resilience-building workshops, and peer mentoring programs (Masood et al. 2024).

Going forward, occupational health should be considered as part of the national health strategies in Saudi Arabia as part of overall healthcare reforms in the vision 2030. Policymakers need to focus the OHS goals on the workforce development, the digital health innovation, and the hospital accreditation standards. Integrating occupational safety into healthcare governance and culture will provide Saudi Arabia with a robust, driven, and secure workforce, who would be able to maintain the high-quality care delivery and effectively react to the challenges of the future in terms of the social health of the population.

Infection Control Measures

One of the most occupational health issues of healthcare workers (HCWs) in Saudi Arabia is infection control. Regular contact with various infectious agents like hepatitis B virus (HBV), hepatitis C virus (HCV), and Mycobacterium tuberculosis is very dangerous especially to the nurses and laboratory personnel. Alqurashi et al. (2024) have found that the needlestick and sharps injuries are also on the list of the most frequent causes of occupational infections, and an estimated 60 percent of HCWs report having experience one incidence in their career.. Occupational injuries of this kind can result from excessive working hours limited training among the healthcare professionals and failure of workers to observe the available prevention measures in the country.

The healthcare professionals of Saudi Arabia, just like other healthcare workers in the world have been exposed to various occupational risks. The COVID-19 pandemic exposed the vulnerability of healthcare professionals in Saudi Arabia. For example, during the pandemic, these workers were reported high rate of infection and others reported of psychological pressure resulting from the nature of their work and poor personal protective equipment (PPE) especially



when the pandemic was starting. The overall experience of workers during this period indicated that there was need to have sustainable preparedness strategies to avert such crisis in the future.

The risk of infection among health workers in Saudi Arabia hospitals can be reduced through a number of strategies which involve regular monitoring, constant training of employees together with adherence to the set health standard measures (Alyami et al., 2024). For example, one of the strategies that can be employed is regular vaccination among the workers and ensuring they have access to PPE. Moreover, hospitals should promote safety culture where employees have the freedom to report any occupational health risk without fear because it is their duty to do so.

Conclusion

The problems of occupational hazards of healthcare workers in Saudi Arabia are complex and intertwined with the changing healthcare situation in the country. According to the literature reviewed, it is evident that biological hazards, musculoskeletal disorders, psychosocial stress, as well as the chemical exposures are extremely prevalent and tend to be mutually dependent. The issue of infection control has been a major problem in health sector especially during the time of pandemic because frontline healthcare professionals are at risk of being infected. These workers are normally at risk of being exposed to musculoskeletal as well as ergonomic risks which are considered common among the frontline workers. Another thing that poses health challenge to these workers in Saudi Arabia is stress which exposes them to both physical and mental health risk as well as patients because health workers with stress cannot fully follow the laid standards or provide quality care.

The combination of these risks can be mitigated if hospitals adopt holistic as well as evidence-based approach that can involve education, ergonomics, mental health support, and organizational reform. The key policies that can also help alleviate this menacing problem in Saudi hospitals are those that are focused on occupational safety, rest time, and resilience of staff. The Saudi Vision 2030 agenda will give a strategic chance to institutionalize extensive occupational health plans to ensure that the medical workforce is secure, engaged, and able to provide quality care. Further studies ought to be directed at measuring the efficacy of the existing interventions and introducing new measures to increase workplace safety among Saudi healthcare institutions.

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