

DETERMINATION OF OCCUPATIONAL STRESS FACTORS AMONG RADIOLOGY EMPLOYEES IN TERTIARY CARE HOSPITALS PESHAWAR, PAKISTAN

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Abstract

Background: Occupational stress is a significant global health issue, particularly prevalent among healthcare professionals. Radiographers operate in a high-pressure environment, facing unique stressors such as radiation exposure, heavy workloads, and challenging patient interactions. However, context-specific data on the primary stressors affecting radiographers in Pakistan is limited. This study aimed to determine the most frequent occupational stress factors among radiology employees in tertiary care hospitals in Peshawar, Pakistan.

Methods: A descriptive, cross-sectional study was conducted over four months in the radiology departments of four tertiary care hospitals. A sample of 125 radiology technicians and technologists was recruited via convenience sampling. Data were collected using a structured questionnaire assessing 15 potential occupational stress factors. Data analysis was performed using SPSS version 22, employing descriptive statistics to calculate frequencies and percentages, stratified by occupation and gender.

Results: The response rate was 100%. The most prevalent occupational stress factors, reported by more than half of the participants, were: poor communication with patients (70.4%), fear of radiation exposure (68.8%), noise in the workplace (68.8%), overwork in the department (63.2%), fear of infection (59.2%), inadequate leaves (58.4%), and not being paid enough (57.6%). While male workers reported higher raw counts for most stressors, a larger proportion of female workers reported stress due to harassment and lack of possible promotion.

Conclusions: Radiology employees in Peshawar experience high levels of occupational stress, driven predominantly by workload, financial concerns, occupational hazards, and the work environment. These findings highlight an urgent need for institutional interventions, including workload management, fair

compensation, enhanced safety protocols, communication training, and the fostering of a supportive work culture. Addressing these factors is crucial for improving radiographer well-being and ensuring the delivery of high-quality patient care.

INTRODUCTION

Occupational stress is a prevalent and significant issue affecting healthcare professionals globally, characterized by the physical, emotional, and psychological strain resulting from workplace demands (1). It has been recognized as a detrimental factor to the well-being of employees, leading to a range of negative outcomes including depression, anxiety, cardiovascular disease, and insomnia (2). Within the healthcare sector, workers are considered among the most stressed professional groups due to factors such as high job demands, risk of infection, understaffing, and insufficient resources (3, 4). This stress not only impacts the health of the workers but also compromises the quality of patient care and organizational outcomes (5).

Radiographers, as integral members of the healthcare team, operate in a uniquely demanding environment that combines patient care with the technical and potential hazards of radiation and other physical risk factors (6). The nature of their work exposes them to a multitude of stressors, including ongoing radiation exposure, long shifts, excessive workloads, and interactions with distressed or dissatisfied patients (7, 8). Furthermore, the constant pressure to maintain accuracy in patient positioning, radiation dosage, and reporting under such conditions increases the likelihood of medical errors, which can have direct consequences on patient diagnosis and treatment (9). Studies conducted in various countries, including Ghana, the United Kingdom, and Nigeria, have confirmed elevated stress levels among radiographers, linking them to effects such as job dissatisfaction, depression, and burnout (10, 11, 12). The challenges they face are multifaceted, encompassing issues like poor communication with patients and staff, lack of possible promotion, inadequate remuneration, and fear of infection or radiation exposure (13, 14).

Despite the growing body of international literature on this subject, there is a need for context-specific research to identify the predominant occupational stress factors affecting radiographers in different

healthcare systems. This study was therefore conducted to determine the most frequent occupational stress factors among radiology employees in tertiary care hospitals in Peshawar, Pakistan. The findings aim to provide valuable insights for hospital administration and policymakers to develop targeted interventions, improve the work environment, and ultimately enhance both staff well-being and the quality of radiological services.

Materials and Methods

Study Design and Setting

A descriptive, cross-sectional study was conducted over a period of four months to determine the occupational stress factors among radiology employees. The study was carried out in the radiology departments of four major tertiary care hospitals in Peshawar, Pakistan: Rehman Medical Institute (RMI), Hayatabad Medical Complex (HMC), Northwest General Hospital (NWGH), and the Institute of Kidney Disease (IKD).

Study Participants and Sampling

The study population consisted of radiology technicians and technologists working in the aforementioned hospitals. Clinical radiologists were excluded from the study. The sample size was calculated as 125 using the formula for finite population sampling (22), with a 95% confidence level and a 5% margin of error, assuming a population proportion of 50%. A non-probability convenient sampling technique was employed to recruit participants.

Data Collection Tool and Procedure

Prior to data collection, ethical approval was obtained from the institutional review board of the supervising college. Data was collected using a structured questionnaire designed to capture demographic information and assess various occupational stress factors. The questionnaire

included variables such as inexperience in certain situations, disrespect from supervisors, overwork, inadequate pay, fear of radiation, harassment, job insecurity, lack of promotion opportunities, poor workplace environment (noise, lighting), poor communication with patients, inadequate leaves, and fear of infection.

The questionnaires were distributed directly to the radiology employees (technicians and technologists) at their respective workplaces. Participation was voluntary, and completed questionnaires were collected upon return.

Data Analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 22. Descriptive statistics were performed to summarize the socio-demographic characteristics of the participants. The frequency and percentage of each stress factor were calculated and presented both overall and stratified by gender and occupation (technician vs. technologist). The results are presented in the form of tables and graphs for clarity.

Results

A total of 125 radiology employees participated in this study, comprising both technicians and technologists. The demographic distribution revealed a higher percentage of male workers (75%) compared to female workers (25%).

Table 1 presents the distribution of occupational stress factors reported by the participants, stratified by their occupation (Technologist vs. Technician). The most prevalent stress factors across both occupational groups were 'Poor communication with patients' (88%), 'Fear of radiation exposure' (86%), 'Noise in workplace' (86%), 'Fear of infection' (74%), 'Inadequate leaves' (73%), 'Not being paid enough' (72%), and 'Overwork in department' (79%). In contrast, 'Stress of harassment' was the least frequently reported factor (14%).

Table 1

Frequency of Occupational Stress Factors Among Radiology Employees by Occupation

Factor	Technologist (n = 75)		Technician (n = 50)		Total (N = 125)
	Yes	No	Yes	No	
Suffered from an inexperience situation	42	33	16	34	125
Disrespected by supervisors	22	52	8	43	125
Overwork in department	45	29	34	17	125
Stress due to not being paid enough	48	26	24	27	125
Force to work for long hours	37	37	23	28	125
Fear of radiation exposure	52	22	34	17	125
Feeling pressurized	36	38	20	30	125
Stress of harassment	10	64	4	47	125
Stress due to lack of possible promotion	38	36	20	31	125
Stress due to poor lighting	35	39	18	33	125
Poor communication with patients	49	25	39	12	125
Stress due to inadequate leaves	46	28	27	24	125
Fear of infection	49	25	25	26	125
Stress due to noise in workplace	53	21	33	18	125
Stress due to job insecurity	33	41	18	33	125

The analysis of occupational stress factors was also stratified by gender. **Table 2** shows the frequency of these factors among male and female radiology employees. The data indicates that a higher raw count of male employees reported stress for the majority of factors. However, a greater proportion of female employees reported stress related to

harassment and lack of possible promotion relative to their total numbers. The most significant stressors for both genders, in terms of frequency, aligned with the overall findings, including overwork, fear of radiation, inadequate pay, and poor communication with patients.

Table 2: Frequency of Occupational Stress Factors Among Radiology Employees by Gender

Factor	Male (n = 94)		Female (n = 31)		Total (N = 125)
	Yes	No	Yes	No	
Suffered from an inexperience situation	41	54	16	14	125
Disrespected by supervisors	20	75	10	20	125
Overwork in department	59	36	20	10	125
Stress due to not being paid enough	56	39	16	14	125
Force to work for long hours	49	46	11	19	125
Fear of radiation exposure	64	31	22	8	125
Feeling pressurized	39	56	17	13	125
Stress of harassment	4	91	10	20	125
Stress due to lack of possible promotion	43	52	15	15	125
Stress due to poor lighting	36	59	16	14	125
Poor communication with patients	68	27	20	10	125
Stress due to inadequate leaves	59	36	14	16	125
Fear of infection	57	38	18	12	125
Stress due to noise in workplace	63	32	23	7	125
Stress due to job insecurity	43	53	9	20	125

To summarize the primary findings, **Table 3** presents the most prevalent occupational stress factors reported by the radiology employees, ranked

by the total frequency of affirmative responses. This synthesis identifies the core stressors impacting the radiology workforce in the studied setting.

**Table 3
Most Prevalent Occupational Stress Factors Among Radiology Employees (Ranked by Total Frequency)**

Rank	Stress Factor	Total "Yes" Responses (N = 125)	% of Total Sample
1	Poor communication with patients	88	70.4%
2	Fear of radiation exposure	86	68.8%
2	Stress due to noise in workplace	86	68.8%
4	Overwork in department	79	63.2%
5	Fear of infection	74	59.2%
6	Stress due to inadequate leaves	73	58.4%
7	Stress due to not being paid enough	72	57.6%
8	Stress due to lack of possible promotion	58	46.4%
9	Feeling pressurized	56	44.8%
10	Stress due to job insecurity	51	40.8%

Discussion

This study aimed to identify the most frequent occupational stress factors among radiology employees in tertiary care hospitals in Peshawar, Pakistan. The findings reveal a high prevalence of stress, driven primarily by factors related to workload, the physical work environment, and patient interaction. The most significant stressors, each affecting more than half of the respondents, were poor communication with patients, fear of radiation exposure, noise in the workplace, overwork in the department, fear of infection, inadequate leaves, and not being paid enough.

The high prevalence of stress related to **overwork and inadequate leaves** is consistent with global literature on healthcare workers. Studies conducted in Ghana and the UK have similarly identified heavy workload and staff shortages as primary drivers of stress among radiographers, leading to burnout and job dissatisfaction (6, 11). This chronic overwork depletes emotional reserves and reduces the capacity for empathy, which can directly impact the quality of patient care (5). The feeling of being underpaid further exacerbates this strain, contributing to a sense of being undervalued and increasing financial pressures, which is a known stressor across various professions (2).

A prominent finding of our study was the **fear of radiation exposure and infection**. This aligns with research by Zhang et al. (14), which found that occupational radiation exposure was a significant predictor of job stress and burnout among medical radiation staff. Radiographers operate in an environment with unique physical hazards, and the perceived risk, even with safety protocols in place, contributes significantly to psychological strain (7, 17). Similarly, the fear of infection, particularly salient in a post-pandemic world, is a well-documented stressor for healthcare workers who are on the front lines of patient care (4, 20).

Issues with the **work environment**, specifically **noise and poor communication with patients**, were also highly reported. A noisy environment can impede concentration, increase fatigue, and contribute to irritability, which is detrimental in a field requiring high levels of precision (15). Poor communication with patients, reported by over 70% of our sample, is a critical finding. This challenge has been noted in

other studies, where dealing with anxious, angry, or uncooperative patients was a major source of emotional exhaustion for radiographers (11, 18). Effective communication is a cornerstone of patient care and safety; when it is compromised, it not only increases staff stress but also elevates the risk of errors and patient dissatisfaction (9).

When examining the data by gender, our study found that while male radiographers reported higher raw counts for most stressors, a larger *proportion* of female radiographers reported stress due to **harassment and lack of possible promotion**. This suggests that female healthcare workers may face additional, gender-specific challenges in the workplace, including potential barriers to career advancement and exposure to harassment, which aligns with broader concerns about the well-being of women in the health workforce (13).

The consequences of these unaddressed stressors are not trivial. As evidenced by prior research, chronic occupational stress in healthcare is linked to depression, burnout, and a higher propensity for medical errors (1, 5, 19). The finding that a majority of radiographers in Peshawar are experiencing these levels of stress indicates an urgent need for institutional intervention. Our results are consistent with the broader consensus that a supportive work environment, adequate staffing, fair compensation, and clear communication channels are essential for mitigating occupational stress (10, 21).

Limitations

This study has several limitations. The use of a cross-sectional design allows for the identification of associations but not causal relationships. The non-probability convenient sampling method may limit the generalizability of the findings to all radiology settings in Pakistan. Furthermore, the reliance on self-reported data through a questionnaire is subject to biases such as social desirability and recall bias.

Conclusion

In conclusion, this study demonstrates that radiology employees in tertiary care hospitals in Peshawar experience significant occupational stress. The primary contributing factors are multifaceted, encompassing heavy workload, financial concerns, fears related to occupational hazards (radiation and

infection), and challenges within the work environment, particularly noise and difficult patient interactions. These findings underscore the critical need for hospital administrators and policymakers to implement targeted strategies. Recommended interventions include reviewing staffing levels and workload distribution, ensuring fair compensation and adequate leave policies, reinforcing safety protocols and training to allay fears, providing communication skills training, and fostering a supportive and respectful workplace culture. Addressing these factors is essential not only for safeguarding the well-being of radiographers but also for ensuring the delivery of high-quality, safe patient care.

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