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Occupational Stress and coping Strategies among Radiographers

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Abstract
Radiographer's ability to execute their jobs well and provide high-quality care to patients may be impacted by stress. Effective interventions to lessen the effects of occupational stress can only be adopted if the stressors and coping mechanisms have been identified. The study aimed to investigate the occupational stress and coping strategies adopted by radiographers in a university teaching hospital. A cross-sectional survey using a five-point Likert scale questionnaire was administered to the respondents. Majority of the radiographers admitted to feeling moderately stressed (73%). Physical exercises and engaging in other activities to divert attention were frequently used to reduce stress.

Keywords: Stress; perceived stress; coping strategies; radiographer

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1.0 Introduction

Work is largely considered a critical determinant of well-being as it can provide an income and social identity. However, working can also be stressful and harm one's health (Carvalho et al., 2020). Mental health problems among workers have long been studied and the rise of mental illness among workers is a big concern for many employers. Stressful environments may adversely impact psychological conditions such as depression, anxiety, and stress. In this 21st century, stress is the prevalent disease, impacting human in many ways and causing 31% of illnesses and absences from work among health care workers (Ravari et al., 2020). Occupational stress is a psycho-physical that occurs when work demands outweigh a person's capability or resources to adequately meet their needs (Nakasis & Ouzouni, 2018; Parizad et al., 2021). It has become a major concern in recent years due to its possible effect on both job satisfaction and employee performance. In addition, occupational stress is often associated with multiple biochemical responses that can potentially lead to health risks, such as cardiovascular disease or death in serious cases. Chronic health conditions such as cardiovascular disease, musculoskeletal disorders, physical injuries, and cancers have also been linked with occupational stress (Alves, 2015). Furthermore, mental illness and health-compromising risky habits such as increased risk of suicide, misuse of drugs, smoking, drinking, unhealthy diet and lack of exercise are often correlated with work stress (Oginska-Bulik, 2016). Occupational stress has also been linked with several physical and mental adverse effects, including insomnia, depression, heart disease and anxiety. Besides, workplace stress leads to high organizational costs regarding employee turnover, loss of efficiency and quality services (AbuAlRub, 2014; Nakasis & Ouzouni, 2018).

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Healthcare employees are subjected to various stressors at the workplace, which may harm their physical, mental, and emotional health (Chinene et al., 2023). Prior to the Covid-19 pandemic, studies had already revealed higher rates of burnout among healthcare professionals compared to the general population, with a prevalence ranging from 25% to 65% (Shanafelt et al., 2020). Radiography departments are at the fore-front, particularly in diagnosing, managing, and monitoring of patients by using modalities such as X-ray and computed tomography (CT), especially during Covid-19 pandemic. As a result, this might increase the department and radiographer's workload. Stress experienced by radiographers can affect their working performances in delivering quality service, especially to the patients (Ashong et al., 2016). Moreover, the ability of the individual to manage their work environment may affect the efficiency and output of their work due to various problems that occur at the workplace (Tran et al., 2018). In addition, radiographers may experience sleep deprivation, anxiety, and mental fatigue. Hence, they need to be equipped with coping strategies to ensure excellent working skills among radiographers when facing obstacles in their daily work. Coping is the ability to assess the stressful environment, intending to adapt to change or rebalance, and the power and ability to meet new challenges that arise (Samson-Akpan, 2017). However, the ability to withstand pressure or the coping mechanism varies from person to person (Orzechowska et al., 2013). The need for this study stems from the fact that effective interventions to lessen the effects of occupational stress can only be adopted if the stressors and coping mechanisms have been identified. Therefore, this study aims to evaluate the occupational stress and coping mechanism among radiographers. A further aim of this study was to determined whether demographic factors influence occupational stress.

2.0 Literature Review

Radiographers are part of the healthcare team who play a crucial part in the health care community. Radiographers are involved with various radiological procedures such as general X-ray, computed tomography (CT), magnetic resonance imaging (MRI), ultrasound, and interventional radiology. Working in healthcare, where people's lives and deaths are at stake on a daily basis, can be draining both physically and emotionally. Previous study among radiographers found that a many radiographers have reported a deterioration in their mental health (Murphy et al., 2022). Ashong et al. (2016) highlighted that occupational stress is not uncommon among radiographers, and typically places much pressure on them. Their study found more than half of the respondents (63.1%) experienced high to very high-stress level. In addition, various studies found the impact of Covid-19 on mental health of radiographers globally (Lewis & Mulla, 2021; Yasin et al., 2021). However, it is worth noting that radiographer's working conditions have always been challenging, even before the pandemic (Murphy et al., 2022; Rajan, 2012).

One of the important strategies to manage or reduce occupational stress is by identifying the stressors. According to HSE Management Standard, there are six primary sources of occupational stress: "demand, control, support, role, relationship, and change" (Great Britain Health and Safety Executive, 2019). Previous studies shows that role ambiguity, role conflict and social support problem is considered the highest predictors of stress (Nayak et al., 2020; Jagodič et al., 2020). Besides, high workload and absence of support are among the cause of occupational stress. Relationship conflict between colleagues was also found to be one of the causes of occupational stress (Nayak et al., 2020). Kharjahrin & Hrangkhawl (2022) study shows the main sources of stress are managers' support, control, relationship conflict among colleagues, excess demand, and lack of peer support.

However, ensuring that quality radiography services are rendered is an ethical obligation that calls for radiographers' commitment and dedication as well as their ability to adopt appropriate coping strategies to deal with occupational stress that arises while doing their job. In several parts of the world, people use spiritual coping to help them manage their stress, and it is found to be an effective method (Ibrahim et al., 2020). Previous study documented different coping strategies adopted by radiographers such as "exercise, relaxation, and medication", with approximately 56% claiming they adopted the coping mechanism daily (Ashong et. Al., 2016).

3.0 Methodology

3.1 Sample selection

This cross-sectional survey study was conducted among radiographers at a university teaching hospital. A total of 49 out of 57 radiographers participated in this study. The respondents were recruited using purposive sampling and only non-clinical radiographers and students were excluded from the study. The questionnaire was distributed to the respondents by hand and then collected when they finished it. Respondents were assured of data confidentiality, and their participation were kept anonymous.

3.2 Research instrument

This survey study used a self-administered questionnaire to evaluate occupational stress and coping strategies among radiographers. The questionnaire was adapted from a previous study done by Ashong et al. (2016). The questionnaire consisted of three sections. Section A consisted of demographic information such as gender, age, marital status, years of working experience, and academic qualification. Section B was used to identify the radiographer's perceived stress level. It consisted of 24 questions divided into four parts: "experience in work station, physical workplace environment, statement pertaining to job and measure of workload". Each item is rated individually based on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The scoring was reversed for negatively phrased questions. The stress level was categorized based on the total scores by summing across all the 24 items. The stress level was categorized based on Occupational Stress Index Method which is low (below 60), moderate (60-83), and high (above 84) levels of stress. Section C was used to evaluate the radiographer's coping strategies in managing occupational stress. Respondents

were asked to answer 15 Likert questions and give ratings either 1 (never), 2 (yearly), 3 (monthly), 4 (weekly), and 5 (daily). A higher mean score indicates that the respondents are more frequently engaged with that coping strategies.

A total of 30 radiographers were recruited in a pilot study for questionnaire reliability testing. The reliability test was conducted using test-retest reliability method. Cohen's kappa coefficient was used to determine the reliability of the questionnaire using SPSS, and it yielded a value of 0.83 and 0.89 for section B and section C respectively, which reflected a substantial agreement of reliability.

3.3 Data analysis

Both descriptive and inferential data analysis were performed using IBM SPSS Statistics for Windows, version 27.0, Armonk, NY: IBM Corp, with a value of $p<0.05$ being considered statistically significant. A normality test was performed, which showed not-normally distributed data. Hence, Pearson Chi Square test was performed to find association between demographic factors and stress level. Descriptive analysis such as mean, standard deviation, frequency, and percentage were used to describe the socio-demographic variables of the respondents, stress level and coping strategies.

3.4 Ethical consideration

Approval from UiTM Research Ethics Committee was sought before commencing this study (REC/06/2020 (UG/MR/166). Participants were provided with consent forms and agreed to participate in this study.

4.0 Findings

4.1Demographic of study population

A total of 22 male (44.9%) and 27 female (55.1%) radiographers participated in this study. The age of the respondents ranges from 20 to 59 years old, with the majority being married (71.43%). 49% of the respondents have working experience of less than five years, with a higher number of diploma graduates (67.3%) participating in this study. Furthermore, a higher number of diploma holders (59%) were recruited in this study.

4.2 Occupational stress perceived by the radiographers

Table 1 shows the level of stress perceived by the radiographers. Most of the respondents perceived that they experienced either a moderate level (73%) or a low level (27%) of stress at their workplace. Furthermore, the study revealed that more female respondents (32%) perceived that they experienced low-level occupational stress as compared to male respondents. The findings also show that a higher percentage of unmarried respondents (36%) experienced low stress levels than married respondents. In addition, this study revealed that with increasing in working experience, the percentage of respondents who experienced a moderate level of stress increased. Apart from the oldest group (>50 years old), it is observed that more respondents perceived that they are moderately stress. Besides, it was also found that the diploma holders experienced a low level of stress (31%) as compared to degree holders. However, the Pearson Chi Square test was conducted revealing no statistically significant association *($p>0.05$)* between demographic factors and occupational stress, as shown in Table 1.

Table 1. Occupational stress perceived by the radiographers

Level of occupational stress		Low n (%)	Moderate n (%)	*p*-value
Gender	Male	5 (21%)	19 (79%)	0.376
	Female	8 (32%)	17 (68%%)	
Marital status	Single	5 (36%)	9 (64%)	0.357
	Married	8 (23%)	27 (77%)	
Working experience	<1 year	1 (50%)	1 (50%)	0.607
	2-5 years	7 (33%)	14 (67%)	
	6-10 years	2 (22%)	7 (78%)	
	>10 years	3 (18%)	14 (82%)	
Age group	20-29	9 (43%)	12 (57%)	0.089
	30-39	3 (12%)	22 (88%)	
	40-49	0 (0%)	1 (100%)	
	>50	1 (50%)	1 (50%)	
Academic qualification	Certificate	0 (0%)	2 (100%)	0.691
	Diploma	9 (31%)	20 (69%)	
	Degree	4 (24%)	13 (76%)	
	PhD	0 (0%)	1 (100%)	

4.3 Factors of stress

Four stressors were evaluated based on the theme, which is related to "experience in work station, physical workplace environment, statement pertains to job, and measure of workload". A higher mean score indicates that factor contributes to respondents' stress levels. Table 2 shows a higher mean score in immediate supervisor's support (4.04) and a good relationship with a colleague (3.96). It indicates that the relationship with colleagues and supervisors is the main factor that causes stress among respondents at their workplace. According to the findings, approximately 85% the respondents have been affected by their relationship with colleagues and immediate

supervisors, which increases their stress level. In addition, it is revealed that the physical workplace environment and the burden of work has recorded higher mean scores. It shows that these factors also contribute to higher occupational stress among respondents. Furthermore, unnecessary exams requested by physicians and the relevant training attended by the radiographer are also found to be among the factors that can affect the radiographer's stress level.

Table 2. Factors affecting occupational stress

Factors	Item	Mean (SD)
Experience in work station	Lack of staff	3.31 (1.14)
	Inadequate salary	3.29 (1.08)
	Unnecessary exams requested	3.53 (1.00)
	Radiologists uncooperative and non-supportive	2.31 (1.00)
	Patients uncooperative and abusive	3.08 (1.02)
	Management rules unreasonable	3.00 (1.06)
	Work not enough to prevent boredom	2.82 (1.17)
	Stressed and have lost interest in work	2.53 (0.96)
	Feel miserable or depressed	2.55 (1.00)
	People annoy and irritate	2.63 (0.99)
	Accept things the way they are	3.37 (0.91)
Physical workplace environment	Physical working conditions satisfactory	3.90 (0.77)
	Facilities in this department is comfortable	3.76 (0.86)
	Imaging rooms are well-designed	3.63 (0.73)
	Equipment is well maintained	2.98 (1.15)
Statement pertains to job	Good achievements are rewarded	3.39 (0.89)
	Staffs exposed to necessary courses relevant to profession	3.63 (0.73)
	Good terms with colleagues	3.96 (0.61)
	Get help and support from your immediate superior	4.04 (0.71)
Measure of workload	Work very hard physically and mentally	3.76 (0.95)
	Inadequate time for communicate to patient	2.76 (0.95)
	Sick absence reported by staff	3.12 (1.05)
	Burden of on-call duties	2.90 (1.23)
	Insufficient imaging rooms	3.37 (0.99)

4.3 Coping strategies implemented by radiographers

Table 3 summarises the coping strategies adopted by the respondents. A higher mean score indicates that the respondents are more frequently engaged with that coping strategies. Table 3 shows that the most frequent coping mechanism adopted by respondents is doing exercises and turning to other activities. According to the findings, approximately 30% of the respondents do exercise on a daily and weekly basis to help them cope with their stress at the workplace. Furthermore, about 45% of the participants revealed that they turned to other activities such as such as shopping, reading, sleeping, and watching television. On the other hand, a minority of the participants (8%) use alcohol or drugs on a daily or weekly basis to cope with their stress.

Table 3. Coping strategies

Coping strategies	Mean (SD)
Do exercise	3.20 (1.24)
Use relaxation technique	2.57 (1.19)
Use medication prescribed by doctor to help get through it	1.33 (0.90)
Use alcohol or drugs to make feel better	1.04 (0.29)
Eating	2.33 (0.99)
Get help and advice from other people	2.78 (1.18)
Do the alternative therapies	1.76 (1.16)
Blame own self for things that happened	2.00 (1.32)
Turn to other activities to take your mind off things such as shopping, reading, sleeping and watching TV	3.18 (1.03)
Try to find comfort in religion or spiritual beliefs	2.35 (1.03)
Try to come up with a strategy about what to do	2.59 (1.17)
Give up the attempt to cope	1.80 (1.06)
Making fun and joke about it	2.31 (1.23)
Express negative feelings	1.92 (1.37)
Get angry and yell at people	2.02 (1.51)

5.0 Discussion

The results of this study reflect that the majority of the respondents perceived a moderate level of occupational stress. It agrees with a study done by Kakunje (2011) which also recorded a moderate level of stress among his respondents. In contrast, another study found that the radiographers experience high level of stress at their workplace (Yasin et al., 2021; Ashong et al., 2016). On the other hand, it is found that female respondents are less stress as compared to males, with 32% of them self-reporting a low level of stress. Similar findings were recorded by Ashong et al. (2016) which found that male radiographers are highly stressed as compared to females. However, this study found no statistically significant association between gender and stress level among respondents. This is consistent

with the study done by Ogolodom et al. (2022) and Jagodic et al. (2020), which found that there is no gender variation in relation to occupational stress among radiographers.

Furthermore, this study found that married respondents recorded a higher level of stress as compared to unmarried respondents, which is in agreement with a previous study (Kakunje, 2011). This might be due to the fact that married radiographers need to juggle between career and family, which might lead to increased stress at the workplace. Besides, this study also found that more radiographers experience higher level of stress with increasing in working experience. It is also evident in the assessment between age group and stress level, which reported a higher level of stress with an increase in age. This is in line with a study by Ashong et al. (2016), which recorded a higher stress level among experience radiographers. This might be attributable to the higher workload or responsibility among older or more experienced radiographers. In addition, it is found that the stress level among diploma holders is lower than degree holders. However, there is no statistically significant association found between academic qualification and stress level among respondents. This is consistent with previous study by Kakunje (2011) which found that qualification does not affects stress level. It is owing to the fact that radiographers are exposed to continuing educations to equip themselves with the necessary knowledge as well as to keep pace with technological advancement.

Occupational stress has become a significant concern in recent years as it has enormous potential, which influences job productivity and performance. Identification of the stressors can help the employee and employer to outline appropriate action to reduce stress in the workplace. In this present study, factors affecting occupational stress among respondents were evaluated in terms of experience in work station, physical workplace environment, statements pertaining to career/job and measure of workload. This study found that majority of radiographers are of the opinion that support from supervisor and relationship with colleagues greatly affects their stress level at the workplace. This is consistent with the study done by Kharjahrin & Hrangkhawl (2022), which found that among the main sources of stress are managers' support and relationship among co-workers. Furthermore, Caillier (2017) stated that there's a beneficial effect if the employees have a good relationship with their supervisors and peers, which can boost the employee's productivity. The support that the employees received from their managers can provide consolation, boost self-confidence, and reduce the stress that the employee is experiencing (Nakao, 2010). Hence, employers should encourage positive interactions between supervisor and employees through effective communication.

In addition, the physical workplace also affects the wellbeing of the employees. Nieuwenhuijsen et al. (2010) stated that the facilities at the department or organization could boost the employee's motivation to work and reduce the level of stress. Therefore, the management needs to provide a conducive physical workplace environment which could assists in the radiographer's daily work. This study also found that the level of stress will be affected by heavy workload and unnecessary exams requested by physician. A study by Sipos et al. (2023) found that radiographers cited high workload and labour shortages as the main causes of stress. In addition, heavy workload and running out of time to finish the tasks within the deadline makes work even more stressful (Awang et al., 2010).

Coping strategies implemented by radiographers can lead to experiencing lower level of occupational stress as well as helping to sustain a professional commitment to their department. Ashong et al. (2016) found that radiographers adopt better problem-focused abilities to cope with stress. There are various coping strategies adopted by the respondents to overcome their stress level. This study revealed that most of the respondents practise a healthy lifestyle by doing exercise to cope with the stress. Previous study also found that as they practice a healthy lifestyle, it enable them to handle their pressure well by taking relevant actions (Lua & Imilia, 2011). Besides that, the respondents do their preferable activities such as shopping, reading, sleeping, and watching television to take their minds off. It is useful as they can manage their stress by doing their favourite activities. Though it is found in this study that a minority of the respondents turn to alcohol or drugs to manage their stress, the majority of the respondents adopted a positive coping mechanism to manage their stress. The coping strategies adopted by the radiographers are found to have a significant effect in reducing job stress as they could provide emotional support, face the problem at hand and work to resolve the issue rather than trying to evade the problem (Lloyd, 2014). An effective coping mechanism is crucial to prevent more serious psychological problems such as depression or burnout.

This study presented some limitations. First, the data are rely on self-reports, which could make them vulnerable to social response bias due to sensitive subject matter. However, it was mitigated because the researcher guaranteed complete anonymity and stressed the importance of honest responses to the questions. Besides, the study had a small sample size and was conducted only at one centre. Future study with a larger sample size and a multicentre is recommended to ensure generalisation to the Malaysian radiographer's population can be achieved. A qualitative study can be also conducted to explore in depth the stressors and coping mechanisms adopted by the radiographers. Despite the limitation, this study has provided some insight into how radiographers perceived their stress at the workplace. Serious attention and effective coping mechanism should be continuously implemented and monitored to ensure quality service can be delivered to the patients.

6.0 Conclusion & Recommendation

Although the majority of the respondents perceived that they were moderately stressed, it does not negate the importance of the radiographers in assessing their current state of mental well-being. Based on the stressors identified, it is found that the manager's support, relationship with colleague and physical workplace environment are the main sources of stress. Hence, it is important for the employees and employer to engage and take a necessary action so that the stressors can be managed and subsequently reduce occupational stress. In addition, the coping strategies are essential to ensure the respondents can handle the pressure well so that they can render the best services to the patients, which greatly benefits the healthcare organisation. Frequent assessment of the current state of occupational stress should be encouraged from time to time to avoid a more serious mental health issue. Besides, it would be

good if healthcare facilities could incorporate stress management workshops into recruitment or training schedules, to help employees to cope with occupational stress.

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Paper Contribution to Related Field of Study
This study will contribute to the area of behavioral science particularly related to working environment and mental health.

References

AbuAlRub, R. F. (2014). Job stress, job performance, and social support among hospital nurses. Journal of nursing scholarship, 36(1), 73-78.

Alves, S. L. (2015). A study of occupational stress, scope of practice, and collaboration in nurse anesthetists practicing in anesthesia care team settings. AANA journal, 73(6).

Ashong, G. G. N. A., Rogers, H., Botwe, B. O., & AnimSampong, S. (2016). Effects of occupational stress and coping mechanisms adopted by radiographers in Ghana. Radiography, 22(2), 112–117. https://doi.org/10.1016/j.radi.2015.09.002

Awang, M.I., Dollard, M. F., & Winefield, A. H. (2010). Lay Theory Explainations of Occupational Stress: The Malaysian Context. Cross Cultural Management An International Journal , 17 (2), 135-153.

Caillier, J. G. (2017). The impact of high-quality workplace relationships in public organizations. Public Administration, 95(3), 638-653.

Carvalho, A. E. L. D., Frazão, I. D. S., Silva, D. M. R. D., Andrade, M. S., Vasconcelos, S. C., & Aquino, J. M. D. (2020). Stress of nursing professionals working in pre-hospital care. *Revista Brasileira de Enfermagem*, *73*.

Chinene, B., Mudadi, L., Mutandiro, L., Mushosho, E. Y., & Matika, W. (2023). Radiographers' views on the workplace factors that impact their mental health: Findings of a survey at central hospitals in Zimbabwe. *Journal of Medical Imaging and Radiation Sciences*, *54*(2), S51-S61.

Great Britain Health and Safety Executive. (2019). *Tackling work-related stress using the Management Standards approach: A step-by-step workbook*. Stationery Office.

Ibrahim, M. A., Isa, K. Q., Haji-Idris, H. A., Nawi, S. H., Teo, Y. C., Abdul Rahman, H., & Abdul-Mumin, K. H. (2020). Spiritual coping with stress among emergency and critical care nurses: A cross-sectional study. *Community mental health journal*, *56*, 287-293.

Jagodic M, Hlebec V, Starc T. Identification of occupational stressors amongst radiographers. Medical Imaging and Radiotherapy Journal. 2 0 2 0 ; 3 7 (1) : 2 0 - 2 4 . D O I : https://doi.org/10.47724/MIRTJ.2020.i01.a00 4

Kakunje A (2011). Stress among Health Care Professionals - The Need for Resiliency. Online J Health Allied Scs. 10(1):1

Kharjahrin, B., & Hrangkhawl, W. (2022). A Study on the Occupational Stress Among the Radiographers Working in Healthcare Centres in Shillong.
Lewis, S., & Mulla, F. (2021). Diagnostic radiographers' experience of COVID-19, gauteng south africa. *Radiography*, *27*(2), 346-351.

Lloyd, I. I. (2014). Emotional intelligence and stress coping in high stress occupations (NorthCentral University). Ph.D. Dissertation.

Lua, P. and Imilia, I. (2011). Work related stress among health care providers of various sectors in Penninsular Malaysia. Medical Journal of Psychology, 20(2): 1-15.

Murphy, M., Moore, N., Leamy, B., England, A., O'Connor, O. J., & McEntee, M. F. (2022). An evaluation of the impact of the Coronavirus (COVID 19) pandemic on interventional radiographers' wellbeing. *Journal of Medical Imaging and Radiation Sciences*, *53*(3), 384-395.

Nakao, M. (2010). Work-related stress and psychosomatic medicine. *BioPsychoSocial medicine*, *4*, 1-8.

Nakasis, K., & Ouzouni, C. (2018). Factors influencing stress and job satisfaction of nurses working in psychiatric units. Health science 2(4), 183-195.

Nayak, K., Kumar, N., & Panakkal, N. C. (2020). Occupational stress among radiographers working in tertiary care hospital in Udupi and Mangalore. *Prof.(Dr) RK Sharma*, *20*(4), 306.

Nieuwenhuijsen, K., Bruinvels, D., & Frings-Dresen, M. (2010). Psychosocial work environment and stress-related disorders, a systematic review. Occupational medicine, 60(4), 277-286.

Oginska-Bulik, N. (2016). Occupational stress and its consequences in healthcare professionals: the role of Type D Personality. International Journal of Occupational Medicine and Environmental Health, 19 (2), 113-122.

Ogolodom, M., Okankwu, E. A., Chiegwu, H. U., Okeke, J. S., Joseph, D. Z., Ugwuanyi, D. C., ... & Egop, E. B. (2022). Occupational Stress Level and the Associated Factors among Intern Radiographers in Anambra State, Nigeria. *Tropical Journal of Medical Research*, *21*(2), 1-9.

Orzechowska, A., Zajączkowska, M., Talarowska, M., & Gałecki, P. (2013). Depression and ways of coping with stress: a preliminary study. Medical science monitor: international medical journal of experimental and clinical research, 19, 1050–1056. doi:10.12659/MSM.889778

Parizad, N., Lopez, V., Jasemi, M., Gharaaghaji Asl, R., Taylor, A., & Taghinejad, R. (2021). Job stress and its relationship with nurses' autonomy and nurse–physician collaboration in intensive care unit. *Journal of Nursing Management*, *29*(7), 2084-2091.

Rajan, D. (2012). Stress impact among radiographers. *International journal of business and management tomorrow*, *2*(7), 1-11.

Ravari, A. K., Farokhzadian, J., Nematollahi, M., Miri, S., & Foroughameri, G. (2020). The effectiveness of a time management workshop on job stress of nurses working in emergency departments: an experimental study. *Journal of Emergency Nursing*, *46*(4), 548-e1.

Samson-Akpan, P. (2017). Stress and Coping Strategies among Undergraduate Nursing Students in Calabar, Nigeria. IOSR Journal Of Nursing And Health Science, 06(03), 61-70. doi: 10.9790/1959-0603086170

Shanafelt, T., Ripp, J., & Trockel, M. (2020). Understanding and addressing sources of anxiety among health care professionals during the COVID-19 pandemic. *Jama*, *323*(21), 2133-2134.

Sipos, D., Kunstár, O., Kovács, A., & Csima, M. P. (2023). Burnout among oncologists, nurses, and radiographers working in oncology patient care during the COVID-19 pandemic. *Radiography*, *29*(3), 503-508.

Tran, K. T., Nguyen, P. V., Dang, T., & Ton, T. (2018). The Impacts of the High-Quality Workplace Relationships on Job Performance: A Perspective on Staff Nurses in Vietnam. Behavioral sciences (Basel, Switzerland), 8(12), 109. doi:10.3390/bs8120109

Yasin, B., Barlow, N., & Milner, R. (2021). The impact of the Covid-19 pandemic on the mental health and work morale of radiographers within a conventional X-ray department. *Radiography*, *27*(4), 1064-1072.