Peer Reviewed **Article**

WORKPLACE WELLBEING DURING THE THIRD WAVE OF COVID-19: PERCEPTIONS OF SOUTH AFRICAN DIAGNOSTIC RADIOGRAPHERS AT THREE RADIOLOGY DEPARTMENTS IN THE EASTERN CAPE PROVINCE

Amy Bemetz[1] *BRad* | **Luqmaan Isaacs**[1] *BRad* | **Katelyn Papman**[1] *BRad* | **Carmen Stindt**[2] *MCom* | **Riaan van de Venter**[3] *DRad, MTech Rad, PGDip Tert. Edu., PGDip Distance Higher Edu.*

[1]Bachelor of Radiography in Diagnostics graduate, Department of Radiography, Faculty of Health Sciences, Nelson Mandela University, Gqeberha, Eastern Cape, South Africa
[2]Eversci (Pty) Ltd., Gqeberha, Eastern Cape, South Africa
[3]Lecturer, Department of Radiography, Faculty of Health Sciences, Nelson Mandela University, Gqeberha, Eastern Cape, South Africa

https://doi.org/10.54450/saradio.2025.63.1.941

Abstract

Introduction. Constant development and changes in the working environment, staff shortages, unexpected crises and role conflicts can negatively impact the wellbeing of radiographers as they try to navigate and cope with these to perform optimally. This can have a significant negative impact on their mental health and work performance, which in turn results in suboptimal service delivery and patient care.

Methods. A quantitative approach using a descriptive, cross-sectional research design was employed. Sixty diagnostic radiographers (n=60) were recruited, using a census sampling strategy, at three research sites. A two-part hardcopy questionnaire was used to collect participants' demographic information and their perceptions related to their workplace wellbeing.

Results. Most of the participants were found to have low to moderate levels of job satisfaction (80%), organisational support (93.4%), employer care (83.4%) and work-life balance (86.7%). Results demonstrate that job satisfaction is positively correlated with organisational support (r=0.698, p=0.000) and that organisational support is positively correlated with employer care (r=0.842, p=0.000). A negative correlation was found to exist between work-life balance and job satisfaction (r=−0.322, p=0.000), organisational support (r=−0.371, p=0.000) and employer care (r=−0.466, p=0.000), respectively. Statistically significant differences were found for the factors: job satisfaction, organisational support and work-life balance relative to participants' age group. There were no statistically significant differences between the four factors comprising workplace wellbeing relative to the participants' marital status and number of dependants. Participants' workplace wellbeing was significantly lower during the pandemic compared to that prior to the pandemic.

Conclusion. The majority (85.9%) of participants' overall workplace wellbeing was found to be moderate and significantly decreased during the pandemic. The development of strategies should be considered to enhance workplace wellbeing among radiographers to ensure optimal wellness, which can lead to enhanced service delivery quality and radiographer performance, and patient care and safety.

Keywords: Leadership, mental health, occupational stress, service delivery, wellness, workforce development

INTRODUCTION

Radiographers have to constantly adapt to and learn from ever-changing, rapid technological advancements affecting the profession, as well as engage with and work alongside other healthcare professionals (HCPs) to perform their work. This makes for a diverse and dynamic working environment.[1-2] Resource and human capital constraints, and increased workplace demands, results in greater levels of occupational stress which can lead to decreased workplace wellbeing.[3-4]

Workplace wellbeing refers to the intersections of an employee's work and personal live which encompass physical, social and psychological aspects.[5] Hence it is imperative that employers ensure that support mechanisms are in place to promote workplace wellbeing. Support mechanisms may be in the form of opportunities for professional growth and in-service psychosocial education to enable staff to mitigate burnout, cope with occupational stress and practice self-care.[6-7] Additionally, ensuring a more evenly distributed workload, access to the required resources and flexible working hours among staff may also be considered to promote workplace wellbeing.[8] Having these mechanisms in place may lead to reduced absenteeism, greater productivity among staff, reduced errors and stress, as well as enhanced staff morale, health, job retention and job satisfaction. This is because employees would perceive their employer as supportive and caring and therefore their commitment to the organisation and engagement in their work increases.[9-10]

However, the healthcare landscape is also faced with unprecedented crises which cannot be planned for and will inadvertently impact HCPs' workplace wellbeing. The global turmoil caused by the COVID-19 pandemic, the disease caused by the SARS-CoV-2 coronavirus is one such unexpected healthcare crisis that radiographers worldwide had to grapple with to maintain the provision of safe, high quality radiographic services whilst maintaining their own wellness.[11] The pandemic was particularly unique for South African radiographers as they had not encountered any previous respiratory-related pandemics.[12] Radiographers worked through five waves of COVID-19 pandemic (hereafter COVID-19) between 2020 and 2022.[13] Anecdotal evidence indicates that in 2024 individuals were still being infected with COVID-19 globally. The available international body of evidence underscores the immense strain that COVID-19 placed on healthcare establishments, available resources and radiographers. Literature points to the increased levels of work-related stress that radiographers experienced during COVID-19. This stemmed from their fear of contracting the virus, constant changes in workflow and infection control policies and practices. Lack of personal protection equipment (PPE), as well as limited to no education and training on how to cope with and effectively work and maintain safety during these conditions, also negatively impacted radiographers' workplace wellbeing. Depression, anxiety and burnout were common among radiographers during COVID-19.[12,14-17] However, none of these studies explicitly explored workplace wellbeing: the studies focussed more broadly on radiographers' experiences in different geographical and work settings.

Having insight about diagnostic radiographers' workplace wellbeing, and the influence of COVID-19, could inform the respective preparedness strategies of policymakers, radiography managers, and radiographers as well as workforce development needs pertaining to wellbeing for future similar healthcare crises. Our research aimed to contribute to this knowledge gap by investigating the perceptions of diagnostic radiographers, at three radiology departments in one province in South Africa, in terms of the impact of COVID-19 on their workplace wellbeing.

METHODS AND MATERIALS

Ethics approval was obtained from the Nelson Mandela University (H21-HEA-RAD-001) and from each of the three research sites. All participants provided informed consent and participated voluntarily in this study. No personal details were collected from participants to ensure anonymity and privacy. Autonomy was further ensured by allowing participants to complete the questionnaire in their own time during the data collection period. During the data collection period every completed questionnaire was stored in secured areas away from the research sites. Only the researchers had access to the completed questionnaires; the last author (study supervisor), in accordance with university policy, stored them once data capturing and analysis was completed.

» Research design

A quantitative inquiry using a descriptive, cross-sectional design was utilised to explore and describe the perceptions of diagnostic radiographers, at three radiology departments in the Eastern Cape province of South Africa, about the impact of COVID-19 on their workplace wellbeing, This design was appropriate given the paucity of research in this area.

» Study population, sampling strategy and sample size

The study population comprised 80 diagnostic radiographers (n=80), within the Nelson Mandela Bay Health District and Buffalo City Health District of the Eastern Cape, who were employed since 2020 at three different radiology departments (i.e., research sites). The inclusion criterion was registration with the Health Professions Council of South Africa (HPCSA) in the category of independent practice. The three research sites were selected based on time constraints and convenience; these were the departments where the first three authors completed their workplace learning. Using two health districts also contributed to increased participant anonymity. Given the small study population, a census sampling strategy was employed in order to (i) mitigate selection bias, (ii) increase the likelihood of having a representative sample, and (iii) ensure equal opportunity for eligible participants to participate in this study.[18] The maximum sample size was 80 participants (n=80). The minimum representative sample size required was determined using the sampling ratio technique, where a study population that comprises less than 1000 participants requires a minimum sample size of 30% of the study population.[19] The minimum sample size for our study pop-

ulation of 80 would therefore be 24 participants (n=24). Sixty-one participants were available and consented to participate in this study (n=61). One participant's (n=1) data was excluded from the study, during the data capturing stage of the study, due to an incomplete questionnaire. The final sample size was 60 participants (n=60), which was more than double the minimum required sample size. The sample size was adequate.

» Participant recruitment and data collection

Participant recruitment only commenced on receipt of ethics approval and permission of the gatekeepers (i.e., persons at the research sites controlling access to participants). The respective permission was received from the private practice at research site 1; the assistant director of radiography, deputy director of clinical support services, senior manager medical services and chief executive officer at research site 2, as well as the research ethics committee at research site 3 (FCMHREC/A085/2021). Participants were recruited by the first three authors. Each of them recruited participants at the research site where they were placed for workplace learning between August and October 2021. This data collection period coincided with the third wave, which was caused by the delta variant of COVID-19 in South Africa.[20] At each research site the relevant author, during staff meetings, informed all radiographers present about the research study. A copy of the participant information letter was handed to each radiographer present at the respective meetings. A copy of the letter, as a visual reminder, was placed on the departmental notice board of each site. Those willing to participate were informed to liaise with the researcher at their site, namely, the researcher who provided them with the study information in terms of obtaining and submitting an informed consent form and the use of the questionnaire as the research tool. Participants who approached the respective researcher at their research site were provided with an informed consent form. Once participants submitted the completed informed consent form, they received a hardcopy questionnaire and unlabelled envelope. They were also reminded not to include any identifiable information on the questionnaire or envelope. They could complete the questionnaire in their own time and a place convenient for them. The participants had to place their completed questionnaire inside the unlabelled envelope and seal it. The participants handed their sealed envelopes to the researcher at their respective research site. The sealed envelopes were stored in a locked cupboard in each of the the first three authors' residences for the duration of the data collection period. At the end of the data collection period ended, the three first authors met and placed their sealed envelopes in one container. They then opened each envelope to check that the entire questionnaire had been completed in preparation of data capturing, cleaning and analysis. This was in keeping with participants' privacy and anonymity. In terms of COVID-19 safety, all infection control protocols were observed for handling hardcopy research instruments (i.e., sanitising hands before and after handling informed consent forms, questionnaires, and envelopes; wearing gloves and masks; keeping at least 1.5 metres between researcher and participant).

» Data collection instrument

A self-reporting, hardcopy, questionnaire was used to collect data. Section A of the questionnaire comprised six closed-ended and two open-ended questions about participant demographics and working conditions that could impact participants' wellbeing during the COVID-19 pandemic. Section B comprised 31 five-point Likert scale type questions based on the workplace wellbeing questionnaire which measures four sub-constructs (i.e., factors) of workplace wellbeing: work satisfaction, organisational respect for the employee, employer care and intrusion of work into private life. The questionnaire may be freely downloaded by anyone and used on condition that no changes are made to the questions.[21-22]

» Data analysis

The first three authors captured, cleaned and verified the data for accuracy, using an Excel spreadsheet. Data were analysed by the first four authors, using IBM SPSS Statistics 28. The fifth author checked the analyses for accuracy as a quality control measure. Descriptive statistical methods (mean, standard deviations, distribution frequencies and proportions) were used to provide summative descriptions of the participants' demographics and work satisfaction, organisational respect for the employee, employer care, and intrusion of work into private life. The scoring and categorisation methods recommended by the developers of the questionnaire were adopted for each factor of workplace wellbeing measured.[21] To determine whether there were associations between the participants' workplace wellbeing and their biological sex, age, marital status and the number of dependants, independent sample t-tests and one-way ANOVA analyses were done. To determine whether there was a significant difference between the participants' wellbeing prior to and during COVID-19 the Wilcoxon test was used to assess the associations between wellbeing and changes to work conditions. To determine the relationship between the workplace wellbeing factors' scores, Pearson's correlation coefficients were calculated. Results were considered statistically significant when $p < 0.05$.

» Validity and reliability

The questionnaire in this study had not been used in the context of a study like this one. It was therefore important to ensure reliability and validity of the data collection instrument and to determine whether it was applicable to the South African radiography context. Standardised scoring

Table 1. Confirmatory factor analysis (CFA) model fit

FACTOR	PARAMETERS	CMIN/DF	GFI	SRMR	CFI	RMSEA
Work satisfaction	All significant ($p < 0.01$)	1.888	0.898	0.0616	0.944	0.123
Organisational respect for the employee	All significant ($p < 0.01$)	1.67	0.895	0.061	0.937	0.107
Employer care	All significant ($p < 0.01$)	1.495	0.912	0.0481	0.967	0.092
Intrusion of work into private life	All significant ($p < 0.01$)	1.199	0.95	0.047	0.984	0.058

Table 2. Demographic statistics

Biological sex	**n (%)**
Female	56 (93.3%)
Male	4 (6.7%)
Age	
21 – 30 years old	11 (18.3%)
31 – 40 years old	27 (45%)
41 – 50 years old	13 (21.7%)
51 – 60 years old	6 (10%)
60+ years old	3 (5%)
Marital status	
Married	34 (56.7%)
Divorced	4 (6.7%)
Single	21 (35%)
Widowed	1 (1.7%%)
Dependants	
0 dependants	18 (30%)
1 dependant	15 (25%)
2 or more dependants	27 (45%)

procedures were used to analyse and interpret the results. The questionnaire format and instructions were the same for all participants. No previously published internal consistency measures could be found for the workplace wellbeing questionnaire (WWQ) used in this study. Cronbach's alpha scores were then obtained to determine the reliability of each factor: work satisfaction (Cronbach's α = 0.874), organisational respect for the employee (Cronbach's α = 0.854), employer care (Cronbach's α = 0.898) and intrusion of work into private life (Cronbach's α = 0.834). The reliabilities were all deemed good and appropriate.[23]

To assess the validity of each scale, confirmatory factor analysis (CFA) was performed. The results of the CFAs are summarised in Table 1. For work satisfaction, three items (WS5, WS7 and WS8) were removed due to standardised estimates that were < 0.4. For intrusion of work into private life, item IWP6 was reversed coded to be aligned with the remaining items in the factor structure. During the CFA this item was found to be insignificant (Estimate = 0.46, SE = 0.246, $p = 0.061$) and removed from the structure. All factor structures for the scales (Table 1), showed adequate model fit and were deemed to be valid according to the criteria of Hair et al.[24]

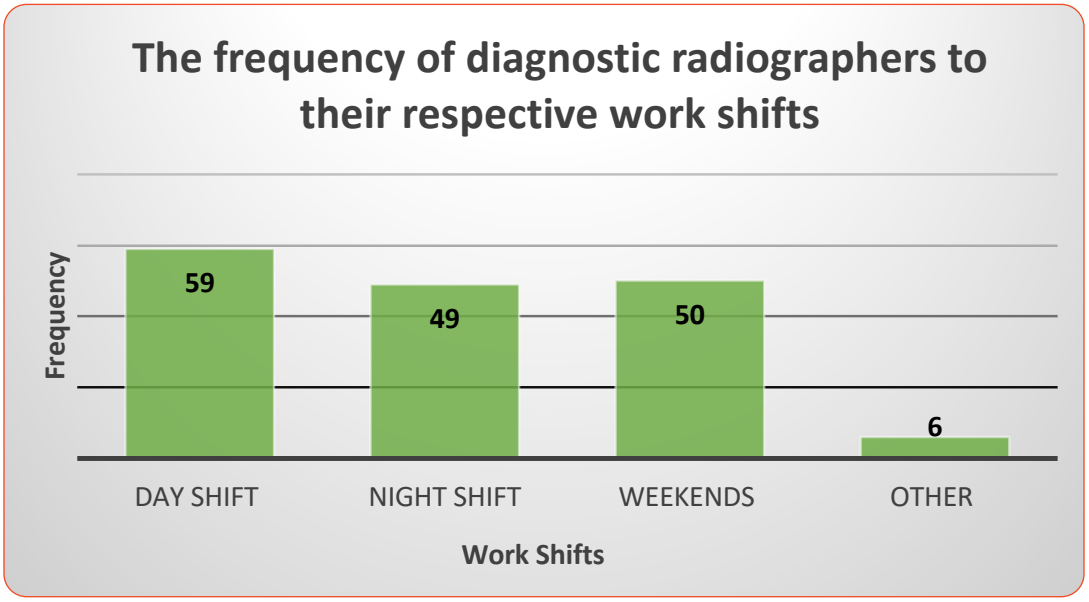

Figure 1. Shifts worked by the participants.

RESULTS

» Response rate and participant demographics

Sixty participants from a possible 80 (n=60/80), which yielded an acceptable 75% response rate.[25] Figure 1 provides a summary of the shifts worked by the participants. Participants had to select all shifts applicable to them, hence only the distribution frequency is presented. Table 2 outlines participants' demographic statistics: the majority (93.3%), were female (93.3%), between the ages of 31 and 50 years old (45%), married (56.7%), and had two or more dependants (45%).

» Workplace wellbeing

The questionnaire measured four factors of workplace wellbeing: work satisfaction, organisational respect for the employee, employer care and intrusion of work into private life. The distribution frequencies and proportions of participant responses to the questions comprising each of the four factors are presented in Table 3. The ranges of participants' response frequency for each of the response categories (not at all, slightly, moderately, very and extremely) are provided in the reporting below.

Most participants indicated "moderately" (35%-45%), "very" (12%-25%) or "extremely" (8.3%-11.7%) in response to six

Table 3. Distribution frequencies and proportions of responses to each of the four workplace wellbeing factors measured

Workplace wellbeing factor and questions		Distribution frequencies and proportions [n(%)]				
WORK SATISFACTION		**Not at all**	**Slightly**	**Moderately**	**Very**	**Extremely**
WS1	Is your work fulfilling?	5 (8.3)	5 (8.3)	27 (45)	18 (30)	5 (8.3)
WS2	Do your daily work activities give you a sense of direction and meaning?	4 (6.7)	9 (15)	24 (40)	18 (30)	5 (8.3)
WS3	Does your work bring a sense of satisfaction?	3 (5)	10 (16.7)	25 (41.7)	17 (28.3)	5 (8.3)
WS4	Does your work increase your sense of self-worth?	7 (11.7)	9 (15)	27 (45)	12 (20)	5 (8.3)
WS5	Does your job allow you to recraft your job to suit your needs?	21 (35)	15 (25)	15 (25)	6 (10)	3 (5)
WS6	Does your work make you feel that, as a person, you are flourishing?	20 (33.3)	14 (23.3)	21 (35)	2 (3.3)	3 (5)
WS7	Do you feel capable and effective in your work on a day-to-day basis?	0 (0)	3 (5)	25 (41.7)	25 (41.7)	7 (11.7)
WS8	Does your work offer challenges to advance your skills?	13 (21.7)	16 (26.7)	23 (38.3)	7 (11.7)	1 (1.7)
WS9	Do you feel you have some level of independence at work?	2 (3.3)	9 (15)	21 (35)	21 (35)	7 (11.7)
WS10	Do you feel personally connected to your organisation's values?	12 (20)	20 (33.3)	20 (33.3)	8 (13.3)	0 (0)
ORGANISATIONAL RESPECT FOR THE EMPLOYEE		**Not at all**	**Slightly**	**Moderately**	**Very**	**Extremely**
ORE1	In general terms, do you trust the senior people in your organisation?	15 (25)	13 (21.7)	22 (36.7)	7 (11.7)	3 (5)
ORE2	Do you believe in the principles by which your employer operates?	12 (20)	15 (25)	24 (40)	9 (15)	0 (0)
ORE3	Do you feel content with the way your employer treats its employees?	17 (28.3)	13 (21.7)	23 (38.3)	5 (8.3)	2 (3.3)
ORE4	Do you feel that your employer respects staff?	8 (13.3)	17 (28.3)	24 (40)	9 (15)	2 (3.3)
ORE5	How satisfied are you with your work's value system?	9 (15)	16 (26.7)	28 (46.7)	6 (10)	1 (1.7)
ORE6	Compared with your organisation's 'ideal values', to what degree are actual work values positive?	2 (3.3)	23 (38.3)	29 (48.3)	5 (8.3)	1 (1.7)
ORE7	Do people at your work believe in the worth of the organisation?	8 (13.3)	19 (31.7)	30 (50)	3 (5)	0 (0)

EMPLOYER CARE		Not at all	Slightly	Moderately	Very	Extremely
EC1	At a difficult time, would your boss be willing to lend an ear?	5 (8.3)	11 (18.3)	22 (36.7)	15 (25)	7 (11.7)
EC2	Is your boss caring?	7 (11.7)	13 (21.7)	19 (31.7)	17 (28.3)	4 (6.7)
EC3	Do you feel that your boss is empathic and understanding about your work concerns?	15 (25)	19 (31.7)	14 (23.3)	11 (18.3)	1 (1.7)
EC4	Does your boss treat you as you would like to be treated?	11 (18.3)	9 (15)	27 (45)	10 (16.7)	3 (5)
EC5	Does your boss shoulder some of your worries about work?	17 (28.3)	14 (23.3)	22 (36.7)	5 (8.3)	2 (3.3)
EC6	Do you feel your transactions with your boss are, in general, positive?	5 (8.3)	13 (21.7)	19 (31.7)	21 (35)	2 (3.3)
EC7	Do you believe that your employer cares about their staff's wellbeing?	17 (28.3)	16 (26.7)	19 (31.7)	4 (6.7)	4 (6.7)
INTRUSION OF WORK INTO PRIVATE LIFE		**Not at all**	**Slightly**	**Moderately**	**Very**	**Extremely**
IWP1	Does your work eat into your private life?	11 (18.3)	18 (30)	10 (16.7)	15 (25)	6 (10)
IWP2	Do you feel stressed in organising your work time to meet demands?	15 (25)	12 (20)	17 (28.3)	14 (23.3)	2 (3.3)
IWP3	Do you feel excessively pressured at work to meet targets?	11 (18.3)	18 (30)	13 (21.7)	12 (20)	6 (10)
IWP4	After work, do you find it hard to wind down?	22 (36.7)	12 (20)	9 (15)	12 (20)	5 (8.3)
IWP5	Do you find yourself thinking negatively about work outside work hours?	10 (16.7)	16 (26.7)	12 (20)	16 (26.7)	6 (10)
IWP6	Do you feel that you can separate yourself easily from your work when you leave for the day?	13 (21.7)	21 (35)	12 (20)	11 (18.3)	3 (5)
IWP7	Does your work impact negatively on your self-esteem?	24 (40)	18 (30)	5 (8.3)	10 (16.7)	3 (5)

of the work satisfaction items. Many participants indicated "not at all" (20%-35%) and "slightly" (23.3%-33.3%) for the other four items (WS5, WS6, WS8 & WS10). Most participants indicated "moderately" (36.7%-50%), "very" (5%-15%) and "extremely" (1.7%-5%) for six items of the factor organisational respect for the employee. Participants indicated an even response frequency for one item of this factor (ORE3) when considering the sum of "slightly" and "not at all" (n=30) relative to the sum of "moderately", "very" and "extremely" (n=30). For the employer care factor most participants indicated "moderately" (23.3%-45%), "very" (6.7%-35%) or "extremely" (1.7%-11.7%) for four items. Most participants indicated "not at all" (25%-28.3%) and "slightly" (23.3%-31.7%) for the other three items (EC3, EC5 & EC7). Most participants indicated "moderately" (16.7%-28.3%), "very" (20%-26.7%) and "extremely" (3.3%-10%) for four items (IWP1, IWP2, IWP3 & IWP5) of the intrusion of work into private life factor. Whereas the other three items for this factor were indicated by the majority as "slightly" (20%-35%) and "not at all" (21.7%-40%).

The summated scores for the four factors of the WWQ (i.e., section B of the data collection instrument) as prescribed by the user manual.[21] Table 4 indicates the mean score and standard deviation (SD) for each of the four factors. The scores were categorised into three categories: low, medium and high scores. This was done to compare the distributions of responses between the four workplace wellbeing factors (Table 4).

From Table 4 one can deduce that the participants perceived a low to medium level of work satisfaction (80%), organisational respect for the employee (93.4%), employer care (83.4%) and intrusion of work into private life (86.7%). This means that they perceived their workplace wellbeing to be low to moderate in terms of work satisfaction, organisational respect for the employee and employer care. Interestingly, just more than half of the participants had a low intrusion of work into private life score (56.7%). This indicates they did not perceive their work to intrude on their personal lives. This is because a lower score, when using the WWQ, is indicative of greater work-life balance.

» Relationship between workplace wellbeing factors' scores

To ascertain whether there were statistically significant relationships between work satisfaction, organisational respect

Table 4. Categorisation of the four workplace wellbeing factors' scores

	MEAN	SD	LOW (%)	MEDIUM (%)	HIGH (%)
Work satisfaction	1.938	0.77	23.3%	56.7%	20%
Organisational respect for the employee	1.533	0.70	41.7%	51.7%	6.7%
Employer care	1.714	0.87	36.7%	46.7%	16.7%
Intrusion of work into private life	1.597	0.94	56.7%	30%	13.3%

for the employee, employer care and intrusion of work into private life, Pearson's correlation coefficients were calculated. A significant, strong positive relationship between work satisfaction and organisational respect for the employee scores was found (r = 0.698, p = 0.000), as well as between organisational respect for the employee and employer care (r = 0.842, p = 0.000). There were a significant, moderate negative relationships between intrusion of work into private life and work satisfaction (r = -0.322, p = 0.000), organisational support (r = -0.371, p = 0.000), and employer care (r = -0.466, p = 0.000), respectively.

» Associations between participants' demographics and workplace wellbeing factors

To establish whether there was any statistically significant difference between the workplace wellbeing scores according to biological sex, age, marital status and number of dependants, independent sample t-tests and one-way ANOVAs were performed. The only differences that were statistically significant were found for the factors, work satisfaction (F = 6.33, df = 3, p < 0.001), organisational respect for the employee (F = 2.996, df = 3, p = 0.038) and intrusion of work into private life (F = 3.101, df = 3, p = 0.034) according to age. It was found that for work satisfaction, there were significant differences between participants in the 31-40 years age group and those in the 41-50 years age group (p = 0.037), and between participants in the 31-40 years age group and participants in the 51+ years age group (p = 0.002). The participants in the 31-40 years age group had significant lower work satisfaction scores (mean = 1.5344, SD = 0.719) compared to the participants in the 41–50 years age group (mean = 2.1758, SD = 0.683) and the participants in the 51+ years age group (mean = 2.5397, SD = 0.389).

It was found that for organisational respect for the employee, there was a significant difference between the 21-30-year-old participants and 31-40-year-old participants (p = 0.056). The participants in the 21-30-year-old age group had a significantly higher average organisational support score (mean = 1.883, SD = 0.622) compared to the participants in the 31-40-year-old age group (mean = 1.259, SD = 0.658).

It was found that for intrusion of work into private life, there was a significant difference between the 31-40-year-old participants and 41-50-year-old participants (p = 0.05). The participants in the 31-40-year-old age group had a significantly higher average work-life balance score (mean = 1.981, SD = 0.939) compared to the participants in the 41-50-year-old age group (mean = 1.179, SD = 0.718).

There were no statistically significant differences for marital status in either work satisfaction (t = -1.827, df = 58, p = 0.07), organisational respect for the employee (t = -1.882, df = 58, p = 0.065), employer care (t = 1.64, df = 58, p = 0.106) or intrusion of work into private life (t = -1.272, df = 58,

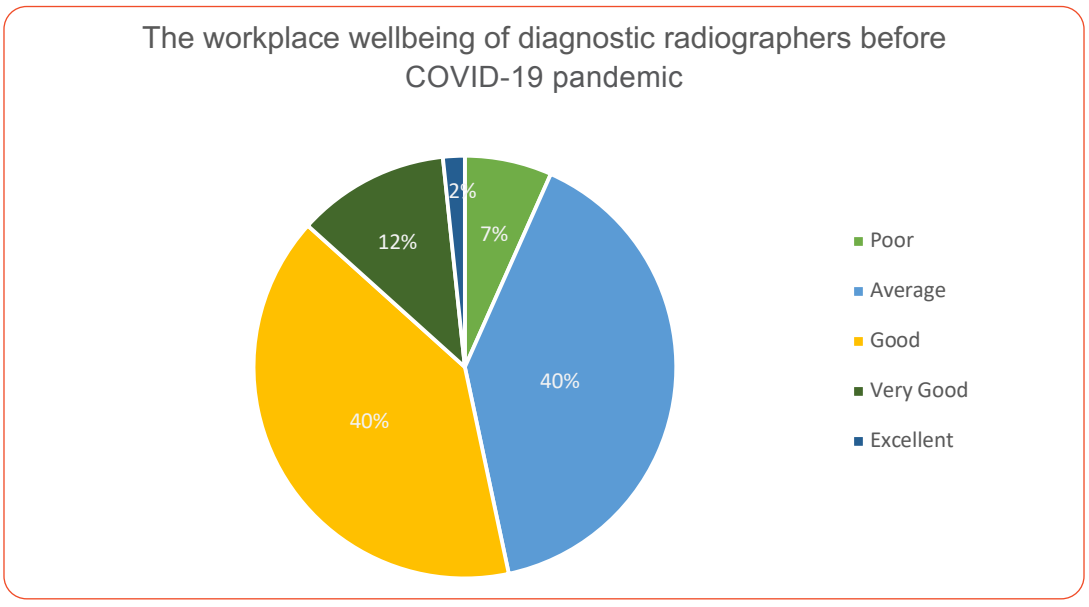

Figure 2. Participants workplace wellbeing rating before the COVID-19 pandemic.

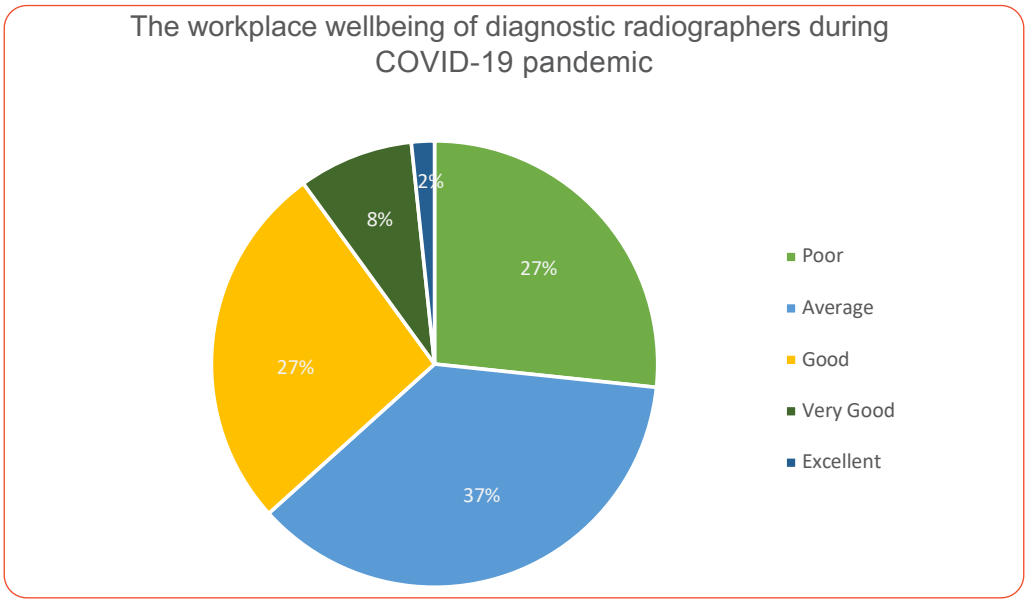

Figure 3. Participants workplace wellbeing rating after the COVID-19 pandemic.

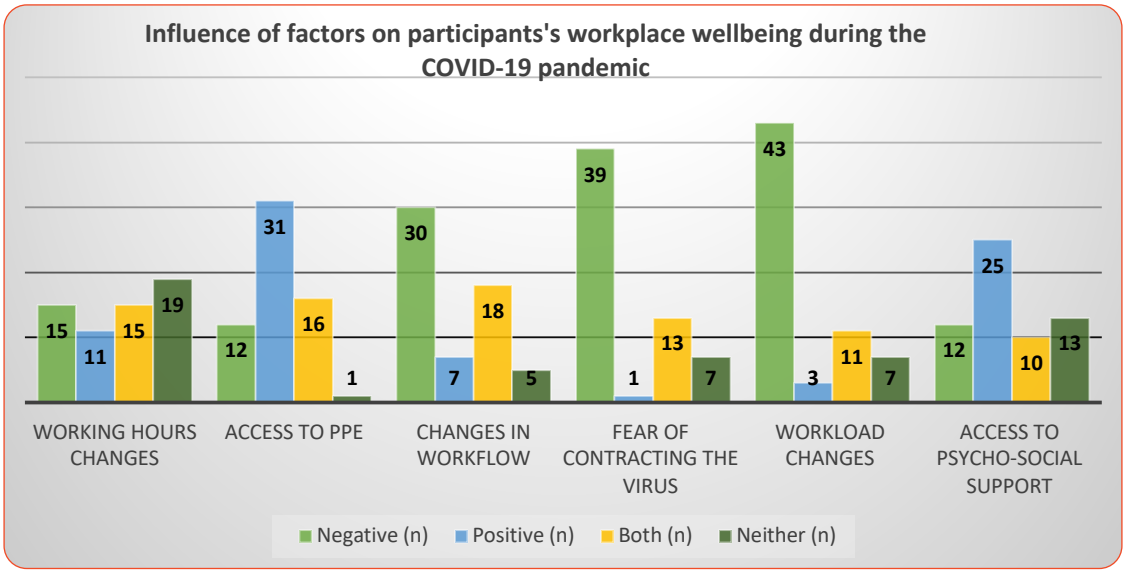

Figure 4. Factors impact on participants' workplace wellbeing during the COVID-19 pandemic.

p = 0.208) scores. Similarly, no statistically significant differences according to number of dependants within either intrusion of work into private life (F(2, 57) = 2.16, p = 0.125), work satisfaction (F(2, 57) = 2.681, p = 0.077), organisational respect for the employee (F(2, 57) = 1.544, p = 0.222), or employer care (F(2, 57) = 0.384, p = 0.683).

» Associations between participants' wellbeing prior to and during the COVID-19 pandemic

The participants were asked to rate their wellbeing prior to and during the pandemic from poor to excellent. Figures 2 and 3 demonstrate the proportions of participants' responses to these two questions. These figures demonstrate that participants' overall perceived workplace wellbeing was negatively impacted by the pandemic.

To assess whether there was a significant difference between the ratings for each participant, a Wilcoxon test was performed. It was found that there was a significant difference between the participants' wellbeing prior and during the pandemic (Z = -3.778, p < 0.001). This finding demonstrates that the participants' workplace wellbeing during the pandemic was significantly lower than their workplace wellbeing prior to it. Figure 4 demonstrates the factors that impacted participants' workplace wellbeing during the COVID-19 pandemic and shows the distribution frequency for each factor among participants. Changes in workload and workflow, and fear of contracting the virus had the greatest negative impact on participants. Conversely, having access to psycho-social support and PPE were the factors that positively influenced participants' workplace wellbeing during the pandemic.

DISCUSSION

This study set out to determine the perceptions about workplace wellbeing of diagnostic radiographers at three radiology departments in two health districts in the Eastern Cape province Participant recruitment and data collection coincided with the third wave of COVID-19, dominated by the delta variant of SARS-CoV-2.[20] This period is considered a possible influencing factor on our study results since we are mindful that the results may have been different if collected during different waves of the pandemic.

Literature underscores the negative impact that COVID-19 had on individuals' wellbeing which can manifest itself in a variety of psychosomatic symptoms. Similarly, diagnostic radiographers, are affected.[26] The constant practice and policy changes, at short notice, as well as having to ensure personal and patient safety during the pandemic further contributed to a stressful working environment. In turn this may negatively influence radiographers' workplace wellbeing.[26] Considering our study findings in the context of the available corpus of knowledge, both similarities and dissimilarities are noted. Each of the workplace wellbeing factors measured in our study are discussed next.

» Work satisfaction

Most participants (56.7%) had a medium level of work satisfaction (Table 4). This means that they are moderately satisfied within their careers and within the workplace. Participants in the 31-40 years of age range had overall lower levels of work satisfaction compared to participants in other age ranges. There was a statistically significant difference between this age range and those in the 41-50 years (p = 0.037) and 51+ years (p = 0.002). Our study is dissimilar to studies from Nigeria and Lithuania that found younger employees to have higher work satisfaction levels compared to their older colleagues. However, a study in Saudi Arabia found that younger radiographers showed lower levels of work satisfaction, which is similar to our study's findings.[27-29] The dissimilar findings may be as result of the manner in which the age categories were measured in the studies, as well as the number of participants in each age category in these studies compared to ours. Our study also found that a significant, strong positive relationship exist between work satisfaction and organisational respect for the employee (r = 0.698, p = 0.000). This means that the participants felt committed to their employer since they felt supported which in turn increases their work satisfaction. However, as seen above, age was an influencing factor of work satisfaction, so this would not be true for all participants in this study, which is in line with a previous 2006 study done in the South African radiography context.[30]

» Organisational respect for the employee

Most participants perceived low to medium levels of organisational support (93.4%). Since most participants are within the medium category (51.7%) one can argue that perceived organisational respect for the employee, like work satisfaction, are moderate among the participants in our study. This further explains the previously discussed strong positive relationship between organisational respect for the employee and work satisfaction since these two factors are directly proportional. This finding is dissimilar to that of Afif et al.[31] where Singaporean radiographers indicated a strong sense of perceived organisational support during COVID-19. However, other South African studies performed during COVID-19 found that participants felt completely unsupported and unrecognised, which resulted in much anxiety, fear and low morale.[12,15-16] This could be that the other South African studies were conducted during earlier waves of the pandemic. Thus, moderate organisational respect for employees may be perceived among our study participants as their respective employers may have implemented strategies to support their staff at the research sites by building on the lessons learnt from the earlier waves of the pandemic. Our study found that participants in the 21-30 years age group had statistically significant higher levels of perceived organisational respect for the employee compared to those in the 31-40 years age group (p = 0.056). This could be explained given that the 31-40 years age group had the lowest work satisfaction levels, since there is a strong, significant positive relationship between organisational respect for the employee and work satisfaction (r = 0.698, p = 0.000).

» Employer care

Most participants in our study scored low to medium for the factor employer care (83.4%) (Table 4). Given that most participants' scores were categorised as medium (46.7%) it can be argued that the participants perceived moderate levels of employer care. Employer care was also found to be directly proportional to organisational respect for the employee (r = 0.842, p = 0.000). This explains the relatively similar scores for the participants between these two factors as part of the overall workplace wellbeing of the participants. These findings are congruent with other radiography studies where radiographers felt cared for which results in greater organisational commitment and work satisfaction. However, in studies where radiographers felt unsupported there are indications of lack of employer care, for example, not being recognised as frontline workers during COVID-19 and receiving little to no PPE.[12,14-17,30-31]

» Intrusion of work into private life

Most participants in our study (86.7%) were found to have low to medium intrusion of work into private life (IWP) scores (Table 4). This means that the participants perceive that their work and personal lives are in harmonious synchronisation because they perceive their professional lives not to intrude on their personal lives. Our study also found

a statistically significant difference between the IWP scores of participants in the 31-40-year age group relative to those in the 41-50-year age group. Those in the 31-40-year age group experienced greater intrusion of their work on their personal lives, i.e., had higher IWP scores. This finding is dissimilar to the research done by Mirković and Đurić[32] among healthcare professionals. They found that participants in the 31-40-year age group had the least work-life balance (WLB). Additionally, and unsurprisingly, our study found a significant, moderately negative relationship between intrusion of work into private life and work satisfaction (r = -0.332, p = 0.000), organisational respect for the employee (r = -0.371, p = 0.000) and employer care (r = -0.466, p = 0.000), respectively. These findings together with the fact that most participants do not perceive their work to intrude on their personal life show that participants have a relatively good WLB, in the face of the myriads of challenges that the COVID-19 pandemic and other workplace challenges they face. This is in line with findings from other studies in the healthcare context where it was found that those who perceived to have great support systems were more satisfied with their work and had lower levels of burnout. Furthermore, these WLB findings among our participants may also be explained as them being committed to the task at hand and being able to complete the task because of the necessary support and care available to them.[33-34] In addition, during the COVID-19 pandemic radiographers may have been forced to foreground their mental health and wellbeing, and employers may have invested more resources in this area. The data for our study were collected during the third wave of the pandemic and it is possible that radiographers have adopted coping strategies to navigate the working conditions brought about by the COVID-19 pandemic. Hence, this can be another possible explanation for the findings in our study regarding the participants' intrusion of work into private life scores.

» Perceived workplace-wellbeing before and during the COVID-19 pandemic

Our study found that participants' workplace wellbeing was significantly lower during the COVID-19 pandemic compared to before it (Z = -3.778, p < 0.001) (Figures 2 & 3). Changes in workflow and workload, and fear of contracting the virus were the main contributing factors that negatively impacted participants' workplace wellbeing. Access to PPE and psycho-social support positively influenced participants' workplace wellbeing (Figure 4). These findings are similar to those in other studies that investigated radiographers' experiences during the COVID-19 pandemic.[12,14-17,30-31,35]

LIMITATIONS

The data collection instrument was self-administered and based on a particular WWQ. This may have resulted in participant response bias, where participants may have responded either neutrally, or they may have over or under stated their perceptions of their workplace wellbeing even though they were assured anonymity throughout the research study. The findings are not generalisable because the study focused on the perceptions of workplace wellbeing of diagnostic radiographers at three radiology departments in two health districts of the Eastern Cape province. The period during which data collection took place may be considered a limitation as we appreciate that findings may be different if data collection were done during other waves of COVID-19. The study did not account for variations that may exist regarding employer care and organisational support, which may have influenced the results of this study.

CONCLUSIONS AND RECOMMENDATIONS

The workplace wellbeing of the participants in this study is moderate. This is one of the first studies in South Africa focusing on workplace wellbeing among diagnostic radiographers specifically during the third wave of the COVID-19 pandemic. The findings demonstrate that the participants' disposition to their working conditions and the strategies that may have been in place assisted in maintaining a moderately healthy workplace wellbeing. It is recommended that radiology departments use the lessons learnt from COVID-19 to further enhance radiographers' workplace wellbeing and service delivery quality, radiographer performance, as well as increased patient care and safety.

Furthermore, given the findings it is imperative that employers co-create policies and appropriate support systems alongside radiographers to enable optimal workplace wellness among them. The support systems could include workshops and seminars that cover employee wellness. Mental health resource posters can also be placed within departments to further facilitate the development of a departmental culture that values the importance of workplace wellbeing. Allowance is also needed for formal and informal debriefing mechanisms where radiographers can discuss concerns affecting their workplace wellbeing so that these can be attended to in a timeous manner.

Larger studies are required to further investigate the workplace and personal factors that impact on radiographers' workplace wellbeing so that wellness programmes can be tailored to address these.

CONFLICT OF INTEREST

The first four authors have no conflict of interest to declare. The last author is a co-editor of this journal and was not involved in any part of the review or decision process as per the journal's conflict of interest policy.

AUTHOR CONTRIBUTIONS

AB, LI, KP and RvdV conceptualised the study and literature review. AB, LI and KP collected, captured and prepared the

data for analysis. AB, LI, KP and CS did the data analysis and RvdV did quality control thereof. All authors contributed to writing and revising this manuscript.

DISCLAIMER

The views and opinions expressed in this research article are those of the authors and do not necessarily reflect the views of the publisher and editorial board.

REFERENCES

1. Lim R, Pinto C. Work stress, satisfaction, and burnout in New Zealand radiologists: Comparison of public hospital and private practice in New Zealand. Journal of Medical Imaging and Radiation Oncology. 2009; 53(2):194-199.
2. Grossman VA. (Ed). Fast facts for the radiology nurse. New York: Springer; 2014.
3. Chipere A, Gilbert T, Nkosi P. Reality shock in radiography: fact or fiction? Findings from a phenomenological study in Durban, South Africa. BMC Psychology. 2019; 7(1):1-7.
4. Gqweta N. Role extension: the needs, perceptions and experiences of South African radiographers in primary health care. The South African Radiographer. 2012; 50(1):22-26. [cited 2024 October 9]. Available from: https://www.sar.org.za/index.php/sar/article/view/191/164
5. Bennett JB, Weaver J, Senft M, Neeper M. Creating workplace wellbeing. In Cooper C & Quick JC (Eds), The handbook for stress and health . Chichester, West Sussex: John Wiley & Sons; 2016. p.570-604
6. Alelyani M, Mohammed A, Khalid Y, Alamri S, Alghamdi A, Alqahtani E, Abumelha R. Job satisfaction among radiologic technologists at hospitals in Saudi Arabia's southern region: a cross-sectional study. Bioscience research. 2020;17(3):1659-1666. [cited 2024 October 9]. Available from: https://www.isisn.org/BR17(3)2020/1659-1666-17(3)2020BR20-269.pdf
7. McDiarmid M, Condon M, Gaitens J. The healthcare sector employer's duty of care: Implications for worker well-being. International Journal of Environmental Research and Public Health. 2021;18(11):1-12. https://doi.org/10.3390/ijerph18116015
8. Hsu Y, Bai C, Yang C, Huang Y, Lin T, Lin C. Long hours effects on work-life balance and satisfaction. BioMed International Research. 2019; (5046934). https://doi.org/10.1155/2019/5046934
9. Deriba BK, Sinke SO, Ereso BM, Badacho AS. Health professionals' job satisfaction and associated factors at public health centers in West Ethiopia. Human Resources for Health. 2017; 15(1):1-7. https://doi.org/10.1186/s12960-017-0206-3
10. Haddon J. The impact of employees' well-being on performance in the workplace. Strategic HR Review. 2018; 17(2):72-75. https://doi.org/10.1108/SHR-01-2018-0009
11. Kandeepan K, Robinson J, Reed W. Pandemic preparedness of diagnostic radiographers during COVID-19: a scoping review. Radiography. 2023; 29(4):729-737. https://doi.org/10.1016/j.radi.2023.04.021
12. van de Venter R, Williams R, Stindt C, ten Ham-Baloyi W. Coronavirus-related anxiety and fear among South African diagnostic radiographers working in the clinical setting during the pandemic. J Med Radiat Imag Sci. 2021; 52(4):586-594. https://doi.org/10.1016/j.jmir.2021.09.016
13. Mabuka T, Naidoo N, Ncube N, Yiga T, Ross M, Kurehwa K, Nyathi MN, Silaji A, Ndemera T, Lemeke T, Taiwo R, Macharia W, Mthokozisi S. The impact of SARS-CoV-2 lineages (variants) and COVID-19 vaccination on the COVID-19 epidemic in South Africa: regression study. JMIRx Med. 2023; 4:1-26. https://doi.org/10.2196/34598
14. Pereira JM, Silva C, Freitas D, Salgado A. Burnout among Portuguese radiographers during the COVID-19 pandemic. Radiography. 2021; 27(4):1118-1123. https://doi.org/10.1016/j.radi.2021.05.001
15. Lewis S, Mulla F. Diagnostic radiographers' experience of COVID-19, Gauteng South Africa. Radiography. 2021; 27(2):346-351. https://doi.org/10.1016/j.radi.2020.09.009
16. Lewis S. Two years on and four waves later: Johannesburg diagnostic radiographers' experiences of COVID-19. J Med Radiat Imag Sci. 2023; 54(2):S77-S84. https://doi.org/10.1016/j.jmir.2022.11.012
17. Madonsela N, Matue O, Mohono P, Nkuna N, Muller H. Radiography students' lived experiences during the coronavirus pandemic: A letter to our peers. J Med Radiat Imag Sci. 2023; 54(2):S3-S5.
18. Brink H, van der Walt C, van Rensburg G. Fundamentals of research methodology for healthcare professionals. 5th ed. Cape Town: Juta; 2022. p.137-156
19. St. Olaf College. (2024). Sample size. [cited 2024 October 9]. Available from: https://wp.stolaf.edu/iea/sample-size/#:~:text=Sampling%20ratio%20(sample%20size%20to,ensure%20representativeness%20of%20the%20sample
20. National Institute for Communicable Diseases. Proposed definition of COVID-19 wave in South Africa. Communicable Diseases Communiqué. 2021; 20(11):3-4. [cited 2024 October 9]. Available from: https://www.nicd.ac.za/wp-content/uploads/2021/11/Proposed-definition-of-COVID-19-wave-in-South-Africa.pdf.
21. Black Dog Institute. (2020). Workplace Wellbeing. [cited 2024 October 9]. Available from: https://www.blackdoginstitute.org.au/resources-support/wellbeing/workplace-wellbeing/
22. Parker GB, Hyett MP. Measurement of well-being in the workplace. The development of the work well-being questionnaire. The Journal of Nervous and Mental Disease. 2011; 199(6):394-397. https://doi.org/10.1097/nmd.0b013e31821cd3b9
23. Statistics Solutions. Cronbach's alpha. [cited 2024 October 9]. Available from: https://www.statisticssolutions.com/cronbachs-alpha/#:~:text=The%20general%20rule%20of%20thumb,90%20and%20above%20is%20best
24. Hair JF, Black WC, Babin BJ, Anderson RE. Multivariate data analysis. 8th ed. Hampshire: Cengage Learning EMEA; 2019. p. 603-657
25. Nulty DD. The adequacy of response rates to online and paper surveys: what can be done? Assessment & Evaluation in Higher Education. 2008; 33(3):301-314. https://doi.org/10.1080/02602930701293231
26. Ruiz C, Llopis D, Roman A, Alfayate E, Herrera-Peco I. Spanish radiographers' concerns about the COVID-19 pandemic. Radiography. 2021; 27(2):414-418.
27. Gyang MD, Dankyau M, Gidado S, Gyang BA, Madaki AJ. Job satisfaction among healthcare workers at a district hospital in Plateau State, Nigeria. Journal of Medicine in the Tropics. 2018; 20(2):111-116.
28. Vanckaviciene A, Navickiene R, Viliusiene I, Sakalauskiene Z. (2017). Radiographers' job satisfaction: cross-sectional survey in Lithuania. [cited 2024 October 9]. Available from: https://dx.doi.org/10.1594/ecr2018/C-2223
29. Alamri S, Faizo N, Alelyani M, Alghamdi A, Altwerqi S, Almarghoub G, Almalki N, Almarghoub S, Alzahrani S, Alhamami S. Are radiology technologists satisfied with their work? A

cross-sectional study from Taif hospitals. Open Journal of Radiology. 2020; 10:45-56.

30. Makanjee CR, Hartzer YF, Uys IL. The effect of perceived organizational support on organizational commitment of diagnostic imaging radiographers. Radiography. 2006; 12(2):118-126.
31. Affif AM, Razak HA, Choong AWD. COVID-19 pandemic experience of diagnostic radiographers: A Singapore survey. J Med Radiat Imag Sci. 2023; 54(S2):S62-S69.
32. Mirković, B. & Đurić, D. (2022). Socio-demographic characteristics, job demands and work-life balance of healthcare workers. 2022. [cited 2024 October 9]. Available from: https://doi.org/10.46630/dpp.2022
33. Kocatepe M, Kocatepe V, Yildirim D. 2022. Work-life balance and burnout among emergency healthcare professionals during the COVID-19 pandemic: a cross-sectional study. International Journal of Healthcare Management. 2022; 17(3):498-504.
34. Irfan M. Khalid RA, Kaka Khel SSUH, Maqsoom A, Sherani IK. Impact of work–life balance with the role of organizational support and job burnout on project performance. Engineering, Construction and Architectural Management. 2023; 30(1):154-171. https://doi.org/10.1108/ECAM-04-2021-0316
35. Shanahan MC, Akudjedu TN. 2022. Australian radiographers' and radiation therapists' experiences during the COVID-19 pandemic. J Med Radiat Sci. 2022; 68(2):111-120. https://doi.org/10.1002/jmrs.462