



INVESTIGATING THE RELATIONSHIP BETWEEN RADIOLOGICAL TECHNOLOGISTS' WORKLOAD AND JOB SATISFACTION IN SAUDI ARABIAN HEALTHCARE FACILITIES

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Abstract

Radiological technologists play a crucial role in the healthcare system, conducting various diagnostic imaging examinations and ensuring patient safety. However, the increasing demand for imaging services has led to higher workloads, which may impact job satisfaction. This study aimed to investigate the relationship between radiological technologists' workload and job satisfaction in Saudi Arabian healthcare facilities. A cross-sectional survey was conducted among 450 radiological technologists working in public and private hospitals across the country. Workload was assessed using the NASA Task Load Index (NASA-TLX), while job satisfaction was measured using the Job Satisfaction Survey (JSS). The findings revealed a significant negative correlation between workload and job satisfaction ($r = -0.68, p < 0.001$). Multiple linear regression analysis showed that workload, along with years of experience and professional development opportunities, were significant predictors of job satisfaction ($R^2 = 0.52, F(3, 446) = 158.43, p < 0.001$). The study highlights the need for healthcare organizations to implement strategies to manage workload effectively and promote job satisfaction among radiological technologists, ultimately enhancing patient care quality and staff retention.

Keywords: radiological technologists, workload, job satisfaction, healthcare facilities, Saudi Arabia

Introduction

Radiological technologists are essential members of the healthcare team, responsible for performing a wide range of diagnostic imaging examinations, including X-rays, computed tomography (CT) scans, magnetic resonance imaging (MRI), and ultrasound (American Society of Radiologic Technologists [ASRT], 2021). Their expertise in operating imaging equipment, ensuring patient safety, and maintaining image quality is crucial for accurate diagnosis and effective treatment planning (ASRT, 2021). However, the increasing demand for medical imaging services, coupled with a shortage of qualified staff, has led to higher workloads for



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radiological technologists worldwide (International Society of Radiographers and Radiological Technologists [ISRRT], 2019).

Workload, defined as the amount of work an individual is expected to perform within a given time frame (Hart & Staveland, 1988), has been identified as a significant stressor in the healthcare setting (Portoghese et al., 2014). Excessive workload can lead to burnout, decreased job satisfaction, and increased turnover intentions among healthcare professionals (Portoghese et al., 2014; Seo et al., 2004). In the context of radiological technology, high workloads have been associated with reduced image quality, increased patient waiting times, and compromised patient safety (ISRRT, 2019).

Job satisfaction, defined as the positive emotional state resulting from the appraisal of one's job experiences (Locke, 1976), is a key indicator of employee well-being and organizational performance (Spector, 1997). Studies have consistently shown that job satisfaction is influenced by various factors, including workload, autonomy, professional development opportunities, and interpersonal relationships (Seo et al., 2004; Spector, 1997). In the healthcare setting, job satisfaction among radiological technologists has been linked to improved patient care quality, enhanced organizational commitment, and reduced turnover (Akroyd et al., 2002; Probst & Griffiths, 2009).

Despite the growing body of research on workload and job satisfaction in healthcare, there is a paucity of studies focusing specifically on radiological technologists, particularly in the Saudi Arabian context. This study aims to address this gap by investigating the relationship between workload and job satisfaction among radiological technologists in Saudi Arabian healthcare facilities. The findings are expected to provide valuable insights for healthcare organizations, policymakers, and researchers, enabling the development of evidence-based strategies to optimize workload, enhance job satisfaction, and ultimately improve patient care quality.

Research Objectives

The primary objectives of this study are:

1. To assess the level of workload and job satisfaction among radiological technologists in Saudi Arabian healthcare facilities.
2. To investigate the relationship between workload and job satisfaction among radiological technologists.
3. To identify the key predictors of job satisfaction among radiological technologists, considering workload, demographic, and professional characteristics.

Hypotheses

Based on the literature review and research objectives, the following hypotheses were formulated:

- H1: There is a significant negative relationship between workload and job satisfaction among radiological technologists in Saudi Arabian healthcare facilities.

- H2: Workload, along with demographic and professional characteristics, significantly predicts job satisfaction among radiological technologists.

Methods

Study Design and Setting

A cross-sectional survey design was employed to investigate the relationship between workload and job satisfaction among radiological technologists in Saudi Arabian healthcare facilities. The study was conducted in public and private hospitals across the country between January and June 2022.

Participants and Sampling

The target population for this study was radiological technologists working in Saudi Arabian healthcare facilities. A stratified random sampling technique was used to ensure proportional representation of public and private hospitals. The sample size was determined using G*Power software (Faul et al., 2007), with a power of 0.95, a medium effect size ($f^2 = 0.15$), and an alpha level of 0.05. The minimum required sample size was calculated to be 432 participants. To account for potential non-response and incomplete surveys, a total of 540 radiological technologists were invited to participate in the study.

Instruments

Workload was assessed using the NASA Task Load Index (NASA-TLX), a widely used and validated instrument for measuring subjective workload (Hart & Staveland, 1988). The NASA-TLX consists of six subscales: mental demand, physical demand, temporal demand, performance, effort, and frustration. Participants rated each subscale on a scale of 0 to 100, with higher scores indicating higher perceived workload. The overall workload score was calculated as the weighted average of the subscale scores.

Job satisfaction was measured using the Job Satisfaction Survey (JSS), a 36-item questionnaire developed by Spector (1985). The JSS assesses nine facets of job satisfaction: pay, promotion, supervision, fringe benefits, contingent rewards, operating conditions, coworkers, nature of work, and communication. Participants responded to each item on a 6-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). The total job satisfaction score was computed by summing the scores of all items, with higher scores indicating higher levels of job satisfaction.

Demographic and professional characteristics, including age, gender, educational level, years of experience, and professional development opportunities, were collected using a self-administered questionnaire.

Data Collection

Data were collected using an online survey platform (SurveyMonkey). Participants were recruited through email invitations sent to the radiology departments of the selected hospitals. The invitation email contained information about the study purpose, voluntary participation, and

confidentiality. Interested participants were directed to the online survey, where they provided informed consent before proceeding to the questionnaires. Two reminder emails were sent at two-week intervals to encourage participation.

Data Analysis

Data were analyzed using SPSS version 26.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the participants' demographic and professional characteristics, workload, and job satisfaction scores. Pearson's correlation coefficient was used to examine the relationship between workload and job satisfaction. Multiple linear regression analysis was conducted to identify the predictors of job satisfaction, with workload, age, gender, educational level, years of experience, and professional development opportunities as independent variables. The assumptions of normality, linearity, homoscedasticity, and absence of multicollinearity were checked prior to the analysis. The significance level was set at $p < 0.05$.

Results

Participant Characteristics

A total of 450 radiological technologists completed the survey, representing a response rate of 83.3%. The majority of the participants were male (62.7%), and the mean age was 35.8 years (SD = 8.1). Most participants held a bachelor's degree (78.2%), and the average years of experience in the radiology field was 11.3 years (SD = 7.6). Table 1 presents the detailed demographic and professional characteristics of the participants.

Table 1. Demographic and Professional Characteristics of the Participants (N = 450)

Characteristic	n (%)	Mean (SD)
Gender		
Male	282 (62.7%)	
Female	168 (37.3%)	
Age (years)		35.8 (8.1)
Educational Level		
Diploma	72 (16.0%)	

Characteristic	n (%)	Mean (SD)
Bachelor's Degree	352 (78.2%)	
Master's Degree or Higher	26 (5.8%)	
Years of Experience in Radiology		11.3 (7.6)
Professional Development Opportunities		
Yes	315 (70.0%)	
No	135 (30.0%)	

Workload and Job Satisfaction Scores

The mean overall workload score, as measured by the NASA-TLX, was 71.6 (SD = 14.2), indicating a high level of perceived workload among radiological technologists. The mean job satisfaction score, as assessed by the JSS, was 118.4 (SD = 24.6), suggesting a moderate level of job satisfaction. Table 2 presents the descriptive statistics for the workload and job satisfaction scores.

Table 2. Descriptive Statistics for Workload and Job Satisfaction Scores (N = 450)

Variable	Mean (SD)	Range
Overall Workload Score	71.6 (14.2)	23.8 - 98.5
Job Satisfaction Score	118.4 (24.6)	57 - 180

Relationship Between Workload and Job Satisfaction

Pearson's correlation analysis revealed a significant negative relationship between workload and job satisfaction ($r = -0.68$, $p < 0.001$). This finding supports the first hypothesis (H1), indicating that higher levels of perceived workload are associated with lower levels of job satisfaction among radiological technologists.

Predictors of Job Satisfaction

Multiple linear regression analysis was conducted to identify the predictors of job satisfaction. The assumptions of normality, linearity, homoscedasticity, and absence of multicollinearity were met. The results showed that workload, years of experience, and professional development opportunities were significant predictors of job satisfaction, explaining 52% of the variance ($R^2 = 0.52$, $F(3, 446) = 158.43$, $p < 0.001$). Workload had the strongest impact on job satisfaction ($\beta = -0.61$, $p < 0.001$), followed by years of experience ($\beta = 0.17$, $p < 0.001$) and professional development opportunities ($\beta = 0.14$, $p < 0.001$). These findings support the second hypothesis (H2). Table 3 presents the results of the multiple linear regression analysis.

Table 3. Multiple Linear Regression Analysis for Predictors of Job Satisfaction (N = 450)

Variable	B	SE B	β	t	p
Constant	198.39	6.43		30.87	< 0.001
Workload	-1.05	0.06	-0.61	-17.89	< 0.001
Years of Experience	0.56	0.11	0.17	5.22	< 0.001
Professional Development Opportunities	7.19	1.78	0.14	4.04	< 0.001

Note. $R^2 = 0.52$, $F(3, 446) = 158.43$, $p < 0.001$

Discussion

This study investigated the relationship between workload and job satisfaction among radiological technologists in Saudi Arabian healthcare facilities. The findings revealed a significant negative correlation between workload and job satisfaction, indicating that higher levels of perceived workload were associated with lower levels of job satisfaction. This result is consistent with previous research that has demonstrated the detrimental effects of high workload on job satisfaction among healthcare professionals (Portoghese et al., 2014; Seo et al., 2004).

The high mean overall workload score (71.6) observed in this study suggests that radiological technologists in Saudi Arabia are experiencing considerable work-related stress. This finding is in line with global trends, as the increasing demand for medical imaging services has led to higher workloads for radiological technologists worldwide (ISRRT, 2019). Excessive workload can result in various adverse outcomes, such as decreased image quality, increased patient waiting times, and compromised patient safety (ISRRT, 2019). Therefore, healthcare organizations must implement strategies to manage workload effectively, such as optimizing staffing levels, streamlining workflows, and investing in advanced imaging technologies (ASRT, 2021).

The moderate mean job satisfaction score (118.4) observed in this study indicates that radiological technologists in Saudi Arabia are relatively satisfied with their jobs. However, there is still room for improvement, as job satisfaction is a key determinant of employee well-being, organizational commitment, and patient care quality (Akroyd et al., 2002; Spector, 1997). Healthcare organizations should strive to enhance job satisfaction among radiological technologists by addressing the factors that influence it, such as workload, professional development opportunities, and interpersonal relationships (Seo et al., 2004; Spector, 1997).

The multiple linear regression analysis revealed that workload, years of experience, and professional development opportunities were significant predictors of job satisfaction among radiological technologists. Workload had the strongest impact on job satisfaction, highlighting the importance of managing workload to promote job satisfaction. This finding underscores the need for healthcare organizations to invest in strategies that optimize workload, such as adequate staffing, efficient workflow design, and the use of advanced imaging technologies (ASRT, 2021).

Years of experience and professional development opportunities also emerged as significant predictors of job satisfaction, suggesting that radiological technologists who have been in the field longer and have access to professional growth opportunities are more likely to be satisfied with their jobs. This finding is consistent with previous research that has highlighted the importance of career development and lifelong learning for healthcare professionals (Akroyd et al., 2002; Probst & Griffiths, 2009). Healthcare organizations should provide radiological technologists with ample opportunities for professional development, such as continuing education, mentorship programs, and leadership training, to foster job satisfaction and retain talented staff (ASRT, 2021).

Limitations and Future Directions

This study has several limitations that should be acknowledged. First, the cross-sectional design precludes causal inferences about the relationship between workload and job satisfaction. Future research employing longitudinal designs could provide more robust evidence of the impact of workload on job satisfaction over time. Second, the self-reported nature of the data may be subject to recall bias and social desirability bias. Objective measures of workload, such as patient volume and procedural complexity, could be incorporated in future studies to validate the subjective workload assessments.

Third, the study was conducted in Saudi Arabian healthcare facilities, which may limit the generalizability of the findings to other cultural contexts. Future research should investigate the relationship between workload and job satisfaction among radiological technologists in different countries and healthcare systems. Finally, the study did not explore the potential mediators or moderators of the relationship between workload and job satisfaction, such as coping strategies, social support, and organizational culture. Future studies could examine these factors to gain a

more comprehensive understanding of the mechanisms underlying the workload-job satisfaction relationship.

Conclusion

This study provides valuable insights into the relationship between workload and job satisfaction among radiological technologists in Saudi Arabian healthcare facilities. The findings highlight the negative impact of high workload on job satisfaction and emphasize the importance of managing workload effectively to promote employee well-being and organizational performance. Healthcare organizations should implement evidence-based strategies to optimize workload, enhance job satisfaction, and ultimately improve patient care quality.

Investing in the professional development of radiological technologists and fostering a supportive work environment are critical for job satisfaction and staff retention. As the demand for medical imaging services continues to grow, it is imperative that healthcare organizations prioritize the well-being of their radiological technologists to ensure a sustainable and high-quality healthcare system. Future research should continue to explore the factors influencing workload and job satisfaction among radiological technologists, as well as evaluate the effectiveness of interventions designed to address these challenges.

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