

ORIGINAL ARTICLE

Workplace experiences of diagnostic radiographers, on job satisfaction and staff retention in the public health sector in Lusaka District of Zambia

Mubanga Bwalya¹, Roshneer Sunder², Foster Munsanje³, Oswald Bwanga⁴

¹St Francis Central Hospital, Katete, and University of Lusaka, Zambia

²Durban University of Technology, Durban, South Africa

³Evelyn Hone College, School of Applied and Health Sciences, Lusaka, Zambia

⁴Midlands University Hospital Tullamore, Radiology Department, Ireland

ABSTRACT

Background: Zambia's healthcare workforce is reportedly inadequate for the country's healthcare needs. This stems from healthcare professionals, particularly radiographers, exiting the public health sector for non-governmental organizations or other countries with attractive conditions of service. This study required to explore and describe the workplace experiences of public health sector radiographers in the province of Lusaka in Zambia and to examine how these experiences influence job satisfaction and staff retention.

Methods: The study used a qualitative research design. Semi-structured interviews were conducted to collect data from 20 purposively selected public service radiographers, working in the Lusaka district of Zambia. Interviews were recorded, transcribed, and analysed by themes.

Results: Five themes emerged: physical work environment, remunerations and rewards, staff workloads, leadership and supervision, and professional development. This study established

Corresponding author:

Mubanga Bwalya,
St Francis Central Hospital and University of Lusaka,
E-mail: bwalyamt@gmail.com

that participants appreciate their physical work environment that constitutes modern and various imaging equipment. However, the majority of the participants expressed dissatisfaction with their workplace experiences owing to inadequate work spaces, inadequate salaries, a lack of incentives and rewards, increased workloads and inflexible work schedules, unapproved leadership style, lack of performance recognition and support for continuing professional development.

Conclusion: The study findings provided information on the deficiencies within public service radiographers' work environment. To enhance job satisfaction and retention, the employer needs to address the challenges being experienced by the radiographers.

INTRODUCTION

Job satisfaction and staff retention amongst healthcare workers in Sub-Saharan Africa is a challenge affecting the delivery of quality healthcare services. Several studies show that the Republic of Zambia's human resources for health ranks proportionately lower than other countries in Sub-

Keywords: Job satisfaction, radiographers, staff retention, workplace experiences, Zambia

This article is available online at: <http://www.mjz.co.zm>, <http://ajol.info/index.php/mjz>, doi: <https://doi.org/10.55320/mjz.50.4.454>

The Medical Journal of Zambia, ISSN 0047-651X, is published by the Zambia Medical Association

© This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.



Saharan Africa. It generally, operates with fifty percent of the recommended workforce thereby posing a threat to Zambia's healthcare system.^{1,2} These concerns over staff shortages have a direct bearing on a country's responsibility in achieving the United Nations' Sustainable Development Goal number 3, namely "Good health and well-being, to ensure healthy lives and promote well-being for all at all ages".³

In 2017, the Zambian Ministry of Health reported shortages of health professionals in the medical imaging services, namely: medical physicists, radiographers, radiologists, and sonographers, in 80% of healthcare facilities.⁴ And more specifically revealed an approved radiography establishment (Funded Radiography positions on the establishment) of 542 in 2016. However, there were only 419 radiographers employed in the public sector at the time, with a deficit of 23%; without distinguishing between Diagnostic and Therapy Radiographers.⁴ The Zambian healthcare system faces critical shortages of specialist radiographers in areas such as diagnostic ultrasonography (US), mammography, computed tomography (CT), magnetic resonance imaging (MRI), nuclear medicine, radiation protection, picture archiving and communication system (PACS), and clinical education. These specialised medical imaging services were not included in the 2017 report.⁴

Studies that have examined staff shortages of healthcare workers within the public health sector have attributed this to emigration to other African countries and beyond.^{2,5} Makasa⁶ points out that migration of health workers is associated with poor working conditions such as poor infrastructure and equipment, inadequate salaries, and excessive workloads as factors encouraging emigration. Verrier and Harvey⁷ add that shortage of radiographers contributes to increased workloads for the available staff resulting in work-related stress. Additionally, the migration of public health workers contributes to workforce gaps in competencies and experiences that lead to

inadequate service delivery within the public health sector.

Workplace experiences are known to contribute negatively or positively to job satisfaction and retention of employees.⁸ Staff retention is defined as efforts of preserving the workplace environment to encourage the staff to remain within an organization to meet organizational goals⁹, whilst job satisfaction is defined by Lambrou *et al.*¹⁰ as "positive emotional state that results from job experience." Job satisfaction studies undertaken outside Zambia show that workload, the opportunity for professional development, and attitudes of supervisors, impact the overall job satisfaction among radiographers.^{11,12,13} These studies highlight the context of the inadequate number of radiographers covering excessive workloads, leading to burnout and ultimately employee dissatisfaction.

There is a paucity of literature on workplace experiences, job satisfaction, and retention among public service radiographers in the Zambian context. Therefore, this study aimed to explore the workplace experiences of public service radiographers on job satisfaction and staff retention in the Lusaka district of Zambia; using Herzberg's Two-Factor Theory (TFT) that proposes two sets of factors, namely hygiene factors, and motivating factors that influence motivation and employee performance in the workplace.¹⁴ According to Herzberg's (TFT), hygiene factors include salary, secondary work conditions, physical work environment, and relationships with co-workers.¹⁵ When present, the hygiene factors prevent dissatisfaction while their withdrawal contributes to job dissatisfaction. Motivating factors also referred to as satisfiers include; performance, recognition, job status, responsibility, and opportunities for growth.^{15,16}

METHODS

Study design and setting

A qualitative, explorative, and descriptive research design was used to gain an understanding of the

workplace experiences of radiographers working in the public health sector in the Lusaka district.¹⁷ The study settings were four public hospitals in the Lusaka District of Zambia: University Teaching Hospital, Cancer Diseases Hospital, Chainama Hills Hospital, and the Levy Mwanawasa University Teaching Hospital.

Population and sampling

The study population consisted of diagnostic radiographers (N=75) working at the four study sites from which 20 participants were purposefully selected until data saturation. The inclusion criteria were all radiographers working in any of the four selected hospitals, with a minimum of two years of post-qualification radiography experience in the public health sector. It was considered that radiographers with a minimum of two years' work experience had extensive knowledge and experience on the research topic. The study excluded private health sector radiographers.

Data collection tool and procedures

An interview schedule was developed based on the research objectives; To explore the workplace experiences of radiographers working at selected hospitals in the public health sector in the Lusaka district, and to examine how the workplace experiences of radiographers, working at selected hospitals in the public health sector, affect job satisfaction and staff retention was utilised. A pilot study that lasted between 40 to 70 minutes was conducted in March 2019 to test the interview schedule using three participants working outside the study sites. The schedule did not undergo any changes, as the participants were able to appreciate the questions and provided needed feedback.

Participants were recruited through radiology managers. Data were collected face-to-face, via semi-structured interviews, in office locations within the respective radiology departments, away from the busy clinical areas. On the day of the interview; participants were welcomed, the purpose of the study explained, signed consent obtained, and permission to record the interviews also obtained. Questions were asked in order of sequence in the interview schedule. The participants were given adequate time to answer the questions. The interviews were recorded, using a digital audio-recorder. At the end of the interview, the participants were thanked for participating in the interview.

Data analysis

The audio-recorded data was transcribed verbatim and analyzed by thematic analysis as used by Braun and Clarke.¹⁸ Initially, the researcher listened to all interview recordings and read each transcript methodically to elicit data. This was then followed by coding the data set. Texts with the same meaning in the transcripts were singled out and highlighted in a chosen colour. Codes were then grouped to form sub-themes. Finally, sub-themes were grouped to form themes and titles in relation to Herzberg's (TFT) theory.

Trustworthiness

Trustworthiness involves the use of strategies to increase confidence in the qualitative research process.¹⁷

RESULTS

Following thematic analysis, five themes and 13 sub-themes emerged as shown in Table 1.

Table 1: Themes and sub-themes that emerged subsequent thematic analysis

Themes	Sub-themes	Participant's Responses
1. Physical work environment	<ul style="list-style-type: none"> Space and infrastructure 	<p><i>"We don't have enough rooms; we are using one room for mammography and ultrasound. So, if am [when I am] seeing patients for ultrasound, those who have come for mammography have to wait that's it." (P5)</i></p> <p><i>"We do not have a proper place to eat like a staff room. We use a darkroom.</i></p> <p><i>We don't have lockers so there are a lot of things that we don't have as radiographers." (P2)</i></p>
	<ul style="list-style-type: none"> Imaging equipment and consumables 	<p><i>"We are using old equipment, and the servicing of the equipment is not ... structured. So when it breaks [breaks down] that's when we run around to have it repaired." (P2)</i></p>
	<ul style="list-style-type: none"> Ancillaries & consumables 	<p><i>"I think the supplies; you find that we don't have films. If you want to do a chest x-ray for a male patient who is very tall then you have a 35 x 35 [cm x-ray film]. You find that maybe 35 x43 [x-ray film] is out of stock for a long period."(P1)</i></p>
	<ul style="list-style-type: none"> Ventilation 	<p><i>"The x-ray room is not well ventilated. So that's a risk for us the radiographers working in this area. We risk catching infections." (P16)</i></p>
2. Remuneration and rewards	<ul style="list-style-type: none"> Salaries 	<p><i>"The main reason as to why I would leave is because the effort I put in does not equal to what I get out. They don't balance; they don't match." (P11)</i></p> <p><i>"In terms of salary, I think [I]am not satisfied; that's why most of radiographers are leaving this country, going abroad..." (P5)</i></p>
	<ul style="list-style-type: none"> Rewards and incentives 	<p><i>"You know this is radiation that we deal with; it's not being considered here in Zambia. Of course, one would stand up and say in each field there are risks relating to their field, but radiation is exceptional ok, radiation is exceptional." (P11)</i></p> <p><i>"On s taffretention yes, the government needs to do a lot more. For example, they need to have retention allowances for senior radiographers, for those with degrees." (P19)</i></p> <p><i>"Maybeif am supposed to knock off at 17 hours but I have a queue, I still have a lot of people [to serve]; they never look into that. The overtime is never looked into." (P4)</i></p>

3. Staff workloads	<ul style="list-style-type: none"> • Work schedule 	<p>“...again we are not given shifts. Other places even though there isn't much workload, people work in shifts. They come in the morning, [and at] 12 hours they are out for fresh air.” (P12)</p>
	<ul style="list-style-type: none"> • Task and Job rotation 	<p>“...Things have just become... it's a routine. I know when I wake up from home am [I am] going to do a CT chest, abdomen and pelvis for our cancer patients. Well, I am going to do a CT brain for a CVA patient.” (P6)</p>
	<ul style="list-style-type: none"> • Staffing 	<p>“... I can say there is a shortage of radiographers here. So, you find that you are overwhelmed; you have to do this modality [and] you have to attend to...[that] modality, and then you are just a few in the department yah.” (P15)</p> <p>“You know the work here is so stressful; others would think of leaving this place because of too much pressure.” (P13)</p>
4. Leadership and supervision	<ul style="list-style-type: none"> • Leadership style 	<p>“I have been working for the public service, I think for the past 3 years, I have seen that people around this place don't motivate especially the leadership they don't motivate the subordinates.” (P1)</p>
	<ul style="list-style-type: none"> • Emotional intelligence 	<p>“I feel most of the supervisors are working through emotions; they are not leading us because you know there are qualities of a leader. They don't follow that. Today they wake up like this, tomorrow they wake up like this [that].” (P10)</p> <p>“...and also, when it comes to language, they can just tell you anything and get away with it.” (P14)</p>
	<ul style="list-style-type: none"> • Autonomy 	<p>“You know where those politics are being dragged also to the workplace. It's like you are working with fear, you know like you have people watching you exactly what you are doing. And then any slight mistake you make, you know it's all about...a political move.” (P12)</p> <p>“Ah, job satisfaction, hard work is not appreciated....” (P12)</p> <p>“Our leaders encourage us to enhance our training when a chance comes... and when the resources are available, they plan for radiographers to go for additional training.” (P20)</p> <p>“Good in the sense that we can carry out certain investigations without any influence from whatever angle be it the Head of Department.” (P3)</p>

<p>5. Professional development</p>	<ul style="list-style-type: none"> • Continuing professional development (CPD) learning activities 	<p><i>“There has to be continuing training for us to keep up with the new technology that is coming.” (P9)</i></p> <p><i>“The experience has been great because there are a variety of things to be done. At least we do; digital radiography, CT scanning, MRI, Ultrasound, biopsies; ultrasound -guided, and sometimes CT -guided biopsies. And it’s an environment where you learn a lot of things daily especially that [it] is a modern hospital.” (P6)</i></p> <p><i>“Just trying to go for training is a big issue because they do not understand. The managers of the hospital...don’t understand the need for the radiographer to upgrade...[the] qualification.” (P7)</i></p>
	<ul style="list-style-type: none"> • Advocacy by professional body or society 	<p><i>“I feel like radiography, as a profession is not well represented. Like we don’t have leaders in the topmost to represent us.” (P16)</i></p> <p><i>“If you start as a radiographer, you should see that maybe in 2 years you would be a senior radiographer, a principal radiographer, or a chief radiographer. What is happening on the ground is that there are people who have worked for more than 10 years, and they have remained at the same level.” (P12)</i></p>

Theme one: Physical work environment

All participants reported experiencing challenges related to the physical work environment, which included space and infrastructure, imaging equipment, and ventilation. Participants narrated that poor spaces and infrastructure were seen as contributing factors to job dissatisfaction. These included the limited number of imaging rooms for patients, the lack of resting spaces for staff including the lack of personal spaces such as lockers for keeping belongings. The participants indicated that the limited number of imaging rooms was seen as a hindrance to the delivery of quality imaging services. Poor service delivery was compounded by the inadequate amount of imaging equipment and the erratic supply of consumables for daily use. Poor maintenance of the equipment led to non-functioning imaging rooms that further compromised imaging services to patients within the various hospital environments. The participants also reported that they were being exposed to an

unsafe work environment as they were working in poorly ventilated spaces. Sub-optimal ventilation in the imaging rooms leads to an increased risk of occupational hazards including cross-infections. These conditions within the physical work environment contributed to low morale and poor performance within the imaging sector and contributed significantly to low job satisfaction among the radiographers.

While the condition of the physical work environment was reported as dismal in most instances, there was a view that hospitals/x-ray departments with modern and advanced imaging modalities enhanced radiographers' work experiences and impacted positively job satisfaction and staff retention:

“I am happy about my profession, as a radiographer, because like here, we have got a lot of imaging modalities. We have got a CT scanner, we have got Nuclear Medicine, and

we also have Cath-lab [catheterization Laboratory].”(P8)

Theme two: Remuneration and rewards

Salary, benefits, and incentives all surfaced as elements that may improve public sector radiographers' job satisfaction and employee retention. Participants claimed that the pay was insufficient to cover their requirements and that it was not commensurate with the amount of effort they put in. Furthermore, the participants expressed dissatisfaction with their work, citing low pay. The participants emphasised the necessity for rewards and incentives to improve job satisfaction and staff retention among radiographers. Another factor that was considered to harm job satisfaction was the absence of overtime compensation. Throughout the interviews, participants related having to work long hours to discharge patients without receiving extra pay, which led to radiographers becoming dissatisfied with their jobs.

Theme three: Staff workloads

Concerns about work scheduling, task and job rotation, and staffing were expressed by participants. Over the full-time schedule from 8 am to 6 pm, some participants preferred working in shifts, such as the 7 am to 1 pm shift. While the latter was exhausting and consumed most of the radiographers' day, the former permitted one to do other things after the shift. The participants anticipated a flexible work schedule that would allow them to work but also have time for personal errands before or after the shift. As part of the same discussion on staff workloads, other participants complained that doing the same thing again and over again made their jobs less fulfilling. The participants were of the view that doing the same work or performing the same task was non-progressive. In addition, some participants reported staff shortages as one other hindrance to job satisfaction and staff retention. The shortage of staff in the departments led to radiographers being overwhelmed with the workload. Participants

narrated how movements from one imaging room to another to clear patients were fatiguing. Because of the increased workload due to staff shortage, some participants expressed intention to leave for other places given the opportunity:

Theme four: Leadership and supervision

In this study, participants appreciated the significance of leadership style, autonomy, emotional intelligence, and motivation in enhancing job satisfaction and staff retention.

Participants expressed discontentment with the lack of motivation from supervisors and appreciation for the effort they put into the work. This concern was reported as a demotivating factor by participants who expressed working for the public sector, for many years without seeing leadership that took notice of their commitment towards work. The participants also felt that their leaders were inconsistent with what they wanted the radiographers to do; the leadership was seen to exhibit unstable moods and use inappropriate language. This was reported as a demotivating factor in their work. Some participants expressed intimidation from politicians, which affected their work. Political interference in imaging services resulted in job dissatisfaction, especially among the radiographers in management positions. Some participants perceived the leadership as unappreciative of their efforts. This is obvious from the responses of participants when questioned about their experiences with job satisfaction and staff retention. Not all participants, nevertheless, expressed their discontent with the style of leadership used at their workplaces. Some participants valued leadership that was accommodative and allowed the freedom to make decisions about their work. This was cited as a motivator and a contributor to job satisfaction and staff retention.

Theme five: Professional development

Regarding professional development, the participants recognised the importance of

continuing professional development (CPD) and lobbying on the part of the professional body to foster these outcomes. Participants agreed that CPD is essential for fostering professional development. The participants held that one needed to regularly participate in professional development activities, such as meetings and long or short-term training programmes, to keep up to speed on advancements in medical imaging technology. Due to the large number of cases that are sent to public hospitals and the variety of imaging modalities accessible, the participants claimed that public hospitals offer a fresh learning experience. The many cases that would be referred to the public hospital were considered as a mechanism for the radiographers to obtain professional experience, and this viewpoint was seen as a motivating element. This was viewed as a favourable impact on employee retention and work satisfaction. In light of the favourable comments on CPD possibilities within public health facilities, a lack of local postgraduate imaging courses was identified as a demotivating issue to radiographers' work satisfaction, since this translated into a lack of professional growth. Some participants were dissatisfied with the lack of funding for training abroad. The participants saw this as one of the negative consequences on job satisfaction and employee retention. Another issue identified by participants was a lack of support from the Radiological Society of Zambia (RSZ), their professional body. The participants reported that the RSZ didn't do much advocacy on behalf of its members, and this impacted negatively on motivation in the workplace. Participants thought that the Radiological Society of Zambia (RSZ) was not successfully representing its membership by not cooperating with labour unions to improve their working conditions. Similarly, the participants voiced displeasure with their jobs owing to a lack of career progression even after further training. The participants regarded being remained in the same position notwithstanding having pursued further training as a lack of professional growth, which negatively impacted job satisfaction and staff retention.

DISCUSSION

The discussion of findings was informed by Herzberg's (TFT) theory which consists of two factors that influence the job satisfaction of workers: hygiene factors, and motivator factors.¹⁴

Hygiene factors

In line with the physical work environment, radiographers raised concerns about the inadequate number of imaging rooms, ventilation in the imaging rooms, as well as lack of lockers and spaces for staff to rest. The Health and Safety Executives (HSE)²⁰ emphasize the need for suitable seating areas for workers during break times. Breakrooms and lockers are significant in creating a balance between work and personal life. Ventilation is also important to remove particulates, allergens, and bacteria that cause infections and diseases.²¹ Besides, health facilities, with poorly ventilated buildings and with a large number of infected patients have a high risk of infectious disease transmission among the patients, workers, and visitors.²² Literature also reports a lack of radiation protection measures and devices, as one of the reasons for job dissatisfaction amongst radiographers.¹²

The current study reveals the inadequate numbers of imaging equipment, poor equipment maintenance, and erratic supply of consumables. This finding is consistent with a previous study conducted in Zambia by Bwanga and Sichone.²³ The lack of maintenance and servicing of imaging equipment is due to inadequate trained biomedical equipment engineers in Zambia, as reported by Bwanga and Chanda,²⁴ which contributes to frequent equipment breakdown resulting in the disruption of imaging services. Radiographers also require a continual supply of consumables such as x-ray films and compact discs (CDs) important in the recording and storage of medical images.

On remunerations and rewards, Zambia's salaries have historically been relatively low among other countries in the Sub-Saharan Africa region.²⁵ In this study, the radiographers expected a balance between

the work done and the pay. This finding is consistent with studies conducted in South Africa and Sudan amongst radiographers.^{11,12} The employer should consider revising salaries to bridge the gap between the work done and the pay. This study also reveals that most radiographers work overtime due to increased workloads. However, overtime allowance is not paid, thereby negatively impacting radiographers' motivation. Additionally, a concern was raised over the lack of radiation risk allowance. Radiographers are a unique workforce that works with ionising radiation which causes biological effects on the body. Participants in this study suggest the introduction of radiation risk allowance towards the radiographer's retention strategy.

In line with staff workloads, the participants preferred working the 7 am to 1 pm or 1 pm to 6 pm shifts as opposed to the 8 am to 5 pm shift. The former allowed time for family and personal activities during the day while the latter was fatiguing and took up most of their time. Similarly, performing the same task can lead to the tedium of work. To alleviate this challenge of boredom and fatigue, job rotation should be practiced in different areas of imaging. According to Trivikram,²⁶ "many successful organizations are practicing job rotation to increase the employee knowledge, skills, and motivational levels." Radiographers in the current study were demotivated to perform the same tasks or be maintained in the same work environment interminably. The other concern raised by radiographers is understaffing resulting in increased workload. Makasa⁶ reports that "health workers in Zambia are demotivated by the run-down healthcare facilities and heavy workloads due to the increased disease burden." This finding agrees with the current study findings as radiographers expressed dissatisfaction with the excessive workloads.

With regards to leadership and supervision, this study reveals that radiographers value leadership styles that allow the opportunity for innovations in radiographic roles which is key to professional development and role advancement. Regarding EI, in this study, the leaders were seen as inconsistent

with what they wanted the staff to do. A person with EI is consistent and confident with their work.²⁷ Healthcare managers with an appreciation of employees' feelings and emotions develop healthy and positive relationships, which is vital to understanding what motivates and concerns them.²⁸ Concerning the cited use of inappropriate language among the supervisors, Bwanga and Chitamy,²⁹ assert that bullying or abuse can be verbal, emotional, or physical. It is hereby argued that supervisors should always act professionally, especially in the way they address employees. On the concern over autonomy, it is worthwhile to comprehend that autonomy in a workplace allows workers to make certain decisions about their work, without the influence of supervisors.³⁰ However, in a professional sense, the scope of practice and standard operating procedural guidelines would be required to aid in guarding professional malpractices. This study shows resounding emphasis among radiographers in expressing dissatisfaction with their jobs owing to shortcomings in the leaders' EI and the lack of autonomy in the workplace.

Motivator factors

Public hospitals are ideal for learning new skills as evidenced by the current study findings. Some participants from one hospital were satisfied with their jobs due to the availability of a range of imaging modalities that offered substantial practical experiences. This finding concurs with a study conducted in Saudi Arabia by Alamri et al.¹³ which found job satisfaction was high among radiographers who worked with different modalities. Regarding CPD, there was a concern over the lack of local, postgraduate imaging courses coupled with a lack of support for training from management of healthcare institutions. However, Munsanje³¹ reports that three out of four employers in a study conducted in South Africa dispelled the radiographers' assertions in this regard. Instead, the employers indicated a willingness to offer higher remuneration if a radiographer could successfully handle more responsibilities because of additional qualification in general radiography and especially in specialized

imaging modalities such as CT and MRI".³²In 2022, the University of Zambia (UNZA) started offering master's degree programmes in radiography and ultrasound, as well as a Doctor of Philosophy (PhD) in radiography.³³ With the establishment of local postgraduate programmes registrable by professional bodies, it is envisaged that management will allow radiographers to upgrade their knowledge and skills.

In this study, radiographers recounted the lack of advocacy by their professional body; the RSZ. They believed that RSZ should work with the trade union to advocate for improved conditions of service. Positive activities by the professional bodies uplift the radiographers' job satisfaction and retention. Such motivation is comparable in desire for every employee. Motivation is one way that healthcare managers can ensure employees achieve organizational goals,³⁴ coupled with more appealing leadership styles that recognise and appreciate professional performance.

CONCLUSION

Radiographers working in public hospitals of the Lusaka district in Zambia experience challenges relating to their physical work environment, their remuneration and rewards, the staffing workload, their leadership and supervision, and their professional development. Inadequate ventilation, workspaces, and the number and range of imaging equipment influence job satisfaction and staff retention. Erratic supply of consumables, inadequate remuneration, lack of incentives, inadequate staffing, increased workload, and inappropriate leadership styles all negatively influence job satisfaction and staff retention. Addressing the challenges that radiographers endure would contribute positively to job satisfaction and staff retention and improve the quality of imaging service delivery in public healthcare.

ACKNOWLEDGMENT

I would like to thank the Durban University of Technology's Institutional Research Ethics

Committee (IREC) and the National Health Research Authority of Zambia (NHRAZ) for ethical approval to conduct the research. Sincere gratitude also goes to the Senior medical superintendents (SMS) and radiology managers of the hospitals covered in this study, the radiographers who participated in the study, and Dr. Timothy Wiggins for proofreading the final manuscript.

COMPETING INTERESTS

The authors declare no conflict of interest related to this research.

AUTHORS' CONTRIBUTIONS

Mr Mubanga Bwalya is the main researcher in this work derived from his research project that led to his award of Master of Health Sciences in Radiography by the Durban University of Technology. Mrs Roshnee Sunder and Dr Foster Munsanje supervised the research project. Dr Oswald Bwanga rendered support in the literature search and drafting of the manuscript for this publication. All the authors reviewed, made corrections, and approved the manuscript for publication.

REFERENCES

1. Herbst CH, Vledder M, Campbell K, Sjöblom M, Soucat A. *The Human resources for health crisis in Zambia*. Washington DC: The World Bank; 2011.
2. Fuller LE. Zambia country report for use in radiology outreach initiatives. Chevy Chase: The RAD-AID International; 2015.
3. United Nations. *The sustainable development goals report 2019*. New York: United Nations; 2019.
4. Ministry of Health. *National health strategic plan 2017-2021*. Lusaka: Ministry of Health; 2017.
5. Ministry of Health. *National health strategic plan 2011-2015*. Lusaka: Ministry of Health; 2011.
6. Makasa E. The Human resource crisis in the Zambian health sector: a discussion paper.

- Medical Journal of Zambia*. 2008; 35(3): 81-87.
7. Verrier W, Harvey J. An investigation into work related stressors on diagnostic radiographers in a local district hospital. *Radiography*. 2010; 16 (2): 115-124.
 8. Chandrasekar K. Workplace environment and its impact on organizational performance in public sector organizations. *International Journal of Enterprise Computing and Business Systems*. 2011; 1(1): 1-19.
 9. Kaila HL. Human resource development and business growth. New Delhi: IK. *International Publishing House*; 2012.
 10. Lambrou P, Kontodimopoulos N, and Niakas D. Motivation and job satisfaction among medical and nursing staff in a Cyprus public general hospital. *Human Resources for Health*. 2010; 8 (26): 1-9.
 11. Khoza T, Pieterse T, Motto J. Factors affecting job satisfaction for radiographers in Gauteng, South Africa. *The South African Radiographer*. 2018; 56(1): 26-30.
 12. Elkhadir AM, Saeed IO. Job satisfaction of radiographic technologist in Sudan and the main reasons of dissatisfaction. *International Journal of Science and Research*. 2018; 7:12-14.
 13. Alamri S, Faizo N, Alelyani M, Alghamdi A, Altwerqi S, Almarghoub G et al. Are radiology technologists satisfied with their work? A cross-sectional study from Taif Hospitals. *Open Journal of Radiology*. 2020; 10:45-56.
 14. DuBrin A J. Essentials of management. 10th Ed. New York: Wessex Press Publishing Company; 2016.
 15. Kuijk A. Herzberg two factor theory of motivation; 2018. From <https://www.toolshero.com/psychology/two-factor-theory-herzberg/> (Accessed 19 September 2021).
 16. Juneja P. Herzberg's Two-Factor Theory of Motivation; 2015; From <https://www.managementstudyguide.com/herzbergs-theory-motivation.htm>. (Accessed 1 September 2021).
 17. Creswell JW, Creswell JD. Research design: qualitative, quantitative, and mixed methods approaches. 5th ed. London: SAGE Publications Ltd; 2018.
 18. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006; 3 (2): 77-101.
 19. Lincoln YS, Guba EG. Naturalistic inquiry. Newbury Park, CA: Sage Publications; 1985.
 20. Health and Safety Executive. Welfare at work: Guidance for employers on welfare provisions. London: HSE; 2011.
 21. Jenson B. The Role of ventilation in workplace indoor air quality; 2017. From <http://bobjenson.com/blog/role-ventilation-workplace-indoor-air-quality/> (Accessed 25 August 2021).
 22. World Health Organization. Health and sustainable development: Ventilation and airborne diseases. Geneva, WHO; 2019.
 23. Bwanga O, Sichone JM. Experiences of clinical supervisors regarding the clinical training of radiography students in Zambia. *The South African Radiographer*. 2020; 58(2): 22-28.
 24. Bwanga O, Chanda E. Challenges in radiation protection in healthcare: A case of Zambia. *EAS Journal of Radiology and Imaging Technology*. 2020; 2(1):7-14.
 25. Gow J, George G, Mutinta G, Mwamba S, Ingombe L. Health worker shortages in Zambia: An assessment of government responses. *Journal of Public Health Policy*. 2011; 1(3): 1-13.
 26. Trivikram S. How job rotation motivates employees; 2017. From <https://myventurepad.com/job-rotation-motivate-employees/> (Accessed 08 September 2021).
 27. Shukla S, Adhikari B, Ray M. Emotional intelligence and job satisfaction: An empirical investigation. *Amity Global HRM Review*. 2016; 55-56.
 28. Mahfuz J. Emotional intelligence and retention: the moderating role of job involvement. International Conference on

- Economics, Business and Marketing Management. Madrid; 2013.
29. Bwanga O, Chitamya K. Supportive function of the clinical supervision of radiography students. *IAR Journal of Medical Sciences*. 2020; 1(1): 46-53.
 30. Choi S, Leiter J, Tomaskovic-Devey D. Contingent autonomy technology, bureaucracy, and relative power in the labor process. *Work and Occupations*. 2008; 35(4): 422-455.
 31. Munsanje F. Frontline radiographic humancapital development: a case of Zambia and way forward. Doctor of Technology in Radiography thesis, Durban University of Technology: Durban. 2013: 26.
 32. Du Plessis, J., Friedrich-Nel, H., van Tonder, F. A postgraduate qualification in the specialisation fields of diagnostic radiography: a needs assessment. *African Journal of Health Professions Education*. 2012; 4(2): 112-117.
 33. Ng'andwe EM, Bwanga O. Factors affecting the ability of radiographers to deliver imaging services in rural parts of Zambia. *Radiography*. 2022; 28(3): 758-765. doi:10.1016/j.radi.2022.03.005
 34. Bateman TS, Snell SA. Management, leading and collaborating in a competitive world. 10th ed. New York: McGraw-Hill. 2013.