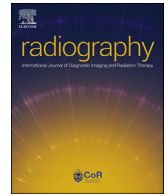




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Diagnostic radiographers' experience of COVID-19, Gauteng South Africa

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ARTICLE INFO

Article history:

Received 31 July 2020

Received in revised form

2 September 2020

Accepted 12 September 2020

Available online 18 September 2020

Keywords:

COVID-19

Diagnostic radiographers' experiences

Gauteng South Africa

Well-being

Resilience

ABSTRACT

Introduction: As of July 2020, South Africa (SA) had the fifth highest number of COVID-19 infections in the world, with the greatest contributor of these infections, being the province of Gauteng. Diagnostic radiographers in Gauteng providing chest CT, chest radiograph and MRI services are frontline workers experiencing these unprecedented times. Therefore, this study undertook to explore diagnostic radiographers' experiences of COVID-19.

Methods: A qualitative approach using an asynchronous opened-ended online questionnaire was used to explore diagnostic radiographers' experiences of COVID-19. Responses from purposively sampled diagnostic radiographers in Gauteng SA, underwent thematic analysis.

Results: Sixty diagnostic radiographers representing both the private and public health sector responded to the questionnaire. Thematic analysis revealed three themes: new work flow and operations, effect on radiographer well-being and radiographer resilience.

Conclusion: Besides experiencing a shift in their professional work routine and home/family dynamics, diagnostic radiographers' well-being has also been impacted by COVID-19. Adapting to the "new way of work" has been challenging yet their resilience and dedication to their profession, providing quality patient care and skill expertise is their arsenal to combat these challenges.

Implications for practice: Understanding the impact of COVID-19 on diagnostic radiographers will allow radiology departments' management, hospital management, professional bodies and educational institutions to re-evaluate provision of resources, training, employee wellness programs as well as policies and procedures.

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Introduction

In 1918 the Spanish flu killed approximately 300 000 South Africans in six weeks.¹ Since 1982, HIV/AIDS has claimed in excess of three million South Africans.^{1,2} South Africa (SA) also remains one of eight countries that contribute to two thirds of the total global tuberculosis (TB) infections.³ Now, in addition to its burden of existing diseases, SA like the rest of the world, faces a novel pandemic.⁴

Since 31 December 2019 when the first case of a new Coronavirus was reported the disease Coronavirus 2019 (COVID-19)

caused by the severe acute respiratory syndrome Coronavirus 2,⁵ has spread to 213 countries and territories worldwide.^{6,7} SA reported its first COVID-19 patient on 5 March 2020 and on the 26th March 2020 the country went into a 21 day national lockdown with 927 confirmed positive cases.⁸ The aim of the lockdown was to reduce the rate of transmission and to allow health care facilities to prepare for the anticipated infection surge.^{8,9}

SA's healthcare sector consists of a public and a private sector. SA's public healthcare sector is government funded but under-resourced, supporting approximately 85% of the population. The private healthcare sector, paid through medical aid schemes and individuals is well-resourced, catering for the remaining 15% population.¹⁰ News reports indicate that the private healthcare sector may accommodate COVID-19 patients from the public health sector at an agreed price.^{11,12}

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SA's rate of new infections at the time of writing this article (July 2020) was still on an upward trajectory with strong indications that the peak was yet to come. SA remains in lockdown, however, due to the negative impact on the economy the government has had to ease certain restrictions.^{13–15} As of 30 July 2020, the total number of cases in SA was 471,123 placing it among the top five countries with the highest infection rates.¹⁶ Gauteng, the smallest yet most densely populated of the nine South African provinces, has the largest number and percentage of COVID-19 cases in SA (at the time of writing this article).^{17,18}

Background

The 2003 Severe Acute Respiratory Syndrome (SARS) Coronavirus resulted in an increased need for medical imaging services and stringent infection control practices.¹⁹ Radiographers working through the SARS outbreak, experienced SARS as being stressful. Low staff morale, inadequate infection control and poor risk management skills were highlighted as contributing factors. However, after the outbreak, radiographers found the experience to be a valuable opportunity to reflect on their role as radiographers, radiography practice and professionalism.¹⁹

Seventeen years later, the COVID-19 pandemic has had a similar impact on medical imaging services. Chest computed tomography (CT), lung ultrasound, magnetic resonance imaging (MRI) and chest radiographs, performed by radiographers, play a pivotal supportive role in the diagnosis, management and treatment of COVID-19.^{20–25} As a result, medical imaging departments had to introduce new work flow and operations. Measures included the use of personal protective equipment (PPE), social distancing and stringent equipment sanitization. Staff allocations were also amended to mitigate spread among staff while ensuring continued service. Infection of staff would mean that the workload on remaining staff would increase.^{26–31} Besides these changes to the working environment, enforced lockdown protocols resulted in furloughs, loss of jobs, reduced work hours and children needing to be schooled at home.^{32–34} Adjusting to this new way of work and life has resulted in emotional, physical, financial and mental stress.^{35–39}

The impact of these multitude of changes needs to be explored. Therefore, this study undertook to explore diagnostic radiographers' experience of COVID-19. The study was conducted in Gauteng, SA.^{20–25}

Method

A qualitative approach using an open-ended online questionnaire was used to explore Gauteng's diagnostic radiographers' experiences of COVID-19.⁴⁰ Diagnostic radiographers (*hereafter referred to as radiographers*) employed in Gauteng, SA were purposively sampled.⁴⁰ Demographic data was obtained and answers to a single question: "How has your experience been during COVID-19?" underwent thematic analysis. Radiographers' responses were read and reread to obtain a general sense of the information; the data was coded and categorised and then themes were generated.

Due to COVID-19 restrictions preventing face to face interviews, telephonic or video calls could have been used, but considering

changes to radiographers' work and home life, the option to have an online open-ended questionnaire was favoured. Asynchronous qualitative online, open-ended questionnaires are not commonly used for qualitative research⁴¹ but were selected for use in this study so as not to burden participants in time-locked obligations.⁴² Radiographers choosing to participate in the study could do so at any time they found suitable without being burdened by contact at a specific time. Also invitations to participate in the study asked radiographers to share their experiences in as little or as many words as they liked. Written responses allow for self-reflection and focused answers.⁴³

Measures of trustworthiness included member checking and reflexivity to ensure credibility.^{40,44} Themes were shared with radiographers that participated in the study to establish if it portrayed the truth value of their experience of COVID-19.^{40,44} The authors kept research diaries of their own to allow continuous reflection.^{40,44} Dependability and transferability of the study was ensured by a detailed description of results along with providing direct quotations from participants.^{40,43,44} Confirmability of a study is ensured by an audit trail.^{40,44} Questionnaire responses from the study is preserved to allow for independent auditing.⁴⁴ Ethical clearance and consent to conduct the study were obtained (REC-524-2020).

Results and discussion

Diagnostic radiographers were invited to participate in the study through email and messaging applications as well as through the head of radiology departments. Data collection continued until data saturation was achieved. Sixty radiographers from Gauteng's public and private sector responded to the questionnaire. Both sectors were represented in the study with 31 radiographers working in public hospitals, 27 working in private hospitals and the remaining 2 radiographers working in both public and private hospitals.

The study information letter outlined the purpose of the study as well as provided the opportunity for radiographers to express their experiences of COVID-19 without restrictions of time or length of responses. Qualitative studies exploring experiences may use a central question to allow participants to share an authentic narrative of their experience without influence from the researcher.⁴⁰ Probing questions would then follow based on the participants' responses.⁴⁰ However, the use of asynchronous online questionnaires, in this study, meant the responses could not be probed further. Most responses though were focussed and showed self-reflection. Responses ranged from a minimum of four words to a maximum of 821 words and an average of 100 words.⁴²

The demographic data of participants is presented in Table 1. More than half the radiographers participating were below 34 years aligning to the Health Professions Council of South Africa's (HPCSA) register.⁴⁵ The majority of participants indicated having less than 12 years of experience. Studies show that clinical and technical skills together with emotional intelligence positively correlate with years of experience and age.^{46–48}

Radiographers' responses to the question "How has your experience been during COVID-19?" were read and reread to obtain a general sense of the data. The data was then coded and categorised

Table 1
Demographic data of participants.

Age (years)					Years of experience					
18–24	25–34	35–44	45–54	55+	1–6	7–12	13–18	19–24	25–30	31+
11	33	10	5	1	34	13	7	3	2	2

yielding three themes: New work flow and operations, effect on radiographer well-being and radiographer resilience.

New work flow and operations

Medical imaging departments' operations were affected by the decrease in imaging referrals at the onset of the lockdown.⁴⁹ Even though it has been viewed as an opportunity to address "overuse and overdiagnosis",⁵⁰ the reduction in imaging referrals, has resulted in some radiographers in the private sector experiencing pay cuts:

"... since the lockdown patients were advised not to come to the hospital unnecessarily and with that in private sector, we were affected economically. Less patient = less profit to the company then salaries we cut off"^{R34}

Radiographers' experiences confirm the introduction of new work flow and operations as well as the need to conform to new changes.^{26–29} The quotes below convey radiographers' experiences of the changes:

"A lot of protocols and precautionary steps taken. Even with all that, people are still confused about what to do, even staff members of other disciplines."^{R17}

"In my workplace we do not have a set protocol in place for suspected and confirmed cases that are understood by everyone, it sometimes feels like protocols change every day based on who is in charge on that particular day."^{R3}

"Exhausted from shift changes. Getting irritated with rules that don't make sense."^{R59}

The South African Department of Health and HPCSA provide guidelines for health practitioners and hospitals with the caveat of them being evolving documents.^{51–53} Transitioning in fluid contextual circumstances requires constant evaluation of the effectiveness and efficiency of work flow and operations. However, success of implementation is embedded in the staff's understanding of the changes effected and the need for the changes²⁰ Similar to radiographer 59 (R59), more radiographers commented on changes to their allocations:

"During this pandemic we've also had to work extended hours at the hospital (12 hour shifts for 7 days and then 7 days off which I feel also adds to the exhaustion."^{R10}

"... So my experience has been okay and at times difficult as we divided ourselves into teams"^{R7}

Comparably, worldwide medical imaging departments have adapted operations to mitigate cross-contamination and staff shortages.^{26–28} However, an 84 h work week as indicated by R10, despite the time off, constitutes prolonged working hours. Prolonged working hours raise concern of health and safety as well as increasing the risk of respiratory disease.^{54,55}

Radiographers shared their experience of medical imaging departments implementing stringent infection control measures that affected work flow and operations.^{26–28,56} Their responses ranged from having access to sufficient PPE to lack of PPE; lack of disinfectants as well as delayed testing and provision of results.⁶⁰

Radiographers' experiences of infection control measures are shared through these direct quotes:

"... At least we have PPE."

"We have had to fight tooth and nail to receive PPE. There is a shortage of surface disinfectants. There is no regular screening at the gate for the staff. The backlog of getting Covid 19 results is also tiresome."^{R4}

"Horrible ... Lack of PPE!"^{R16 and R39}

"We wear our own fabric masks and do not have much else in the way of equipment. When some of my colleagues had contact with positive cases, they didn't test or quarantine any of us."^{R48}

"There is a lot of negligence in terms of proper isolation and treatment of Covid-19 patients. The hospital I'm working at is not Covid ready and many of the staff members here do not feel safe."^{R58}

Radiographers routinely wear gloves and practice handwashing in daily practice however now continuous use of masks and face shields was described as "stifling" and as "not being able to breathe properly".³⁴ Rising infection rates means a substantial increase in COVID-19 hospital admissions. Consequently, more patients need medical imaging services, requiring radiographers to use PPE for longer periods. Moreover, some radiographers indicated that the correct guidelines for donning and doffing of PPE was not demonstrated in their departments. There were also concerns for the proper wearing of the PPE and its safety.

"Tired of not being able to breathe properly because of the mask that I have to wear the whole day. Tired of PPE (I know it's there for my safety but still)... I often question myself with regards to the PPE. Did I don properly? Did I doff properly? Did I touch my face? Was my hair exposed?"^{R10}

"Even though all aspects of PPE and sanitising is observed, there is still that incessant doubt and fear, just ever lingering" (sic)^{R57}

Social distancing at work was found to be challenging but the support from colleagues was appreciated. Of concern was the lack of clinical history provided by requesting doctors along with the lack of feedback provided to the medical imaging departments for persons under investigation for COVID-19:

"... patients, colleagues & other staff members are in contact with you all the time. It is very difficult to always remind yourself to distance yourself 1,5 m away from people."^{R33}

"... patients under investigation, no feedback from the doctors."^{R43}

Effect on radiographer well-being

Radiographers describe being sad, terrified, confused, stressed, scared, exhausted, anxious, overwhelmed, frustrated, uncertain and panicked. Their "roller coaster" of mixed emotions has stirred up an "emotional war" draining them emotionally, physically, financially and mentally.^{33–35} Seeing patients out of breath, deteriorate, being ventilated and dying; in the same way, seeing colleagues falling ill and some dying, take a toll on radiographer's mental health. Radiographer's mental health is marauded even further by not being able to see family and friends coupled with the anxiety of contracting and transmitting the disease.^{33–35} There is also the notion that healthcare workers are not human and therefore should cope.²⁸ These descriptions are reflected in the following quotes:

"Emotionally, physically and mentally exhausting I'm tired of seeing patient's condition deteriorate because there is no cure so their symptoms are only being treated. I'm tired of seeing patients lose their lives. It's also heart breaking to see patients so

short of breath and a lot of the patients are elderly and end up on ventilators ...” R10

“We are so proud of you!! Great Job!! That’s what the frontliners hear. But have you ever looked beyond that ... to the homes and extended family of those that are on the frontline?... nobody on the outside considers the emotional impact of this on the immediate and extended family ... entire family dynamics and values have been uprooted ... Are we not human as well? Do we not have feelings and fears? Do you assume that when you qualify with a health degree our hearts automatically turn to steel WE ARE HUMAN just like you” R12

“No longer can I just reach out and give you a hug or comforting shoulder to cry on ... your safety and mine ... distance ... invisible barriers we need to create” R12

Yet some radiographers report being told that “staff” are overreacting. During the SARS epidemic radiographers were motivated through the crisis by reassurance.⁵⁷

“I, for one know that at work, we were often told “staff is overreacting” so I fought this and I felt a lot of emotional and mental strain on myself” R51

Not being considered frontline workers, a concern echoed by professional bodies impacts allocation of resources as well as radiographers’ well-being:^{58–64}

“It has been rather negative, as we do not get proper personal protective equipment (PPE), we are not recognized as Frontline workers, and we are not considered by our hospital.” R48

“Very nerve wrecking. It’s a learning curve so you have to be on guard all the time. Being a radiographer, you are essential but not considered total frontline. With everyone testing the waters it’s difficult to have proper guidelines.” R15

There was also concern about the volumes of COVID-19 information. Information overload coupled with misinformation and conspiracies results in psychological distress.^{65,66}

“At the beginning there was very limited factual information about the virus itself and an overload of information about different theories/conspiracies about covid-19 and this has in turn resulted in so much confusion and difficulty to find the path of how to deal with the situation and find a way forward. There were many arguments and different opinions of how one should go about doing things.” R51

Radiographer resilience

South African radiographers already work in stressful environments that is now exacerbated by COVID-19.^{67–69} The themes generated thus far speak to the impact of work flow and operational changes as well as the increased burden on radiographer well-being. Yet, radiographers share experiences that COVID-19 has provided an opportunity for growth and new knowledge, demonstrating their flexibility and willingness to adapt⁷⁰:

“Challenging and stressful at the same time. Covid - 19 is a novel virus, I had to unlearn and learn new ways of providing health care to the patients, as well as protecting myself from contracting the virus. But I got to learn and experience new things in the profession. This brought with growth and new knowledge.” R5

For some radiographers even though it is not easy, regular training and support from colleagues provides some reprieve.⁷¹

“But thankfully with the experience, training and help of our colleagues we able to get through it.” R13

“Not easy but manageable, extra training has put me at ease (COVID & PEE regular trainings).” R7

Moreover, it has provided an opportunity to create social awareness of the disease in their communities.

“It has been quite fascinating and frustrating at the same time thus working with such patients you never know when you safe whilst us as Radiographers we’re hands on with our patients, and have to always be cautious. But thus this far a great experience to be part of giving back to the community and helping in the establishment of diagnosis” R44

Radiographers express their dedication to the profession⁷⁰: “Love being a radiographer”; duty bound to placing patients at the forefront and pride at being part of the diagnosis and management of COVID-19.

“I have dedicated my life to this profession, and I will fight until it’s done and carry out my duty with efficacy and grace.” R57

Despite the impact of changes and the burden on their well-being, experiences shared by radiographers reveal their ability to find the positives even in these anomalous times. These experiences indicate an initiation of strategies towards resilience.

Conclusion

Radiographers in Gauteng, SA are exposed to the highest number of COVID-19 infections in SA. They have experienced changes to staff allocations and work-hours as well as the implementation of stringent infection control and social distancing measures. Moreover, they face mental, physical, emotional and financial challenges. However, honing the positives, they have initiated strategies towards resilience.

Conflict of interest statement

None.

Acknowledgements

Thank you to all the radiographers working in the frontline, who shared their experiences during this pandemic.

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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