International Journal
of
Radiology and Diagnostic Imaging

E-ISSN: 2664-4444
P-ISSN: 2664-4436
https://www.radiologypaper.com
IJRDI 2021; 4(4): 80-85
Received: 01-12-2021
Accepted: 28-12-2021

Dr. D Ravichander
Associate Professor,
Department of Radiodiagnosis,
Dhanalakshmi Srinivasan
Medical College and Hospital,
Perambalur, Tamil Nadu,
India

Dr. Preeti Allum
Associate Professor,
Department of Radiodiagnosis,
G.R. Medical College, Hospital
and Research Centre,
Mangalore, Karnataka, Indi

Corresponding Author:
Dr. D Ravichander
Associate Professor,
Department of Radiodiagnosis,
Dhanalakshmi Srinivasan
Medical College and Hospital,
Perambalur, Tamil Nadu,
India

Radiologists and medical imaging technicians' specialized quality of life during the COVID-19 pandemic in India

Dr. D Ravichander and Dr. Preeti Allum

DOI: http://dx.doi.org/10.33545/26644436.2021.v4.i4a.311

Abstract
Background: Professional quality of life is one of the growing concerns among healthcare workers, especially during COVID-19 pandemic. The presence and work of radiologist and medical imaging technologist for prolonged hours with patients could be stressful and painful.
Objectives: This study aimed to assess the professional quality of life among the radiologist and medical imaging technologist by analyzing professional satisfaction, compassion, and burnout during the COVID19 pandemic.
Methods: An online, cross-sectional, self-reported, and internet-based survey was carried out among 153 radiologists and medical imaging technologists. Descriptive statistics were used to summarize the socio demographic variables and domains of professional quality of life scale. Cronbach's alpha was used to check internal consistency. Independent sample t-test (two-tailed) was used to compare the demographic variables and compassion satisfaction, burnout, and secondary traumatic stress.
Results: Most participants reported moderate and higher level of compassion satisfaction, whereas moderate burnout and secondary traumatic stress was reported by most participants during COVID-19 pandemic. There was negative correlation between compassion satisfaction and burnout and secondary traumatic stress.
Conclusion: The findings of this study are vital to understand the work-related quality of life among healthcare professionals not only during COVID-19 pandemic but also after the pandemic situation. There is a need to conduct qualitative evaluation to ascertain the risk factors associated with professional quality of life. The study also reflects the need to focus more on the mental health of healthcare professionals not only during and after pandemic situation.

Keywords: COVID-19 professional quality of life compassion satisfaction (CS) burnout secondary traumatic stress (STS) computed tomography (CT)

Introduction

Professional quality of life (ProQOL) is the level of satisfaction people have with their working conditions and one of the vital concerns centered on the wellbeing of professionals who are providing healthcare services (Stamm, 2010) [29]. A professional's work environment and characteristics are complex concepts that could involve exposure to primary trauma (trauma resulting from personal experience) or secondary trauma (trauma based on others) (Severn *et al*., 2012; Stamm, 2010) [25, 29]. ProQOL is associated with both positive and negative aspects of their assigned role at their workplace and is influenced by the individual's demographics, workplace environment, and characteristics (Stamm, 2010) [29]. Occupational stress and burnout are found to be very common among healthcare professionals and it is commonly researched among cardiologists, nurses, palliative care, etc. (Singh *et al*., 2017) [26]. Studies have been also conducted to assess the ProQOL among different medical health professions like nurses (Kim and Choi, 2012; Lauvrud *et al*., 2009; Potter *et al*., 2010) [13, 15, 19], doctors (Huggard and Dixon, 2011) [11], genetic counsellors, and audiologists (Ravi *et al*., 2016; Severn *et al*., 2012) [21, 25].

There are different validated and reliable scales available to assess ProQOL such as the ProQOL scale (Stamm, 2010) [29] or Maslach Burnout Inventory (Maslach *et al*., 1996) [16]. The two main domains of the ProQOL are compassion fatigue (CF) and compassion satisfaction (CS), which are both positive. CF is further divided into two categories: the first category deals with the frustration, exhaustion, anger, and depression that are typical of

burnout and the second category is related to secondary traumatic stress (STS) disorder, which is a negative emotion fueled by fear and work-related trauma (Stamm, 2010) [29]. As per research, those who assist someone who has had traumatic stressors run the risk of experiencing signs of posttraumatic stress disorder, depression, and exhaustion (Stamm, 2010) [29].

CS is the satisfaction that professionals derive from their ability to do their jobs well and from their enjoyment of doing so (Stamm, 2010) [29]. Job satisfaction is composed of numerous factors like age, hours per week, workplace conditions, support, remunerations, work recognition, and years of experience, peer support, and support from their supervisors (Reeter, 2012) [22]. Professionals with a lower degree of CS typically find happiness in activities other than their regular jobs or experience issues with their work profiles (Stamm, 2010) [29]. It may include the experience of helping combined with influencing factors like patient interaction, bonding with coworkers and overall management which leads to influence positively in their lives (Stamm, 2002) [27]. The ability and concern of the professional to participate in empathy (Stamm, 2010) [29], or to be able to experience the anguish of important persons in their own lives, patients, or occasionally coworkers, is lessened in CF (Figley, 2002) [7]. Burnout and STS comprise the CF category on the ProQOL scale (Stamm, 2010) [29]. Among working professionals, burnout is a phenomenon marked by emotional tiredness, depersonalization, and decreased personal satisfaction (Freudenberger, 1975; Maslach and Zimbardo, 1982; Stamm, 2010) [7, 17, 29]. It is a condition of physical, mental, and emotional tiredness brought on by deteriorating of an individual's capacity to cope with their working environment. It is a state of collective stress brought on by the difficulties of everyday living (Maslach and Zimbardo, 1982) [17].

Radiology is among one of the essential units in the healthcare system where the medical imaging technologist works under the supervision of radiologists with multiple machines like X-ray, computed tomography (CT), magnetic resonance imaging, ultrasound, etc. An increase in the demand for examinations often causing a higher level of psychological stress among radiologists and technologists as compared to other groups of occupational groups (Alavi *et al*., 2016) [3]; however, handling and working with patients to provide the best healthcare services requires a lot of patience, compassion, and professional skills.

The potential cause of stress among these professional healthcare workers is their interaction with patients regarding their psychological, emotional, and social problems (Akroyd *et al*., 2002) [1]. Various existed studies have shown an increase in occupational stress, burnout among radiologists due to prolonged hours of medical image reporting, and work; hence, there is an increase in concern about the poor mental health (Graham *et al*., 2000) [10]. Studies also reported that there are frequent stressors in the department of radiology because of pressure to complete tasks/overwork, inadequate salaries, and inadequate holiday/vacation time (George and Ndlov, 2013) [9].

The COVID-19 epidemic was first identified in the Chinese population in Wuhan in December 2019, and the World Health Organization declared it to be a pandemic in March 2020 (World Health Organization, 2020). CT and before X-ray plays an important role in detecting the changes in the respiratory tract due to COVID-19 (Joob and Wiwanitkit, 2020) [12]. The whole world is facing the COVID-19 pandemic, so patients visit the radiology department for chest X-rays or CT scans at any time. Chest Xrays and CT scans of suspected COVID-19 patients are commonly requested by medical imaging technologists and radiologists and their full force (Akudjedu *et al*., 2020) [2]. Existing studies among medical imaging professionals reflect occupational stress due to workload, shortage of staff, and increase in the number of patients (Rutter and Lovegrove, 2008; Verrier and Harvey, 2010) [24, 31].

Stress and fear of being infected with COVID-19 infection were found common among radiology workers irrespective of personal protective equipment. It is necessary to provide capacity-building sessions and constant mental health support and evaluate the healthcare professional's mental health and quality of life during similar future pandemics (Elshami *et al*., 2021) [6]. Due to long working hours and constant work pressure, the physical and mental health of healthcare workers may be affected, so ProQOL became one of the concerns, centered on the wellbeing of professionals, especially medicine. There is evidence lacking among medical imaging on ProQOL professionals in the Indian setting specifically during the COVID-19 pandemic. Therefore, present study was conducted to investigate the ProQOL among radiographers and radiologists during the COVID-19 pandemic.

Materials and Methods

Present study was conducted after obtaining an ethical clearance from the institute. This study was conducted following declarations (World Medical Association). Informed consent was sought from each participant before their participation in this study. The objective of the study and their voluntary participation in this study were explained to the participants.

An online, cross-sectional, self-reported, and internet-based survey design was conducted in the year 2021 to assess the ProQOL during COVID-19 pandemic among medical imaging technologists and radiologists in India. The contact details of the medical imaging technologists and radiologists were obtained through the investigator's professional contacts using the principle of snowball sampling. The questionnaire was then mailed to 232 medical imaging technologists and radiologists using their e-mail identifications based on the below-mentioned eligibility criteria.

Inclusion Criteria

Medical imaging technologists and radiologists who are practicing in hospitals, clinics, and laboratory settings are eligible to participate.

Exclusion Criteria

1. Participants who are involved in academics only.
2. Participants who did not consent to participate in this study.

Data collection

Data were collected using Google form as per the Government of India's recommendation to maintain social distancing and minimize physical interaction. To ensure the completeness of the response and zero miss-outs, all of the questions on our Google form were single-choice answers. For reasons of secrecy, only the researchers had access to

the responses that had been gathered. The SPSS computer code as specified in the manual was followed (Stamm, 2010) [29].

Table 1: Demographic detail of study participants

Variables	Number, n (%)
Gender Male	81 (52.9)
Female	72 (47.1)
Occupation Radiologist	37 (24.2)
Technologist	116 (75.8)

Study instrument

The survey questionnaire was divided into two sections: the first section asked about the study participants' gender and occupation, whereas the second section asked about their ProQOL version 5 scores (Stamm, 2010) [29]. ProQOL is a validated and freely available tool developed by Stamm in 2009 (Stamm, 2009) [28] and later modified in 2010 (Stamm, 2010) [29]. ProQOL measures the negative and positive aspects of helping others. The ProQOL had subscales for CS, burnout, and STS. This scale consists of 30 questions, with 10 questions each on CS, burnout, and STS. The questions are scored on a Likert-type 5-point rating scale (1 ¼ never, 2 ¼ rarely, 3 ¼ occasionally, 4 ¼ often, and 5 ¼ very often), and the scale is composed of 30 questions in total. Participants in the study had to mark their responses in accordance with their present employment status and their experiences during the previous 30 days, as per the ProQOL standards. Each subscale (CS, burnout, and STS) has 10 items with an average score of 50. The alpha scale reliability reported for CS is 0.88, burnout is 0.75, and STS is 0.81. For the burnout section of ProQOL, five items were scored in reverse order and were added during the analysis phase. Furthermore, raw scores for CS, burnout, and STS were converted to t scores with a mean and standard deviation of 50 ± 10. The cut-off scores were established using a manual by Stamm (2010) [29] to identify low, average, and high degrees of CS, burnout, and STS.

Statistical analysis

Descriptive statistics summarized the sociodemographic variables and subscales of ProQOL. Data were checked for its normality using the Kolmogorov-Smirnov test and internal consistency was assessed using Cronbach's alpha. A subgroup analysis among gender and occupation was performed for each subscale of ProQOL. Independent sample t-test (two-tailed) was used to compare the mean score between demographic variables and CS, burnout, and STS with a significance level of $P < .05$. Correlation between the three subscales was compared using Pearson's product-moment correlation. Statistical analysis was performed using SPSS 16.0 (IBM SPSS Statistics, New York).

Results

The questionnaire was shared with nearly 230 medical imaging technologists and radiologists, of which 158 had responded (response rate: 68.6%). Five respondents did not consent to participate in this study; hence, responses from 153 participants were been recorded. The internal consistency of all three domains of the ProQOL was assessed using Cronbach's alpha were CS (a¼ 0.84), burnout (a¼ 0.55), and STS (a¼ 0.72). Table 1 depicted the demographic details based on gender and occupation, whereas Table 2 reported the mean and standard deviation score with the range of the study participants.

In Table 3, most participants (70.6%) reported a moderate level of CS, whereas nearly one-fourth (28.1%) reported a high level of CS and only 1.3% reported low CS. In terms of burnout, more than onefourth (28.8%) of the participants reported a low level of burnout and nearly three-fourth participants (71.2%) reported a moderate level of burnout. A moderate level of STS was reported by most (69.3%) participants and nearly one-third (30.7%) of the participants reported a lower level of STS.

Table 2: Mean and standard deviations for each domain of scale

Domain of scale	Mean (Standard deviation)	Range
Compassion satisfaction (CS)	37.6 (6.4)	13 to 49
Burnout	25.1 (4.6)	14 to 35
Secondary Traumatic Stress (STS)	25.5 (5.6)	13 to 39

Table 3: Distribution of the scores of each domain of scale

Grading	Compassion satisfaction, n (%)	Burnout, n (%)	Secondary traumatic stress, n (%)
High	43 (28.1)	0 (0)	0 (0)
Moderate	108 (70.6)	109 (71.2)	106 (69.3)
Low	2 (1.3)	44 (28.8)	47 (30.7)

The mean scores of all three scales of ProQOL were compared with gender (male and female) and occupation (radiologist and technologist) using an independent sample t-test. There was no statistically significant difference present for any scale across gender and occupation. Subgroup Analysis Among Sociodemographic Variables Compassion satisfaction, burnout, secondary traumatic scale, and gender Among males, nearly three-fourth (74.1%) of males reported a moderate level of CS, whereas less than one-fourth (23.5%) reported a higher level of CS and very few (2.5%) reported a low level of CS. Most (75.4%) males reported a moderate amount of burnout, whereas nearly one-fourth (24.7%) of males reported a low level of burnout. More than 70% of males reported a moderate amount of STS and almost 30% reported a lower level of STS. Among females, 66.7% or two in every three females reported a moderate level of CS; almost one-third (33.3%) reported a higher level of CS. Most (66.7%) females reported a moderate amount of burnout, whereas one-third (33.3%) reported a low level of burnout. Two-third (66.7%) of females reported a moderate amount of STS and 33.3% reported a low level of STS. Compassion satisfaction, burnout, secondary traumatic scale, and occupation

Among radiologists, more than three-fourth (75.7%) radiologists reported a moderate level of CS, whereas nearly one-fourth (24.3%) reported a higher level of CS. Nearly 62% (62.2%) of radiologists reported a moderate amount of burnout, whereas 37.8% reported a lower level of burnout. Most (70.3%) radiologists reported a moderate amount of STS and nearly 30% of radiologists reported a low level of STS.

Among technologists, nearly 70% technologists reported a moderate level of CS, whereas nearly 30% reported a higher level of CS and only 1.7% reported a lower level of CS. Nearly three-fourth (74.1%) of technologists reported a

moderate amount of burnout, whereas nearly one-fourth (25.9%) reported a lower level of burnout. Most (69%) technologists reported a moderate amount of STS and less than one-third of 31% of technologists reported a lower level of STS (Table 4).

Table 4: Gender and occupation wise distribution for each domain of scale

Moderate	60 (74.1)	48 (66.7)	28 (75.7)	80 (69)
Low Burnout	2 (2.5)	0 (0)	0 (0)	2 (1.7)
Moderate	61 (75.3)	48 (66.7)	23 (62.2)	86 (74.1)
Low Secondary Traumatic Scale	20 (24.7)	24 (33.3)	14 (37.8)	30 (25.9)
Moderate	58 (71.6)	48 (66.7)	26 (70.3)	80 (69)
Low	23 (28.4)	24 (33.3)	11 (29.7)	36 (31)

Correlation Between the Scale Domains

As provided in Table 5, the correlation between the three domains of the ProQOL scale (CS, burnout, and STS) was assessed using the product-moment correlation coefficient. Burnout was found to have a weakly positive connection with STS (r ¼ 0.359) and a moderately negative correlation with CS (r ¼0.405), both of which are statistically significant at the 0.01 level (two-tailed).

Discussion

Radiologists and medical imaging technologists play a key role in the field of clinical medicine. Medical imaging technologists work continuously and proximally with patients for the acquisition of images for long hours, so there are high chances of feeling stressed, burnout, and exhaustion (Cieszanowski *et al*., 2020; Kotian *et al*., 2020) [6, 14]. A study conducted by Wisniewski and Shewan in 1987 discussed the professional's satisfaction and reported about their productivity, deliver high-quality work, and success comes when they are highly satisfied with their profession (Wisniewski and Shewan, 1987) [32]. They are more likely to be in their profession and encourage young individuals to join the same profession. ProQOL is directly associated with work satisfaction. Several factors like burnout and stress as experienced by these professionals influence them in a negative way which leads to a decline in quality work and high attrition. The working environment also affects the physical and psychological wellbeing of a professional (Theorell and Karasek, 1996) [30].

The present study is a rare one focused on the wellbeing of technologists and radiologists during the COVID-19 pandemic. The present study aimed to assess three major components named CS, burnout, and STS among radiographers and radiologists in India. At present, the COVID-19 pandemic has created uncertainty and overload with changes in the department-working protocol leading to stress, fear, and exhaustion among radiology department workers (Elshami *et al*., 2021) [6].

In this study, less than one-fourth (24%) of the participants reported a higher level of CS which is comparable to the study conducted among allied health professionals in New Zealand (Severn *et al*., 2012) [25] and is lower as compared to the previous studies conducted among other healthcare professions (Ravi *et al*., 2016; Stamm, 2010) [21, 29]. Most participants reported a moderate level of CS. Both males and females showed a moderate level of CS followed by a high CS. In this study, most participants reported a moderate level of burnout (71%) and STS (69.3%) as compared to the lower level of burnout (28.8%) and STS (30.7) which is higher from the studies conducted among allied health professionals in India (Ravi *et al*., 2016) [21] and palliative care professionals in Spain and Brazil(Galiana *et al*., 2017).

Table 5: Correlation between the scale domains using product moment correlation coefficient

Scale domain	Compassion satisfaction	Burnout	Secondary traumatic stress
Compassion Satisfaction Burnout	1	0.405[a] 1	0.132a 0.359
Secondary Traumatic Stress			1

Another study conducted in Pakistan reported the impact of the COVID-19 pandemic on the mental health of radiology professionals (Rana *et al*., 2020) [20]. It was seen that the number of patients needing care in the radiology department was increased and many hospitals recruited temporary workers to overcome the workload during the COVID-19 period. It is also interesting to know that none of the professionals reported a higher level of burnout and STS and very few participants reported lower levels of CS from their duties, so this allows them not to achieve a higher level of CF. Among gender, a moderate level of CS (males: 74% and females: 67%), burnout (males: 75% and females: 66%), and STS (males: 71% and females: 66%) is prevalent as compared to high and low level of CS, burnout, and STS. In terms of occupation, a moderate level of CS, burnout, and STS is common among radiologists and technologists. It is also evident among healthcare providers that in India had the low quality of life during COVID-19 pandemic and is associated with the high prevalence of stress and depression which could be due to stressors in the working environment (Rana *et al*., 2020) [20].

Similar observations have been made in the study conducted by Elshami *et al*. (2021) [6] which could be due to the high level of support between workers during the COVID-19 pandemic, which was stressful, and this uplifted as well homogenize their responses. Our findings suggest that there is a need for good management and some sort of stress management pieces of training or activities required to be given to radiology department workers irrespective of their age, gender, and occupation.

Table 5 reported the product-moment correlation between subdomains among favorable outcomes. Any reduction in burnout would result in an increase in CS, and vice versa, as per a moderately negative association between CS and

burnout. In addition, this study showed a slender positive association between burnout and STS. Our findings have been supported by the studies conducted by Ravi *et al*. among allied health professionals (Ravi *et al*., 2016) [21] and Ruiz-Fernandez *et al*. in 2021 [23] among healthcare professionals during the COVID-19 crisis in Spain (Ruiz-Fernandez *et al*., 2021) [23].

A meta-analysis of research studies conducted by Cieslak *et al*. (2014) [5] on professionals with exposure to trauma reported a strong association between burnout and STS. There is no correlation found between burnout and STS in this study which is contrary to the studies conducted among other professionals (Ravi *et al*., 2016; Severn *et al*., 2012) [21, 25].

Furthermore, the relationship between subdomains of the scale and gender and occupation was assessed. No significant difference has been seen among any subdomain scale and gender occupation and is comparable to the study conducted by Blood *et al*. in 2002 [4] among other allied health professionals (Blood *et al*., 2002) [4] and contrary to the study conducted by Ortega-Galan before COVID-19 in Spain (Ortega-Galan *et al*., 2020) [18].

This study emphasized the nature of ProQOL among medical imaging technologists and radiologists during COVID-19 pandemic working in India. The productivity and effectiveness of these professionals are directly impacted by their quality of life in their work.

Limitations of the Study

The study had low response and small sample size, so the result needs to be interpreted with great caution. Few other confounding factors like qualifications, experience (in years), and work setting are still not explored. This study also highlights the need to explore a study with a large sample size of professionals and wide geographical distribution which will further strengthen the implication of the study. Also, there is need of developing the evidence using quantitative and qualitative evaluations on the ProQOL among healthcare professionals.

Conclusion

This study attempted to assess the ProQOL among medical imaging professionals during the COVID-19 pandemic in India. The current area of ProQOL among healthcare workers needs to be explored because the quality of life plays a vital role in the work related outputs and provide quality service to the patients.

References

1. Akroyd D, Caison A, Adams RD. Burnout in radiation therapists: the predictive value of selected stressors. International Journal of Radiation Oncology, Biology, Physics. 2002;52(3):816-821.
2. Akudjedu TN, Lawal O, Sharma M, Elliott J, Stewart S, Gilleece T. *et al*. Impact of the COVID-19 pandemic on radiography practice: findings from a UK radiography workforce survey. British Journal of Radiology Open, 2, Article 20200023; c2020.
3. Alavi SS, Dabbagh ST, Abbasi M, Mehrdad R. Radiation protection knowledge, attitude and practice (RP-KAP) as predictors of job stress among radiation workers in Tehran Province, Iran. Iranian Red Crescent Medical Journal. 2016;18(10):e29394.
4. Blood GW, Thomas EA, Ridenour JS, Qualls CD. Job stress in speechlanguage pathologists working in rural, suburban, and urban schools: Social support and frequency of interactions. Contemporary Issues in Communication Science and Disorders. 2002;29:132-140.
5. Cieslak R, Shoji K, Douglas A, Melville E, Luszczynska A, Benight CC. A meta-analysis of the relationship between job burnout and secondary traumatic stress among workers with indirect exposure to trauma. Psychological Services. 2014;11(1):75.
6. Cieszanowski A, Czekajska E, Giz_ycka B, Gruszczynska K, Podgorska J, Oronowicz-Jaskowiak A, *et al*. Management of patients with COVID-19 in radiology departments, and indications regarding imaging studies - recommendations of the Polish Medical Society of Radiology. Polish J Radiol. 2020;85:e209-e214. Elshami W, Akudjedu TN, Abuzaid M, David LR, Tekin HO, Cavli B., *et al*. The radiology workforce's response to the COVID-19 pandemic in the Middle East, North Africa and India. Radiography. 2021;27(2):360-368.
7. Figley CR. Treating compassion fatigue. New York, NY: Brunner- Routledge. Freudenberger, H.J. The staff burn-out syndrome in alternative institutions. Psychotherapy: Theory, Research & Practice. 1975, 2002;12(1):73.
8. Galiana L, Arena F, Oliver A, Sanso N, Benito E. Compassion satisfaction, compassion fatigue, and burnout in Spain and Brazil: ProQOL validation and cross-cultural diagnosis. Journal of Pain and Symptom Management. 2017;53(3):598-604.
9. George RC, Ndlov B. The prevalence and antecedents of occupational stress among radiographers in Zimbabwe: Interplay of economics and culture. International Journal of Medical Research and Health Sciences. 2013;2(2):233-238.
10. Graham J, Ramirez AJ, Field S, Richards MA. Job stress and satisfaction among clinical radiologists. Clinical Radiology. 2000;55(3):182-185.
11. Huggard P, Dixon R. Tired of caring": The impact of caring on resident doctors. Australasian Journal of Disaster and Trauma Studies. 2011;3:105-112.
12. Joob B, Wiwanitkit V. Radiology management and COVID-19 in resource limited setting. Academic Radiology. 2020;27:750.
13. Kim HJ, Choi HJ. Emergency nurses' professional quality of life: compassion satisfaction, burnout, and secondary traumatic stress. Journal of Korean Academy of Nursing Administration. 2012;18(3):320-328.
14. Kotian RP, Faujdar D, Kotian SP, D'souza B. Knowledge and understanding among medical imaging professionals in India during the rapid rise of the COVID-19 pandemic. Health and Technology. 2020;10:1415-1420.
15. Lauvrud C, Nonstad K, Palmstierna T. Occurrence of post traumatic stress symptoms and their relationship to professional quality of life (ProQoL) in nursing staff at a forensic psychiatric security unit: a cross-sectional study. Health Qual Life Outcomes. 2009;7(1):1-6.
16. Maslach C, Jackson SE, Leiter MP. Maslach Burnout Inventory Manual. Palo Alto, CA: Consulting Psychologists Press; c1996.
17. Maslach C, Zimbardo PG. Burnout: The Cost of Caring. Englewood Cliffs, NJ: Spectrum; c1982.

18. Ortega-Galan AM, Ruiz-Fernandez MD, Lirola MJ, Ramos-Pichardo JD, Iban~ezMasero O, Cabrera-Troya J, *et al*. Professional Quality of Life and perceived stress in health professionals before COVID-19 in Spain: Primary and hospital care. In Healthcare. Spain: Multidisciplinary Digital Publishing Institute; c2020. p. 484.
19. Potter P, Deshields T, Divanbeigi J, Berger J, Cipriano D, Norris L. *et al*. Compassion fatigue and burnout: Prevalence among oncology nurses. Clinical Journal of Oncology Nursing. 2010;14(5):E56.
20. Rana W, Mukhtar S, Mukhtar S. Mental health of medical workers in Pakistan during the pandemic COVID-19 outbreak. Asian Journal of Psychiatry, 51, Article 102080; c2020.
21. Ravi R, Yerraguntla K, Gunjawate DR, Guddattu V, Bellur R. Professional quality of life in audiologists and speech language pathologists working in India. Journal of Workplace Behavioral Health. 2016;31(3):162-172.
22. Reeter RE. Job Satisfaction Survey in Speech-Language Pathology. [Unpublished master's thesis]. University of Northern Iowa. Retrieved from https:// comdis. Uni; c2012.
23. Ruiz-Fernandez MD, Ramos-Pichardo JD, Ibanez-Masero O, Carmona-Rega MI, Sanchez-Ruiz MJ, Ortega-Galan AM. Professional quality of life, selfcompassion, resilience, and empathy in healthcare professionals during COVID19 crisis in Spain. Research in Nursing & Health. 2021;44:620-632.
24. Rutter DR, Lovegrove MJ. Occupational stress and its predictors in radiographers. Radiography. 2008;14(2):138-143.
25. Severn MS, Searchfield GD, Huggard P. Occupational stress amongst audiologists: Compassion satisfaction, compassion fatigue, and burnout. International Journal of Audiology. 2012;51(1):3-9.
26. Singh N, Knight K, Wright C, Baird M, Akroyd D, Adams RD. *et al.* Occupational burnout among radiographers, sonographers and radiologists in Australia and New Zealand: findings from a national survey. Journal of Medical Imaging and Radiation Oncology. 2017;61(3):304-310.
27. Stamm BH. Measuring compassion satisfaction as well as fatigue: developmental history of the compassion satisfaction and fatigue test; c2002.
28. Stamm B. The ProQOL Manual. Boise, ID: Sidran Press; c2009.
29. Stamm B. The Concise ProQOL Manual: The concise manual for the Professional Quality of Life Scale (2nd ed.). ProQOL.org; c2010.
30. Theorell T, Karasek RA. Current issues relating to psychosocial job strain and cardiovascular disease research. Journal of Occupational Health Psychology. 1996;1(1):9.
31. Verrier W, Harvey J. An investigation into work related stressors on diagnostic radiographers in a local district hospital. Radiography. 2010;16(2):115-124.
32. Wisniewski AT, Shewan CM. There is joy in Mudville. Career satisfaction. ASHA. 1987;29(9):30-31.