

By Dr M Schneider

Occupational burnout among radiographers, sonographers and radiologists in Australia and New Zealand: findings from a national survey

Health care professionals are prone to occupational burnout as they have to deal with sick and injured patients on a daily basis. This can affect their psychological and physical wellbeing and may also impact on the health care delivery to patients. Staff working in radiology clinics in the UK and USA are known to experience high levels of burnout. Here, we summarise the findings from a national survey exploring and comparing the levels of occupational burnout among radiographers, sonographers and radiologists working in Australian and New Zealand radiology clinics. Our study has shown that almost all participants suffered from occupational burnout with levels of burnout higher than those reported in other countries. Emotional exhaustion and depersonalisation scores were very high across all professions. Radiologists had slightly better scores for personal accomplishment than radiographers or sonographers. These findings highlight that current work practices in radiology clinics across Australia and New Zealand need to change in order to reduce the observed high levels of burnout among all staff and maintain quality levels of patient care.

OCCUPATIONAL BURNOUT IN THE RADIOLOGY CLINIC

Health care practitioners interact with sick or injured patients and their families or caretakers, exposing them to the associated emotional, physical and social problems on a regular basis. Over time, this exposure can result in stress in the workplace which can lead to a range of problems such as increased absenteeism, ill health and lack of motivation/care for patients. It may ultimately affect the quality of care delivered to patients. It has been well established that health care professionals suffer a high level of occupational burnout compared to other professionals. Health care professionals working in radiology clinics appear to be particularly affected by stress and burnout. The increased 'commercialisation' of radiology services and the pressure to complete patient lists

without the time to engage with individual patients appears to be the main cause of stress in this particular clinical environment. Previous studies have demonstrated that radiologists [1,2] and sonographers [3] in the USA experience high and moderate levels of burnout respectively. Radiographers in Australia [4,5] and mammographers in the UK [6] appear to also suffer high levels of occupational stress.

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Maslach and Jackson developed a survey tool to evaluate work-related burnout [7]. This survey tool, the 'Maslach Burnout Inventory' (MBI) has been used extensively to investigate occupational burnout among various professions including medical and allied health practitioners. According to Maslach and Jackson, burnout occurs in a sequence of stages:

- Initially, professionals feel an increased level of emotional exhaustion.

This stage is followed by a stage of depersonalisation which is characterised by poor or an impersonal response towards patients.

The final stage in the sequence of burnout is a feeling of low personal achievement which typically include feelings of being unsuccessful at work and having low levels of competence.

The MBI measures these stages of burnout using a scoring system for each of these three stages and also provides a score for the overall level of burnout (a combination of the three sub scores). The MBI allows for direct comparisons between the results of different studies.

We set out to evaluate and compare the level of burnout among Australian and New Zealand health professionals working in radiology clinics, namely radiologists, radiographers and sonographers. We also aimed to explore sociodemographic and occupational characteristics which may predict the level of burnout among these professionals as there is very limited information on such predictors in the literature.

A NATIONAL SURVEY

Our survey aimed at capturing the responses of radiology professionals across Australia and New Zealand in order to gain a broad spectrum of responses from professionals working in varied clinical practices across both countries where the work culture and practices are very similar. Radiographers, sonographers and radiologists who were registered with their respective professional bodies (Australian Institute of Radiography – now renamed the Australian Society of Medical Imaging and Radiation Therapy; the Australasian Sonographers Association and the Royal Australian and New Zealand College of Radiologists) were invited to participate anonymously via an online, self-administered, cross-sectional survey. Radiation therapists or therapy radiographers were not included in this survey. The survey was advertised on the web sites of all three professional bodies. Consent was implied

upon completion of the survey.

We used the validated MBI to measure burnout in our study cohort [7]. The MBI consists of 22 questions which measure the three stages of burnout, emotional exhaustion (EE), depersonalisation (DP) and personal accomplishment (PA). For each question, participants rate

completed the survey. Most participants were working full time, performed up to five hours overtime each week, had over 10 years' experience, were married and had dependents.

The burnout scores for EE, DP and PA for all participants are shown in Table 1. All participants had high levels of EE and

	Radiographers N = 613	Sonographers N = 121	Radiologists N = 35
Variable (N (%))			
Emotional exhaustion	581 (94.8)	119 (98.3)	35 (100)
Depersonalisation	536 (87.4)	108 (89.2)	34 (97.1)
Personal accomplishment	326 (53.2)	42 (34.7)	12 (34.3)
* Emotional exhaustion score = 27 Depersonalisation score = 13 Personal accomplishment score = 31			

Table 1: Number (%) of radiographers, sonographers and radiologists with high burnout scores for emotional exhaustion, depersonalisation and personal accomplishment*

their experience on a 7-point Likert scale ranging from 1 (never) to 7 (every day). The overall burnout score comprises the sum total of the scores for each of the three stages. Occupational burnout according to the MBI is characterised by high scores for EE and DP (≥ 27 and ≥ 13 respectively) and low scores for PA (≤ 31). These scores are compared to the national norms in the USA for medical staff (N = 11,067) as reported in the MBI [7] and between published studies. Participants also provided information on demographic characteristics, such as gender, number of years' experience in the profession, highest qualification, marital status, dependents, work commitments (full or part time work) and average number of hours worked overtime/week. We used t-tests and ANOVA with Tuckey's post hoc analysis to investigate the relationship between demographic characteristics and the three stages of burnout for each group of professionals. The study was approved by our institutional human research ethics committee.

OUR FINDINGS: PREVALENCE OF BURNOUT

By the end of the study, 613 radiographers, 121 sonographers and 35 radiologists had

DP compared to MBI norms. Radiographers in particular were characterised by low levels of personal accomplishment in comparison to sonographer's and radiologists, as well as the MBI norms. Radiologists had the highest level of EE and DP compared to the other medical imaging staff.

BURNOUT ACCORDING TO DEMOGRAPHIC CHARACTERISTICS

Among radiographers and sonographers, qualification, marital status and dependents were not significantly associated with burnout. However, working hours and involvement with student training were factors identified as having significant influence on burnout levels. In particular, radiographers working > 10 hours overtime/week reported significantly higher emotional exhaustion levels ($p = 0.0001$). Male radiographers who were involved in < 10% of their time training students/week had higher depersonalisation scores than female radiographers who spend more time training students and who work part-time/casually. The findings for sonographers were similar. For radiologists, there were no statistically significant associations between any of the demographic characteristics and the three stages of burnout.

DISCUSSION

Our results have shown that radiographers, sonographers and radiologists working in Australia and New Zealand experience high levels of occupational burnout and have higher burnout scores than those reported in other countries among the same professional groups. Radiographers in particular report very low levels of personal accomplishment. Other studies have indicated that radiographers experience little autonomy in the radiology clinic [8], report feelings of subordination and paternalism and felt that their work is underappreciated and undervalued by the radiologists in their clinic [8]. Major stressors for radiographers include interaction with patients, high workload and on call/overtime duties [5]. Sonographers typically experience similar stressors in the clinic as radiographers. However, little has been published in this group of professionals. Our findings concur with those reported among sonographers in the USA which found moderate levels of burnout across all three stages of the MBI [3]. In our study, sonographers had higher MBI scores than those for sonographers in the USA. It is not known why Australian and New Zealand sonographers would have higher burnout scores than their American counterparts. This requires further research.

Not surprisingly, many hours spent working overtime was the key contributor to burnout among radiographers and sonographers. These findings make intuitive sense. In many centres, the 'value' of a radiographer or sonographer is determined by the number of successful scans performed each day. There is little time to engage with patients and, coupled with increasing pressures to complete growing patient lists and stay abreast of technological advances, demands on these professionals continues to increase. Sonographers are also prone to musculo-skeletal disorders, further placing stress on their daily performance.

Our study found that some engagement with training of students or staff (< 10% of overall time) reduces occupational burnout and provides an improved level of personal accomplishment. However, little has been published to support this finding.

Radiologists in our study experienced EE and DP but reported high levels of PA. Similar findings have been reported

among radiology trainees in the USA [1]. None of the demographic characteristics attributed to the level of burnout in this group. Unfortunately, very few radiologists participated in this survey and larger studies are needed in order to provide more conclusive outcomes.

CONCLUSION

A high number of radiographers, sonographers and radiologists report high levels of occupational burnout in Australia and New Zealand. Hours worked overtime is one of the key contributors to burnout among radiographers and sonographers. Research is needed to explore ways to alleviate the ongoing pressures experienced by these professional groups in order to maintain optimal patient care in the future.

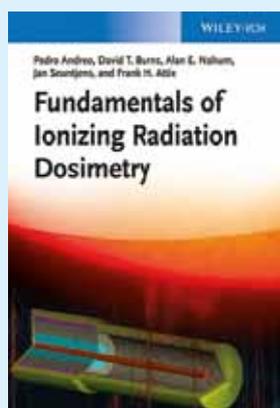
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Book review

Fundamentals of Ionizing Radiation Dosimetry, 2nd Edition

By P Andreo, DT Burns, AE Nahum, J Seuntjens, F H Attix
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A new, comprehensively updated edition of the acclaimed textbook by F.H. Attix (*Introduction to Radiological Physics and Radiation Dosimetry*) taking into account the substantial developments in dosimetry since its first edition. This monograph covers charged and uncharged particle interactions at a level consistent with the advanced use of the Monte Carlo method in dosimetry; radiation quantities, macroscopic behaviour and the characterization of radiation fields and beams are covered in detail. A number of chapters include addenda presenting derivations and discussions that offer new insight into established dosimetric principles and concepts. The theoretical aspects of dosimetry are given in the comprehensive chapter on cavity theory, followed by the description of primary measurement standards, ionization chambers, chemical dosimeters and solid state detectors. Chapters on applications include reference dosimetry for standard and small fields in radiotherapy, diagnostic radiology and interventional procedures, dosimetry of unsealed and sealed radionuclide sources, and neutron beam dosimetry. The topics are presented in a logical, easy-to-follow sequence and the text is supplemented by numerous illustrative diagrams, tables and appendices.