Work-related stress among diagnostic radiographers

N Gam[1], S Naidoo[1] and T Puckree[2]

[1] Department of Radiography, Faculty of Health Sciences, Durban University of Technology, South Africa
[2] Faculty of Health Sciences, Durban University of Technology, South Africa

Correspondence: Prof. Threethambal Puckree, Mansfield School, Gate 8 Steve Biko Road, Durban University of Technology, Durban, South Africa 4000. e-mail: puckreet@dut.ac.za

ABSTRACT

This study sought to determine work-related stress in public sector diagnostic radiographers in a selected district in KwaZulu-Natal. Data were collected through a cross-sectional descriptive survey using self-administered questionnaires. All public sector diagnostic radiographers in one district participated in the study after ethical approval and informed consents were obtained. The public domain questionnaire was developed by the Health and Safety Executive in the United Kingdom and sought information in five standards believed to result in stress in healthcare workers. The results showed that radiographers were overworked but their stress emanated from a lack of communication, demands and external controls ($p<0.001$). Managers created significant stress in the respondents ($p<0.001$). The other main sources of stress were workload (60%), faulty equipment (54%) and staff shortages (40%). We conclude that stress in diagnostic radiographers as reported by the respondents is dependent on external rather than internal loci of control.

Keywords: **work-related stress, radiographers, public sector**

INTRODUCTION

Work-related stress impacts on the psychosocial, emotional and quality of life of the individuals affected and those being serviced.[1-3] In healthcare environments, absenteeism, poor work performance and reduced quality of patient care ensue.[4,6] Work-related stress is precipitated by staff shortages, increasing demands, and issues of control.[5,7] The South African healthcare industry faces dire shortages in almost every discipline of care. Radiographers have not been immune, especially in the face of needs generated at the primary healthcare level, and the increasing prevalence of malignant and infectious disorders. The ratio of radiographers to the population in the province of KwaZulu-Natal, which stands at 1.42 per 10 000 of the population, is unacceptable.[8] The province has 437 unfilled vacancies for radiographers.[8] The 2008 statistics show an annual graduate output of 180 per year for the entire country, which will do little to mitigate the dire need for radiographers.

Few studies have investigated work-related stress in radiographers.[4-7,9-11] In South Africa, Makanjee et al. studied the effects of occupational stress and organisational support on the quality of service rendered by radiographers and reported that organisational structure contributed to stress.[3] Verrier and Harvey found that support from managers, relationships, role and change were categories of stressors that produced the greatest risks.[7] They also found that staff shortages and heavy workloads produced pressure at work. These findings were affirmed by Yeboah et al.[6] and Rutter and Lovegrove.[5]

Several models of understanding work-related stress have been proposed.[2,6,12] These pertain to external and internal loci of control, and assist in understanding the constructs of work-related stress in healthcare professionals. Where the worker had the opportunity to control his/her environment, stress was managed. Since the extent of occupational stress in radiographers in KwaZulu-Natal is not known, this study investigated public sector diagnostic radiographers' views on work-related stress based on the standards proposed by the Health and Safety Executive (HSE) in the United Kingdom (UK) and used by Verrier and Harvey.[7]

METHODS

A descriptive cross-sectional survey determined stressors in five work-related domains in public sector diagnostic radiographers in the eThekwini district of KwaZulu-Natal.

At the time of the study (February 2014), there were 156 diagnostic radiographers working in public health institutions which offer diagnostic radiographic services in the selected district. Only those radiographers who were registered as independent practitioners with the Health Professions Council of South Africa (HPCSA), had completed their community service by 31 December 2013, and were appointed as diagnostic practitioners, were invited (n = 101).

A questionnaire adapted from that designed by the HSE, which comprised 68 open- and closed-ended questions in six management standards (demands, control, support, relationship, role, and change) was used to collect data.[7] The questionnaire was adapted by the investigator to ensure applicability to the research setting. The first section (13 items) requested demographic data. In the next two

categories, a five-point Likert scale included 27 questions measuring frequency (never to always), and 24 questions gauging agreement (strongly disagree to strongly agree). The anonymised questionnaire was validated using an expert group and a pilot study, for use in the local setting. The overall reliability coefficient (Cronbach's alpha) for the tool was 0.75.

Quantitative data were analysed using the Statistical Package for Social Sciences (SPSS), version 21.0. Descriptive statistics, cross tabulations, Pearson's correlation coefficients and Chi square tests determined relationships between variables at a 95% level. Cronbach's alpha allowed us to determine the internal consistency of the questionnaire.

Ethical approval was obtained from the Institutional Research Ethics Committee, and the KwaZulu-Natal Department of Health (KZNDOH). Permission to access public sector diagnostic radiographers was also received from the KZNDOH.

RESULTS

The response rate was 42.6% (n = 43) despite repeated attempts to increase participation. The respondents' ages ranged from 20 to 60 years (31.7 ± 9.5 years). About half of the respondents (51%) were aged 20 to 29 years. The majority were single (58%), female (88%) and held a national diploma (67%). The majority (41.9%) of the participants were senior radiographers (level 3); 4.9% were at level one (junior), and the remainder were at the rank of level two.

Thirty-two percent of the respondents had more than 16 years of experience as radiographers. The remainder had three to five years (26.0%), or fewer than two years (19.0%), of experience. Most (72.1%) of the respondents worked in a regional hospital, 16.2% worked in a district hospital, 7.0% in a central hospital, and 4.7% in a community health centre.

Stressors

Demands

Almost one fifth of the respondents often found it hard to manage demands from various people (Table 1). A significant proportion agreed that, more often than not, they had to work intensively ($p<0.001$) and fast ($p<0.001$). Nearly half (48.8%) indicated that their shift duties often added to their stress levels and more than a third stated that some tasks had to be neglected due to them having too much work to do; about one third (34.9%) indicated that they were satisfied with their jobs. Almost 33% of the radiographers experienced unrealistic time pressures (Table 1). Radiographers who worked in regional hospitals (58.0%) had to work intensively, often ($p = 0.002$) compared to those in district hospitals.

A moderate correlation between "deadlines were achievable" and "but difficult to honour due to the various demands" was noted ($r = 0.529$, $p<0.001$). Younger radiographers found it difficult to take sufficient breaks due to divergent demands

Table 1. Responses to items related to demands (%)

	Seldom	Sometimes	Often	p value
Different groups from work demand things from me that are hard to combine	34.9	46.5	18.6	0.079
I have unachievable deadlines	51.2	39.5	9.3	0.002
I have to work very intensively	11.6	14.0	74.4	< 0.001
I have to neglect some of my tasks because I have too much to do	34.9	30.2	34.9	0.911
I am unable to take sufficient breaks	41.9	44.1	14.0	0.026
I am pressured to work long hours	44.2	32.6	23.2	0.242
I have to work very fast	9.3	27.9	62.8	< 0.001
I have unrealistic time pressures	37.2	30.2	32.6	0.850
I am satisfied with my job	27.9	37.2	34.9	0.739
Students in training add to my stress	62.8	27.9	9.3	< 0.001
Students in training affect my ability to complete my work to my satisfaction	58.1	27.9	14.0	< 0.001
My shift duties add to my stress at work	25.6	25.6	48.8	0.098

Table 2. Responses to items related to manager's support and role ambiguity (%)

	Disagree	Neutral	Agree	p value
Manager's support				
I am given supportive feedback on the work I do	32.6	41.9	25.5	0.423
I can rely on my line manager to help me out with a problem	30.2	27.9	41.9	0.486
I have opportunities for personal growth	37.2	39.5	23.3	0.368
I have time for personal growth	60.5	16.2	23.3	0.001
I am allowed to take time off work when personal emergencies occur	23.2	32.6	44.2	0.242
I can talk to my line manager about something that has upset or annoyed me about work	25.6	25.6	48.8	0.098
My line manager encourages me at work	37.2	25.6	37.2	0.559
I am able to take a sufficient number of leave days	25.5	14.0	60.5	0.001
Role ambiguity				
I am clear about what is expected of me from work	2.4	20.9	76.7	< 0.001
I know how to go about getting my job done	0.0	2.3	97.7	< 0.001
I am clear about what my duties and responsibilities are	0.0	11.6	88.4	< 0.001
I am clear about the goals and objectives for my department	4.7	20.9	74.4	< 0.001
I understand how my work fits into the overall aims of the hospital.	0.0	18.6	81.4	< 0.001

compared to older respondents (r = 0.317, p = 0.04). Age (older), rank (senior) and experience (more years) were significantly related to decisions to take a break as required (p = 0.04, p = 0.007 and p = 0.041, respectively). Respondents who worked longer shifts were less satisfied with their jobs (r = -0.315, p = 0.04).

Control

The "often" responses to the items on control ranged from 9.3% to 53.5%; the proportion of responses for "often" was higher for the statements relating to freedom of radiographers to express themselves with regard to their own work speed (p = 0.03) and having a say over how they worked (p = 0.006) compared to "seldom" or "sometimes" (Figure 1). Many respondents (48.8%) reported that they had a say in their own work speed. More of the longer serving radiographers were able to decide on how they did their work compared to those with fewer years of service (p = 0.033).

Managers' support

Many respondents reported that they had neither the time nor the opportunities for personal growth (Table 2). Respondents' opportunities for personal growth was moderately inversely proportional to stress induced by shift duties (r = -0.508, p = 0.001). Respondents who could take time off to deal with personal emergencies felt that they had a say in their work speed (r = 0.437, p = 0.003) as well as in deciding on how to go about doing their jobs (r = 0.399, p = 0.008). The respondents felt that they received less favourable feedback when their shift duties became more strenuous (r = -0.323, p = 0.034). Encouragement received from the manager at work was moderately related to job satisfaction (r = 0.448, p = 0.003). A positive correlation was noted between encouragement received from managers and radiographers having a say in their own work speed (r = 0.377, p = 0.013).

Correlation between statements related to stress

Four out of five statements in this category had significant responses for "often" compared to "sometimes" or "seldom" (p≤0.001). The proportion of responses for these statements ranged from 53.5% to 65.1% (Figure 2).

Peer support

The eagerness of colleagues to help when work got hard was moderately inversely proportional (r = -0.307, p<0.05) to the achievement of deadlines. Respondents also felt that the more they received help from colleagues, the less they felt the pressure from working long hours (r = -0.350, p<0.01). The more the radiographers received respect from their colleagues, the less they neglected their tasks (r = 0.408, p<0.05).

Relationships

Most respondents (58.1%) reported that they were seldom subjected to personal harassment in the form of unkind words or behaviour and close to three quarters felt that they were seldom exposed to bullying at work. Many respondents aged 20 to 29 years (47.2%) reported that they seldom experienced bullying at work. Personal harassment in the form of unkind words was related to unachievable deadlines (r = 0.383, p<0.05). When respondents were subjected to personal harassment, they also had to neglect some of their tasks due to high workloads and vice versa (r = 0.0518, p<0.05). The same group of respondents who experienced personal harassment also felt that they had unrealistic time pressures. Friction and anger amongst radiographers also resulted in them having to neglect some tasks (r = 0.338; p<0.001) and being unable to take sufficient breaks (r = 0.373, p<0.01). Friction or anger between colleagues was moderately inversely proportional to job satisfaction (r = -0.521, p< 0.01).

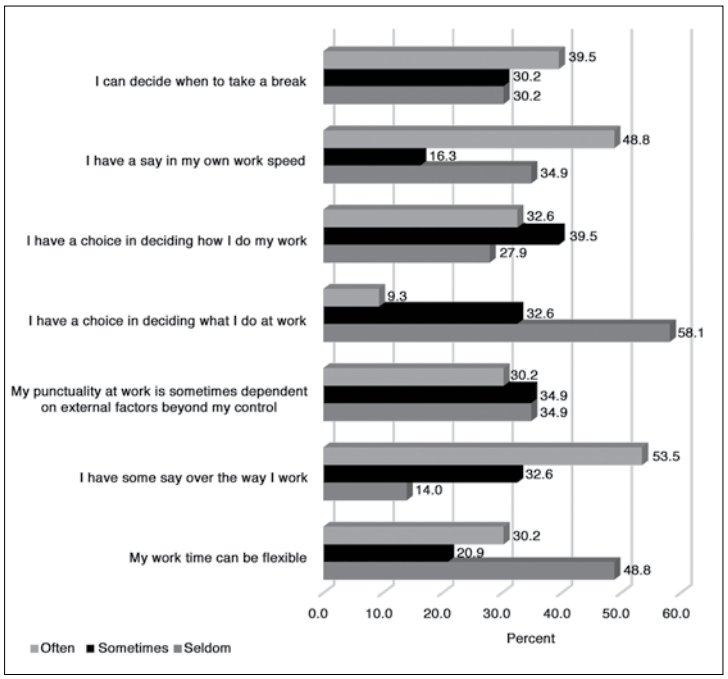

Figure 1. Responses to items related to control (%)

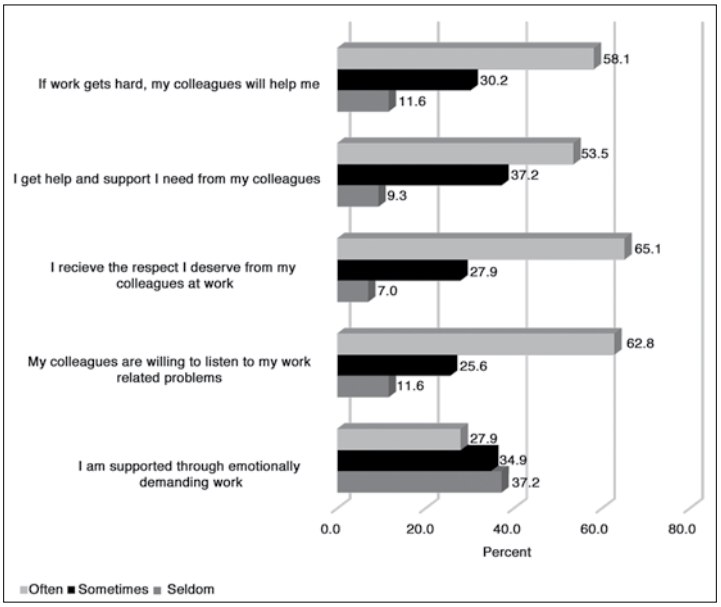

Figure 2. Responses to items related to peer support (%)

Role ambiguity

In this category, 74.4% to 97.7% of the respondents responded "often" to statements (Table 4) compared to "seldom" or "sometimes" ($p<0.001$). Many respondents were clear about their internal loci of control as shown in the responses for role ambiguity in which all "often" responses were significantly higher than "seldom" or "sometimes". Rank of the respondents did not affect the "often" responses. When radiographers were clear about the goals and objectives of their departments, they also had fewer unachievable deadlines ($r = -0.314$, $p<0.01$); less pressure to work long hours ($r = -0.425$, $p<0.01$); more say in their work speed ($r = 0.319$, $p<0.01$); more say over the way they worked ($r = 0.469$, $p<0.01$); more control over factors influencing their punctuality ($r = 0.380$, $p<0.01$); and increased flexibility of work time ($r = 0.379$, $p<0.01$).

Organisational change

Almost 47% of the respondents agreed that staff were consulted about work-related changes and 39.5% agreed that when changes were made, they were clear about how changes would work out in practice (Figure 3).

Other stressors

The three other main sources of stress were workload (19.1%), faulty equipment (16.9%) and staff shortages (12.5%). Less important sources of stress included demands, poor management skills, social support, staff attitudes, and control.

DISCUSSION

The response rate was low in relation to other quantitative studies.[1,2,5] A normal distribution by age and a preponderance of women is supported by the demographic profile of the profession in South Africa. The proportion of respondents who held diplomas is congruent with the developmental level of the profession in this country. The distribution of therapists in the various healthcare settings is reflective of the healthcare structure in South Africa.

Our finding that the respondents find it hard to manage many demands resulting in stress concurs with Verrier's and Harvey's report.[7] The finding that they had to work intensely, for long hours and were sometimes unable to take sufficient breaks is similar to that found in other professions such as pharmacy and nursing.[4,6] Grunfeld et al. reported that the increasing demand for oncology care impacts the work place environment.[11]

In South Africa, radiography students receive their clinical training at public hospitals, and the associated burden of training has been placed on the radiographers. Respondents, however, did not feel that this additional work contributed to stress. Despite the workload, more senior and older radiographers took breaks whenever required. This allowed them to have some degree of control over their work situations. There is no literature to support or refute this finding. As indicated by Sehlen et al.[4], structural conditions that caused high stress among participants included time pressure, "having conflicting demands on the time", and "high workload". Grunfeld et al. affirmed this, based on a survey in 681 cancer care workers in Ontario.[11]

Table 3. Correlations between statements

Statement	Pearson's r	p value	Correlating statement/s
Ability to manage divergent demands	0.529	< 0.01	Achievable deadlines
	0.312	0.04	Work very intensively
	0.317	0.04	Unable to take sufficient breaks
Mismatch between demands and available time	0.364	0.02	Working very intensively
	0.456	0.002	Unable to take enough break times
Job satisfaction	-0.315	0.04	Longer shifts
	-0.358	0.02	Speed at which they worked
If work gets hard my colleagues will help me	-0.350	<0.001	I am pressured to work long hours
I receive the respect I deserve from my colleagues	0.336	<0.001	I am satisfied with my job
We were consulted about changes in the department	0.392	0.009	Had a say over the work they did
	0.471	< 0.001	Had a flexible work time
Clarity of respondents about the outcome of their work changes	0.321	0.036	I am clear about the goals and objectives for my department
	0.325	0.034	I understand how my work fits into the overall aims of the hospital
	0.621	< 0.001	Staff are always consulted about change at work
	-0.382	0.011	Less friction and anger amongst them

Table 4. Responses for role ambiguity (%)

	Seldom	Sometimes	Often	p value
I am clear about what is expected of me from work	2.4	20.9	76.7	< 0.001
I know how to go about getting my job done	0.0	2.3	97.7	< 0.001
I am clear about what my duties and responsibilities are	0.0	11.6	88.4	< 0.001
I am clear about the goals and objectives for my department	4.7	20.9	74.4	< 0.001
I understand how my work fits into the overall aims of the hospital	0.0	18.6	81.4	< 0.001

Similar to the study of Verrier and Harvey[7], the respondents in this study did not feel supported by their managers. Jones et al. found that radiographers working in oncology units reported the highest levels of job satisfaction, co-worker and managerial support, compared to nurses and other healthcare professionals in Scotland.[10] The lack of clarity regarding their specific jobs added to their stress. Support from colleagues reduced stress in the workplace although sometimes there was friction and anger between colleagues. When the latter occurred, tasks were neglected. Similar to findings reported by Verrier and Harvey, Sehlen et al., and Grunfeld et al., other sources of stress included workload and staff shortages.[4,7,11]

Several investigators concluded, based on their studies on radiologists, radiographers and nurses in the German Society of Radiation Oncology (DEGRO), that current workplace environments have a negative impact on the well-being of staff, increased stress levels and decreased job satisfaction.[4,11] A similar situation exists in the South African healthcare environment where demand for healthcare workers has not kept pace with supply and retention.[8] Yeboah et al. reported that healthcare staff at a teaching hospital in Ghana found that the HSE standards impacted on stress on all workers and was high in doctors and nurses but low in other healthcare professionals, including radiographers.[6] Rutter and Lovegrove found that levels of perceived stress were high in all radiographers, regardless of specialisation.[5] Similar to our study, they found that work problems, role ambiguity and conflict were buffered by social support from colleagues. Raj also reported significant stress-related consequences on the physical and mental health of healthcare workers.[9]

CONCLUSION AND RECOMMENDATIONS

This study confirmed that workload and managerial support are significant stressors in the workplace. Role ambiguity was also cited as a stressor. Control over work and support from colleagues were important in reducing stress. A follow-up study should be conducted using private sector radiographers, since the private sector is believed to be better staffed compared to the public sector. In addition, follow-up studies could investigate work-related stressors in the various sub-disciplines of radiography. The outcomes of this study will be communicated to the relevant authorities, to promote necessary interventions.

DECLARATION

The authors declare that there is no conflict of interest

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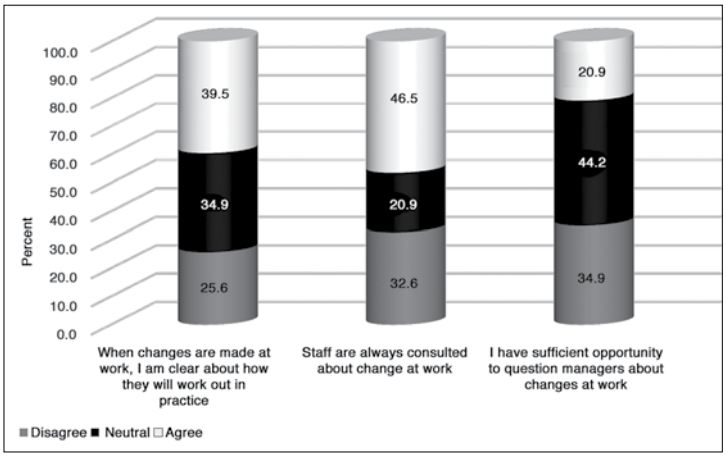

Figure 3. Responses to items related to organisational change (%)

LESSONS LEARNED

1. Health worker health is important and should be nurtured in the workplace in order to protect the quality of patient care
2. Managers must nurture and develop staff to ensure that optimal service is rendered
3. Communication with staff with regard to all matters that concern their work is important in alleviating stress
4. Radiographers should be proactive in planning work schedules to reduce stress
5. Collegiality should be fostered in workplaces

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