Occupational stress in the operating theatre suite: Should employers be concerned?

P LYNNE JOHNSTONE

P Lynne Johnstone is a Lecturer in Health Services Management, School of Public Health, Charles Sturt University – Mitchell, Bathurst.

Abstract

Research conducted amongst perioperative nurses during 1996 investigated both the causes of occupational stress and nurses' perceptions of the effects of modern medical technologies on several aspects of their work life during the preceding three years. It found that there was a strong perception amongst the 433 nurses in the study that medical technologies had contributed to their increased workloads and higher levels of stress. This article presents the key findings on occupational stress and discusses some of their implications for health service managers who have responsibility for the occupational health and safety of nurses working in the operating theatre environment.

Introduction

Research was conducted during 1996 to investigate both the causes of occupational stress amongst perioperative nurses and their perceptions of the effects of modern medical technologies on several aspects of their work life. Four hundred and thirty-three perioperative nurses in Victoria and New South Wales participated in this study that explored perioperative nurses' perceptions of the impact of modern medical technologies on changes in the nature and volume of their work, changes in job satisfaction, and changes in personal levels of stress. It sought to identify the dominant factors which are sources of occupational stress, and how this stress is manifested in individuals. It also explored nurses' satisfaction with employer-supported education and training in the use of medical technologies.

The dominant causes of distress amongst all operating theatre nurses were frequently linked with financial constraints. These were insufficient staff (numerically and experientially), lack of equipment, work overload and role overload, inadequate training opportunities in the use of new medical technologies, and aspects of organisational structure and climate. Nurses who work in scrub or circulating roles, or as operating theatre managers or educators, reported more frequently than other categories of nurses that the increased use of medical technologies in operating theatres was a factor contributing to their heavier workloads and increased levels of stress. Symptoms of stress described by nurses were consistent with what the literature describes as *distress.*

Study goals

The overall goals of the research were as follows.

1. To obtain a profile of perioperative nurses with at least three years experience in the field.

2. To investigate perioperative nurses' perceptions of changes in the nature of their work, workloads, job satisfaction and stress resulting from the dramatic increase in medical technologies in operating suites in recent years.

3. To explore the level of satisfaction that perioperative nurses had with employer-supported training opportunities in the use of operating suite technologies.

4. To investigate whether the stress reported by perioperative nurses could be described as *distress.*

5. To investigate the nature and prevalence of other workplace stressors amongst perioperative nurses.

6. To explore changes in the overall job satisfaction of perioperative nurses over a three-year period.

This article does not attempt to discuss the findings relating to job satisfaction. Rather, it focuses on the causes and symptoms of occupational stress as experienced by nurses working in the operating theatre environment.

Literature review

Occupational stress in the operating theatre has not received much attention in the literature. Some factors such as the work environment, workload and interpersonal professional relationships have been studied, but not extensively, and the dominant remedy suggested for operating theatre stress has been the use

of humour to ease interpersonal stress (Paquet 1993; Morgan 1996). No research appears to have been done on changes in the nature of work, and the effects on nursing staff of new medical technologies in operating theatres. An Australian study conducted over 10 years ago by Brewer (1986) investigated the effects on the work of health professionals (predominantly nurses) of introducing new medical technologies into patient care areas, but operating theatres were not included in her study.

Stress has been defined as 'the physical and psychological reactions experienced by an individual when confronted with a threatening or excessively demanding situation' (Vecchio 1995, p 699). Some researchers have highlighted the need to differentiate between *eustress* and *distress* (for example, Lansbury & Spillane 1983), but it is sufficient in the context of this paper to simply acknowledge that distinctions exist between what can be simply explained as good forms of stress (eustress) and bad stress (distress), and that it is undesirable for anyone to experience persistently high levels of work-related distress.

Occupational stress has been explained using a number of competing perspectives, but this paper adopts the *transactional perspective* on stress (Quinlan & Bohle 1991; McIntyre 1994). Basically, the various approaches put different levels of importance on the causes and effects of stress. The distinctions are important because medico-legal and industrial disputes about accountability for employee stress-related ill health are largely fought over the issue of who is responsible for an employee's distress. The various approaches have attempted to explain stress either in terms of only the characteristics of individual workers, or in terms of characteristics of their social and organisational environments. For example, the *response approach* views stress 'as a bodily reaction to externally imposed demands', whereas the *perception approach* views stress as arising from a worker's subjective appraisal that work is excessively demanding or threatening. However, the *transactional approach* views stress as a 'process that involves a complex set of relationships between aspects of the working environment and the capacities and behaviours of the worker' (Quinlan & Bohle 1991, p 154).

The transactional approach to stress acknowledges that:

- many events in the workplace are conditions that may lead to harsh demands and difficult workloads which will cause problems for everyone

- some stressors will cause problems for particular groups of workers or individuals

- employees respond in different ways to similar stressors.

Brewer (1991, p 15) adopted the transactional approach when she observed that 'work stress needs to be understood as emerging from the interaction between

situational factors such as the employment relationship, workload, threat of injury, working hours; and personal factors such as expectations for control, self-expression and involvement'. However, she explained that situational factors in themselves do not lead to distress because a person's response will also depend on their perception and interpretation of the situation. Yet 'if workers experience excessive job tension arising from work overload or underload, inequitable reward systems, lower career prospects or lack of work engagement, it is likely that they will report some level of experienced distress' (Brewer 1991, p 15).

The personal, interpersonal and organisational factors contributing to employee stress have been discussed in a previous paper by this author (Johnstone 1997). *Organisational factors* contributing to employee stress were summarised as the absence of intrinsically enjoyable and rewarding work, work overload and work underload, role conflict, role ambiguity, role overload, shift work, responsibility for others, emotional labour, job insecurity, and aspects of organisational structure and climate (see Quinlan & Bohle 1991; McIntyre 1994; Vecchio 1995).

Burnout is an extreme state of distress resulting from the cumulative effects of stressors such as role conflict, role ambiguity and role overload. It has been described by Zohar (1997, p 101) as 'a unique response syndrome arising from chronically heightened job demands' that is characterised by 'emotional exhaustion, depersonalisation, and lowered self accomplishment'. Vecchio (1995, p 509) noted that burnout typically affects people who are highly conscientious and work in the helping professions, for example, police officers, social workers and nurses.

Finally, people respond to or cope with stress in various ways. They can be summarised under the following four headings (Vecchio 1995, pp 510–11).

- *Flight or fight*. These relate to the decision to leave a distressing situation or to stay and confront it, possibly by invoking some personal change to deal with it. Many factors might influence an employee's choice to either fight or flee. For example, not being qualified or confident to perform an alternative job, and fear of job insecurity, are two of the numerous reasons why many employees could feel that they have no choice but to remain in their distressing situations, even though they feel overwhelmed and have little or no *fight* left in them.

- *Social support* involves building a support network from others such as co-workers.

- *Exercise and relaxation.*

- *Job redesign.* This relates to ways that employees can try to influence aspects of their work life such as what work is performed, how it is done, by whom, and the volume of work associated with it.

In recent years, employers have responded to employee stress by offering various types of workplace health promotion programs (Quinlan & Bohle 1991). It is worthwhile to briefly explore why this is so. Most programs are based on the assumptions of the *perception approach to stress* which proposes that the way to deal with the stress is to equip the individual worker to handle or manage the stress better. For example, counselling and employee-assistance programs in physical fitness, quit smoking, relaxation techniques and stress management education have the predominant goal of helping individual employees to better manage their responses to distressing situations – strategies which ultimately 'transfer responsibility for dealing with a problem onto the individual worker' (Quinlan & Bohle 1991, p 159). As good as these programs might be, Quinlan and Bohle (1991) are critical of this imbalanced approach to the 'employee stress problem', because *these approaches have focused heavily on individual behaviour change and have diverted the attention of employers from the factors in their work environments which are significant stressors.*

Lansbury and Spillane (1983, p 205) observed that managers have tended to employ the packages promoted by the 'stress management ideology' as solutions because they are relatively inexpensive, 'operate at the level of the individual, leave the technical system undisturbed and do not tamper with the power and authority relationships' in their organisations. In this connection, Quinlan and Bohle (1991) drew attention to one of the inconsistencies of the stress management ideology when they highlighted the unwarranted attention it pays to 'executive stress' whilst ignoring strong evidence that the burden of work stress falls most heavily on workers who are lower in the organisational hierarchy, such as the nurses in this study.

Method

The research instrument in this study was a survey questionnaire. The questions relevant to this article produced data relating to the following.

1. Personal and workplace characteristics *(Questions 1–7)*

    - State of employment (Victoria or New South Wales)

    - perioperative nursing role

    - length of perioperative experience

    - gender

- geographic location
- number of operating theatres
- health sector (that is, public or private).

2. Nurses' perceptions of effects on them of 'modern' technologies in operating suites in terms of:

    - extent of changes in the nature of their work *(Question 8)*
    - changes in the volume of their work *(Question 11)*
    - changes in personal work-related stress *(Question 12).*

3. Nurses' satisfaction with training opportunities supported or provided by employer in relation to 'modern' technologies in operating suites *(Question 9).*

4. The symptoms of the stress *(Question 13).*

5. Other stressors *(Question 14).*

Questionnaires were mailed to potential study participants who were either members of the Victorian Perioperative Nurses' Group (VPNG) (a membership of approximately 900) or perioperative nurses working in one of seven New South Wales hospitals which were deemed by the researcher to be representative of the possible mix of type, sizes and locations of the hospitals of the VPNG participants (a total of approximately 180 potential New South Wales participants).

To satisfy selection criteria for participation in the study it was necessary for a nurse to be currently working as a perioperative nurse, and also to have been working as a perioperative nurse prior to June 1993. The latter criterion was necessary because of the emphasis of the study on nurses' perceptions of changes over time.

Because the study aimed to determine the intensity of nurses' perceptions of the effects of technologies over time, Likert scales of 0–10 (with 0.5 point increments permitted) were employed in Questions 8, 9, 11 and 12 (in relation to study goals 2 and 3) to report the intensity of these perceptions. With the exception of Question 8 relating to the *extent* of changes in the nature of work, the score of 5 represented neutrality (for example, neither satisfied nor dissatisfied). In the case of Question 8, the score of 5 represented 'moderate change' and zero represented 'no change'.

Unstructured responses were requested to Questions 13 and 14 relating respectively to the symptoms of individual stress and nurses' perceptions of other stress-inducing factors in their workplaces. Participants who had experienced

increased levels of stress over the preceding three years were invited to identify and comment on the dominant two symptoms of personal stress and up to two key factors other than medical technologies that had contributed to their stress. The responses to each question were initially analysed by a research assistant who undertook much of the preliminary identification of themes. These were subsequently validated, conceptually grouped and interpreted by the researcher.

Data and results

A total of 451 nurses returned their questionnaires, resulting in 433 valid and usable responses. Of these, 301 were from Victoria (representing approximately 33% of the VPNG membership) and 132 were from New South Wales. The higher participation rate of the New South Wales nurses (in excess of 70%) could be partly attributed to the fact that the researcher made personal contact with the managers of the seven participating operating theatre suites, and there was an expectation that they would encourage their staff to complete and return the questionnaires.

Characteristics of the participants

Overall, more than 80% of the 433 participants worked as scrub or scout/ circulating nurses (see Table 1), and about 88% had worked as perioperative nurses for at least five years (see Table 8).

Table 1: Participants differentiated by dominant perioperative role, based on State

State		Scrub & circulating	Anaesthetics	Recovery room	Flexible endoscopy	Others	Total
Victoria							
	Number	256	12	4	1	26	299
	Percentage	85.6	4.0	1.3	0.3	8.7	100
NSW							
	Number	92	13	18	4	4	131
	Percentage	70.2	9.9	13.7	3.1	3.1	100
Total		**348**	**25**	**22**	**5**	**30**	**430***
Percentage of total		**80.9**	**5.8**	**5.1**	**1.2**	**7.0**	

Note: Three nurses did not identify their perioperative role.

Perioperative nurses' perceptions of the impact of new medical technologies

The impact of new medical technologies on four domains of perioperative nurses' work is reported in the following eight tables. First, a general impression of the overall strength of nurses' perceptions of change in these four domains can be obtained from the summary statistics provided in Table 2. Intensity of perceptions in the four domains were represented on a 0–10 point Likert scale.

Table 2: Overview of the intensity of nurses' perceptions of change in four domains (n = 433)

	Changes in nature of work (Q8) (5 = moderate change)	Satisfaction with training (Q9) (5 = neutral)	Changes in volume of work (Q11) (5 = neutral)	Changes in levels of stress (Q12) (5 = neutral)
Mean	6.81	5.82	7.45	6.83
Standard deviation	2.10	2.29	1.69	1.76

Significant differences between categories of nurses have been observed in two of the four domains summarised above – changes in the volume of work and levels of stress. Overall, scrub and scout nurses and 'others' (managers and educators) reported significantly greater levels of technology-related increased workload and increased stress than the remaining nurses, while nurses working in anaesthetics (n = 25) reported substantially less change in the three domains (nature and volume of work, and stress) than the other categories of nurses. The only exception in the latter group was that more anaesthetic nurses (68%) reported increased stress than recovery room nurses (40.9%).

Table 3 summarises perceptions of change in the *nature of work* resulting from medical technologies since mid-1993. The mean score of 6.81 (SD = 2.1) reveals that, overall, the nurses (n = 433) believe that their work has changed at a greater than moderate extent during the three-year period. Furthermore, 73.5% of nurses surveyed reported *substantial change* (that is, recorded a score ≥5) in the nature of their work and, although a smaller proportion of anaesthetic nurses reported such change, there is no significant statistical difference between the perceptions of the four categories of nurses (χ^2 = 2.47; Crit χ^2 = 7.81, α = 0.05, 3df).

Table 3: Substantial change in the nature of work attributed to new medical technologies

Category	Change in nature of work (Score >5)	Number	Percentage of category
Scrub & circulating*	266	353	75.4
Anaesthetics	12	25	48.0
Recovery	17	22	77.3
Others	21	30	70.0
Total	**316**	**430**	**73.5**

* Note: Because of the small number of nurses working in flexible endoscopy, they have been included in the scrub and scout category for the remainder of this article. The perioperative roles of nurses in this composite group are broadly the same.

Table 4 summarises nurses' *satisfaction with employer-supported training* in the use of new medical technologies. Only 55% of all participants expressed some degree of satisfaction with, or a neutral orientation towards employer-supported training. Conversely, 45% of nurses were dissatisfied with training opportunities. On the Likert scale of 0–10 where a score of 5 represented 'neither satisfied nor dissatisfied', a mean score of 5.82 (SD = 2.29) represents an overall low level of satisfaction with training opportunities. There is no significant statistical difference in the perceptions of the four categories of nurses in this domain ($\chi^2 = 0.66$; Crit $\chi^2 = 7.81$, $\alpha = 0.05$, 3df).

Table 4: Nurses' satisfaction with employer-supported training in the use of new medical technologies

Category	Satisfaction with training (Score >5)	Number	Percentage of category
Scrub & circulating	203	353	57.5
Anaesthetics	14	25	56.0
Recovery	11	22	50.0
Others	20	30	66.7
Total	**248**	**430**	**57.7**

Satisfaction with training opportunities varies on the basis of type and location of hospital and the number of operating rooms, and while the differences are not statistically significant (χ^2 = 1.4; Crit χ^2 = 12.6, α = 0.05, 6df), the results should be noted. Table 5 summarises these results.

Table 5: Satisfaction with employer-supported technology training opportunities based on hospital sector/location/size

	Public hospitals						Private hospitals					
	Capital city		Non-capital city		Other		Capital city		Non-capital city		Other	
	OR<4	OR>3	OR<4	OR>3	OR<4	OR>3	OR<4	OR>3	OR<4	OR>3	OR<4	OR>3
Number	15	102	45	30	36	4	39	74	26	20	28	0
Satisfied with training	10	62	27	19	18	2	26	38	15	10	19	0
Percentage	67	61	60	63	50	50	66	51	58	50	68	na

Note: OR<4 means 'less than 4 operating rooms'; OR>3 means 'greater than 3 operating rooms' in the theatre suite.

The most favourable results were for large public hospitals in the capital cities of Sydney and Melbourne and small regional private hospitals. Large and small regional public hospitals and large private hospitals in non-capital cities recorded the poorest results, with only 50% of nurses reporting some degree of satisfaction with opportunities for training in the use of medical technologies. In the hospitals with the poorest results (n = 60), 95.4% of nurses reported increased volume of work and 93% of nurses reported concurrent increased technology-related workload and stress compared to 85% of all study participants (n = 433).

Table 6 summarises nurses' perceptions of how new medical technologies have changed the *volume of their work* since mid-1993. Overall, 86.5% of nurses reported that new medical technologies had increased the volume of their work. There is a significant statistical difference in the perceptions of the four categories of nurses (χ^2 = 18.83; Crit χ^2 = 18.81, α = 0.01, 6df), with the scrub and circulating nurses and 'others' reporting the strongest perceptions of increased workload. On a 0–10 point Likert scale, where a score of 5 represented neither decreased nor increased volume of work, the mean score of 7.45 (SD = 1.69) suggests that the increased workload is substantial and/or the nurses are convinced that the new medical technologies are an important factor contributing to their increased workload. The significantly stronger perceptions of the scrub and scout nurses and 'others' (managers and nurse educators) in this domain suggest that technology-related increases in the workload of nurses

directly involved with the surgical technologies have been significantly greater than for nurses involved predominantly with the anaesthetic life support and patient monitoring technologies.

Table 6: Changes in volume of work attributed to new medical technologies

Category	Reduced work volume (Score <5)	No change in work volume (Score = 5)	Increased work volume (Score >5)	Total
Scrub & circulating				
Number	16	26	311	353
Percentage of category	4.5	7.4	88.1	
Anaesthetics				
Number	2	5	18	25
Percentage of category	8.0	20.0	72.0	
Recovery				
Number	3	4	15	22
Percentage of category	13.6	18.2	68.2	
Others				
Number	1	1	28	30
Percentage of category	3.3	3.3	93.4	
Total	**22**	**36**	**372**	**430**
Percentage of total	**5.1**	**8.4**	**86.5**	

Table 7 summarises nurses' perceptions of how new medical technologies have changed their levels of *work-related stress* since mid-1993. There is a significant statistical difference between the perceptions of the four categories of nurses (χ^2 = 61.85; α <0.001, 6df). The mean score for the higher proportions of scrub and circulating nurses and 'others' (n = 383) who reported increased technology-related stress is 6.95, compared to a mean of 5.95 for the remaining 50 nurses in the study. Furthermore, 85% of the 339 nurses who reported increases in technology-related stress in this large group (n = 383) also reported increased workload.

Table 7: Changes in work-related stress attributed to new medical technologies

Category	Less stress (Score <5)	No change in stress (Score = 5)	More stress (Score >5)	Total
Scrub & circulating				
Number	19	42	292	353
Percentage of category	5.4	11.9	82.7	
Anaesthetics				
Number	1	7	17	25
Percentage of category	4.0	28.0	68.0	
Recovery				
Number	7	6	9	22
Percentage of category	31.8	27.3	40.9	
Others				
Number	2	4	24	30
Percentage of category	6.7	13.3	80.0	
Total	**29**	**59**	**342**	**430**
Percentage of total	**6.7**	**13.7**	**79.5**	

Length of experience does not appear to be a predictor of increased technology-related stress ($\chi^2 = 1.14$; Crit $\chi^2 = 9.5$, $\alpha = 0.05$, 4df). Table 8 summarises the incidence of stress according to length of operating theatre experience. Overall, 88% of nurses had at least 5 years experience as a perioperative nurse while 57.7% of the total had at least 10 years experience and 10 nurses had 30 or more years experience.

Table 8: Perceptions of increased stress (score >5) based on length of perioperative experience

	3 < 5 years	5 < 10 years	10 < 15 years	15 < 20 years	20+ years	Total
Number in category	52	131	87	68	95	433
Number with increased stress	39	98	75	54	79	345
Percentage of category with increased stress	75.0	74.8	86.2	79.4	83.2	

It was also found that these perceptions of increased stress were independent of broad personal and workplace characteristics. For example, no significant differences in perceptions of technology-related personal stress were evident amongst nurses differentiated according to gender ($\chi^2 = 0.21$; Crit $\chi^2 = 3.84$, $\alpha = 0.05$, 1df), public and private sectors ($\chi^2 = 0.32$; Crit $\chi^2 = 5.99$, $\alpha = 0.05$, 2df) or State ($\chi^2 = 0.06$; Crit $\chi^2 = 3.84$, $\alpha = 0.05$, 1df) (see Tables 9, 10 and 11 for frequency data).

Table 9: Gender-specific incidence of increased technology-related stress

Gender	Increased stress (Q12) (Score >5)	Number
Male		
Number	20	24
Percentage of group	83.3	
Female		
Number	307	409
Percentage of group	75.1	
Total	**327**	**433**

Table 10: Incidence of increased technology-related stress according to public/private hospital

Hospital type	Increased stress (Q12) (Score >5)	Number
Public hospital		
Number	180	237
Percentage of group	75.9	
Private hospital		
Number	143	189
Percentage of group	75.7	
Private/Public hospital		
Number	4	7
Percentage of group	57.1	
Total	**327**	**433**

Table 11: State-specific incidence of increased technology-related stress

State	Increased stress (Q12) (Score >5)	Number
NSW		
Number	103	132
Percentage of group	78.0	
Victoria		
Number	242	301
Percentage of group	80.4	
Total	**345**	**433**

In review, it appears that a significant proportion of perioperative nurses believe that new medical technologies have substantially changed the nature of their work and are a source of increased workload and stress. There is also evidence that certain classifications of perioperative nurses (specifically, scrub and scout nurses and 'others') have experienced greater increases than other categories of operating theatre nurses in both workload and personal stress – increases that they have attributed specifically to changing medical technologies. Furthermore, most nurses in these latter two categories who reported increases in technology-related workload also reported increased stress.

Other stressors and symptoms of stress

The preceding observations provide a framework for interpreting the participants' responses to Questions 13 and 14 (associated with study goals 4 and 5). In Question 13, nurses who had reported an increase in personal work-related stress in Question 12 were invited to identify the two main personal symptoms which they could attribute to stress resulting from the effects on them of developments in medical technology over the preceding three years. In Question 14, all participants were invited to respond to the question: 'Have factors *other than* medical technology caused changes to occur in the volume of your work, or your levels of work-related stress over the last three years?' They were invited to identify and explain the two most significant factors. Content analysis was employed to identify the themes emerging from the qualitative data in both of these questions.

The data relating to other stressors were categorised as personal, interpersonal and organisational stressors (after Vecchio 1995), and the symptoms of stress were grouped into themes in order to analyse the types and prevalence of symptoms associated with *good stress* and *distress* (see Lansbury & Spillane 1983; Vecchio 1995).

Stressors exclusive of medical technologies were found to be predominantly *organisational* in origin, and 10 themes were identified from the 342 participants who voluntarily contributed free text responses to this question. Overall, there is very strong evidence that nurses believe that there are insufficient human and other resources in their operating theatre suites to cope with the increased throughput and productivity pressures. The themes are summarised below, and Table 12 summarises the results using samples of the actual words used by nurses.

Personal

- the home-work interface
- changes in personal work-related responsibilities

Interpersonal

- interpersonal factors within the workplace

Organisational factors

1. Resources
   - inadequate volume of and/or qualified/experienced staff
   - budget cuts and/or equipment shortages
2. Technological changes other than medical technologies
   - external environmental changes
   - technical changes in processes (for example, computerisation, infection control issues)
3. Workload
   - managerial factors within the operating theatre suite
   - throughput and productivity pressures
   - effects of increased throughput and productivity on individual staff

Table 12: Frequency of self-reported causes of workplace stress (excluding medical technologies)

Theme	Frequency	Percentage of all respondents
Resources – human: eg, Lack of staff and/or lack of sufficiently experienced staff; No relief for meal breaks; Sick staff not replaced; Not enough staff who know what they're doing.	180	52.6
Workload – throughput pressures: eg, WEIS targets (Victoria only); Rapid work pace; Overbooked lists; Insufficient time for work not involving direct patient care.	130	38.0
Resources – financial: eg, Financial constraints; Lack of sufficient or appropriate equipment.	89	26.0
Personal workplace factors: eg, Greater pressures due to increased seniority; 'Have to teach and do job'; 'Have to think for three'; No time for education.	61	17.8
Changes in health services environment: eg. Restructuring; Threats of hospital or bed closures.	60	17.5
Managerial factors in the operating room suite: eg, More paperwork; Accreditation pressures; 'Budget's a nightmare'.	44	12.9
Interpersonal workplace factors: eg, Personality clashes; 'Pushy' doctors.	36	10.5
Technical: eg, Computerisation of management functions; Infection control issues.	32	9.4
Workload – effects on individual staff: eg, Too much overtime; Loss of ADOs; Excessive 'on call'; Excessively long shifts; More non-nursing duties.	32	9.4
Personal – home–work interface: eg, Shift difficulties with children; Hard to study.	18	5.3
Total respondents* to Question 14 regarding 'Other workplace stressors'	**342**	

* Note: 'Total respondents' refers to only those participants who reported one or two stressors other than medical technologies. Two of the 342 respondents identified only one stressor.

When participants are grouped on the basis of whether or not they self-reported organisational sources of stress and according to their levels of technology-related stress (that is, less stress, stress unchanged, more stress), it is revealed that there is a significant difference between the groups (χ^2 = 30.8; α <0.000001, 2df). Most significantly, 80% of the nurses reporting increased stress (n = 344) self-reported organisational factors as other stressors.

The key themes associated with symptoms of stress were physical and mental exhaustion, severe headaches and neck problems, and inability to 'switch off' even when off duty. Secondary themes were worsening bad temper and impatience with others at home and at work, a sense of 'loss of control' and feeling overwhelmed, and sleep problems. Table 13 reports the themes and their frequencies, using samples of the actual words used by nurses to describe their symptoms of stress. Symptoms of stress have been identified as being *physical, emotional* or *mental*, and have been sorted into various sub-sets to reflect themes. Symptoms reported by four participants have been classified as unspecified responses.

There were no significant differences in symptoms of stress based on perioperative role, but it was found that those nurses who self-reported organisational factors as other stressors (n = 322) reported significantly higher rates in the dominant six self-reported symptoms of stress than those nurses who did not (n = 111) (χ^2 = 16.4; α <0.01, 5df). Overall, the dominant symptoms of stress were reported by 74% of nurses reporting organisational factors as other stressors compared to 41% of nurses who did not.

Discussion

The preceding sections of this article have presented a background from the literature of the nature, symptoms and effects of workplace stress, and discussed the findings of exploratory research on these topics conducted amongst 433 perioperative nurses in the States of Victoria and New South Wales.

This research has revealed that changes in medical technologies and inadequate employer-supported training in the use of new technologies are important sources of this stress amongst perioperative nurses, and that the dominant sources of stress other than medical technologies are predominantly organisational in origin. Overall, it is evident that medical technologies as sources of stress are not independent of other organisational factors, particularly those relating to resource constraints, throughput pressures and hospital-sponsored training in the use of new medical technologies.

Nurses who work in scrub or circulating roles, or as operating theatre managers or educators, reported more frequently than other categories of nurses that the increased use of medical technologies in operating theatres was a factor contributing to their heavier workloads and increased levels of stress.

Table 13: Frequency of self-reported dominant symptoms of workplace stress

Symptoms	Frequency	Percentage of all respondents
Physical – fatigue: Excessive tiredness; Physical, psychological & mental fatigue; Lack of energy.	61	30.2
Physical – head & neck problems: Headaches; Migraines; Neck tension/pain; Neck problems; Back pain.	60	29.7
Mental – mental tension: Anxiety; Nervousness; Can't switch off; Up tight; Tense; Agitated; Can't relax.	60	29.7
Emotional – short tempered: Anger; Bad or short temper; Cranky; Impatient or intolerant of others; Short fuse.	38	18.8
Emotional – feeling loss of locus of control: Feels overwhelmed or out of control; Feelings of helplessness; Frustration.	33	16.3
Physical – sleep problems: Disturbed sleep; Insomnia; Waking up during night; Difficulty sleeping.	31	15.4
Emotional – feeling loss of self esteem: Low morale; Loss of confidence; Harder to cope; Self doubt; Feel incompetent.	18	8.9
Emotional – fewer good feelings about work: Less enjoyment of work; Job dissatisfaction; Lack of interest or motivation; Apathy.	11	5.5
Physical – gastrointestinal problems: Peptic ulcer 'plays up'; Stomach pains; Nausea; Indigestion.	9	4.5
Physical – cardiovascular problems: Chest pains; Palpitations; Perspiration; Tachycardia; High blood pressure.	9	4.5
Physical – general morbidity: More sick leave; Decreased physical health; Weight loss.	6	3.0
Emotional – mood changes: Depression; Mood changes; Moody.	5	2.5
Mental – intellectual acumen: Lack of concentration; Worse memory; Short-term memory loss.	4	2.0
Physical – allergic responses: Skin problems; Dermatitis; Allergy responses; Asthma.	4	2.0
Response – sexual dysfunction: Decreased libido.	1	0.5
Response: Drinking more alcohol.	1	0.5
Response: Over-eating.	1	0.5
Response: Smoking more.	1	0.5
Total responses* to Question 15 regarding 'Symptoms of stress'	**353**	

* Note: 'Total responses' refers to all the symptoms of stress reported by nurses who had experienced increased levels of stress. Nurses were permitted to identify up to two symptoms, and not all of the 327 nurses who reported increased stress responded to this question.

The literature review drew attention to the competing perspectives on workplace stress, and highlighted that in organisations where workplace stress is acknowledged the dominance of the *perception approach* has resulted in remedial programs which have focused heavily on individual behaviour change whilst diverting the attention of employers from the factors in their work environments which are significant stressors. An alternative and probably common strategy in many health services managers is to simply ignore the 'soft evidence' of employees who self-report distress because they think that it is up to the employees to manage their stress better, and in so doing, they adopt the *perception approach* view.

The literature review also presented the *transactional approach* as an alternative perspective which does not view stress as a fixed component of either the environment or the individual worker, but rather 'as a process that involves a complex set of relationships between aspects of the working environment and the capacities and behaviours of the worker' (Quinlan & Bohle 1991, p 154). If organisations were to adopt this view, a more proactive approach to managing the workplace contributors to distress (such as reducing work overload and improving opportunities for employee training in new technologies) would be adopted. However, one of the problems for organisations is that by accepting that many avoidable environmental factors contribute to employee distress, they admit liability for the dysfunctional consequences of that distress in any event where they fail to make reasonable efforts to improve working conditions. It is not surprising that the perception approach to stress is the preferred managerial viewpoint.

Symptoms of stress described by nurses were consistent with what the literature describes as *distress,* and the research provides evidence that perioperative nurses are increasingly at risk of *burnout* resulting predominantly from insufficient numbers of, and sufficiently experienced, staff (and the work overload and role overload resulting from this situation), and to a lesser extent from aspects of organisational structure and climate.

Although it is not customary to report data from respondents who have been excluded from a study due to failure to satisfy selection criteria, it is nonetheless informative to note that most of the 18 unusable responses to the survey questionnaire came from members of the VPNG whose responses were invalidated because they were no longer working as perioperative nurses. The majority of them cited workplace stress or burnout as their reason for leaving.

As one of these respondents with 20 years perioperative experience reported:

> *I needed to take several months off work early this year ….to help me recuperate from mental and physical exhaustion and 'burnout'. I feel the topic …..is something that could have been addressed before now.*

Evidence such as this highlights the need to explore the phenomenon of workplace-related burnout amongst perioperative nurses who have 'fled', and it should alert managers to a stress problem amongst operating theatre nurses which demands more attention than it is currently receiving. Whilst the health services industry in Australia is under significant pressure to constrain the costs of service provision, it cannot afford (potential industrial and medico-legal costs aside) to lose highly qualified and experienced staff such as the participants in this study from its employ as a result of burnout.

This article has not attempted to argue that employee stress is the sole responsibility of employers. Rather, it acknowledges that individual employees react to demanding workplace situations in different ways and that some people can benefit from programs aimed at helping them to better handle stress-inducing circumstances. However, it has provided evidence that aspects of the quality of perioperative nurses' work-life for which employers have responsibility but fail to manage effectively (such as work loads and staff training) are significant sources of distress amongst perioperative nurses.

Future research

There are several potential topics for future research arising from the issues discussed in this article.

- Replicate the study to test the findings of this research.
- Conduct in-depth studies of each of the dominant 'other stressors' in the operating theatre identified in this article.
- Explore the reasons for the differences in technology-related workload and stress observed amongst nurses with different perioperative roles.
- Investigate the incidence of, and reasons for, employee turnover amongst operating theatre nurses.

Conclusion

This research has contributed to the growing body of evidence that work and role overload are increasingly the causes of employee distress. In particular, it has shown that new medical technologies and inadequate employer-supported training opportunities in their use, combined with other organisational factors, particularly those relating to human and financial resource constraints and throughput pressures, are among the organisational factors that are contributing to the increased workload and stress amongst perioperative nurses.

Although the findings reported in this article are the result of a single exploratory study, they should be sufficiently convincing to alert managers to the fact that, despite persistent pressures on hospitals to operate efficiently, there is an urgent need for employers to acknowledge the existence of distress amongst operating theatre staff and to be proactive in implementing human resource management strategies that reflect their concern for the health and well-being of their staff.

References

Brewer A 1986, *New Medical Technologies in the Health Sector and their Labour Market Implications: Final Report,* A study commissioned by the Department of Employment and Industrial Affairs, Canberra, School of Health Administration, University of NSW, Sydney.

Brewer A 1991, *Work-stress study. New South Wales Coal Industry,* Graduate School of Management and Public Policy, University of Sydney, Sydney.

De Poy E & Gitlin LN 1994, *Introduction to Research. Multiple Strategies for Health and Human Services,* Mosby, St Louis.

Johnstone PL 1997, 'The impact of medical technologies on stress and job satisfaction amongst perioperative nurses', *ACORN Journal,* vol 10, no 2, pp 23–32.

Lansbury RD & Spillane R 1983, 'Occupational stress and work effectiveness', *Organisational Behaviour in the Australian Context,* Longman Cheshire, Melbourne.

McIntyre D 1994, 'Occupational stressors: An insidious form of assault', *in* C Waddell & AR Peterson (eds) *Just Health. Inequality in Illness, Care and Prevention,* Churchill Livingstone, Melbourne.

Morgan W 1996, 'Stress in the operating theatre: A literature review', *British Journal of Theatre Nursing,* vol 5, no 11, pp 7–10.

Paquet JB 1993, 'Laughter and stress management in the OR', *Todays OR Nurse,* vol 15, no 6, pp 13–17.

Quinlan M & Bohle P 1991, *Managing Occupational Health and Safety in Australia. A Multidisciplinary Approach*, MacMillan, Melbourne.

Vecchio RP 1995, *Organisational Behavior,* 3rd international edn, Harcourt Brace, Fort Worth.

Zohar D 1997, 'Predicting burnout with a hassle-based measure of role demands', *Journal of Organizational Behavior,* 18, pp 101–15.