APPSA Journal

Association for Peri-operative Practitioners in South Africa

Vol 9 Issue 1 February 2023

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- APPSA is a non-profit organisation which exists for the benefit of its members. This is accomplished by way of congresses, local meetings and travel grants, with the express goal of raising the standard of peri-operative practice in South Africa

- Revenue is raised from, among other sources, the sale of advertising in the APPSA Journal

- Publishing dates for 2022: February, May, August and November.

- All editorial material for the APPSA Journal must reach The Editor at least six weeks prior to the month of publication. Send material to:
  Email: carma@gonet.co.za
  The Editor - APPSA Journal
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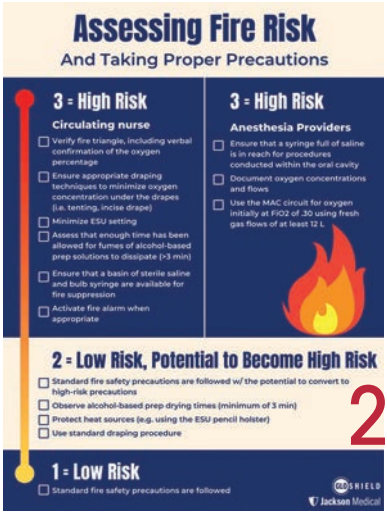

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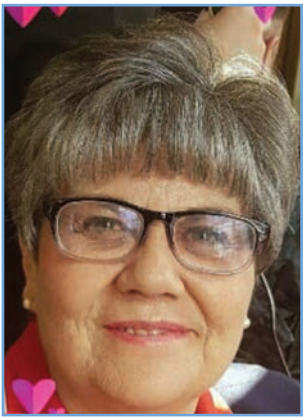

From The PRESIDENT

2023 is a year of *New Beginnings* - because that is the theme of our Congress which is taking place in Joburg at the Premier Hotel OR Tambo between 12 and 14 May - and I cannot think of a better way to start a year. For many of us, 2022 saw the tail end of the COVID pandemic and as we all know, tail ends are not always happy. But the time has come to put the sadness, the devastation, behind us and concentrate on moving forward with purpose and determination. What better way to accomplish this than with exciting study days, and a Congress to signify a return to some sort of normalcy. Because we know for sure that COVID has not left us completely, we have sadly had to limit the number of people who can attend the APPSA Congress to only 200 delegates - a far cry from the heady hay-days of 600 delegates that we had in the late 1990s and early 2000s. But we will claw our way back as soon as we've mastered our way out of the economic slump and healthcare concerns that COVID has driven us into.

New Beginnings must not only be confined to 12 to 14 May. I am appealing to all our APPSA Chapter Presidents to start your study days NOW. New entrants into the peri-operative space are eager to learn, absorb knowledge, and become involved in everything APPSA as an organisation has to offer: and we have experience aplenty that we can share with them. So I urge us all to bring all the new recruits into the fold, and into our wonderful APPSA family.

As you are all aware, one of the adjuncts to the new nursing curriculum - which could have a significant effect on how long it takes new recruits to come into the peri-operative, intensive care and emergency unit space - is the mandatory inclusion of a two-year Midwifery course. This will increase the pressure on our specialised units, which makes it all the more important for us to ensure that those people already in our units are happy and welcome in our space. AND WE HAVE TO STRENGTHEN OUR VOICES. We need to be heard, we need to make our voices heard - and we can only accomplish that by ensuring that more and more existing peri-operative practitioners join the ranks of APPSA so that we become more of a representative body than we already are. There are countless peri-operative practitioners out there who know about APPSA, who attend some of our study days - but haven't signed up as members. It's your responsibility to ensure that the person standing next to you in the OR is a paid up member of APPSA. We need to stand together and be counted so that we when we have an opinion - WE SPEAK FOR THE ENTIRE PROFESSION, not just a branch of the profession.

New Beginnings is around the corner. Let's make it count. Let's make our *New Beginnings* happen now! Let's recruit more members, let's welcome new members into our team and let's make 2023 ROCK! WE CAN DO IT! APPSA is an amazing team of people. Please see the detailed information on the Congress in this issue of the Journal. See you at the Premier Hotel OR Tambo on 12 to 14 May. I'm looking forward to welcoming you all.

Marilyn de Meyer

From The EDITOR'S DESK

WELCOME TO 2023! Let us hope that is it going to be a wonderful, wonder-filled and awe-inspiring year for us all. Sadly, for many of our nurses and doctors the year did not start on a fabulous, wonderful and awe-inspiring note, as on 27 January 1 000 doctors were forced to take to the streets to demand a remedy to the critical shortage of doctors in South African hospitals. This is not a new story - but what is new is that the situation has become so dire that even doctors are now joining the masses and protesting in the streets to get their voices heard. It seems that the only way the South African Government listens is when their failures are paraded on television for the whole country to see. The sad reality is that it is not only did South Africans see our doctors begging our Government to let them work, but the rest of the world does too!

According to MP Michele Clarke, the DA Shadow Minister of Health, last year the Minister of Health, Dr Joe Phaahla, revealed a vacancy for 1 339 doctors in the public health sector, as well as 10 831 vacancies for nurses. In December, the South African Medical Association Trade Union (Samatu) said that at least 225 post-community service doctors had yet to find employment. But nothing has been done to address the situation. Doctors and nurses are being forced to work `doubles' in most public health facilities in order to cover shifts - and in many private facilities the situation over December showed similar situations also in evidence.

Every year we hear of doctors, nurses and ancillary healthcare personnel being unable to find placements to undertake both internship or community service placements in order to complete their requirements for their degrees. As a country, we are crying out for assistance in the healthcare arena. Staff in these facilities are burning out because of the excessive pressure, the long and extended hours of overtime they are expected to work - and yet there are upwards of 1 000 doctors who are begging the Health Professions Council of South Africa (HPCSA) to place them in positions to complete their requirements so they **can** work. Neither the HPCSA nor the Government show any haste in wanting to address this crisis.

The same applies to nurses - whether in basic or post-basic training. Placement remains a concern. I was in hospital in December. Granted it was a private hospital and not a public sector hospital, but there were two shifts were day staff had to continue working as `emergency measures' had to be put into place because night shift staff just did not pitch for work ... and a 12-hour day suddenly became a 15-hour day. This is unconscionable. If for no other reason than this, we need every single APPSA member to recruit others to join the organisation so that we can HAVE A SAY! We need to strengthen APPSA's voice when called upon to do so. We need to be able to make input when input is called for. Like with the NHI Bill. Universal Healthcare is a MUST - but we need to double, if not treble, our staff complement before that can become a reality. Or it will break what is left of this healthcare system we have devoted our lives to serving.

Madeleine Hicklin

NURSE MANAGERS' EXPERIENCES REGARDING THE USE OF KEY PERFORMANCE INDICATORS (KPIs) In Developing Work Plans

By Thembelihle SP Ngxono and Judith N Mdima Masondo, Department of Nursing, Faculty of Health Sciences, Durban University of Technology

INTRODUCTION

The overarching aim of universal health coverage is for all people who need health services to be able to access and receive high-quality care. The World Health Organisation defines quality of care as 'the degree to which health services for populations increase the likelihood of desired health outcomes, and are consistent with evidence-based professional knowledge'[1]. Therefore, quality of care can be measured and continuously improved through the provision of evidence-based care that takes into consideration the needs and preferences of service users[1]. Quality provision of care in healthcare clinics requires competent and motivated healthcare professionals, as well as information systems that enable reviews and audits to take place[1]. Thus, a well-established District Health Information System (DHIS) through which data is reported annually in the District Health Barometer supports the monitoring and evaluation system for the primary healthcare (PHC) system in South Africa as a strategy to facilitate quality provision of healthcare services[2]. Data inform decisions regarding the flow of patients and the diversity of their needs in predictive workforce modelling, identify cost drivers and inform the culture of workplace safety within a healthcare environment[3].

The PHC clinics have several data sets, referred to as key performance indicators (KPIs), with some specific targets attached to them for monitoring and evaluation[4]. In its publication of the Sustainable Development Goals, the 2030 Agenda for Sustainable Development provided the goals and target descriptions that, if implemented at a country level, would lead towards a sustainable future[5]. However, the 2030 Agenda leaves it to countries to adopt the targets, with each government setting its own national targets guided by the global level of ambition, but taking into account national circumstances. Within each country, targets for each KPI at each level of operation (provincial, district and PHC levels) are set such that they are aligned to each other because they are all working towards the achievement of national targets[5].

The KPIs for PHC clinics are determined based on the key performance areas for each PHC clinic. Coupled with these, KPIs are performance targets to meet, which are a guiding tool for performance measurement of quality of healthcare services[6]. Key performance indicators are ways to measure how well the PHC clinics, or projects within PHC clinics, are performing in relation to the strategic goals and objectives[7]. They provide important performance information that enables the nurse managers(NM)s to understand whether they are on track towards the stated objectives and assist them in ensuring that PHC plans are focused on intended results.

NMs are responsible for leading the process of developing and implementing work plans that outline day-to-day activities for the PHC clinics that are aimed at facilitating achievement of the set target for each KPI[8, 9]. The DHIS facilitates analysis of data from PHC clinics and generation of

reports on each KPI. NMs are expected to retrieve these reports, analyse and interpret them to determine how targets have been met and to inform future work plans. The work plans assist managers to assign tasks, manage workflow and track the various components and milestones or deadlines and to articulate strategies to employees in a way that improves team member focus and drive. Therefore, NMs should be highly creative in their thinking, and they should be able to piece together multiple pieces of seemingly unrelated information and test out new approaches in the pursuit of new meaning in support of patient nursing care[3, 10, 11].

Several previous iLembe district annual reports reflected underperformance for various KPIs, thus making underperformance a constant problem in this district[6]. Failure to achieve targets for KPIs appears to be a universal problem in South Africa as several other provinces have, in the same District Health Barometer report (2017 to 2018), been shown to be failing to meet the set targets for a number of KPIs[2]. One example is couple-years of protection rate, which was reported to be below the national target of 60% at the national, provincial and district levels. The report showed that, the couple-years of protection rate was 48.2% at the national level, and by province it ranged from 35.1% in North West to 58.6% in the Western Cape, with North West, the Northern Cape and KwaZulu-Natal showing decreases of 7.6%, 6.6% and 5.7% points respectively, from the previous year's report[6]. The rate varied widely in the districts, ranging from 35.8% to 85.2%, with only three districts in the country reaching the target of 60%[2].

There is research evidence that poor planning is often responsible for failure to achieve goals and targets[12]. Therefore, failure to achieve KPIs is attributed to poor planning. The researchers observed that audit reports often reflected that the NMs did not use KPIs in developing work plans. Yet KPIs are the core elements for measuring performance and should be used to guide future performance[13].

Individual-level knowledge management practices and the task knowledge outcomes model[14] was used as a theoretical framework to guide the study. In this model, knowledge management practices consist of 'knowledge creation', 'knowledge sharing' and 'knowledge application'. Using the three concepts of the model ('knowledge creation', 'knowledge sharing' and 'knowledge application') guided the researchers in determining the practices of NMs in developing work plans, challenges that they experienced in this regard and possible strategies that could facilitate the use of KPIs when NMs are developing work plans for PHC clinics. The researchers considered that strategies facilitating the use of KPIs by NMs when developing work plans for PHC clinics could influence knowledge management practices and could be conceptualised as conceptual, contextual and operational knowledge gained through knowledge creation and knowledge sharing. This would subsequently result in knowledge application.

RESEARCH AIM AND OBJECTIVES

The aim of the study was to explore the experiences of NMs regarding the use of KPIs in developing work plans. The objectives of the study were to describe the current practices of NMs in developing work plans; identifying and describing the challenges, if any, experienced by NMs with the use of KPIs in developing work plans; and exploring strategies that can facilitate the use of KPIs by NMs to develop work plans.

RESEARCH METHODS AND DESIGN

A qualitative research design using an exploratory descriptive approach was employed. In line

with the description by Grove, Burns and Gray,[15] the exploratory descriptive qualitative research approach assisted the researcher in gaining an understanding of NMs' experiences in the use of KPIs in developing work plans for PHC clinics in order to find ways to address the constant under-performance for various KPIs, which was attributed to the NMs not using KPIs in developing work plans[15].

Setting

The study was conducted in one of the four local municipalities within the iLembe district in KwaZulu-Natal. This local municipality has a total of 14 healthcare clinics,comprising one district hospital, one community health centre, seven fixed and five mobile PHC clinics. The focus of the study was on the seven fixed PHC clinics. All other healthcare institutions were excluded, as operations in these were managed differently to the fixed PHC clinics[16]. All seven PHC clinics in the selected local municipality were included in the study.

Study population and sampling strategy

The participants were the NMs from the fixed PHC clinics. All NMs, except those who were reliefs while the NM was on leave, were targeted. A purposive sampling method was used to select NMs who were either acting or permanently appointed as NMs. There were 28 NMs in the selected PHC clinics at the time of the study (four in each PHC clinic), out of which 20 met the inclusion criteria and were all sampled. Eight NMs were excluded based on the exclusion criterion, which was being a relief while the NM was on leave.

Sample size

A minimum of one and a maximum of four NMs per PHC met the inclusion criteria and were all included in the study. In total, 20 NMs were included in the study, which was a census of all NMs who met the inclusion criteria.

Data collection

All data were collected by one researcher who was working as a monitoring and evaluation manager in another local municipality within iLembe in KwaZulu-Natal, different to the one where the study was conducted. One-on-one semi-structured interviews that were guided by an interview guide were used to collect data. Face-to-face interviews were conducted in a suitable venue, which was either at the PHC clinic or the sub-district office, depending on the participants' choice. The researcher ensured that the venue preferred was a private room with no distractions, such as people moving, noise or ringing telephones, and that the room was comfortable, appropriately ventilated with good light and with comfortable seating arrangements. The interview guide was prepared by the researcher in English and organised around a set of open-ended questions which assisted to narrow the interview to specific aspects of the phenomenon being studied while remaining open to how the participants respond[15].

The interview guide was developed based on the research objectives and the theoretical framework that guided the study. The interview guide consisted of three broad questions in line with the three study objectives. Relevant probing questions based on the concepts of the theoretical framework (which are knowledge creation, knowledge sharing, and knowledge application) were listed under each broad question. The researcher, with previous experience and skills as a monitoring and evaluation manager, was able to conduct and control the semi-structured interviews. The semi-structured nature of the interviews allowed the participants to

discuss their experiences in a manner that was comfortable to them and to discuss only the information that they were free and comfortable to discuss. This ensured that the participants did not feel pressured and that they were relaxed during the interviews. No interviewee was coerced to answer any specific question, or to provide information than she felt uncomfortable sharing with the interviewer. That the researcher was from another local municipality and had no personal relationship with the study participants facilitated a free discussion during the interviews. The interview sessions were scheduled on a first-come, first served basis. However, the researcher ensured that she rotated scheduling interview sessions from one PHC to the next to ensure that all PHC clinics were included.

Before commencement of the interview, participants were screened for possible coronavirus disease 2019 (COVID-19) infection or exposure. The screening questions included whether the participant had recently been diagnosed with COVID-19 or had signs and symptoms of possible COVID-19 infection such as cough, sneezing, sore throat, and so on, or had recently been in contact with persons infected with COVID-19.

The plan was to either cancel or postpone the interview sessions with all persons confirmed or suspected to be infected until it was safe. No such persons were identified during data collection. The COVID-19 preventative measures that applied during the interview sessions included the use of hand sanitiser, wearing of masks throughout the interview session (both supplied by the researcher) and the seating arrangement ensuring a distance of 1m between the interviewer and the interviewee, who were seated squarely to avoid breathing onto each other's faces.

Data saturation was reached after 16 participants were interviewed. Four additional interviews were conducted to confirm data saturation, thus giving a total of 20 NMs interviewed and a census of NMs who met the inclusion criteria. Nine NMs were overall in-charge for the PHC clinics and 11 were NMs for selected sections within the PHC clinic (acute illness, chronic illness and mother-and-child sections).

Data analysis

Data analysis was done concurrently with data collection, preferably on the same day as the interview, or within three days but ideally before the next interview. The reason for this was to ensure that each interview's information was analysed as soon as possible while the session was still fresh in the mind of the interviewer. This facilitated comprehension and interpretation. Data were analysed using content analysis guided by Tesch's open coding approach[17].

Firstly, the recorded information was read and reread several times until it was fully understood, and thereafter it was read against the field notes, which assisted the researcher to get a clearer understanding of the information, and subsequently transcribed into a written format and compared and consolidated with the field notes. Again, the transcribed information was read, reread and compared with the original to ensure no meaning was lost during this process. A list of all topics was compiled, similar topics clustered together and preliminarily organised as major topics, unique topics and leftover topics. Related topics were grouped together, and an emerging list of categories was compiled. The preliminary analysis of data was accomplished by assembling data that belonged to each category, from which themes and sub-themes emerged. Finally, existing themes and sub-themes were identified and grouped together. A total of 11 themes and several sub-themes were identified.

Ethical considerations

Ethical clearance to conduct this study was obtained from the Institutional Review Board of Durban University of Technology (IREC 102/20). Gatekeeper permission was granted by relevant managers from the KwaZulu-Natal Provincial Department of Health, which included the research unit manager, the iLembe district manager, the PHC services general manager and NMs in charge of the seven PHC clinics in the selected local municipality.

RESULTS

The findings on demographic characteristics of the study participants are presented in Table I. Eleven themes and several sub-themes emerged from the study. Because the majority of the themes and sub-themes were interrelated, they were grouped together and collapsed into three major themes in line with the three study objectives. The three major themes included the practices of NMs in developing work plans, the challenges experienced by NMs in the use of KPIs in developing work plans and the strategies that, according to the NMs, could facilitate the use of KPIs in developing work plans. Table II presents the themes and sub-themes and how they were collapsed into the three major themes.

TABLE 1: Demographic characteristics of the study participants.

Demographic variable	*n*	%
Gender		
Female	15	75
Male	5	25
Age group		
< 25 years	0	0
25–35 years	3	15
> 35 years	17	85
Ethnicity		
Black people	17	85
Indian people	3	15
Mixed race people	0	0
White people	0	0
Experience as a nurse		
< 5 years	0	0
5–10 years	6	30
> 10 years	14	70
Experience as a nurse manager		
< 2 years	6	30
2–10 years	9	45
> 10 years	5	25

Major theme 1: Practices of nurse managers in developing work plans

In healthcare services, including PHC clinics, NMs are responsible for planning, organising and directing health services in their departments to ensure that the goals and objectives are achieved consistently and that the services provided to the community are of the highest quality and standard[10]. Under this role, one of the NMs' core functions is to play a leading role in developing work plans that outline day-to-day activities for the PHC clinics which are aimed to facilitate achievement of the national targets[3]. The plans are reviewed for accuracy and relevance by senior managers, who are first-line managers for PHC NMs. The participants attested that, as

rated by senior management, the work plans prepared by the NMs were not meeting the expected standard because the NMs were either not using, or incorrectly using, the KPIs when preparing work plans. However, the participants gave various reasons for why their work plans were not meeting the expected standard. The reasons shared by the participants included that the KPIs were not written in a straightforward language that was easy for them to understand, which made interpretation and understanding difficult, especially in the absence of guidelines to follow when developing work plans and/or frequent changing of monitoring and evaluation guidelines. Another reason was poor or delayed feedback to NMs regarding submitted work plans, which made it difficult to learn and fully understand this process:

'My major concern is interpretation of the KPIs. You will think you understand them, yet you are completely off the point; they are not written in simple language that is easy to understand.' (PHC Clinic A, NM2)

However, some participants stated that the majority of NMs were reluctant to use the KPIs when preparing the work plan because they perceived this as unnecessary and just another senior management strategy to increase the workload for NMs:

'Truly speaking, I am not even convinced why they are forcing us to these KPIs in developing work plans; it is just another strategy to increase our workload.' (PHC Clinic F, NM1)

Major theme 2: Challenges experienced by nurse managers with the use of key performance indicators in developing work plans

The management role of a NM in a PHC setting is to ensure that the resources required to execute daily activities are available, safe and fairly distributed. Nurse managers often experience a number of challenges in leadership roles that affect the effectiveness of their leadership and the quality of primary PHC services rendered[18]. Similarly, the current study identified four challenges experienced by NMs with the use of KPIs in developing work plans. These included the knowledge of NMs regarding their expected role and function, training and support, resource allocation and exclusion of NMs from selected activities. The majority of participants stated that they were getting insufficient attention from the Department of Health concerning the provision of knowledge information related to developing work plans and interpreting KPIs and targets. The participants also stated that they never received induction training, in-service education and support or mentoring and coaching on data management when promoted to be NMs:

'I must be honest; the task of using the KPIs in developing work plans is not an easy one, especially because most of us were never taught how to do this. Most of us were never inducted; you are just thrown into the deep end and you are expected to deliver.' (PHC Clinic E, NM2)

However, they commended their peers for support, mentoring and coaching:

'What has kept us going is having each other as NMs. We are always there for each other; we support and mentor each other.' (PHC Clinic F, NM3)

As contributory factors in their inability to use KPIs in developing work plans, almost all study participants flagged the shortage of resources such as computers and software to view the

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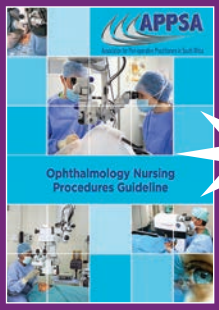

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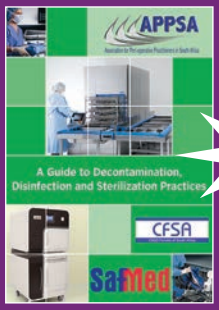

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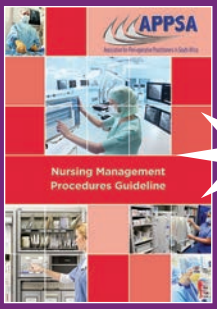

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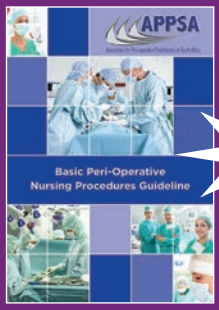

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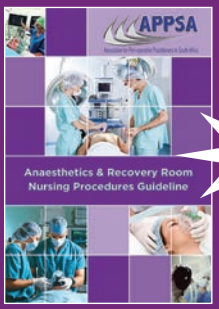

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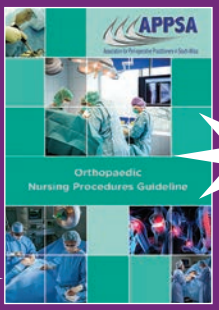

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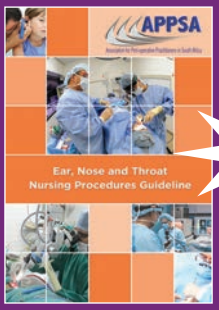

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District Information System and other reports, knowledge and skills to operate the computers, time and human resources:

'One huge problem is the network. The clinic where I am working the network is most of the time down. Therefore, rather than being late in submitting my reports and the work plan, I use whatever little information I have to compile and submit these.' (PHC Clinic F, NM2)

Furthermore, the participants indicated that excluding them from selected activities such as platforms where decisions were made and staff development forums such as workshops and in-service education training sessions affected their ability to use the KPIs in developing work plans:

'As NMs, we work like machines; decisions are made for us. This is very frustrating and demotivating.' (PHC Clinic C, NM1)

Major theme 3: Strategies that can facilitate the use of key performance indicators by nurse managers in developing work plans

There is global recognition that competent managers are essential for ensuring that priority health needs are met, quality health services are delivered, and that resources are used effectively[19]. However, there are a number of challenges experienced by NMs in the execution of their duties. Therefore, addressing the challenges identified in the work experiences of PHC NMs would go a long way in ensuring the successful implementation of health sector reforms and other nursing management responsibilities, including the use of KPIs in developing work plans[19]. According to the study participants, the four strategies that can facilitate the use of KPIs by NMs in developing work plans include support in the management role, induction and in-service education, provision of resources and participative management. Receiving support from selected people in the organisation such as management, peers and subordinates could facilitate the NMs' use of KPIs in developing work plans:

'… If senior managers can standardise and make regular their visits to PHC clinics for support and guidance.' (PHC Clinic A, NM1)

Induction, in-service education and including KPIs and development of work plans in the training curriculum for the post-basic nursing management course were strategies that, according to the participants, could improve NMs' knowledge and skill in the appropriate use of KPIs when developing work plans:

'We cannot avoid frequent changing of KPIs and their targets due to ever-changing disease patterns, but it would be better that in-service trainings are provided every time the new KPIs are introduced and provision of on-going support thereafter.' (PHC Clinic C, NM1)

Equitable provision and allocation of resources such as computers and related software, Internet access, time and human resources for all PHC clinics, irrespective of location, whether urban or rural, was also listed among strategies to facilitate the use of KPIs in developing work plans:

'Unlike the urban clinics that are well resourced, in our sub-district we have huge resources constraints with one clinic having just one or two computers, no printer, and no fax machine.' (PHC Clinic F, NM3)

The participants also highlighted participative management as another important strategy that in their opinion could facilitate the use of KPIs in developing work plans. All NMs should be involved in decision-making pertaining to the operations in the PHC clinics, including revision of current KPIs and targets, and deciding on new KPIs and targets, and should be given timeous composite feedback regarding PHC clinic operations:

'It would be wise to invite NMs in meetings for KPIs revisions, as we are the ones who are at an operational level and who understands community dynamics.' (PHC Clinic D, NM1)

TABLE 2: Themes and subthemes and how they were collapsed into the three major themes.

Major theme	Themes	Subthemes
1. Practices of NMs in developing work plans	1.1 Work plan not meeting the expected standard	• Not using or incorrectly using KPIs in preparing work plans • Reasons for work plan not meeting the expected standard
	1.2 Perception of nurse managers	• Workload of NMs • Not necessary to use KPIs in developing work plan
	1.3 Monitoring and evaluation strategies not facilitating the use of KPIs in developing work plan	• Ever-changing monitoring and evaluation guidelines • Feedback to nurse managers
2. Challenges experienced by NMs with the use of KPIs in developing work plans	2.1 Knowledge of NMs regarding their expected role and function	• Knowledge related to developing work plans • Knowledge related to interpreting KPIs and targets
	2.2 Training and support	• Induction • In-service education • Support, mentoring and coaching
	2.3 Resource allocation	• Computers and software to view DIS and other reports • Time • Human resources
	2.4 Exclusion of NMs from selected activities	• Planning meetings • Decision-making
3. Strategies that can facilitate the use of KPIs by NMs to develop work plans	3.1 Support in management role	• Management support • Peer support • Subordinates
	3.2 Skills development and orientation	• Induction • In-service training • Training curriculum
	3.3 Provision of resources	• Computers and software • Time • Human resources
	3.4 Participative management	• Involvement in decision-making • Feedback

NMs, nurse managers; KPIs, key performance indicators; DIS, District Information System.

DISCUSSION

The discussion focuses on the three objectives of the study, which were to describe the current practices of NMs in developing work plans; identify and describe the challenges, if any, experienced by NMs with the use of KPIs in developing work plans; and to explore strategies that can facilitate the use of KPIs by NMs to develop work plans. The three objectives incidentally correspond to the three major themes that emerged as the interrelated themes and sub-themes were collapsed.

PRACTICES OF NURSE MANAGERS IN DEVELOPING WORK PLANS

Quality of submitted work plans

The work plans submitted by the NMs were reported to be of poor quality. Nurse managers' inadequate knowledge regarding how to use the KPIs in developing work plans was reported as one of the major reasons responsible for this. Nurse managers should have capabilities to retrieve, analyse and interpret reports on clinic performance from the District Information System in order to be able to use KPIs effectively in preparing work plans[3]. A number of participants acknowledged the inability of NMs to develop appropriate work plans and attributed this to a number of challenges experienced by the NMs. Other participants claimed that they were developing good work plans except that they were not using the KPIs, instead relying on their observation and knowledge regarding what the plans should entail, because in their opinion this was a more appropriate approach than using the KPIs. The action of the latter group is supported by Jeseviciute-Ufartiene, who stated that in the action of planning, managers often use their pure and rational thinking, reflection, experience of management and awareness[20].

In addition, a number of the participants stated that the instruction to use KPIs in developing work plans was another senior management strategy to increase the NMs' workload, which, according to them, was already high and heavy. This notion is supported by *Syed et al.*, where they stated that the major problem in the efforts made by organisations to create conditions to achieve optimal production by the employees is that the interests of the organisation and the employees are most often not in the same direction. While the employees wish to have less work, the managers try to gain optimal production from existing workers by overloading them[21].

Monitoring and evaluation strategies

Monitoring and evaluation strategies used in the PHC clinics were reported as not facilitating the use of KPIs in developing work plans because of the ever-changing monitoring and evaluation guidelines and inappropriate and sometimes delayed feedback given to NMs. The problem of ever-changing guidelines was compounded by delays in communicating changes to NMs, which left them misinformed regarding new developments. Monitoring and evaluation aims to provide managers, decision-makers and other stakeholders with regular feedback on progress in implementation, results and early indicators of problems to be corrected through reporting on actual performance against what was planned or expected[4]. Thus, data sources from the district health management information system and other sources such as surveillance, population surveys and management information are integrated in the National Health Information Repository and Data Warehouse and made available to NMs for future planning[22].

South Africa uses the National Department of Health Data Dictionary as a guideline to support the district health management information system policy. The Data Dictionary provides a reference point for selected health information standards to support healthcare activities and

the most up-to-date version of data set specifications, particularly data elements, indicators and data validation rules and the organisational unit hierarchies[8]. Guidelines are considered one of the most influential and effective tools for the promotion of evidence-based practice and a cure for the tension between healthcare cost and quality. They offer a chance to improve the quality of care by reducing practice variation and producing adherence to standards of good care[23]. Implementing guidelines in healthcare systems often requires a multi-pronged approach that includes targeted intervention strategies with both clinicians and the healthcare system[24]. The district health office is responsible for ensuring that all district health management information system users within the district (including sub-districts and clinics) have access to implementation guidelines[25].

Poor and delayed feedback regarding PHC performance and submitted reports was another practice that negatively influenced the use of KPIs in developing work plans. Several researchers look at feedback together with audit findings and regard these as strategies for improving performance and supporting quality and safety in healthcare systems[26, 27]. Audit and feedback are widely used as a strategy to improve professional practice, either on its own or as a component of multi-faceted quality improvement interventions based on the belief that healthcare professionals are prompted to modify their practice when given performance feedback showing that their clinical practice is inconsistent with a desirable target[27].

Perceptions of nurse managers

This study identified that the perception of NMs influenced their use of KPIs in developing work plans. Self-efficacy is one's belief in one's ability to succeed in specific situations[28]. An individual's decision to adopt a given behaviour is a function of their intention to adopt that behaviour, which in turn is influenced by the three main drivers: attitudes towards the behaviour; subjective and descriptive norms; and perceived behavioural control[29].

A number of NMs had negative perceptions about the use of KPIs in developing work plans. In their opinion, it was not necessary that the department be prescriptive that they should use KPIs in developing the work plans. According to the participants, an NM as the custodian of the work plan should be allowed liberty on how best to prepare the plan. Attitudes towards the behaviour, subjective and descriptive norms and perceived behavioural control are in part a function of an individual's characteristics and past experiences[30]. They are informed by beliefs about the positive and negative aspects of the behaviour and usually have an indirect effect on behaviour. Development of appropriate work plans could be enhanced by extracting managers' perceptions and intuitions during the planning process[20].

CHALLENGES EXPERIENCED BY NURSE MANAGERS WITH THE USE OF KEY PERFORMANCE INDICATORS IN DEVELOPING WORK PLANS

Four key challenges identified as impeding the use of KPI in developing work plans included the knowledge of NMs regarding their expected role and function, training and support, resource allocation and exclusion of NMs from selected activities.

Knowledge of nurse managers regarding their expected role and function

The use of KPIs in developing work plans requires that NMs are able to interpret the KPIs. The current study identified that NMs lacked the knowledge regarding how to interpret the KPIs, which resulted in them developing substandard work plans. As alluded to by Muhammed, Doll and

Deng, knowledge creation drives the behavioural processes related to knowledge management, such as knowledge application, which in turn impacts the individuals' task-related knowledge[14]. Regardless of the professional and managerial ability of an individual who is working within an organisation, if that certain individual does not have the right or the freedom to decide on certain management situations, performance cannot be attained within the organisation[31].

Training and support

All persons involved in health information are required to have the ability to appropriately collect, consistently define, accurately aggregate, link, relate to knowledge and machine process health data accurately[32]. However, in the current study, the NMs lacked this ability. The current study identified an absence of training opportunities and support as part of the challenges that were experienced by NMs, which resulted in their inability to use KPIs in developing work plans for their respective PHC facilities. The critical areas mentioned in this regard were induction, in-service education and training and support, mentoring and coaching. Although under normal circumstances, NMs are supposed to have undergone a nursing management training course to prepare them for the management role, a number of NMs were promoted based on experience as a professional nurse without going through a formal course[33].

Training is an act that plays a positive role in the success of the organisation that increases the skills and knowledge of the employees for the required purpose or task and allows the employees to obtain new skills and knowledge and become more effective and productive for the organisation[34]. Effective leadership is the result of the appropriateness or fit between particular behaviours (being well trained and willing) and particular situations (being in an appropriate and welcoming context) to the functional necessities of each leadership organisation[35].

It is also compulsory that employees assuming new positions are subjected to a full induction programme[36]. A number of participants stated that no induction is provided for newly-appointed NMs. Others stated that the induction sessions often do not address the critical challenges that NMs face in their role. Induction training is one of the forms of training that should be routinely conducted by organisations for its new, transferred, recategorised and promoted employees to help them settle quickly in their new roles[34].

Furthermore, in order to keep staff members abreast with practice and new development, staff members in the healthcare establishment are subjected to a series of workshops and in-service education sessions co-ordinated at various operational levels, such as national, provincial or district levels. The participants in the current study stated that NMs are often not invited to the in-service training sessions related to data management, or when invited, they are unable to attend because they are too busy in the clinics. In-service training is an important undertaking in improving the performance of employees, simply because it has several positive effects on performance, which include self-development and gaining of new skills that enable employees to perform their tasks better with timely completion of tasks, all of which have a direct contribution towards better performance[37].

Participants also mentioned that they did not get adequate support from their senior managers. When an individual is engaged in knowledge creation, this knowledge is typically applied by the individual in his or her work if he or she has all the resources necessary to put the new idea into practice[14].

Resource allocation

Data sources from the DHIS and other sources such as surveillance, population surveys and management information are integrated in the National Health Information Repository and Data Warehouse and are made available to managers for future planning[38]. Managers require access to computers and relevant software to be able to view these. Limited and disproportionate allocation of resources, including computers and software to view the DHIS and other reports, was another key finding of the current study. Some participants highlighted that they sometimes had to use their personal resources like computers and external drives to save reports from mother facility computers for them to have data available within their workplace for easy reference.

One of the foremost challenges that healthcare systems are facing is the scarcity of resources in combination with rising demand for services, putting their sustainability in danger[39]. Amid multiple demands and inadequate resources, there are times when nurses find it impossible to fulfil all nursing care requirements or choose not to complete all aspects of care for a variety of reasons by abbreviating the care, delaying the care or simply omitting the care[39]. Missed care (nursing care left undone) is often caused by overwhelming demands on the nursing resource in specific contexts[40].

The shortage of human resources has resulted in NMs spending most of their time attending to patients instead of focusing on management duties. The provision of health services is largely dependent on the sufficiency of the health workforce in terms of numbers, the quality of skills they possess, how and where they are deployed and how they are managed[41]. The shortage of human resources in healthcare has been an on-going problem in South Africa, particularly in rural areas where the unbalanced distribution between urban and rural areas leaves South Africa's rural dwellers with 12% of its nurses[24].

The 2016 report by the World Health Organisation revealed that 57 countries, most of them in Africa and Asia, faced a severe health workforce crisis[38]. Human Resources for Health South Africa recognises that the extensive and changing burden of disease in South Africa has several implications for human resource development and planning and states that ensuring an appropriate, trained and sustainable workforce is a priority for the South African health sector[42].

Exclusion of nurse managers in selected activities

This study identified that NMs are often excluded from selected activities which are meant to be part of their role, such as planning and decision-making. Thus, the participants in the current study stated that their exclusion resulted in missed opportunities to make their input and voices heard on these platforms. Managers are persons who are formally appointed to positions of authority in an organisation and decision-making, which is part of problem-solving and problem analysis, which is an inherent activity of managers, allowing them to make decisions within and among the different management functions such as planning, organising, directing, controlling and staffing - all of which are brought to life and connected by decision-making[43].

STRATEGIES THAT COULD FACILITATE THE USE OF KEY PERFORMANCE INDICATORS BY NURSE MANAGERS IN DEVELOPING WORK PLANS

The researcher sought the opinions of the study participants regarding strategies that could facilitate the use of KPIs by NMs to develop work plans. The proposed revision of the curriculum

for post-basic training for nurses, induction of newly appointed NMs on data management, involvement of NMs in decision-making, management support to NMs and equitable distribution of resources in health facilities, irrespective of their geographical location, are the key strategies that could facilitate the use of KPIs by NMs to develop work plans.

Revision of curriculum for post basic training for nurses

Nurse managers are required to possess specific knowledge to be able to perform their role expectation, and knowledge is gained through education and training or experience in the field[44]. Information acquired from school forms the basis of knowledge that a person can build up from, and it is usually the one that prunes an individual[45]. However, most participants stated that they never received any training on data management neither from their basic training as nurses nor during their post-basic nurse training. Nevertheless, the minimum educational requirement for NMs varies from one employer to another, with some employers allowing an experienced registered nurse to assume the role of NM without completing a nursing management course[46].

Induction of newly appointed nurse managers

Despite the importance of the role of NMs, a number of new NMs received little, if any, formal preparation, yet they were expected to lead the operations in their units, including development of work plans[31]. Thus, even though there is a data dictionary that is provided to the clinics' personnel to define the indicators and data elements, sometimes NMs see the information as being too complex and not easy to understand, especially for those NMs who had not been trained in data management. Participants recommended that the Department of Health should either introduce a new system on the induction and orientation of newly appointed NMs on KPIs or strengthen the existing one. Kunene agrees strongly with the personal growth of NMs, saying that if the health professionals are inducted effectively, they will have the motivation and enthusiasm to implement the departmental goals and priorities related to service delivery in their workstations[47].

Involvement of nurse managers in decision making

In South Africa, the healthcare system remains centralised, with narrow decision space over most matters such as finance and human resources, policies, etc, for managers from district level downwards[46]. This results in little or no involvement of NMs in decision-making. The majority of participants stated that they were not involved in the process of developing KPIs for the programmes that they were expected to manage; instead, data management personnel were prioritised. They proposed that the department should include NMs in the process of developing KPIs because they were the ones playing leading roles in the process of developing work plans. In the context of changing healthcare goals, delivery approaches and health management, health managers and leaders with adaptable and relevant capabilities are critical to high-quality systems of healthcare delivery and thus should be involved in decision-making[46].

Management support for nurse managers

Lack of support is a significant work-related problem that NMs are often exposed to. This results in NMs who are unproductive, discontented and more vulnerable to burnout and depersonalisation[48]. Participants showed dissatisfaction with the level of support they were receiving from senior management. Knowledge is a process and does not exist independent of human action[49]. Yet organisations often face difficulties, including lack of senior management commitment, when applying knowledge management systems[50].

Equitable distribution of resources in health facilities

The study participants recommended that equal allocation of all resources in PHC facilities, including computers and network systems, would assist PHC facilities to access their data timeously for planning. In order to provide quality services, a number of basic resources need to be available, regardless of how well-utilised the service is[51]. The participants also proposed that the department should establish and strengthen the system of facilities to assess one another so as to create opportunity for them to learn best practices from one another. By comparing one facility's operations to those of other organisations, there is the potential to learn and improve performance, because benchmarking one's business operations with defined metrics helps track progress and reach goals faster[52].

Limitations

This study was carried out on a very small scale involving one small district with a limited number of participants, and thus the results are not generalisable. The involvement of senior management in the study and a retrospective review of work plans would have enriched the findings from the study.

Recommendations

Recommendations are made in relation to service delivery, nursing education and training and further research to address the challenges experienced by NMs. These recommendations are aimed at the different tiers of management, including the ward or unit, line manager or senior manager and human resources levels.

Despite the importance of the role of NMs, a number of new NMs receive little, if any, formal preparation, yet they are expected to lead the operations in their units including development of work plans[31]. Thus, it is recommended that human resources should ensure that there is formal induction of newly appointed NMs and that the induction programme cover relevant aspects of the expected role of NMs. The human resources division should also ensure adequate provision of human resources in PHC clinics to allow NMs to focus on their management role instead of carrying out tasks meant to be carried out by subordinates.

The line manager or senior manager should ensure that support is available for NMs in the form of in-service training, workshops on data management and ensuring that NMs are actively involved in decision-making. Training is an act that plays a positive role in the success of the organisation, increasing the skills and knowledge of the employees for the required purpose or task and allowing the employees to obtain new skills and knowledge and become more effective and productive for the organisation[32]. They should also ensure adequate allocation of resources so that all NMs have relevant tools to practise and ensure that NMs are skilled in the use of available tools, such as computers. In order to provide a certain service, a number of basic resources need to be available, regardless of how well-utilised the service is[53].

At the ward or unit level, NMs should support each other, identify mentors and benchmark good practices from each other to facilitate the execution of the use of KPIs in developing work plans and other management tasks. The dedicated guidance that is received through mentoring and coaching is more beneficial than formal teaching because they inspire, energise and facilitate learning and are deemed to be a highly effective way to help people, through talking and increasing self-direction, self-esteem, efficacy and accomplishments in the new

millennium[54, 55, 56]. In addition, a broader study involving more districts and provinces is recommended. The current study identified gaps in areas such as knowledge of NMs regarding their role, support received by NMs and resource allocation to PHC clinics located in rural areas. These are critical areas requiring further research, as they negatively impact the performances of NMs and therefore service delivery and management.

CONCLUSION

Relevant knowledge management practices are essential for the development of task knowledge (NMs' knowledge regarding the use of KPIs in developing work plans) to ensure that tasks are appropriately executed. Although several other challenges such as inadequate resources allocation impacted the NMs' use of KPIs in developing work plans, this study identified a knowledge gap which could be filled through training, in-service education, induction, mentoring and support as the major cause of this problem. Therefore, as alluded by Muhammed, Doll and Deng, knowledge creation and knowledge sharing can facilitate knowledge application and improve the practice of NMs in the use of KPIs in developing work plans.

Acknowledgements

The authors would like to acknowledge Institutional Review Board of Durban University of Technology in KwaZulu-Natal for granting ethical approval to conduct the research project; the iLembe District Department of Health for granting gatekeeper permission for data collection; and the participants of this research, the PHC NMs from the selected local municipality of iLembe district, for sharing their experiences.

Competing interests

The authors declare that they have no financial or personal relationships that may have inappropriately influenced them in writing this article.

Authors' contributions

Thembelihle SP Ngxono and Judith N Mdima Masondo both contributed to the design and implementation of the research, to the analysis of the results and to the writing of the manuscript.

Funding information

This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors.

Data availability

The data that support the findings of this study are available on request from the corresponding author, TSP Ngxongo The data are not publicly available due to it containing information that could compromise the privacy of research participants.

Disclaimer

The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any affiliated agency of the authors.

Ngxongo TSP, Masondo JNM. Nurse managers' experiences regarding the use of key performance indicators in developing work plans. 1717 J Prm Health Care Fam Med. 2022;14(1), a3556. https://doi.org/10.4102/phcfm.v14i1.3556 Copyright:© 2022. The Authors. Licensee: AOSIS. This workis licensed under the Creative Commons Attribution License.

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APPSA Congress 2023

12 to 14 May 2023

Premier Hotel OR Tambo

IT'S A KINDA MAGIC – AND IT'S HAPPENING ON YOUR DOORSTEP!

For the first time since COVID made its appearance anywhere in the world – but especially in South Africa – the National Executive Board is thrilled to announce that it will be hosting an APPSA Congress in Johannesburg between 12 to 14 May 2023 at the Premier Hotel, OR Tambo, Johannesburg. It will herald our *New Beginnings* – and that is the theme of our Congress! Local leaders, luminaries and visionaries will showcase the future of peri-operative care, worldwide, with presentations and lectures delivered during the event – but space WILL be at a premium as ONLY 200 people can be accommodated to ensure that we are all kept as safe as possible in these still COVID-volatile times. So book your space early to become part of the peri-operative movement as we still strive to improve patient outcomes for those entrusted into our care.

APPSA is the foremost voice of peri-operative practitioners in the country, and we need both old and new members to join us at congressess, conferences and study days at all times. **Those APPSA members whose membership is paid up between 01 March 2022 and 28 February 2023 will qualify for an additional, discounted member registration fee of R1 800-00 for the 2023 APPSA Congress, provided that payment is effected before 15 April.** If you are unsure as to whether you qualify, or if you have any other questions or queries, please contact the APPSA office at: congress@internext.co.za and we will clarify your queries.

As has been the tradition in the past, the APPSA Congress is a highlight of the peri-operative calendar in South Africa - from both an academic and a social point of view. *New Beginnings* will make things even better as our impressive list of speakers will deliver presentations on the most up-to-date technological advancements you have been waiting for, as COVID has kept us 'isolated' for so long. Our APPSA Congress will boast an impressive Official APPSA Welcome Function on Friday 12 May 2023, and the APPSA Gala Dinner on Saturday 13 May 2023. Both these social functions are included in your APPSA Congress registration fees.

Dates: **Friday 12 May 2023 to Sunday 14 May 2023**
Venue: **Premier Hotel OR Tambo, Johannesburg**
Theme: ***New Beginnings***

CONGRESS SCHEDULE

Friday, 12 May 2023

08:00 to 12:00	Stand build-up for exhibitors
12:00 to 15:00	Delegate registration at the Premier Hotel
15:00	Official Opening of the APPSA Congress 2023
18:00	Official APPSA Congress Welcome Function







Saturday 13 May 2023

07:00	Breakfast
08:00 to 16:00	Lectures (lunch break approximately 12:00 to 13:00)
19:00	APPSA Gala Dinner Theme: *Night of the Stars*

Sunday 14 May 2023

07:00	Breakfast
08:00 to 12:00	Lectures. Packed lunch will be available for delegates to take with them
12:00	Delegates depart and exhibitors break down

ACCOMMODATION AND TRANSPORT

NOTA BENE: ACCOMMODATION IS STRICTLY ON A 'FIRST COME, FIRST SERVED' BASIS. THE RATE IS **R1 500-00 PER PERSON PER ROOM**, OR **R1 710-00 PER ROOM FOR TWO PEOPLE SHARING**, BED AND BREAKFAST ONLY. **THE CUT OFF DATE FOR EARLY REGISTRATION AND HOTEL BOOKING IS 15 APRIL 2023.** IF THE HOTEL IS FULL, NO OTHER HOTEL ACCOMMODATION WILL BE OBTAINED. DELEGATES WILL THEN BE RESPONSIBLE FOR THEIR OWN ACCOMMODATION **AND** TRANSPORT TO AND FROM THE CONGRESS VENUE.

AIRPORT TRANSPORT

The Premier Hotel has a fleet of coaches and microbuses used for airport shuttles. Transfers to and from OR Tambo International Airport are free of charge. The Premier Hotel Shuttle can be found outside at the designated Hotel 'pick up' and 'drop off' point situated outside the terminal and Car Rental buildings. This point can be found opposite the Airport Intercontinental Hotel.

The shuttle times are as follows:

From the Premier Hotel to the Airport	**From the Airport to the Premier Hotel**
05:00	05:15
05:30	05:45
06:00	06:15
Etc	Etc
Last bus: 23:45	Last bus: 00:00

Directions to get to the shuttles:

1. Guests need to make their way to the entrance of the Car Rental Agencies
2. From there, you must look for the INTERCONTINENTAL HOTEL (It can be seen from across the parking lot from outside the Terminals where the flagpoles are)
3. Guests need to make their way past the Intercontinental Hotel
4. Immediately behind the hotel, delegates will find a parking area where the shuttle parks







Immediately after the congress ends on Sunday 14 May, 2023, a shuttle service will be available to transport delegates from the congress venue to the OR Tambo Airport. Please arrange your return flights to leave after 15:00 on the Sunday.

SHOULD YOU WISH TO MAKE USE OF ALTERNATIVE ACCOMMODATION OPTIONS, YOU WILL BE RESPONSIBLE FOR YOUR OWN TRANSPORT TO AND FROM THE ACCOMMODATION TO THE CONGRESS VENUE AND SOCIAL FUNCTIONS.

APPSA CONGRESS 2023 REGISTRATION DETAILS

FULL REGISTRATION:

	EARLY BIRD	**STD REGISTRATION**
	Before 15 April	*After 15 April*
APPSA Members	R1 800-00	R2 000-00
(The above rate only applies to paid up members 2022/23)		
Non/New-members	R3 000-00	R3 500-00
Students*	R1 500-00	R1 800-00

*To qualify for student rates, a certified statement attesting to your student status is required from your academic institution

Full registration fee includes:

- Attendance of all academic sessions
- Congress bag, including the Trade Feature and programme
- Lunch on each day of the congress
- Tea and refreshments
- APPSA Official Welcome Function and Gala Dinner

DAY REGISTRATION

Friday	R 600-00
Saturday	R1 200-00
Sunday	R1 200-00

Day registration fee includes:

- Admission to all academic sessions on the day of choice
- Congress bag, including the Trade Feature and programme
- Lunch on the day of attendance
- Tea and refreshments
- Function of the day on which you attend

On the accompanying APPSA Congress Registration Form, please indicate which day you will be joining us for.

REGISTRATION PROCEDURE:

- The Registration Form must be completed in full
- The Congress Organisers will issue an invoice - in your name - upon receipt of your Registration Form. Payment must be effected against this invoice
- If you want the congress office to make out the invoice in your company/ institution name, please supply the full details of how the invoice must be made out







- To avoid errors, please write your account number (which appears on the invoice) or initials and surname in the deposit reference block on the deposit slip or bank transfer
- Once you have submitted your Registration Form, you will receive email confirmation of your registration. You will also receive an invoice, for your records
- Any amendments to registration must be made in writing and directed to the Congress Organisers

NO registration will be confirmed until the completed Registration Form and FULL payment has been received. Electronic transfers should be made in favour of APPSA Congress trading as SATS Congress. Please note: The bank account details are the same as for the previous congresses and will appear on the invoice.

Unfortunately we **DO NOT** accept Government orders.

BANK ACCOUNT DETAILS:

Account name:	APPSA trading as SATS Congress
Bank:	ABSA Bank
Account number:	405 982 5362
Branch code:	632 005
Type of Account:	Cheque

CANCELLATION POLICY:

When effecting payment, please use your name and surname or account number (which appears on the invoice) as the reference. Only 50% of the registration fee will be refunded in the case of cancellations after 01 May 2023. No refunds will be made after 08 May 2023.

Please Note: **If your accommodation and registration is not paid by the 15 April both your registration and accommodation will be cancelled without further notice.**

We look forward to welcoming you to the APPSA Congress 2023

New Beginnings

WHAT DO WE DO IN THE OPERATING ROOM/THEATRE
If There Is A Fire?

By Sheila L Allen, BSN, RN, CNOR (E), CRNFA (E)

INTRODUCTION

Often crises occur in the peri-operative arena. Whether it is a sudden mass trauma that creates a myriad of challenges to the team, or an occurrence in a single room, such as sudden haemorrhages, air emboli, malignant hyperthermia, etc; the team must know how to respond immediately. As a novice nurse in the peri-operative arena, I can remember wondering ... how will I know what to do if a patient arrests or something unexpected happens?

Fortunately our organisations provide us with the information to assist us to craft our care to address such emergencies. One of the most alarming sounds I have ever heard was a colleague in a procedure across the hall from where I was call out, "Help, my patient is on fire." The quick thinking of the circulating nurse grabbing a fire extinguisher and a well-rehearsed team for this kind of emergency created a more positive outcome for the patient. I will never forget the experience and how proud I was of our team for performing as if this occurred every day. It is the only time I have ever been involved in this particular crisis in my fifty-plus years in the peri-operative setting.

Of the commonly identified crisis events noted in the literature, fire is considered unique because of the available information available to the peri-operative team to prevent a surgical fire. The primary responsibility of the peri-operative team is to protect patients, personnel, and the area utilising fire safety, prevention, and control. Because patients in the surgical arena usually have multiple existing conditions, are not ambulatory, are under anaesthesia, and are in a controlled area that contain multiple sources of the three elements required for a fire: an oxidiser, an ignition source, and a fuel source. Most peri-operative fires are preventable with appropriate education, communication, risk management, and practice of fire protocols.

INCIDENCE AND IMPACT OF OR FIRES

Because reporting is not mandatory, the Emergency Care Research Institute (ECRI) reports of occurrence of OR fires are described in a range of 217 to 650 events each year in the United States. Most injury claims occur in an out-patient setting (78%), involve the upper body (85%), and are cases managed with monitored anaesthetic care (MAC; 86%). Other sources provide a wider range of 100 and 2 260 each year!

Most commonly, these fires result in burns to the upper chest, head, face, and neck because of the oxygen-rich environment in which they occur. Utilising the fire triad, the risk factors for operating room fires could be listed as the following:

Ignition Sources:

- Laser
- Electro-surgical and electro-cautery units
- Electrical haemostatic devices
- Fibre-optic light sources and cables
- Defibrillators
- Flexible endoscopes
- Sparks from surgical drills

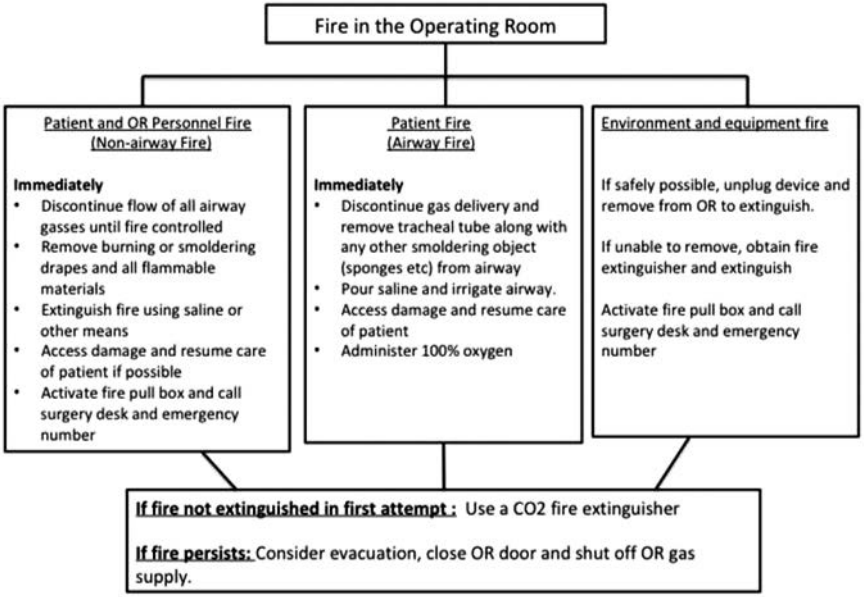
Oxygen Sources:

- Oxygen (O_2)
- Nitrous Oxide

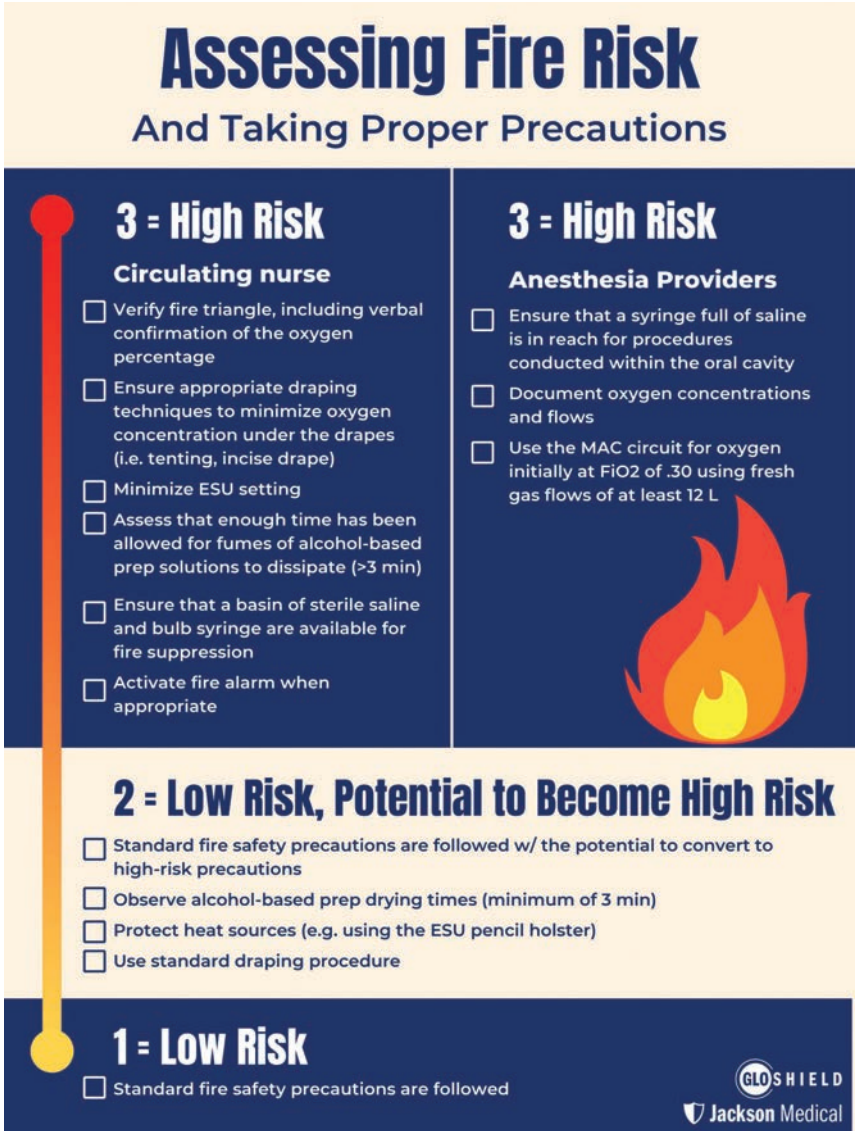
Fuel Sources:

- Flammable prepping agents including tinctures (iodophor, thiomersal, chlorhexidine)
- Drapes, towels, surgical sponges, dressings
- Gowns, hoods, masks
- Mattresses, pillows, blankets
- Patient hair (face, scalp, body)

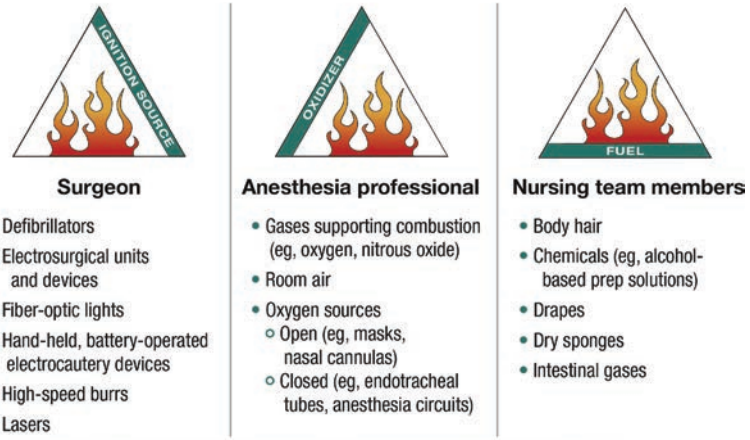
Electro-surgical equipment is involved in approximately 67% to 90% and supplemental oxygen is nearly always present. Most can be classified as either airway or non-airway.



Assessing the risk of a fire is the first way to work toward preventing a fire. There are a number of one-page items that can be found on the web by searching for 'fire safety tools'. One example of such an item is the following:



The location of the fire occurs and how the patient is involved determines the response of the team. Organisations have information about fire prevention and control. Each member of the team should (and must) be familiar with the role they need to play in minimising the trauma to the patient, the team, and the environment.



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3. Guidelines for safe environment of care, part I. In: *Perioperative Standards and Recommended Practices*. Denver, CO: AORN, Inc; 2014:229-254.

Methodologies are utilised to assist staff to remember protocols:

The **R A C E** Method

- **R**escue anyone in immediate danger – determine the location of the fire, move patients to safe location, disconnect electrical machines and devices
- **A**lert or alarm others to the presence of a fire - pull the fire alarm and call for help
- **C**onfine the fire - close doors to contain the fire and smoke, cover bottom of doors to prevent smoke spread, and place moistened material against the bottom of OR doors
- **E**xtinguish the fire if it can be done safely or evacuate the patient - obtain the fire extinguisher, use water or sodium chloride solutions from the back table to douse the fire, do not pour saline or water on an electrical fire, and evacuate the patient as instructed

The **P A S S** method refers to a fire-prevention mnemonic for recalling the correct fire extinguisher use:

- **P**ull the safety pin from the handle
- **A**im the extinguisher at the base of the fire, not at the flames
- **S**queeze the handles slowly together to discharge the extinguishing agent
- **S**weep side-to-side in a sweeping motion until expended, keeping a safe distance from the fire

Fire safety is the responsibility of **every member of the team** with education and practice of the established protocols. Patients depend on, and place their trust in, the surgical team to protect their lives. Should a fire occur, remember to save all the items such as drapes, endotracheal tubes, anaesthetic circuit tubing, cautery tools, and basically everything in the room. **This is forensic evident of an accident.**

OPEN, HONEST DISCLOSURE AND RISK MANAGEMENT

A fire in the OR would be an adverse event that the physician has an ethical and professional responsibility to disclose. Open discussion of possible adverse events is part of the discussion

about clinical risk. Patients have the right to be informed, to be a part of the decision-making process of the appropriate actions of their care. Manner and tone are important components of the conversation with the patient and family. Many times a simple expression of sorrow is instrumental in enhancing the patient-physician relationship.

SUMMARY

An OR fire is a life-threatening emergency. Team training, recurrent education, practicing appropriate actions, and efficient communication are essential to providing all healthcare workers on the most effective way to respond to emergent situations. A team approach, in addition to a comprehensive fire safety programme, is a continued effort to make a safer healthcare environment for every worker and patient. Only by working together can we minimise the occurrences of fires in the peri-operative setting. The Children's Hospital in Omaha has developed a tool for the use of their peri-operative team and it is included here.

NOTA BENE: All South African ORs and wards have specific evacuation plans that should be triggered and aborted when/if the fire is put out. A calling cascade should be triggered. The OR/ward staff should only make one call - to management - who should take it from there. Fire doors should be in strategic places and while they may need manual closing - the rest should be left to the professionals, according to plans as per OHSC.

OPERATING ROOM FIRE RESPONSE PROTOCOL

Fire on Patient

Small flames or a small area:

- Announce 'Fire'
- Pour water or normal saline on the fire slowly to prevent spreading and to extinguish the fire, if this can be accomplished safely
- Perform Sheet Sweet method: Lay a wet towel or sponge over the flame, place one arm over the end of the towel nearest the patient's head, and sweep the other arm over the towel and toward the patient's feet
- Lift the material used to smother the flame to vent heat
- Remove burning material from the patient
- Assess the surgical field for a secondary fire on the underlying drapes or towels
- Assess the patient for injuries
- Activate the EVACUATION PLAN

Large flames or a large area:

- Announce 'Fire'
- Anaesthesia professional to stop the flow of anaesthetic gases to the patient, and disconnect the breathing circuit from the anaesthesia machine
- If a drape is involved, remove it to the ground and roll it on itself to smother the fire
- Avoid moving the drape into what may be an evacuation route for the people in the OR or other procedure room.
- Assess the surgical field for a secondary fire on the underlying drapes or towels
- Assess the patient for injury
- Verify the flames are extinguished and use a fire extinguisher if necessary
- Employ the PASS technique when using a fire extinguisher:

- Pull the pin
- Aim at the base of the fire
- Squeeze the handle
- Sweep from side to side

• Activate the EVACUATION PLAN

Fire in Patient

Handling a fire in a patient:

• Announce 'Fire'
• Anaesthesia professional to determine the necessary actions to take to extinguish an airway fire:
  - Disconnecting and removing the anaesthesia circuit
  - Turning off the flow of oxygen
  - Removing the endotracheal tube and any segments of the burned tube that remain in the airway
  - Pouring saline or water into the airway
• Re-establishing the airway
• Examine the airway
• Assess the surgical field for a secondary fire on the underlying drapes or towels
• Assess the patient for injury
• Report to management

Electrical

Equipment Fire

• Announce 'Fire'
• Disconnect equipment from its electrical source
• Shut off electricity to the piece of equipment at the electrical panel if it is not possible to remove the plug from the outlet
• Shut off gases to equipment, if applicable
• Assess the size if the fire and determine whether equipment can be removed from the OR or the Procedure Room (PR) safely, or if the room needs to be evacuated
• Extinguish the fire using a fire extinguisher, if appropriate
• Isolate the room and activate the EVACUATION PLAN if the fire is not quickly extinguished

Evacuation of Patient (if the room is dangerous from smoke or fire)

Follow the **R A C E** protocol:

• **R**escue
  - Determine the best method to remove the patient (for example, procedure bed, gurney, or carry) from the area.
  - Determine the safest location to receive the patient (for example, behind smoke barriers)
  - Call for assistance
  - Remove the patient and personnel from the room containing the fire or smoke
• **A**larm
  - Communicate to all personnel in the peri-operative areas, especially personnel in the adjoining rooms.
  - Activate the EVACUATION PLAN

- **C**ontain
  - Close the doors to the involved room
  - Shut off medical gases to the involved room
  - Turn off electricity to the involved room
- **E**vacuate
  - **When:** When a danger is posed to patients in adjoining areas because of fire or smoke.
  - **Where:** Transfer the patients to a designated area that is beyond the first set of smoke barriers, and then to an area where the operative or other invasive procedure may be completed safely
  - **How:** Transfer patients by moving procedure beds with the patients remaining on the bed, by using gurneys, or by carrying them.

Anaesthesia to direct Emergency Gas Shut off Valves located outside the OR/PR
Save all fire-involved materials devices for later investigation

LAST PERSON OUT OF ROOM: CLOSE DOOR PLACE TAPE IN SHAPE OF "X" ON DOOR TO ALERT FIRE RESPONSE PERSONAL ROOM IS CLEAR- AND DO NOT REOPEN

Note: This article is not intended to provide the reader with a comprehensive, technical approach to fire prevention and protocols. Nevertheless, it is intended to remind the reader of the importance of establishing protocols, education, communication, and repeated practice and discussion of this important emergency in the OR so that everyone will be equipped to manage this crisis in our environment.

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Sheila Allen served as the National AORN President between 2001 and 2002 and the IFPN Secretary between 2001 and 2007. She is a regular contributor to the APPSA Journal and offers contemporary studies and opinions of great value and interest. She wrote this paper specifically for the APPSA Journal.

EXPLORING THE SOURCE OF STRESS AMONG OPERATING THEATRE NURSES
In A Ghanaian Teaching Hospital

By Vera Asimh Ackah and Atswei Adzo Kwashie

INTRODUCTION

The human body is designed to experience stress and react to it. Stress can be positive, keeping us alert and ready to avoid danger. Stress becomes negative when a person faces continuous challenges without relief or relaxation between the challenges. As a result, the person becomes overworked and stress-related tension builds. Selye (1976) described stress as a non-specific response of the body to an imbalance between its resources and any demands made upon it. Also, stress according to *Fink (2016)* is a psycho-biological reaction of the body to physical or psychological demands threatening or challenging the well-being of a person. Musazzi, Tornese, Sala and Popoli (2017) categorised stress as being acute or chronic. Acute stress is short-lived and usually involves a speedy response to a sudden, single, easily-identified stressor. In acute stress, for example, an unexpected bereavement, a person's anxiety will rise sharply and then start to decline. For the majority of people who experience acute stress, usually the body begins to react before the individual fully understands the situation, but a return to normal life is immediate once the issue is resolved (Musazzi *et al.,* 2017). Chronic stress on the other hand is a state of on-going physiological agitation from an unresolved issue or situation (Musazzi *et al.,* 2017).

Job stress, also known as occupational stress, workplace stress or work-related stress refers to an individual's reaction when confronted with work demands and pressures that are no match to their knowledge and abilities and challenge their coping capability (Laeeque, Bilal, Babar, Khan, & Ul Rahman, 2018; Lenthall *et al.,* 2018). This implies that occupational stress occurs when an individual perceives the work environment as challenging, threatening, or damaging to the person's coping. Białek and Sadowski (2019) have indicated that the International Bodies, including the World Health Organisation (WHO) and the International Labour Organization (ILO), have recognised stress among workers and the probable destructive effects of workplaces as a global menace. In the UK, occupational stress was the second major work-related health problem and estimated to cost £4-billion annually (Hassard, Teoh, Visockaite, Dewe, & Cox, 2018). Work-related stress is more strongly associated with health complaints than are financial or family problems (American Institute of Stress, n.d.). Carson and Kuiper's model (1998) classified the major sources of stress into three groups. The first is the specific occupational stressors that vary according to the unique problems or strains that each professional group faces. For example, changes in the health service may be a major source of stress. The second is the stressors derived from major life events and the third is minor stressors that obtain power and can affect the individuals as they accumulate. Other researchers such as Strizhitskaya, Petrash, Savenysheva, Murtazina and Golovey (2018) also identified daily hassles such as getting stuck in traffic jams, waiting in line and being behind household chores as being stressful.

Existing literature on sources of stress can be grouped into two sub-themes; internal and external factors. Internal factors influencing occupational stress encompasses those situations that arise from within the individual and these include personality traits and demographic characteristics (Behar, 2020; Chaudhuri & Maulik, 2019; Lee *et al.,* 2018; Manomenidis *et al.,* 2017; Poursadeghiyan *et al.,* 2016; Singh & Ullah, 2016). Notably, among health personnel, anxiety, openness to change and low self-esteem have been identified as specific personality traits capable of having a major influence on whether nurses are stressed or even over-stressed to a point of burnout (Behar, 2020; Chaudhuri & Maulik, 2019; Lee *et al.,* 2018; Manomenidis *et al.,* 2017; Poursadeghiyan *et al.,* 2016; Singh & Ullah, 2016). Several studies have also traced the sources of stress as coming from the demographic characteristics of nurses. For instance, Johansen and Cadmus (2016) noted that the majority of the participants who were experiencing a low level of stress were young. On the contrary, Guo *et al.* (2019) found that younger nurses reported greater stress than did older nurses. Also, some studies suggest such as Klein *et al.* (2016) and (Vismara *et al.,* 2016) noted that women who display traditional gender roles perceived more stress than men. The traditional gender roles of women which includes but not limited to managing the home and raising children, expose them to additional, non-work-related stressors compared to the male gender. Young and Schieman (2018) also argued that the overflow of family-related stress on work-related stress might be greater for women than for men. Other demographic sources of stress identified are level of education achieved, career development and job certainty (Khuong & Yen, 2016; Klein *et al.,* 2016; Leung, Liang, & Olomolaiye, 2016). In contrast, Noormaliza, Najibah, Fauzana, Azizah and Nukhdiha (2016) showed that there is no significant association between the level of stress and the level of education. Also, El-Hneiti Shaheen, Bani Salameh, Al-Hussami and Ahmad (2019) observed that aside from academic qualification, nurses who have worked for long years reported less stress.

The external sources of stress include work-family conflicts, daily hassles and job demand, moral distress and interpersonal relationship (Cohen & Venter, 2020; Ferguson, Carlson, Kacmar, & Halbesleben, 2016; Holland, Tham, Sheehan, & Cooper, 2019; Jafari, Habibi Houshmand, & Maher, 2017; Klein *et al.,* 2016; Li *et al.,* 2019) and financial difficulties affected nurses (Li *et al.,* 2019). Similarly, Abdul-Samed (2019) reported that in Ghana, health workers reported that balancing work-life and home-life is another big stressor that may account for the higher levels of stress among nurses. According to Cohen and Venter (2020), the stress nurses experience also results from long commuting hours and chaotic traffic conditions. The long hours spent commuting to and from work on daily bases led to increased levels of stress, coupled with chaotic traffic conditions such as congestion and delays contributed significantly to the stress levels of the nurses. Job demands often include workload, shortage of human and material resources, and time constraint regardless of organisational or cultural differences (Holland *et al.,* 2019; Karatepe, Yavas, Babakus & Deitz, 2018). Studies in different jurisdictions have also identified heavy workload as one of the major causes of stress among nurses (Biganeh *et al.,* 2021; Birhanu,Gebrekidan, Tesefa, & Tareke, 2018; Faremi, Olatubi, Adeniyi, & Salau, 2019; Kwiatosz-Muc, Fijałkowska-Nestorowicz, Fijałkowska, Aftyka, & Kowalczyk, 2018).

In Ghana, Abdul-Samed (2019) discovered that most of the times, nurses faced too heavy a workload, which the study described as one of the most common stressors at the workplace to these nurses. Lack of equipment and medicine shortages, as well as lack of standard equipment (Atefi, Abdullah, & Wong, 2016; Ghavidel, Fallahi-Khoshknab, Molavynejad, & Zarea, 2019),

lack of proper logistics (Buheji & Buhaid, 2020), staff shortage (Cohen & Venter, 2020; Johan, Sarwar, & Majeed, 2017; Kakemam *et al.,* 2019), nature of work (Dagget Molla, & Belachew, 2016; Khamisa, Peltzer, Ilic, & Oldenburg, 2016; Maharaj, Lees, & Lal, 2019) and time pressures (Guo *et al.,* 2016; Labrague *et al.,* 2018; Trousselard *et al.,* 2016) have also been identified as the most important factors of stress in nursing. Studies revealed that nurses become stressed when dealing with 'death and dying' as well as involvement with life and death situations (Dagget *et al.,* 2016; Gheshlagh *et al.,* 2017). Amarneh (2017) also identified that death and dying issues are the most prevalent stressors among nurses. Similarly, Wazqar, Kerr, Regan, and Orchard (2017) in a related study on stress revealed that the nurse's daily exposures to patients' pain, suffering and traumatic life events could contribute to stress. According to Gao, Plummer and Williams (2017), peri-operative nurses exhibit psychological trauma of stress presenting in the form of anger, numbness, emotionless, hollow feelings, sadness and feelings of melancholy and helplessness as a result of not saving a patient's life. Beuthin (2018) reported that regardless of culture and country-specific professional role, nurses identify the emotional issues related to death and dying to be overwhelming.

The association between interpersonal relations and job stress have also been identified through various studies. Communication, collaboration and control practices are aspects of interpersonal relationship among health personnel that various studies have identified to be sources of stress to nurses in the health sectors (Chu, 2017; Ghazwin *et al.,* 2016; Starc, 2018). Kunii, Nomura, Takayama and Sera (2017) identified that verbal abuse from co-workers' results in nurses experiencing increased stress. Abdellah and Salama (2017) noted that the constant exposure to professional and interpersonal verbal abuse among operating theatre nurses within the high acuity theatre environment might increase stress. More so, Johansen and Cadmus (2016) identified that dealing with patients or their relatives and handling their anger, criticism or aggressive behaviour are among the most common stressors. Conflict with patient relatives has also been identified to generate some degree of stress in nurses (Hetland, McAndrew, Perazzo, & Hickman, 2018; Najafi, Fallahi-Khoshknab, Ahmadi, Dalvandi, & Rahgozar, 2018). Manos and Braun (2019) also revealed that nurses experience stress when they encounter difficult patients, as such they are unable to establish good working interpersonal relationships with the patients.

The nursing profession is heavily plagued with occupational stress as many nurses perceive their work as stress-producing (Baye, Demeke, Birhan, Semahegn, & Birhanu, 2020). The stress nurses encounter in the clinical setting can result in physical, emotional, social and spiritual changes. A report by Health and Safety Executive (2020) shows that between March 2019 and March 2020, stress, depression or anxiety accounted for 51% of all work-related ill health cases and 55% of all working days lost due to work-related ill health. One of the emotional changes that peri-operative nurses tend to experience is burnout. Tavella, Hadzi-Pavlovic and Parker (2020) defined burnout as depletion of an individual's energy where personal resources seem diminished, resulting in vulnerable and negative feelings.

In Ghana, the most common psychological health problems reported by workers of organisations are stress-related (Fordjour & Chan, 2019). As a middle-income country, inadequate resources and partial interventions for workplace problems appear to be the common antecedents to work-related stress in Ghana. Poor working conditions and inadequate yet dwindling numbers of nurses combine with other factors to put most healthcare workers, especially operating theatre

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Clinical evaluation of an active therapy support surface within a critical care unit

NHS
Sherwood Forest Hospitals
NHS Foundation Trust

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Introduction

Pressure ulcers are recognised as an avoidable patient harm and represent a key quality indicator for all healthcare providers. The elimination of avoidable pressure ulcers remains a priority within the NHS. [1]

Preventing pressure related tissue injury is all about effectively offloading pressure from patients' tissues. In normal circumstances this is done by combining a suitable support surface with a patient specific repositioning schedule.

Critical care which includes high dependency units (HDU) and intensive care units (ICU) can be a particularly challenging environment in the prevention of avoidable pressure ulcers due to a combination of caring for very ill patients who are often too sick to be regularly re-positioned.

As part of a comprehensive care package, the use of an active therapy support surface is often essential to assist with the prevention of pressure related skin damage. International pressure ulcer prevention and treatment guidelines recommend the use of active therapy support surfaces *'for individuals at higher risk of pressure ulcer development when frequent manual repositioning is not possible'*. [2]

Therefore for critical care patients who cannot be regularly repositioned, the use of an active therapy support surface is an accepted intervention. The key issue for healthcare providers is to determine which active therapy mattress offers suitable levels of tissue offloading and meets the clinical requirements of their most dependent patients.

FIGURE 1.
The QUATTRO Acute active therapy support surface from Talley

Aims

The primary aim of this evaluation was to capture the clinical progress/skin status of patients nursed on the QUATTRO® Acute in the critical care setting, to ensure they all remained free from pressure related tissue injury. Secondary aims include reporting on the user acceptance of the QUATTRO Acute and to document wound progress for any patients with existing pressure ulcers.

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Pressure Relieving Systems

Method

The evaluation took place on a 14-bedded critical care unit catering for level 2 (high dependency) and level 3 (intensive care) patients.

The Talley QUATTRO Acute active therapy support surface (see Figure 1) was evaluated on the unit and used in line with local Trust guidelines.

Patient demographics recorded included age, sex, relevant co-morbidities, pressure ulcer risk level, history of previous and existing pressure damage and nutritional status.

Patient progress was reported weekly and user acceptance of the support surface was determined by structured questionnaires using Likert scales upon completion of the evaluation.

Results

Five patients completed the evaluation on the QUATTRO Acute, 4 males and 1 female (one level 3 and four level 2 patients). Mean age was 78 years and length of stay on the mattress was up to 6 days. None of the patients had pre-existing pressure ulcers on admission to the evaluation.

Pressure ulcer risk was determined using the Purpose T pressure ulcer risk assessment tool. [3] All patients were assessed as being 'at risk' and placed onto the primary prevention pathway. Four hourly re-positioning regimes were undertaken for four out of the five patients, with one patient sitting out for 2 to 4 hours per day and able to reposition independently whilst on the mattress.

None of the patients developed any pressure related tissue damage during the evaluation.

Six staff provided feedback and reported that the QUATTRO Acute was reliable, easy to use, and effective in pressure redistribution and maintaining patients skin integrity.

Discussion

The QUATTRO Acute has been effective in the prevention of pressure related tissue damage for patients nursed within the critical care unit.

When dealing with such a vulnerable, high risk patient cohort their pressure ulcer risk is further compounded by their inability to reposition themselves independently and/or the fact that they have a limited number of positions they can be nursed in.

In this situation it is imperative that the support surfaces chosen by clinicians offer optimal pressure relief and redistribution and that the tissue offloading offered by these products is sufficient to safeguard patients by reducing the risk of pressure ulceration.

Not all alternating pressure air mattresses are the same, therefore evaluating products in the correct clinical setting allows clinicians to make an informed choice when prescribing support surfaces to their patients.

Conclusion

Critical care typically looks after the most clinically dependent patients in the acute care setting and providing safe, harm free care for this patient cohort can be a real challenge for clinical staff.

From a pressure ulcer prevention perspective, ensuring that the support surfaces used in the critical care setting are fit for purpose reduces the risk of pressure ulcer incidence even in the most dependent patients.

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(OT) nurses at risk of occupational stress. In the OT, the nurses appear to be the hosts, making sure that every other team member that comes in there get their needs met accordingly. They set up the theatre, assist surgeons during surgery, observe the overall condition of patients and care for those at risk of developing a critical condition during surgery to prevent any complications from arising. The nurses focus intently on changes in the unconscious patients' condition. These nurses work at a fast pace, handle delicate instruments and they have to master complex techniques. They also have to run uncertain shifts. Yoosefian Miandoab, Charkhat Gorgich, Rezvani Amin and Shahrakipoor (2015) observed that these nurses tend to spend more time, often all of their time, in a sterilised and closed environment, which can be stressful. An OT work milieu is critical in terms of patient safety and is closely associated with elevated stress (Vahedian-Azimi *et al.,* 2019; von Vogelsang, Swenne, Gustafsson, & Falk Brynhildsen, 2020). Caring for patients in the peri-operative setting is dynamic and depends on nurses' clinical knowledge, judgment and critical thinking (Vahedian-Azimi *et al.,* 2019; von Vogelsang *et al.,* 2020). As a peri-operative nurse and peri-operative nurse educator for more than 18 years, the researcher can speak from experience when she say how complex and distinctive operating room (OR) nursing is, and how it is constantly changing. The incredible improvement in technology for surgical patient care has increased the tasks of the OR nurse, which can increase workload and demands for maintaining their professional standards. Because stress perception is so individualised, it is possible that nurses will identify stressors differently due to the intricacy of peri-operative nursing practice.

As a peri-operative nurse with a passion for improving the welfare of this group of professionals, the researcher decided to conduct this study among OR nurses. This, in her opinion, can only be successful if she can get a thorough grasp of the difficulties they face at work. There have also been a lot of research on stress among peri-operative nurses in high-income nations and a few in certain middle-income countries. Even though 82% of nurses believe that work-related stress has a negative influence on their mental health in comparison to their physical health, it does not seem to attract the same attention in Ghana (Kaburi *et al.,* 2019). It is therefore imperative to explore the sources of stress of OT nurses as perceived by these nurses to appreciate the nature of their stressors which may influence the development of context-specific interventions to reduce work related stress among OT nurses.

AIM OF THE STUDY

This study sought to explore events from outside and within the OTs of a teaching hospital in Ghana causing stress in the nurses.

METHODS

A qualitative design was employed using a using an exploratory descriptive approach. This approach helped provide an in-depth understanding of the OT nurses' stressors since it highlighted the accurate portrayal of the stress experience of each participant and established a detailed description of their experiences of stress. This design is used frequently in nursing research for these purposes An example is a study conducted by Simmons (2013) on an exploration of workplace stressors among 18 participants.

The study was carried out at a teaching hospital in Accra. It is one of the leading national referral hospitals in Ghana and the West Africa sub-region with a bed capacity of over 2 000 and over 4 500 members of staff. It provides services in surgical and medical care. The hospital has nine

OTs. For this study, the largest theatre among the nine theatres was used. This theatre was chosen because, it had more peri-operative nurses as compared to the other small theatres to sample from. There is a recovery room where post-surgery patients are sent to be stabilised before being sent to the various wards. The theatre handles cases on general surgery, genito-urinary, maxillo-facial and eye surgery on day-to-day schedules.

The total number of nurses in all the theatre at the time of the study was 25. The final number of participants was guided by the two criteria determined by Morse (1991), which are appropriateness and adequacy. That is, it depended on how well the sample represents the phenomena of interest and the point at which no new information or themes were observed in the data. The sample was made up peri-operative nurses and qualified general nurses who have worked in the OT for more than six months; the most and least experienced OT nurses from the different shifts and who were willing to participate in the study. Peri-operative nurses who have worked for less than six months, as well as student nurses were excluded from the study. This was necessary in order to ensure that participants have obtained maximum depth and variation in perspectives and understanding of the stress among OT nurses. Respondents were purposively sampled and by the time the researcher attained the 12th participant, data saturation was reached where an in-depth understanding into the sources of stress in the OR to nurses had been gathered. Hence the sample was made up of 12 participants (10 females and 2 males).

A semi-structured interview guide was developed by the researcher with the help of the supervisors which was used to collect the data. The interview guide comprised questions on participants' demographic characteristics and their perception about stress and sources of stress. The items developed were informed by the reviewed literature which shows that stress is interpreted as a stimulus, a life event or group circumstances which may awakens normal and/or psychological reactions, which may increase the vulnerability of the individual to disease.

The main items in the guide included:

- What do you understand by stress?
- Where does stress come from?
- Tell me about a time within the past three to six months that you were at work and you experienced stress in the OR
- How do you feel during this experience?

Some additional probes were also used during each interview. The items were reviewed by the research supervisors and the interview guide was pre-tested on two OT nurses. Based on the feedback received from the pre-test, the interview guide was revised as needed. The researcher conducted face-to-face interviews with the participants which lasted about 30 minutes. The interviews were recorded using an audio recorder and hand written notes were taken to record the non-verbal signals of participants. Any relevant questions that were missing in the interview guide, but surfaced during the course of the previous interview was added for the subsequent interviews. When the researcher had collected rich and adequate data to build a comprehensive and convincing theory and no new data emerged, the researcher considered that saturation was achieved, hence ended the data collection.

The study employed thematic content analysis in which data was analysed using Clarke and Braun's (2018) Six Steps of Qualitative Data Analysis and the Constant Comparison Method

(Glaser & Strauss, 1967; Strauss & Corbin, 1990) to determine the sources of stress. These methods allowed the researcher to identify the themes that were important in systematically answering the research questions. After interviewing each participant, the responses were transcribed verbatim into written text and typed out by researcher. The initial ideas and interesting features of the data such as the language used and semantics (both stated and implied) were noted down and then systematically generated into codes across the entire data set while collating data relevant to each code. After all the data had been coded and different codes identified, the codes were searched through and similar codes were collated into potential themes. The generated themes were later checked and refined in relation to the coded extracts to determine whether they appeared to form a coherent pattern in relation to the entire data set. A further review of the themes was done to refine the specifics of each theme and the overall story the analysis tells while generating clear definitions and names for each theme. More themes that were specific and addressed the research questions within these broader categories were generated. Each sub-theme is presented with supporting anonymous quotes using pseudonyms.

The principal investigator, a peri-operative nurse and nurse educator with extensive experience who worked in the OR for eight years and has been involved in the training of peri-operative nurses since 2007, conducted, audio-recorded, transcribed, and coded all of the interviews for the study. As a researcher, a peri-operative nurse and an educator, some of the participants knew me. Due to this, the researcher made an effort to eliminate presuppositions and biases from the analysis, therefore the language of the participants was examined in light of the available data. By defending the researcher's interpretations and conclusions in front of the supervisory team, bias was further prevented through explanation and discussion. Through this approach, the researcher gained confidence in my ability to code the data correctly and, more importantly, the researcher developed transferable insights that helped me address the purpose of the research.

After the interviews were concluded, initial ideas about self-managed action learning were reviewed with supervisors. The researcher acted with integrity, followed the research principles, and gained the appropriate ethics review. The co-author, a senior lecturer in the School of Nursing and Midwifery with substantial experience in qualitative methods, provided input into the interview guide, and reviewed the audio recordings, transcripts as well as the coded data. Both the principal investigator and the co-author collaboratively agreed on the codes and generated the themes from the data. These help to ensure consistency between data presented and the findings.

Ethical clearance was sought from the Institutional Review Board of the Noguchi Memorial Institute for Medical Research with a research proposal and a letter, and approval was given (IRB No. 00001276). Also, permission was sought from the teaching hospital with an introductory letter for site approval to conduct the research.

At the beginning of each interview, the researcher provided a detailed written synopsis of the study to participants. Afterwards, each participant's consent was sought and they were assured of the confidentiality of the information gathered. Participants were told that their participation was voluntary and that they had the right to withdraw from the study at any time and any compensation they are entitled to be given would not change. Each participant had the chance to choose a convenient place for the interview and the researcher did well to maintain

privacy. Anonymity and confidentiality were ensured by asking respondents not to write their names on the demographic profile sheet. Pseudonyms were used to represent all the quotes from participants.

FINDINGS

Twelve OR nurses participated in this study. These nurses were aged between 27 and 51 years (mean age = 34 years; SD = 7.2). Seven (58%) of the participants were married, and seven (58%) had an average of one biological and non-biological child. Of the 12 OT nurses, eight (67%) were on morning shifts with two groups of two (17%) each working on afternoon and night shifts respectively. Furthermore, seven (58%) of the participants had a Diploma in Nursing and five (42%) had BSc. or BA degrees in Nursing. Three described themselves as Registered General Nurses and the remaining nine (75%) had specialised in Peri-operative Nursing. The average years of experience of the participants in OT was 6.5 years (SD = 4.3). Most of the participants - nine (75%) - were junior nurses with ranks ranging from Staff Nurse (SN) to Nursing Officer (NO) with only three (25%) holding senior positions. Of the senior positions, two (17%) were Senior Nursing Officers (SNOs) and one (8%) Principal Nursing Officer (PNO).The participants explained their sources of stress in detail, from which sub-themes were extracted and grouped. Each of the themes and sub-themes presented have been explained and described into detail.

SOURCES OF STRESS

This relates to the origins of the stress experienced and the events, or situations, that acted as stressors. Six sub-themes emerged namely; behaviour patterns, daily hassles, job demand and nature, workplace resources, interpersonal relationships and workplace moral distress. All these sources of stress can generally be grouped into two main categories which are, internal and external sources.

Internal Source of Stress

Stress coming from the internal source encompasses those situations that arise from within the individual. The sub-theme that fits as internal source of stress is behaviour patterns which involved such things as the participants' character and nature making them prone to stress. Two behaviour patterns that stood out strongly were difficulty talking about issues and worrying. The data revealed that some OT nurses (n = 8) by nature find it difficult to talk about things bothering them, which predisposes them to stress. Some participants reported not being able to voice out whenever there is a problem.

'One thing I have realised is that not voicing out things because of the fear of getting into trouble is stressful' (Ladala).

Also, the issue of worrying was identified by half of the participants (n = 6) as leading to stress in a few OT nurses. Some participants indicated that they experience stress because they are always preoccupied with thoughts; worrying about so many things, though sometimes, the source of the worry is hard to pinpoint. One participant made the statement:

'I am always thinking a lot and worried about virtually everything. This gives me stress' (Hadala).

External Sources of Stress

Most of the sources of stress expressed by these OT nurses (n = 12) were from external sources.

The sources of the external stresses were from daily hassles, job demand and nature, workplace resources, co-workers and workplace moral distress.

Daily Hassles

It was found that some participants (n = 7) experienced stress arising from external sources that have to do with constant daily annoyances and frustrations from their family, commuting, queuing and traffic jams. Participants reported getting frustrated by having to carry out certain family responsibilities, dual roles and child care. Some participants indicated that it becomes stressful having to wake up very early in the morning to take care of children before going to work.

'As a nursing mother, I have to get up early, see to the kids before coming to work. And when I get back home, even though I need to rest my children are there for me to take care of, for the one who was also taking care of them while I was away to also rest. Once you are in they think you have to come for your baby [laughs]' (Dadala).

'At home, in the morning you have to wake up very early, take care of your children, bath them take them to school before you'll have to rush to work. All that is stressful' (Fadala).

Aside from having to take care of the children, issues of financial responsibilities towards one's family were also identified to be overwhelming for some participants. Participants (n = 6) reported that they became stressed due to some financial burdens placed on them by their family members. One OT nurse in the statement below vividly captures this:

'Responsibilities from your family, your mum and your dad and siblings are also stressful. You must provide for your parents and siblings. So with the little salary, you find out that you are not able to provide for your immediate family needs because you overburden this little salary. So it ends up in a way being stress on you' (Kadala).

In addition, some other daily hassles some of these nurses go through include time spent to get to work, distance to travel to get to work, queuing and means of transportation to work. Participants (n = 9) reported that they go through stress because they struggle with transportation to get to work since they lived far away from their place of work. This sub-category of external stress was saturated having codes such as traffic, distance from work and transportation. Three OT nurses stated as follows:

'It's just struggling through to get to work, distance from home to work, it can be very stressful' (Badala).

'Beating the traffic to get to work is stressful' (Fadala).

'Stress comes from letting me say my transportation. At the moment I don't have my means of transportation. So coming to work you have to join the public transport. You get to work at times late because you have to join long queues before you board transport to the workplace' (Gadala).

Job Demand and Nature

Job demand and the nature of the job were also identified as other external sources of stress to the OT nurses. This could be seen in the responses of participants in the bid to identify the

other sources of stress to the OT nurse. Within this category, all the OT nurses talked about workload, exposure to body fluids and chemicals as well as prolonged standing. Most of the people in this study (n = 10) experienced stress as a result of workload. The OT nurses reported that the number of cases booked for a day is a lot and that they have to be on their feet until their shift was over.

'For my department, I think we have a lot of pressure as in the number of cases done in a day. We have different teams coming to the OT and especially in the afternoons when it is open for emergencies all the different units even those that are not on duty do come in with their cases to operate' (Badala).

'Surgeons book too many cases for the day and they rush you to work. When we finish with a case, they have time to rest for the next case. But we wouldn't rest. We have to tidy up and set up the place for the new cases' (Dadala).

In the responses above, it is obvious that participants in this study go through tremendous stress as a result of their heavy workload at the workplace. Again, the nature of the job, which had to do with exposure to body fluids and chemicals, was another source of stress being reported by half (n = 6) participants. Some OT nurses indicated that they fear that they may become infected while rendering their duty due to the excessive exposure to blood and body fluids. Some even stated that they become stressed because certain chemicals that are used in the OT cause them some form of problems.

'We get exposed to a lot of body fluids and chemicals. Sometimes you can have cut from needles and even blade. When I am exposed to parazone (chlorine) a little, I begin to experience rhinorrhoea, running nose and sometimes I even tear' (Cadala).

'There are some cases that when you are doing it you are afraid; like they have diagnosed someone an HIV patient, a hepatitis patient. Looking at it, seeing it or having knowledge about it will let you have that fear in you that [in Twi: woe mekoo yedee ewose meye very careful na bibira awo meo] *(I must be very careful with this surgery so I don't sustain any needle stick injury)' (Hadala).*

In addition to workload and exposure to body fluids and chemicals, prolonged standing was another factor that led to stress among these nurses (n = 12). The participants reported that due to the nature of the OT work, they can be standing continuously for hours. The issue of prolonged standing being a source of stress to the OT nurse was echoed in the following statements:

'You come to work and you work till you are about leaving the theatre (closing). You have to stand for long hours during an operation' (Gadala).

'One thing is standing for so many hours for long cases. You'll stand for six to eight hours for a case, for example maxillo-facial surgery' (Jadala).

Workplace Resources

Having challenges with resources at the workplace is also seen to be alarming for the OT nurses. Therefore, the non-availability and inadequacy of resources were cited as leading to stress in OT

nurses in this present study. Specifically, resources such as staff shortage, inadequate and faulty equipment, and insufficient supplies were identified as sources of stress from the responses of the participants. The participants (n = 12) reported at often there are small numbers of OT nurses on the various shifts, which stresses them out a lot.

'We have this challenge of shortage of staff and this is worsened when we have a lot of the nurses going on leave, maternity leave and sick leave' (Adala).

'There is a shortage of staff. A lot of them are on leave. Two or three nurses will be working with one team so if there are other cases booked you have to try and finish all during your shift or at least start the last case before the staff for the next shift begin to come. So basically, it's about the staff that is not available' (Fadala).

Data collected revealed that items to work with within the OT, which comprise supplies and equipment as compared to the number of cases booked, are inadequate. About a third (n = 8) of the participants reported there were inadequate sterile items as well as faulty equipment which were usually also inadequate.

Some participants reported that there are times they struggle to have adequate sterile linen, gowns, sutures, gauze and instruments to work with and this, they indicated, resulted in stress. All of the OT nurses made specific comments regarding sterile items and the following two are representative statements:

'We have this problem of our linen, or packs and gowns. The CSSD (Central Sterilisation Supply Department) where we autoclave our things happen to serve the whole hospital. They have to do a bit of every department's own. Therefore, you do not get the number of things that you want at a particular time. It is very stressful' (Adala).

'Sometimes, you have to work and there is no gauze and packs because CSSD is not working. Surgeons will come and will not have scrubs to wear. You request for the things but you don't get enough' (Fadala).

With respect to inadequate and faulty equipment, the theatre nurses indicated that a lot of the equipment such as the diathermy machine and suction machine were faulty causing shortage. The participants (n = 8) reported that due to the inadequacy of this equipment, one was always compelled to move this equipment from one theatre to the other where they are needed most during surgery.

'You are operating with a suction machine; one case is not over but because the machine is needed in another theatre you have to come and move it there. You will be moving up and down the place until you close. Therefore, by the time you close you would have walked over five kilometres even though it is a small place. So those are some of the things that subject me to stress' (Cadala).

'In the theatre, the equipment is not available especially with the suction machine and the diathermy machine so you have to be taking them from one theatre to the other just to go and work with them because they are not available (inadequate)' (Edala).

Interpersonal Relationships

Data also revealed that issues pertaining to interpersonal relationships among OT nurses also brought about stress in the participants in this study. The OT nurses (n =12) reported issues related to communication and disrespectful behaviours that threatened working relationships and had an effect on patient care. The nurses reported that some surgeons bring in emergency cases to operate on without giving the nurses any prior notice. This sub-category comprises codes such as lack of communication, lack of information, lack of co-ordination and delayed information. An OT nurse made the following statement regarding communication:

'Doctors come in unexpectedly and book cases without any prior notice. Since the theatre is where they think they can just pop in and then bring in any case at all at any time for you to work with them. At times too they book the cases alright but they are not around and they will not give you any prior notice that they will come in a bit late' (Hadala).

Workplace Moral Distress

Moral distress also emerged as one of the sub-themes for sources of stress. Data collected also showed that some OT nurses from this current study also do experience moral distress, which results from issues concerning the patient's prognosis, death of a patient, unduly starving patients and case postponement. The OT nurses (n = 5) felt that they had a moral obligation to care for their patients and not to cause harm to them. They also indicated that knowing that the prognosis of a patient is bad and still seeing a patient go through surgery stresses them up. One theatre nurse stated:

'When a patient dies on the theatre table it gives so much stress. There are times we have to wait for surgeons or the cases are postponed. The patients are left in the corridor for long hours and they are starved. Telling a patient that the case is cancelled or postponed for you is stress because at times the patient weeps' (Hadala).

Another nurse stated:

'Where the patient's prognosis is not good enough and you realise the surgery that is about to be carried out on the patient is just palliative it gets very depressing' (Badala).

In these two quotes above, it is obvious that moral distress is one of the sources of stress to some of the participants in this study. To conclude, the main sources of stress to the OT nurses include behaviour patterns, daily hassles, job demand and nature, workplace resources, interpersonal relationships and workplace moral distress.

DISCUSSION

The nurses referred to stress as a reaction to an inability to cope in a given situation. The participants saw stress as an individual's reaction to a mismatch between the demands being placed on an individual and the individual's capacity to meet those demands. This produces a wide range of psychological and biological responses in the individual when exposed to stress. Fink (2016) also indicated that stress is a psycho-biological reaction of the body to physical or psychological demands threatening or challenging the well-being of a person. It is clear that OT nurses had knowledge of what stress is and can identify situations that are stressful whenever they arise in the course of their work in the theatre.

It was identified that the stress OT nurses experience comes from internal and external sources. For the internal source, the individual's behaviour patterns were identified and the external source had to do with daily hassles, job demand and nature, workplace resources, co-workers and workplace moral distress. Some of the OT nurses are very prone to stress because they find it difficult to talk about things bothering them and or worrying. Stress can result from not voicing out what bothers one and keeping things to oneself. Personality traits such as openness and extraversion are associated with lower levels of perceived stress. Individuals who possess the openness trait are ready to re-examine their values, appreciate new ideas and rich in imagination hence experience lower levels of stress (Lee *et al.*, 2018; Khoo & Simms, 2018). However, the finding from this study does not specifically investigate these traits, and hence does not suggest that nurses exhibiting this behaviour pattern are introverts. Furthermore, the results from this study also highlighted the role of worrying in an OT nurse's stress experience. When worries become excessive, chances are that you will trigger the stress response in line with the claim by Ehring and Behar (2020) that a person who worries becomes easily upset, often feels downhearted or irritable, and has the tendency of aggravating stress.

Daily hassles, which include family responsibilities, travel time to work, the long distances travelled to work were identified through this study as a pre-disposition to OT nurses' stress. Spending long hours in traffic commuting to work is a source of stress for the nurses. They end up exhausted on arrival to work and have to contend with unpredictable time spent in the OT during surgery. These non-work-related stressors can be overwhelming for some of these nurses, thereby leading to stress. Cohen and Venter (2020) noted that the stress nurses experience also results from long commuting hours and chaotic traffic conditions. Li, Cheung and Sun (2019) noted that nurses are also affected by other non-work-related stress such as family responsibilities and financial difficulties. Financial responsibilities towards one's family have been confirmed by Asadi, Garavand, Khammarnia and Abdollahi (2017) to lead to severe stress in situations where there are inadequate salaries to meet financial obligations Also, some of the OT nurses in this study perform dual roles; taking care of children and the home before going to work which make them experience stress. Findings of Abdul-Samed (2019) among Ghanaian nurses show that balancing work-life and home-life is another big stressor that may account for the level of stress among nurses because of the conflicting demands of dual roles.

The OT nurses also referred to the overwhelming demand that their job places on them. They stated that they experienced stress due to job demand, which includes heavy workload, exposure to blood and body fluids as well as prolonged standing. Findings from this study demonstrates that the OT nurses believe that heavy workload is one major source of stress, which they attributed to the small staff strength. This reflects the findings of previous studies that workload is one of the frequent and major sources of stress which is overwhelming for nurses (Biganeh *et al.*, 2021; Birhanu *et al.*, 2018; Faremi *et al.*, 2019; Kwiatosz-Muc *et al.*, 2018). However, in another study, Faremi *et al.* (2019) attributed heavy workload more to the shifting of priorities, involvement with life and death situations as well as nurses being required to perform doctor's functions outside of their competence.

The stress associated with fears resulting from exposure to chemicals and body fluid can be unsettling for the OT nurses. Pre-occupation with the thought that patients are potential carriers of some pathogenic organisms specifically HIV and Hepatitis B virus is a major source of stress for fear that they might end up being infected. It has been reported that health professionals

become seriously stressed due to biological dangers the nature of their work have exposed them to through the use of sharp equipment like needles and through skin contact (Dagget *et al.,* 2016; Khamisa *et al.,* 2016). Guo *et al.* (2019) re-iterated that nurses, especially younger nurses while treating infected patients do experience fear of exposure to HIV/AIDS (acquired immunodeficiency syndrome) and Hepatitis, which in turn results in stress. In the OR, the risk of exposure to infected body fluids is high, hence it is a major source of concern to these nurses. The OT work is associated with prolonged standing. Major operations can last for two hours or more. A nurse who stands for this long certainly begins to feel tired and eventually becomes stressed out, especially when there are several cases to be operated upon with little or no breaks between the surgeries. This is referred to as static stress which Tavakkol *et al.* (2020) alluded to as prevalent among OT nurses.

Problems related to workplace resources including staff shortage, inadequate and faulty equipment, and inadequate supplies were reported by the participants as sources of stress. The participants reported that often there are a small number of theatre nurses on the various shifts and these few nurses have to go the extra mile to complete the work expected to be done for the day. Staff shortage has been identified as a source of stress among nurses (Cohen & Venter, 2020; Johan *et al.,* 2017; Kakemam *et al.,* 2019). It is no different from what the theatre nurses expressed in this study. Johan *et al.* (2017) further explained that a shortage of nursing staff exacerbates the problem of the workload resulting in an additional amount of work. Thus, the current situation is strongly believed to be a contributing factor to the heavy workload, which has also been identified as a source of stress to the operating theatre nurse.

Consistent with the findings of Atefi *et al.* (2016) and Ghavidel *et al.* (2019) that lack of supplies and equipment bring about stress in nurses, this study also revealed that OT nurses have been facing challenges with inadequate supplies and equipment. The problem of inadequate material resources could be attributed to the economic hardships that all middle-income countries including Ghana go through. Therefore, the OT nurses who struggle to get the needed supplies and equipment to work with feel the effect. This study also found that interpersonal relationship-related problems such as lack of communication and disrespectful behaviours on the part of doctors contributed to stress among participants. It may be speculated that the doctors' disrespect for OT nurses creates a sense of lack of autonomy in these nurses. The stress therefore may be because these nurses feel left out when it comes to decision making. In line with Ghazwin et al. (2016) and Starc (2018), lack of autonomy and independence in making decisions are sources of stress among staff nurses in the clinical area including OT nurses. Chu (2017) reported that nurses experience stress when they sometimes feel they are unable to make decisions or change unsatisfactory situations.

Moral distress as a source of stress to these nurses may be attributed to the fact that the hospital is a tertiary hospital and many critical and dying patients were referred to these hospitals Regardless of culture and country-specific professional role, nurses identify the emotional issues related to death and dying to be overwhelming (Beuthin, 2018). When OT nurses lose patients in theatre, it is very distressing which often leads to the experience of stress. In a related study, Amarneh (2017) also found that death and dying issues are the most prevalent stressors among nurses. Similarly, Wazqar *et al.* (2017) which show that nurses become stressed when dealing with life and death situations and this study identified that participants also expressed similar concerns. They stated that they experience moral distress, which results from poor patient

prognosis, death of a patient, unduly starving patients and case postponement, which stresses them up a lot. Wazqar *et al.* (2017) have revealed that healthcare employees do experience stress of conscience in situations where an individual feels unable to follow his/her conscience at work and also is unable to deal with moral problems such as difficulty in dealing with feelings aroused when a patient is suffering.

CONCLUSION

This study provides a valuable insight into the reality of stress as experienced by OT nurses in a teaching hospital in Ghana. The study has shown that OT nurses are faced with various stressors from time-to-time and the commonest and the most worrying are those related to their work. The major sources of stress such as work overload, staff shortage and inadequate equipment and supplies to this group of people have been identified. The staff shortage, specifically OT nurses has led to the nurses perceiving their workload as overwhelming. Thus, there is the need to help create a more conducive environment for all OT nurses to enhance their performances. Ensuring a stress-free environment for the OT nurses will also lead to their well-being.

RECOMMENDATIONS

Healthcare and nursing managers should design better stress assessment programmes to enhance OT nurses' quality of work and psychological well-being. Nursing administrators should consider employing more competent and experienced OT nurses, specifically peri-operative nurses into the OT and periodically enhance their scientific and practical abilities through workshops and in-service training to ease stress resulting from the shortage of OT nurses and to:

- Reduce the nurses' work overload
- Hospital administrators and managers should ensure that the equipment and supplies are adequate to meet the demands
- Hospital management should take a more active step in organising yearly workshops with more emphasis on etiquette and attitude among surgical team members
- Government of Ghana should expand the infrastructure of the existing peri-operative training school and establish additional peri-operative nursing schools in all the regions in Ghana to train more peri-operative nurses to increase their numbers in the various OT in the country.

Limitations

The study was confined to one hospital and its qualitative nature made having a larger sample size misplaced and substantially impracticable for in-depth interview analysis. Besides, the self-report method used subjected this study to the mercy of the participants' reporting style, motivation and honesty. There is a possibility that the participants may have withheld certain information in case it would reflect badly on them or in case it would offend the researcher. An individual may also perceive his/her work environment in negative light when stressed and this may negatively affect their responses.

V. Asimah Ackah, A. Adzo Kwashie, Exploring the sources of stress among operating theatre nurses in a Ghanaian teaching hospital, International Journal of Africa Nursing Sciences (2023), doi:https://doi.org/10.1016/j.ijans.2023.100540.

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FLOW CHART FOR MANUAL REPROCESSING OF SOILED INSTRUMENTS

STEP 1

PRE-TREATMENT FOAM
For surgical instruments

- Applied immediately after used–prevent drying of surgical soil.
- Neutral pH, keeps soils moist for up to 100 hours.
- Foam breaks down soil – inhibiting microbial growth - bacteriostatic.
- Easily rinsed from surfaces.

Or **Pre-Water rinse**

- Rinse off all blood, body fluid and tissue immediately after use, using cold water.

STEP 2

MIX SOLUTION

Getinge Enzymatic Detergent.

- Dosing according to manufacturer recommendations.
- Dosing range 2–10 ml/l.
- Cleaning temperature (manual) 30–45 °C (same as for baby bath temp).

STEP 3

CLEANING PROCESS

- Use appropriate cleaning brushes.
- Brushing process should be one way wash action- prevent pullback of soil.
- Wash instrument below water/detergent solution surface – ensure contact time.
- Adequate contact time should be at least for 2min.

STEP 4

RINSE - POST CLEANING

- Ensure thorough rinsing, with clean water.

STEP 5

INSPECT - POST CLEANING

- Inspect all instruments surfaces to ensure visibly clean and free of stains and tissue.
- Inspect for proper function and condition.
- Oil instruments open and close needle holders, scissors and other hinged instruments - using an Oily pen.

STEP 6

DRY OFF THE INSTRUMENTS INFECTION PREVENTION

- Dry instruments thoroughly with a clean paper towel every time.
- A High pressure air gun can be used which is more effective.
- Drying minimizes the risk of corrosion and forming of water spots.
- Most important is the prevention of recontamination.

Reprocessing refers to infection control procedures for removing and inactivating microorganisms on reusable patient-care equipment. Reprocessing of reusable medical devices/instruments includes cleaning, disinfection, and sterilization.

Reminder always wear proper PPE

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