

# Understanding compliance with protective eyewear amongst peri-operative nurses: a phenomenological inquiry

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## KEY WORDS

qualitative, personal protective equipment, protective eyewear, nurses, peri-operative, compliance

## ABSTRACT

### Objective

The objective of this study is to obtain an in-depth understanding of the phenomenon of peri-operative nurses' use of protective eyewear in the operating room (OR), and to understand nurses' attitudes and beliefs towards protective eyewear.

### Design

Data was collected via one-on-one interviews with eight peri-operative nurses working in a private hospital in Melbourne. The data collected underwent rigorous thematic analysis using an extended version of Colaizzi's method of phenomenological inquiry.

### Setting

The participating site is a large, private, metropolitan hospital that has 420 beds and employs 1,100 nurses and midwives, of which 31% are peri-operative nurses.

### Subjects

Eight registered nurses were recruited. They were all female, aged between early 20s to early 60s, ranging in experience in the peri-operative setting from more than six months to approximately twenty years.

### Main outcome measure

The investigation of the phenomenon of peri-operative nurses' use of protective eyewear in the OR with information to help further understand peri-operative nurses' attitudes and beliefs towards protective eyewear.

### Results

For nurses, being compliant with protective eyewear is a combination of intrapersonal, environmental and professional factors, including protecting self, risk appraisal, beliefs, previous experiences, fear, comfort and functionality, professionalism, leadership, forgetting versus routine, time pressure and accessibility, alternatives and patient-centred care.

### Conclusion

Individual nurse's beliefs towards protective eyewear and its impact on work, life and patient care influence their decision to use protective eyewear. Peri-operative nurses are more compliant when they are well informed and are in a supportive work environment.

## INTRODUCTION

Personal protective equipment (PPE) is a part of standard Precautions (SP) – a set of guidelines used to prevent hospital-acquired infections in patients and healthcare workers. SP works in the context of the assumption that no patient or healthcare workers can be 100% certain they do not carry blood-borne viruses (Siegel et al 2007). PPE, which consists of gloves, gowns, aprons, surgical facemasks, protective eyewear, and face shields, is especially important in the operating room (OR).

Nurses working in the OR – scrub, scout, and anaesthetics nurses – are at risk due to the close proximity to large open surgical sites (Nagao et al 2009), having to deal with bloody sponges, specimens and instruments (Taylor 2006), and assisting with intubation and extubation. Recovery nurses looking after patients post-anaesthesia are also at risk of being exposed due to the frequent patient coughing in the recovery room and post-operative vomiting (Neo et al 2012). PPE is therefore an essential part of the nurses' regular attire in the OR setting. In an Australian study, 95% of the nurses who have experienced occupational exposures (OEs) worked in the theatre setting (Knight and Bodsworth 1998). More recently, a study in South Australia also found the peri-operative environment to be one of the departments with highest rates of OEs to mucous membranes or skin (Bi et al 2006).

Despite global guidelines around PPE (National Health and Medical Research Council [NHMRC] 2010), compliance with protective eyewear is relatively low in comparison with other forms of PPE (Gammon et al 2008; Jeong et al 2008; Nichol et al 2008). A review specific to peri-operative nursing and use of protective eyewear revealed that rates of compliance with eyewear were low compared to other forms of PPE (Mills et al 2011). However, only a small percentage of the quantitative literature available focused specifically on peri-operative nurses as a study population (Chan et al 2008; Jeong et al 2008; Hunt and Murphy 2004; Osborne 2003; Kim et al 2001).

While quantitative evidence provides empirical evidence related to use of protective eyewear in the OR and cost of OEs, qualitative research allows a deeper understanding of the experience from the nurses' perspective and can illuminate the motivations related to choosing to use protective eyewear. Only 11 articles of 991 returned abstracts were identified as using qualitative means to investigate nurses' use of PPE in an acute care setting, with only three of these studies specifically mentioned peri-operative nurses or nurses working in the surgical setting. Notably, no qualitative study investigated the Australian context. Therefore, this study aimed to explicate an in-depth description of the phenomenon of peri-operative nurses' contemplation in using protective eyewear.

## METHOD

The study undertook a phenomenological approach to obtain an in-depth understanding of the phenomenon of peri-operative nurses' decision to use or not use protective eyewear. Phenomenology is a rigorous and systematic methodology of explicating elements related to the lived experiences of a phenomenon (Streubert and Carpenter, 2011). It enables researchers to develop a deep and holistic description and understanding of the phenomenon of day-to-day activities, which may be routine, taken for granted and yet complex and situational, as lived by the participants themselves instead of what is observed by investigators (Streubert and Carpenter, 2011). A purposive sample of peri-operative nurses was recruited. The participating site is a large, private, metropolitan hospital that has 420 beds and employs 1,100 nurses and midwives, of which 31% are peri-operative nurses.

Data was collected via one-on-one semi-structured interviews. For the purpose of this study, protective eyewear was defined as protective goggles or masks with visors. The focus/opening question of the interview was "Can

*you describe what influences your decision to use or not use protective eyewear?"* Other recursive questions to encourage the discussion included – *"Can you recall a time when you think you should have worn eyewear but did not?" "What happened?" "What was the situation like?"* Since the phenomenological method used for this study also involved the interpretation of symbolic representations, questions such as – *"When you think about wearing protective eyewear, what image do you have in your mind?"* were also included. The interviews lasted an average of 30-40 minutes. The interviews were also audio-taped to facilitate transcription later. The narrative data is the focus of this article.

Ethical clearance was obtained from both the hospital and university Ethics Committees. Informed, written consent was obtained from each participant before data collection. All transcripts were de-identified after the individual participants validated the accuracy of their individual transcript. The data was analysed using an extended Colaizzi's method established by Edward and Welch (2011), as seen in table 1.

**Table 1: Extended version of Colaizzi's method (Edward and Welch 2011)**

Step One	Transcribing all the subjects' descriptions.
Step Two	Extracting significant statements [statements that directly relate to the phenomenon under investigation].
Step Three	Creating formulated meanings.
Step Four	Aggregating formulated meanings into theme clusters.
Step Five	Developing an exhaustive description [that is, a comprehensive description of the experience as articulated by participants].
Step Six	Additional Step – Researcher interpretative analysis of symbolic representations - from the articulation of the symbolic representation (which occurred during participant interview).
Step Seven	Identifying the fundamental structure of the phenomenon.
Step Eight	Returning to participants for validation.

To ensure credibility, the transcripts of the interviews were referred back to the participants for validation to determine if they found the findings to be accurate – also known as member checking (Streubert and Carpenter 2011). As part of investigator triangulation and peer debriefing, the researchers reviewed the findings to address any possible prejudices, crucial omissions, inaccurate interpretations and failure to identify all of the important themes (Polit and Beck 2010). The fundamental structure of the phenomenon from the narrative was compared with that from the symbolic representations to ensure consistency and rigour in the results – a form of method triangulation.

To ensure dependability an audit trail for this project was kept and included documentation of the data, methods, and decisions made throughout the entire research process and the end product (Gibson and Brown 2009; Schwandt et al 2007). Part of the data in the audit trail included a reflexive journal, which included a log of day-to-day activities and reflections and thoughts regarding each step of the research process. In terms of transferability, provision of sufficient description of the research context, participants and methods used such that readers can judge for themselves whether the findings can inform their own context.

## FINDINGS

Eight registered nurses were recruited. They were all female, aged between early 20s to early 60s, ranging in experience in the peri-operative setting from more than six months to approximately twenty years. Three participants worked in anaesthetics/recovery and five in scrub/scout roles. Four participants also added that they held some form of senior management or education role.

Statements that were directly related to the motivations and barriers of nurses' use of protective eyewear were considered significant statements. According to the modified method, 194 significant statements were extracted from the interview transcripts (Edward and Welch 2011). Table 2 presents examples of the significant statements.

**Table 2: Examples of Significant Statements**

<p><i>[I use protective eyewear because] I don't want to have anything in my eye that doesn't need to be there."</i></p> <p><i>"I've seen blood flicked to the back of the room. Your ability to experience a splash is wherever. ...It [wearing protective eyewear at all times in a theatre] is a precautionary thing regardless of what you're looking at, but what's going on around [you in the theatre] as well."</i></p>
<p><i>"I just wear my normal reading [glasses] everyday, day in, day out. Makes no difference. To me, it's still eye protection."</i></p>
<p><i>"I had to go through quite a little bit of nasty treatment I wouldn't wish that treatment on anyone, it was ghastly. As a result of that [my experience of eye splash], I [now] always wear these spectacles and a mask with a shield on it."</i></p>
<p><i>"I feel a little bit more responsible for wearing stuff like that [protective eyewear] than I did before [the change in my personal life], because of the responsibility of looking after someone else."</i></p>
<p><i>"I don't have many choices [if they run out of disposable goggles], because not all the [protective] eyewear fit over my glasses."</i></p>
<p><i>"I've tried the goggles and they steam up. I can't see and if I'm scrubbed, it's terrible because I just cannot see anything and a couple of hours with steamed up goggles is.. [I] can't do it."</i></p>
<p><i>"You have a list that you have to get through in a certain time and you have to make through at a certain rate. The last thing you want to do is half way through a list is running down and getting some more masks [with visors]."</i></p>
<p><i>"When I'm there over a patient and assisting [with extubation], I'm needed in that space. I can't say, 'Stop. Don't pull that tube out, I'm going to get some eyewear.'"</i></p>
<p><i>"Maybe it takes that other person just to hand you a pair [of protective eyewear in case of an emergency, for one to use it]. You go, 'oh, that's right, I forgot', or 'oh thanks', [when someone hands you a pair of protective eyewear in an emergency]."</i></p>
<p><i>"If I don't have eyewear on, I feel naked in the theatre. It's like if I don't have a mask on in theatre I feel naked. I've got to have it [protective eyewear] on."</i></p>
<p><i>"There are other ways of covering up, like if the person's coughing, [to have] something over their face."</i></p>
<p><i>"You'd be so worried about them [your patients in an emergency situation], you wouldn't want to be the one that do[es] something detrimental to your patient because you wanted to get eyewear."</i></p>
<p><i>"I think when you're greeting a patient, it's nice for them to see your face and not to see a mask [with eyewear]. They're nervous and [wearing PPE] just brings that whole theatre environment straight into their face right at the holding bay. So it's nice to have that smiling communication with the patient."</i></p>

Meanings for each significant statement were then formulated and clustered into themes. Twelve themes were explicated from the data; they were- Protecting self; Risk appraisal; Beliefs; Previous experience; Fear; Comfort; Time; Professionalism; Leadership and education; Forgetting versus routine; Alternatives; and Patient-centred care. The themes were checked against the significant statements and transcripts for validation. The formulated meanings were integrated into a comprehensive description of each theme that arose. The major themes that emerged from the analysis included *Protecting self; Risk appraisal; Beliefs; Previous experience; Fear; Comfort; Time; Professionalism; Leadership and education; Forgetting versus routine; Alternatives and*

*Patient centred care.* The subsequent fundamental structure related to compliance with protective eyewear amongst peri-operative nurses emerged from the data.

From the nurses' perspective, the overarching principle regarding their contemplation of using protective eyewear is to be protected, as much as possible. Using protective eyewear is a key procedure in the theatre environment to protect themselves from the numerous hazards found in the workplace, which is viewed as a high-risk environment involving drugs, body fluids and chemical hazards. Thus, even if protective eyewear may not be 100% protective, the nurses rather use them than not and tend to choose options that allow more facial coverage. Being compliant with protective eyewear is a combination of intrapersonal, environmental and professional factors.

Nurses' compliance with protective eyewear depends on intrapersonal factors such as their personal preferences, habits, and beliefs towards protective eyewear, risk appraisal, previous experiences, and the fear of consequences of a blood splash. From the nurses' perspective, they are more compliant with protective eyewear when the eyewear are comfortable, functional and available, when the eyewear are believed to provide sufficient/more protection, when the nurses have become used to using them routinely, have previous experiences with biological splashes (personal experiences, near-misses or others' experiences), and when the nurses are aware and afraid of the personal, social and financial consequences of blood splashes. Nurses are also more likely to comply with protective eyewear in situations that they deem as high-risk. However, some may have differing ideas on what is risky and what is not. An under-estimation of risk may lead to untoward biological splashes. However, sometimes nurses are not compliant with protective eyewear due to forgetfulness, especially during a time-critical moment.

For nurses, environmental factors can make compliance with protective eyewear challenging. Nurses find it difficult to comply with eyewear when they are unable to access the eyewear when immediately needed, aggravated by the time pressures in the theatre environment, such as the need to progress with a surgical list. When environmental factors interrupt access to protective eyewear, nurses protect themselves by standing back, closing their eyes or covering the patient's face, or by borrowing a pair from others.

Professional factors also influence compliance with protective eyewear. For nurses in the OR, compliance with protective eyewear is part of being a professional and accountable nurse. Nurses are more likely to comply with protective eyewear when there is good team camaraderie, frequent managerial reminders, professional education related to protective eyewear, and when being a role model for others in the theatre team. Compliance with protective eyewear is influenced by the nurses' desire to provide what they think is best for the patient in the theatre environment.

## DISCUSSION

Most participants said that wearing protective eyewear was the norm for them and that using protective eyewear as PPE was part of their peri-operative training and continuous education. However, for one participant, her definition of protective eyewear did not conform to the Standard Precautions definition. That is, this participant believed her prescription glasses were sufficient protection. This lack of awareness could reflect a need for more top-down approaches such as in-services or small posters (Chelenyane and Endacott 2006), as suggested by current literature findings, where nurses reported a lack of awareness of what constitutes PPE and how they will protect nurses (Neves et al 2011; Efstathiou et al 2011).

The current literature identifies embarrassment in using protective eyewear as a contributor to poor compliance (Efstathiou et al 2011; Neves et al 2011). However, in this study, the nurses did not suggest embarrassment as a reason for non-compliance. An inability of the nursing team to work together is also a motive quoted in

current literature for low compliance with protective eyewear (Neves et al 2011; Chelenyane and Endacott 2006), in that, nurses were more motivated to use PPE if their colleagues did (Efstathiou et al 2011). The participants in this study, conversely, expressed that if nurses work as a team, and if there is support from each other and from the management, they are more likely to comply with use of protective eyewear. Support could come in a form of having managers reminding nurses when necessary, or handing them a pair in the middle of an emergency. Accountability to one another as a team in theatre also relates to each person restocking supplies of protective goggles after taking the last one. The literature supports that nurses were more willing to change their practice if senior staff were excellent role models (Efstathiou et al 2011; Lymer et al 2003).

The findings of this study also support the current literature in that nurses will assess the level of anticipated risks when contemplating the use of protective eyewear, as recommended by the guidelines for PPE (NHMRC, 2010). Underestimation of risk level is cited in the literature as a common reason for non-use of PPE (Melo et al 2006; Wu et al 2008). Importantly, different nurses have diverse ideas related to risk and their appraisal of risk in the theatre environment. To some participants in this study, risk was present anywhere in the theatre – such as, when the unconscious patient is on the table, when dealing with specimens or chemicals, or even when cleaning up post-surgery. To others, the risk level was situational and dependent on the type of patient or the procedure the nurses are about to perform.

Time is also cited as a factor for nurses when it came to compliance behaviours related to donning protective eyewear, that is, nurses found they did not have adequate time to use PPE/protective eyewear (Formozo and Oliveira 2009; Ronk and Girard 1994). In support of previous literature related to time, time pressures in the OR environment was a theme that emerged in this study, such as the lack of time to restock and to obtain a pair because of the pressure to get on with a surgical list, or the high-turnover rate between patients causing an inability to get a pair in between cases. The emergency nature of certain procedures in the OR, a high acuity environment, has been related to forgetting to use protective eyewear (Ronk and Girard 1994). The lack of time as a theme in this study was attached to inaccessibility of the equipment, that the eyewear are kept a distance away from where required, the main store being too far from the clinical areas or having run out of stock in the main store. This finding is congruent with the evidence in the current literature (Formozo and Oliveira 2009; Ronk and Girard 1994).

## STUDY LIMITATIONS

The limitations of the project include focusing on only one type of PPE (protective eyewear). Nurses may have different attitudes towards other types of PPE that are commonly used in the theatre environment and exploration of the variations related to other types would be valuable. Additionally, the participants were recruited from one hospital (selection bias); the experiences, attitudes and beliefs of other nurses of other hospital environments may differ from the participants in this study. Finally, as with most qualitative studies, the findings are not generalisable to the OR nursing population as a whole. However, these findings do offer new knowledge related to the motivations of nurses to don protective goggles in the OR.

## CONCLUSION

This study has produced new and valuable insights into experiences with choosing to don protective eyewear that is specific to peri-operative nurses and will contribute to existing knowledge regarding compliance with protective eyewear. These insights can offer a foundation from which to develop a quantitative study to determine effectiveness of particular interventions related to compliance and PPE; such as sustainable in-services regarding protective eyewear and risk assessment, improving accessibility to protective eyewear in the theatre and recovery, enhancing the team spirit and camaraderie within the theatre team to improve

compliance with protective eyewear. This information can influence the establishment of policies and protocols regarding assessment of risk of blood splash in the theatre. In addition, the findings of this study can form the basis of research related to further examination of the experiences of the two categories of peri-operative nurses (nurses in the scrub/scout role or peri-anaesthesia role), and the experiences of other healthcare professionals in the peri-operative setting, including theatre technicians, surgeons and anaesthetists.

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