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# AJAN

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# Public health nurses' (PHNs) experiences of their role as part of a primary care team (PCT) in Ireland

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## KEY WORDS

public health nurse (PHN), primary care, primary care team (PCT), interdisciplinary, teamwork.

## ABSTRACT

### **Objective**

This study aimed to understand public health nurses' (PHNs) views and experiences of their role as part of a primary care team (PCT) and developments within primary care.

### **Design**

The study adopted a qualitative design guided by interpretative phenomenological analysis (IPA).

### **Participants**

Ten PHNs who were working as part of a PCT for at least two years and who also had PHN experience prior to PCT development were interviewed.

### **Findings**

Three super-ordinate themes representing the study participants' lived experience and meanings of PCT involvement were interpreted. 'We are a team' represents mostly positive experiences of being part of a team such as improved communication and teamwork. However, GP non-attendance at PCT meetings was also highlighted by all the PHNs. 'Pushed to the limit' revealed the PHNs' frustrations attributed to lack of resources. In addition, this theme represented PHNs' views of always having to 'take up the slack' within the team. Finally, 'PHN's role' revealed that the health promotion aspect of the PHNs' job was perceived to have been 'pushed aside', and mixed feelings around PHNs' future role were relayed.

### **Conclusion**

The findings contribute to the knowledge of PHNs' roles as part of PCT developments and highlight the need for more dialogue among PCTs on all roles within the team. It is clear that more resources for PHNs in Ireland are needed if they are to fulfil a vision of primary care. In addition, the study findings point to a need to investigate whether policy and practice changes introduced with the introduction of PCTs has improved patient outcomes.

## INTRODUCTION

Internationally, primary care is recognised as the most effective way to provide health services as it provides high quality easily accessible services for the community in a timely manner (WHO 2008). The evolution of primary care has demonstrated positive outcomes with regards to targeting individual and population health needs (WHO 2008).

There have been many developments in primary care in Ireland since the launch of 'Primary Care: A New Direction' strategy (HSE 2007; DoHC 2001) such as the launching of Primary Care Teams (PCTs) around the country (DoHC 2011). Nationally, PCTs work together to deliver local, accessible health and social care services to a defined population of between eight-twelve thousand people at primary first point of contact with the health service (DoHC 2012). According to the HSE (2009) interdisciplinary team-based working in primary care is the ideal approach to providing effective and efficient services at local level following from international counterparts. Public Health Nurses (PHNs) in Ireland play a key role in PCTs due to their generic role and function (Philibin et al 2010). However, they are faced with many opportunities and challenges as part of PCTs (Philibin et al 2010). A major challenge is particularly evident with 44% of the population in Ireland being over the age of sixty five and living in rural areas (Government of Ireland 2012), and this group is supported mainly by PHNs. And while other members of the PCT (e.g. occupational therapists and physiotherapists) are involved in the health care delivery of this particular population group, their specific caseload numbers are capped, resulting in long waiting lists for their specialist services (O'Neill and O'Keefe 2003). The consequence for the PHN is that this professional grouping are left to continue supporting this population group within PCTs, while other services are unable to provide specialist services (Philibin et al 2010). This in turn creates challenges for the PHN in delivering a nursing service as part of the PCT (Philibin et al 2010). Moreover, unlike community based nurses internationally, PHNs in Ireland are seen as 'all-purpose' generalist nurses caring for people of all ages, across the lifespan, in a geographical area, within a PCT (Philibin et al 2010). PHNs have traditionally provided the core nursing and midwifery care in the community, with community registered general nurses (CRGNs) in more recent years, supporting and contributing to community services (INMO 2013). Although the role of the PHN in Ireland involves some specialist role functions (for instance, child and maternal health) (McDonald et al 2013), in other countries, distinct titles are given to these roles which include; district nurses, community nurses and health visitors. District nurses care for people in their homes or residential care homes, providing increasing complex care for patients while supporting their families. They also teach and support patients and their families to care for themselves (Scott 2013). Health Visitors are registered nurses or midwives whose role involves health promotion, public health and working in the community to help families and young children (Christie and Bunting 2011). Community Nurses work closely with patients in the community to provide, plan and organise their care, and their work focuses mainly on those with serious long term complex conditions (Laws et al 2010).

While PCTs are central to the delivery of holistic and co-ordinated primary care, the literature reveals some challenges highlighting inter-professional tensions (Cioffi et al 2010; O'Neill and Cowman 2008). O'Neill and Cowman's (2008) Irish study shows similarities with Cioffi et al's (2010) Australian study regarding inter-professional disagreement among team members. Members of the PCT may not agree with client care management strategies of other health care professionals leading to tensions among team members (Cioffi et al 2010). Nonetheless, much of the literature reveals that teams working in the health service offers clients the highest quality and efficient health care from knowledgeable health care professionals (Sheng et al 2010; HSE 2009; Wilson 2005; Borrill et al 2003; Freeman et al 2000). Furthermore, many researchers also suggest, for a team to function well, it depends on communication and unity within the team (Sheng et al 2010; Carney 2009; Wilson 2005; Zabner and Gredig 2005; Freeman et al 2000).



Other issues for PHNs as part of PCTs include their health promotion role. Traditionally, PHNs were deemed to carry out health promotion in a defined geographical area (Hanafin, 1997). However, recent studies do not show any evidence of PHNs' health promotion initiatives (Burke and O'Neill 2010; Philbin et al 2010). It has been established that PHNs' role in health promotion is reduced due to workload demands (INMO 2013; Philbin et al 2010). The acuity of need determines patient priority, therefore, neonates and their mothers, older people at risk, patient discharges from hospital requiring dressings, terminally ill and bed-bound patients receive priority attention (Philbin et al 2010). Health promotion activities on the other hand are carried out opportunistically whilst caring for these patients and are of secondary importance (INMO 2013; Philbin et al 2010).

The future role of PHNs in Ireland within the PCT is unclear and a major challenge is to prevent the role being seen as a 'catch-all service' (Philbin et al 2010, p.748). Interestingly, in a review of the community nursing service by the Scottish Executive (2006) it emerged that role confusion and increasing trends towards specialist roles were prevalent. However, from the patient's perspective accessing one single discipline was preferred as opposed to the traditional specialist disciplines including; the health visitor, district nurse or school's nurse (Gray et al 2011). Therefore, a radical and new model of nursing was proposed whereby these specialist roles would be absorbed into one generalist community health nurse (Scottish Executive 2006), similar to that of the Irish PHN.

In response to this recommendation of a generalist role as a new model of nursing, Gray et al (2011) carried out a qualitative descriptive case study on 27 purposely-chosen community nurses working in one health board area in Scotland. The aim of this study was an in depth exploration of how community nurse practitioners and managers constituted role changes towards generalist working. Like Philbin et al's (2010) study in Ireland, the 'jack of all trades' was a common theme that emerged and was explored as a discursive strategy to undermine generic changes. Generalist working was outlined by nurses as being detrimental for patient care due to erosion of specialist roles (Gray et al 2011).

Finally, a more recent National study carried out by the Irish Nurses and Midwives Organisation (INMO 2013) found through a national survey of PHNs and CRGNs' work environment there is clear frustration of working in the community. The main issues highlighted by the nurses were staff shortages, huge caseloads, masses of paperwork without added support, difficulties with multidisciplinary/interdisciplinary team working, ambiguity of roles for both the PHN and the CRGN, and cuts to vital services. This study therefore is timely in view of the recent INMO (2013) study, and aimed to provide an in-depth account of PHNs' lived experience of their role as part of the PCT in Ireland.

## **METHODOLOGY**

This study adopted interpretative phenomenological analysis (IPA). IPA is an approach to qualitative, experiential research which is phenomenological in nature as it seeks an insider perspective on the lived experience of individuals (Smith et al 2009). Purposeful sampling was chosen. Inclusion criteria were both having worked in a uni-disciplinary capacity and of having worked or currently working for the past two years as a PCT member. Participants who have had this range of experience were chosen as they are best placed to share experiences of transition to PCT member. The PHNs that were interviewed came from both rural and urban areas of practice. Six of the participants worked in the same building as other PCT members. Two of the participants were working as part of a PCT for three years, seven were working as part of a PCT for five years and one was working as part of a PCT for over eight years. Two of the participants were qualified over twenty years, two over fifteen years, four over ten years and two under five years.

In accordance with the inherent assumptions of IPA, considering researchers' prior knowledge and presuppositions are important (Smith et al 2009). With IPA, the researcher's pre-understandings are viewed as '...necessary precondition for making sense of another person's experience' (Willig 2008, p.69). The lead author is a qualified PHN and has experience of working as part of a PCT in the current economic climate. However, researchers using IPA are advised to 'park or bracket...pre-existing concerns' to allow them focus on the study participants' accounts of their lived experience (Smith et al 2009, p. 64).

Ethical approval was granted by the region's research ethics committee. Letters of invitation were sent inviting PHNs to be interviewed. Ten PHNs volunteered to be interviewed. The first author conducted all ten interviews and used a semi-structured schedule. The interviews lasted between thirty and forty-five minutes. All interviews were transcribed verbatim. Smith et al's (2009) interactive and inductive cycle for analysis was used to guide the analysis. Participants were assigned a pseudonym.

## FINDINGS

Three super-ordinate themes with subthemes were interpreted from the data (table 1).

**Table 1: Super-ordinate and sub themes**

Super-ordinate themes	We are a team	Pushed to the limit	PHN's role
Sub-themes	Communication: The good, the bad and recommendations.	'Primary care has pushed so much in'	Cradle to the grave service
	PCT meetings	Limited resources	Loss of health promotion role
	Supporting each other	PHNs documentation system not capturing role	PHN role will change

### We are a team

Since the development of PCTs in Ireland, communication, relationships and teamwork had improved among PCT members. PCT meetings were seen as a "fantastic" way of enhancing communication through face-to-face interactions, which also motivated team members, improved trust and respect among team members, and ultimately benefited patients.

However, participants also highlighted a breakdown in communication between primary and secondary services. Participants were frustrated with the expectations of hospital staff that they felt were unrealistic, such as; inappropriate referrals from the hospitals or even no referral at all.

*'(...) I wasted my time going to two clients so in total I probably wasted two hours of my time going to clients that didn't actually need my visit (...)' (Chloe).*

*'Number one they are sent from X hospital without letters. They go in get abscesses lanced and different legs treated and just told 'go to the nurse in X'. No referral system, no letter for me' (Amy).*

All participants were very positive about PCT meetings. They highlighted that PCT meetings were 'very good', 'very beneficial' and 'very effective':

*'At least once a month now we would meet the team and I could say 'look I saw this patient' and if the GP had seen him at least we both know where we are coming from. We can both give our opinion on what approach we would like the care to go on for this problem' (Jamie).*

Participants talked about PCT meetings being on a monthly basis. However, fortnightly meetings were highlighted as having the most benefit. Nevertheless, due to workload demands of PCT members, fortnightly meetings were thought to be unrealistic:

*'Well it [fortnightly meetings] would be beneficial but it wouldn't be acceptable really because everybody is so busy at the moment. Everybody is stretched really. Every two weeks it would be just impossible to find that time but it would be beneficial if you had the time' (Jenny).*

The nurses also highlighted that 'everybody's input is as important as the next' (Lacie) at the PCT meetings:

*'(...) when we do come together it works but when we don't come together it doesn't work as well' (Sadie).*

They also expressed particularly the importance of GP attendance:

*'So I feel sometimes that if the GP of the client you are discussing isn't present... that is a challenge' (Katie).*

*'I suppose, a downside, the GPs aren't as involved as I'd like them to be but where the GP is involved with that patient you can sort of push home what you need from them' (Maisy).*

This issue of GP non-attendance echoed throughout the nurses' narratives and they expressed frustration that GPs did not see PCT meetings as beneficial and that everything was being done to accommodate the GP yet they still would not come. Due to GPs not attending meetings, leads to further issues such as lack of role clarity, and the nurses highlighted that role clarity among PCT members depended on PCT meeting attendance:

*'Everybody realises when you sit at the PCT meeting what their role is' (Jenny).*

*'It always extends back to the GP not attending the meetings so they don't know then what our roles are' (Elly).*

Despite the many challenges of working as part of PCTs, the feedback was predominantly positive. The responses from participants included the viewpoint that there was better support for PHNs now, patient care was shared among the PCT and joint visits were found to be very effective and efficient. Team stability was also highlighted as a means of effective teamwork and the nurses acknowledged it is the patient that is at the centre of primary care:

*'Yes I find working in the PCT a huge difference and a great benefit. (...) You feel that you are not 'carrying it on your own shoulders', that you are within a team and it is shared (...)' (Katie).*

### **Pushed to the Limit**

Participants highlighted that their workload had 'increased dramatically' since the introduction of primary care, without the associated supports. Paperwork had increased and PHNs were even resorting to operating waiting lists in order to cope with the pressure:

*'Our service can go extremely busy and it's still the same nurse that is on trying to cover that area, trying to keep on top of it. She is trying to provide the same service that she is trying to do always, but when the workload increases, it is very difficult to do that. That is what I feel. No extra money was invested in staffing levels to support the 'free for all' (Katie).*

*'You are chasing. You are trying to do twelve, fourteen visits a day. So you are catching your tail the whole time' (Chloe).*

Many of the participants also felt overwhelmed with the amount of paperwork they have to do now compared to prior to PCT involvement:

*'(...) you do, you have to document, which is important, but there is an awful lot of documentation for everything. There is duplicated documentation. (...) There is so much clerical work to do. It is very hard to give a quality driven service when there is so much pressure' (Lacie).*

In order to counteract the workload demands, participants highlighted that they prioritised their workload by operating waiting lists, but they had difficulties with this:

*'(...) I had a client last week and I could've left him until this week and I have no doubt that he would probably had a pressure sore I could have put my hand into. (...) Yes I would have a little waiting list and I have had to defer. You try and do your best and that is all you can do' (Lacie).*

A lot of time is spent on the phone dealing with queries and this work goes unrecognised due to the fact it is not recorded on the workload returns:

*'(...) but I did that all on my own time maybe from eight to nine on a night. But I never put it down as my workload and I should have actually because it was very important' (Chloe).*

However, this lack of documentation may be out of the PHNs control and a need for an improved recording system was highlighted by Elly:

*'Because if you look at the return system there is no space on it to say 'new PCT referral'. Which you could be putting in two or three a day. So that is not being recognised. In the Physio and OT system, when they get a new referral the co-ordinator will put it up on the system but for us that's not being recorded anywhere. (...) I am just saying in figures and statistics it's not being recognised. (...) That needs to be sorted out' (Elly).*

### **PHN's role**

Many of the participants expressed concerns that they always seemed to be the 'first port of call' for other PCT members. Participants felt that whatever did not fit the job description of the other disciplines within the PCT, it ended up on the desk of the PHN to 'sort it out'. Educating team members on each other's roles was deemed important by participants:

*'At the very start we gave a presentation and maybe at six months in we gave a presentation again. (...) you know they all think we do nothing else but their defined role and to make them understand that we have a huge vast population and what we do' (Maisy).*

*'(...) I'd say actually the biggest barrier would be this whole grey area. There is always a grey area. If it's not black or white, if it is not strictly Physio or if it's not strictly OT or if it's not strictly medical it seems to be 'lumped on' to the PHN' (Jamie).*

Many of the participants expressed disappointment that the health promotion aspect of their role has been pushed towards a more curative aspect as opposed to preventative role. However, many participants reported carrying out individual opportunistic health promotion where possible showing a duty of care for their patients:

*'(...) there's no definite role in health promotion, there's no real say that it is part of our role am not really' (Sadie).*

*'I would say in the last six or seven years we had a little bit more time for preventative work. Now it's all task orientated. I would worry about that' (Lacie).*

A sense of uncertainty regarding role changes into the future was evident among participants, and comparisons were made with the UK:

*'Downhill and I do I see it [public health nursing] going downhill. Eventually we will become just like England we will be a health visitor and you will have RGNs like District Nurses carrying the loads... It is diluting the role because it's all about money, cost and at the end of the day having an RGN, taking a caseload it's a lot cheaper than training a PHN and paying a PHN' (Amy).*

## DISCUSSION

This current study is timely and enhances the INMO's (2013) findings by providing a deeper insight and meaning into lived experiences of PHNs. This study reveals that since the development of PCTs, the PHN role has also expanded within primary care, without the appropriate resources to cope with the increased workload. The increased volume of paperwork since PCT involvement is also a central concern highlighted by PHNs. Moreover, PHNs' contribution is not visible in terms of documented outcomes. This latter finding is important and signals a need to examine current documentation systems. A possible solution is a method of documenting population-based nursing practice by adding population-based interventions to an underlying electronic health information system (Baisch 2012).

Auckland's (2012) literature review on caseload numbers for community nurses in the NHS highlighted similarities to the findings reported here in that caseload numbers have been recognised as an issue causing anxiety and stress among community nurses. However, community nurses may have fourteen complex patients to care for, whilst health visitors may have eighty to a hundred child health families to care for (Auckland 2012). In comparison, a PHN in Ireland works as a generalist covering all aspects of community care with no cap on numbers, therefore caseload numbers can be much higher than this. Nationally, the average PHN caseload ratio is one PHN to three thousand of a population (HSE 2011) which is constantly increasing due to an aging population (McDonald et al 2013).

The participants in this study identify that face-to-face meetings motivate PCT team members, improves trust and respect among team members. However, due to workload demands participants expressed the desire for improved communication in order to be more efficient and better able to manage their caseloads without the added pressures due to communication breakdown. Similar to the findings reported elsewhere (Arksey et al 2007), the findings reported here reveal that there remains much room for improvement in order to facilitate better communication for PCT members.

A major concern highlighted by participants was the non-attendance of GPs at PCT meetings. However, in Ireland GPs may be assigned to several different PCTs due to their geographical location rather than general practice registration, inhibiting PCT meeting attendance, which is a major barrier to PCT functioning (ICGP 2011). The concept of geographical catchment areas has been a long established practice in community psychiatric services in Ireland but causes many problems for patient access to services (ICGP 2011). For example; a patient may be attending a GP in a health centre but may not be eligible to be seen by a PHN working in the same centre due to their home address being outside the geographical area of the PHN.

Nonetheless, PHNs prefer to work within a geographical remit as opposed to being attached to a particular GP as they would find it more difficult to provide care exclusively to patients of GPs in the team (Burke and O'Neill 2010). For those teams that do have GP involvement and regular attendance at PCT meetings, it was reported that these teams are working effectively. Similarly, O'Riordan (2012) highlights that PCT meetings attended by GPs offer the opportunity to approach difficult clinical or social problems with a broad range of skills and knowledge.

Although attending meetings was highlighted as important for role clarity, educating team members on each other's roles was also deemed important by participants. A similar finding is also reported by O'Neill and Cowman (2008) who found PHNs' value the importance of role clarity among all team members, especially at the early stages of team formation. Developing a communication group, after hours socialising, more efficient computer systems and a review of working arrangements not only improves communication, but could improve role clarity and team functioning (Arksey et al 2007).

Many participants reported that the health promotion aspect of the job has been 'pushed aside' since the introduction of PCTs. In Ireland, the community PHN service has become more like a 'fire brigade' service with PHNs managing those acutely ill and losing the health promotion role (INMO 2013). In Sweden, a similar situation is reported by Wilhelmsson and Lindberg (2009), who found that PHNs focus on medical tasks rather than health promotion due to time limitations. Irish PHNs' role in health promotion has been shown to have reduced due to workload demands (Philibin et al 2010). The acuity of need determines patient priority, therefore, neonates and their mothers, older people, patients discharged from hospital requiring dressings, terminally ill and bed-bound patients receive priority attention (Philibin et al 2010). Nonetheless, many participants reported carrying out individual opportunistic health promotion where possible, a finding also reported by Philibin et al (2010).

Comparisons with community nursing in the UK were made by the PHNs, with predictions that the Irish PHN role would be divided into three strata; health visitor, district midwife and district nurse. However, role confusion can be caused when nurses are organised into specialist roles (Scottish Executive 2006). From the patient's perspective accessing one single discipline is preferred to accessing the health visitor, district nurse or school's nurse separately (Gray et al 2011).

This study has a number of limitations. The hermeneutical interpretation embedded in IPA is individualistic, thus the interpretation is never fully complete. This study is also limited to understanding the views and experiences of PHNs, whilst there are many other members of the PCT.

## IMPLICATIONS

PHNs in Ireland indicate that more resources are needed for them to carry out health promotion initiatives and fulfil the vision of primary care. The findings of this study also suggest a more efficient electronic database may improve communication among PCT members and between primary and secondary services. However, full attendance at PCT meetings is needed along with teambuilding exercises and socialising to build relationships and team functioning. The next step is to test whether changes to policy would improve patient outcomes using prospective interventional methods, such as a cluster randomised control trial. This type of methodology would be ideal as it would allow comparisons to be made between patient outcomes of those attached to PCTs and an intervention group in which PHNs have a capped caseload number, thus allowing more time to carry-out health promotion activities. Finally, if the PHN role is to change to a specialised one, PHNs may need appropriate up-skilling and education.

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# Patient satisfaction with their pain management and comfort level after open heart surgery

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## KEY WORDS

pain, comfort, patient satisfaction, nursing, open heart surgery

## ABSTRACT

### Objective

The aim of this study is to determine patient satisfaction with pain management and comfort levels after undergoing open heart surgery.

### Design

This descriptive study was performed between January 31 and April 29, 2011.

### Setting

The study was conducted in the cardiovascular surgery clinic of Region Training-Research hospital in Erzurum, Turkey.

### Subjects

Fifty two patients (32 males, 20 females; mean age 58.4 years; range 25 to 77 years) who had undergone open heart surgery were included in the study.

### Main outcome measure(s)

The patient data was collected using Personal Information Form, Pain Satisfaction Surveys and General Comfort Scales at the time of discharge. The Pain Satisfaction Survey is a survey tool which was developed by the 'American Pain Society' in 1991. The General Comfort Scale was developed by Kolcaba in 1992 and its validity and reliability in a Turkish setting was tested by Kuşuoğlu and Karabacak in 2004.

### Results

In this study, 61.5% of the patients underwent coronary artery bypass graft surgery, 30.7% aorta and/or mitral valve replacement and 7.7% aneurysm repair. The mean scores of pain intensity immediately after surgery, at first post-operative ambulation, at 24 hours before discharge and at discharge were 7.07+2.6, 6.71+2.7, 6.32+2.4 and 4.57+2.3, respectively. Most subjects (88.5%) reported a wait time of 15 min as the longest time they had to wait for pain medication and patient satisfaction with pain management was found to be high. The mean score of comfort level at discharge was 3.16+0.2 and there was no statistically significant difference between the comfort level and pain rating at discharge ( $r=-0.225$ ,  $p>0.05$ ).

### Conclusion

It was found that pain intensity gradually decreased as patients neared hospital discharge and their overall satisfaction with the nurses' pain management was high.

## INTRODUCTION

Pain after cardiac surgery is often severe (Mueller et al 2000). After open heart surgery patients can be affected in a variety of ways. Pain after surgery decreases the quality of life of the patients and affects their comfort level. Pain is defined as an unpleasant sensory and multidimensional experience associated with actual or potential tissue damage. Although pain is a predictable part of the postoperative experience, inadequate management of pain is common and may result in clinical and psychological changes that increase morbidity, mortality, and costs and decrease the quality of life (Tse et al 2005; Apfelbaum et al 2003; Walker and Wagner 2003).

Pain has also been reported as one of the primary sources of concern for cardiac surgery patients, and post-operative pain is still an important clinical problem although major advances in pain management and treatment have been made (Mueller et al 2000). There are many different causes of post-operative pain after cardiac surgery. Numerous sources of pain have been identified, such as incisions, trauma, immobility, chest tubes left in after surgery, invasive equipment, and nursing and medical interventions (Gélinas 2007; Kwেকেboom and Herr 2001; Hamill-Ruth and Marohn 1999). The impact of inadequate pain relief is well known and can result in delayed mobilisation and related complications as well as psychological distress and anxiety (Taylor and Stanbury 2009).

In 1995, the American Pain Society (APS) indicated that pain is the fifth vital sign and should be measured and treated in the same way as other vital signs, because poorly managed pain leads to negative consequences for the organism (Mularski et al 2006; Reimer-Kent 2004). The American Society for Pain Management in Nursing (ASPMN) states that appropriate pain management is a primary nursing duty for any patient experiencing pain. It is also stated that "*pain management*" and "*comfort management*" are terms that can be used interchangeably (Czarnecki et al 2011). Comfort is defined as the convenience to facilitate daily life and it is a concept central to nursing care (Kolcaba 2002). All health care professionals (HCPs), including nurses, have a responsibility to advocate for optimal comfort of patients and to intervene based on the situation and setting in order to protect the best interests of the patient (Czarnecki et al 2011).

A patient satisfaction tool was developed by the Quality Assurance Committee of the APS in 1991 and used by Ward and Gordon (1996), Beauregard et al (1998), Carroll et al (1999), Miaskowski et al (1999) and Comley and DeMeyer (2001) in a variety of settings. A common finding in these studies is that patient satisfaction with pain management was high even though patients also reported significant levels of pain intensity, long waiting periods for pain medication and ineffective treatment. However, no study was found that used the APS Patient Outcome Questionnaire survey for the extent and nature of the postoperative pain experience of cardiac surgery patients. A study conducted by Doering et al (2002) examined satisfaction, care, physical needs and informational needs of cardiac surgery patients using a single-ended questionnaire. The need for better pain management was mentioned by 15% of patients. These patients stated that pain medication was a problem, they didn't get pain medication and pain killers should be routine. Bedard et al (2006) note that to determine if a relationship exists between satisfaction and pain, it would be important for future studies to ask patients about their expectations of pain following surgery. Therefore, this study examining open heart surgery patients' satisfaction with their pain management and comfort level was initiated. These results may help nurses anticipate and address patient pain more effectively in the early post-operative period following open heart surgery.

## METHOD

A descriptive survey design was used to determine patient satisfaction with pain management and patient

comfort levels after open heart surgery. The target population for the research was those patients who had undergone open heart surgery in the cardiovascular surgery clinic of the Region Training-Research hospital in Erzurum, in the east of Turkey. Approximately 200 patients undergo open heart surgery each year in the cardiovascular clinic of the hospital. A convenience sample (n=52) was taken from patients who met the study criteria and underwent open heart surgery between January 31 and April 29, 2011. The sample consisted of 20 females (38.5%) and 32 males (61.5%) who were all of Turkish nationality, were aged 25 to 77 years (mean, 58.48; SD=13.16), underwent open heart surgery for the first time, were 18 years and older, and were literate, able to respond to the questionnaire and consented to participate in the study. Patients who were not able to hear or see, had chronic pain, or had hemodynamic instability or prolonged hospitalisation were excluded from the study. Eight patients did not meet the eligibility criteria because they were cognitively impaired and had hemodynamic instability and 12 patients refused to participate in the study.

The study was undertaken in Erzurum, in the east of Turkey. The existence and intensity of pain are measured by patient's self-reporting every eight hours or when the patient experiences pain after cardiac surgery in the cardiovascular surgery clinic. A nonopioid analgesic was given if there are pathologic conditions or procedures likely to cause pain or if pain behaviours continue after attention to basic needs and comfort measures. If mild to moderate pain is suspected, nonpharmacological approaches such as rhythmic breathing exercise and a single low-dose short acting opioid (e.g. hydrocodone, morphine) may be also given to provide pain management and comfort to all patients in the postoperative period.

The study was approved by the ethics committee of the Health Sciences Institution at the University of Ataturk. Verbal consent was obtained from the patients participating in the research. All participants were informed of the purpose and design of the study. Participation in the study was voluntary. The participants were reassured that confidentiality would be strictly maintained.

The patient data was collected by the researchers using the 'Personal Information Form', 'Pain Satisfaction Survey', and 'General Comfort Scale' at the time of discharge. The Personal Information Form included questions about the date of hospitalisation and discharge, type of surgery, age, gender, education, profession, marital status, previous surgery, chronic diseases, and smoking and alcohol use. The Pain Satisfaction Survey was the survey tool which was developed by APS in 1991. In 1995, a panel of experts reviewed reports using the 1991 survey, and added six items to the original survey. This modified version of the survey was renamed the American Pain Society Patient Outcome Questionnaire (APS-POQ). This questionnaire consists of 16 questions (Carlson et al 2003). The original APS-POQ had been adapted from previously validated tools, as described by the Quality of Care Committee. Internal consistency varied from 0.82 to 0.68 (McNeill et al 1998). Patients' pain ratings were taken immediately after surgery, at first post-operative ambulation, and at discharge using a scale of 0 to 10 in the survey. It also included some items related to the hours until post-operative ambulation, the worst pain experienced in the previous 24 hours, satisfaction with the nurse's treatment, percentage of pain relief on a scale of 10 to 100, frequency of nausea and vomiting, percentage of the amount of time that pain interfered with sleep, pre-operative and post-operative anxiety about addiction to medication, and receipt of written materials about pain management and the helpfulness of these materials. A total of three new questions were added to the survey. These questions are as follows: "Were there any non-pharmacologic interventions applied for pain relief?", "What are the non-pharmacologic interventions applied for pain relief?", "Who applied this intervention to you for pain relief?" Finally, this study included The General Comfort Scale which was developed by Kolcaba in 1992 (Kolcaba 1992) and its validity and reliability in a Turkish setting was tested by Kuşuoğlu and Karabacak in 2004 (Kuşuoğlu and Karabacak 2008). Kuşuoğlu and Karabacak found that Cronbach's alpha coefficient of the scale was 0.85 and the scale had high reliability. This is a four point likert-type scale consisting of 48 items. The response patterns of the scale consisting of positive and

negative items are presented in mixed order. While evaluating the scale, the negative points obtained are coded in reverse and evaluated with the positive items. The highest total that can be obtained from the scale is 192 and the lowest total is 48. The total score is divided by the total number of items and the average value is obtained. The result is indicated in the 1 and 4 range. Therefore, the highest point (4) in positive items corresponds to the highest comfort and the lowest point (1) corresponds to the lowest comfort level.

### Data Analysis

The Statistical Package for Social Sciences (SPSS, Chicago, IL) for Windows version 12.0 was used for data entry and analysis. The patient characteristic variables were evaluated using the percentage distribution and mean. Descriptive statistics (i.e., mean, range, standard deviation, frequency) were used to address study questions. These included patients' beliefs and expectations about pain, its intensity, and its management, and subsequent satisfaction levels with pain management. In addition, patients' worst pain scores were examined in regards to the following: frequency of the worst pain scores, percentage of patients experiencing discomfort with the worst pain, and types of activities that were being performed at the time of the worst pain. A partial correlation was used to examine the relationship between patients' pain intensity at discharge and general comfort level of the patients. A p-value below 0.05 was considered to indicate a statistically significant difference.

### FINDINGS

The demographic characteristics of the patients are presented in table 1. The sample consisted of 52 Turkish subjects, 32 male and 20 female. Patients ranged in age from 25 to 77 years, with an average age of 58.4 years. Of the patients in the study, 92.3% were married, 48.2% were literate and 73.1% had chronic disease. The majority of subjects (61.5%) underwent coronary artery bypass grafting while 30.7% underwent an aorta and/or mitral valve replacement and 7.7% underwent aneurysm repair (table 1).

Table 2 shows the principal components of satisfaction with pain management. Patients' pain intensity was measured on a scale from "0" (no pain at all) to "10" (the worst pain possible). The mean scores of pain intensity immediately after surgery, at first post-operative ambulation, in the 24 hours before hospital discharge and at discharge were  $7.07 \pm 2.6$ ,  $6.71 \pm 2.7$ ,  $6.32 \pm 2.4$  and  $4.57 \pm 2.3$ , respectively (table 2). One patient experienced no pain in the 24 hours before discharge.

**Table 1: Sample Characteristics (n=52)**

Age (Mean $\pm$ SD)	58.4 $\pm$ 13.16	
	n	%
<b>Gender</b>		
Female	20	38.5
Male	32	61.5
<b>Marital status</b>		
Single	48	92.3
Married	4	7.7
<b>Educational status</b>		
Literate	25	48.1
Primary school	21	40.4
High school	6	11.5
<b>Working condition</b>		
Unemployed	7	13.5
Housewife	21	40.4
Worker	5	9.6
Self-employed	9	6.0
Retired	10	19.2
<b>State of health problems other than heart disease</b>		
Yes	38	73.1
No	14	26.9
<b>Health problems other than heart disease</b>		
Diabetes Mellitus	12	23.1
Hypertension	17	32.7
Rheumatism	3	5.8
Other*	6	11.5
<b>Type of surgery</b>		
Coronary Artery Bypass Grafting	32	61.5
Aorta and/or Mitral Valve Replacement	16	30.7
Aneurysm	4	7.7

\* Chronic Obstructive Pulmonary Disease (COPD), Kidney Disease, Benign Prostatic Hyperplasia, Gastric Ulcer

**Table 2: Principal Components of Satisfaction Items with Pain Management**

Component	Item	Mean $\pm$ SD
I. Pain Intensity	Rate your worst pain in the last 24 hours from the day before discharge	6.3 $\pm$ 2.46
	Pain rating at first post-operative ambulation	6.7 $\pm$ 2.71
	Pain rating now (at discharge)	4.5 $\pm$ 2.34
	Pain rating on the first day after surgery	7.0 $\pm$ 2.64
II. Satisfaction	Percentage of pain relief (%)	82 $\pm$ 13.48
III. Dysfunction	Hour after surgery that you are able to walk	32.1 $\pm$ 14.48

The average worst pain score for the entire sample was much higher at 6.32 and ranged from 0 to 10. However, the majority of patients reported that they experienced their worst pain when they were mobilising.

Patients reported their satisfaction with pain management on a scale of “very dissatisfied” and “very satisfied”. It was determined that 80.8% of the patients were very satisfied with the nurses’ pain treatment. One component of satisfaction examined was the waiting time for analgesic medication. Most subjects (88.5%) reported 15 minutes as the longest time they had to wait for pain medication (table 3). Of the patients in the study, 3.8% stated that their pain was reduced by 60% after treatment, 11.5% reduced by 70%, 44.2% reduced by 80%, 30.8% reduced by 90%, and 9.6% reduced pain by 100%. (graph 1).

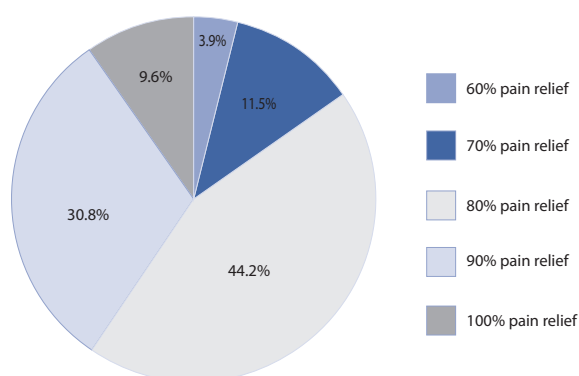
**Table 3: Waiting time for pain medication**

Time	n	%
<15 minutes	46	88.5
15-30 minutes	5	9.6
Never received medication	1	1.9

**Table 4: The Comparison of the ‘General Comfort Scale’ and ‘Pain intensity’**

	Pain rating at discharge	
	R	p
General Comfort Scale	-0.225*	0.109

\*Pearson correlation

**Graph 1: The patients’ pain relief after taking pain medication**

Thirty-eight patients (73.1%) reported that pain impacted their sleep patterns and had sleep problems due to pain. Twenty-nine patients (55.8%) experienced nausea and vomiting in post-operative period. In the post-operative period, 78.8% of the patients indicated that doctors and nurses asked patients to notify them when patients experienced pain; however, all of the patients indicated that no written material was received about the importance of their pain management.

The comparison of the mean pain intensity and comfort level of the patients are presented in table 4. The mean of patients’ comfort level score at discharge was  $3.16 \pm 0.2$ . No statistically significant differences were found between patients comfort level and pain intensity at hospital discharge ( $r = -0.225$ ,  $p > 0.05$ ).

## DISCUSSION

In this study it was found that patients experienced moderate to severe pain after open heart surgery. It was observed that the patients had more severe pain on the first day after the surgery and at first ambulation, and pain intensity gradually decreased as patients neared hospital discharge. Similarly, a

survey of 14 hospitals in the United Kingdom revealed that at 24 hours post-operative period, 60% of patients had a pain score of 5 or more out of 10 during movement (0=no pain; 10=unbearable or very severe), while at 7 days postoperative, 39% had a pain score of 5 or more during movement, with only 8% reporting a pain score of 8–10 (Moss et al 2005).

Only a handful of studies have explored patients' worst pain after surgery. One of these studies focused on patients who had cardiac surgery (Leegaard et al 2008). In a qualitative study of patients after cardiac surgery, Leegaard et al (2008) reported that women experienced worst pain levels of moderate to high intensity. Their worst pain mostly occurred at night and caused sleep disturbances. Similarly, 73.1% of the patients in this study indicated that pain interfered with their sleep. Therefore, it is important to continue to assess patients' pain when they are sleeping. Furthermore, it was reported that patients first mobilised approximately 32 hours after surgery and patients' worst pain was experienced during first ambulation in this study. Since the patients experience severe pain during mobilisation, the pain should be assessed before mobilisation, during mobilisation and again when the patient returns to bed. Teaching the patients turning exercises in bed, supporting the patient during ambulation and using analgesics before mobilisation may help to manage pain episodes (Brown et al 2011).

Svenssen et al (2000) found that patients experienced moderate to severe level of pain during the first 72 hours after various elective surgeries and most of the patients experienced pain while resting. In this study it was reported the patients had pain in the first 24 hours after surgery and during ambulation. Most of these patients had severe pain (at the level of 6-7). According to these findings, it is suggested that nurses should assess the patients' pain during the early periods after surgery. Furthermore, pain assessment should not only be done during mobilisation; it should also be done while resting. The nurses should be careful, as the patients may experience high levels of pain (>7) and they must not ignore the fact that the patients can also experience pain while resting as well as during mobilisation and exercises (Brown et al 2011; Svenssen et al 2000).

The patients in the present study reported high satisfaction with pain management. Most subjects reported a waiting time of 15 minutes as the longest time they had to wait for pain medication and eighty percent of the patients were very satisfied with the nurses' pain treatment. Similarly, Mueller et al (2000) evaluated the location and intensity of pain after cardiac surgery and found post-operative first day patients had relief of 86.5% after the analgesic treatment. Yorke et al (2004) in their study found that although 45.1% of the patients were informed by the nurses about pain management, only 32.4% indicated that they took their pain experience into account. In the same study it was reported that the patients experienced relief of only 67.4% after the pain treatment. Patients in the present study waited less time than subjects included in Miaskowski et al (1994), in which almost one-half of the patients reported a waiting time more than 15 minutes for pain medication. Bookbinder et al (1996) reported 74% of patients surveyed recalled waiting 15 minutes or less for pain medication. In the present study, it was pointed out this rate was quite high and 80.8% of the patients were relieved after the pain treatment applied by the nurses and the nurses treated the patients' pain within 15 minutes.

In this study subjects were also asked whether non-pharmacological methods were applied during the pain management or not. Four patients (7.7%) responded that non-pharmacological interventions were applied for pain management and the most commonly used non-pharmacological method was deep breathing exercises applied by the nurse. McNeill et al (1998) stated that 62% of the patients used prayer, 27% relaxation techniques, 24% distraction, 18% heat application, 13% cold application and 10% massage therapy as non-pharmacological methods for pain management.

According to McCaffery's definition "pain is a sensation that can be described by the patient experiencing it." Therefore, the communication between the nurse and the patients is very important for optimal pain management (McCaffery et al 2000). This study found 78.8% of patients indicated nurses asked patients to notify them when they experienced pain; however, all of the patients indicated that no written material was received about the importance of their pain management. Nurses should ensure that patients are educated pre-operatively about the importance of information concerning their pain and that the expression of pain is acceptable.

Earlier studies indicate that certain beliefs about pain and its management are counter-productive in effective pain control (Dawson et al 2005). Brown et al (2011) stated patients believed they became addicted to pain medication easily and pain medication should be saved for cases where pain gets worse. These beliefs may lead patients to underreport their pain or refuse pain medication even in the presence of substantial pain (Lai et al 2002). Only 7.7% of the patients were concerned about becoming addicted to analgesic drugs during pain medication in this study.

As shown in table 4, the comfort scores of the patients were found to be high at discharge (comfort level, 1-4 range); however, no significant difference statistically was found between the comfort level and pain intensity at discharge ( $p > 0.05$ ). The fact that the pain intensity decreases towards the discharge of the patients may be effective on this result. A study by Milgrom et al (2004) found that pain intensity gradually decreased after the second day in the postoperative period and increased comfort level of the patients after cardiac surgery. Additionally, it is considered that effective pain management, effective communication with the patients and giving information about pain management after surgery are influential in increasing comfort levels. Since the pain experienced by the patient affects the comfort level, assessment of the pain and comfort level can also increase the nursing quality and patient satisfaction in the presence of pain.

### **STUDY LIMITATIONS**

This study had several limitations. The study was conducted in only one cardiovascular surgery clinic and the findings cannot be generalised to all patients who had undergone open heart surgery in Turkey. The findings therefore cannot be generalised to other countries. Another limitation of the present study is the small sample size, which prevents any definite conclusion from being drawn from the findings. For future studies, the present study should be repeated with a larger sample of open heart surgical patients in a different setting in order to test the generalisability of the results. These study findings also rely on patients' recollection information because data were provided at discharge.

### **CONCLUSION**

It was found the pain intensity of patients gradually decreased prior to discharge and their satisfaction with nurses' pain management was at a high level. Assessing patients' pain intensity may be important to monitor and manage in the early post-operative period.

### **RECOMMENDATIONS**

These points can be suggested as results of this study: written material should be given to patients and the use of non-pharmacological interventions in pain management; patients should be encouraged to understand they need to report their pain. Nurses should also understand how difficult patients find this, but by having an understanding of this, they can encourage patients through open communication and compassion. Nurses should assess pain regularly and respond to this by providing appropriate treatments and assessing their effects.

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# Radiation awareness among nurses in nuclear medicine departments

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## KEY WORDS

nurses, awareness, radiation, nuclear medicine, Kuwait

## ABSTRACT

### Objective

The aim of this study is to explore the awareness level of radiation risks among nurses working in nuclear medicine departments (NMDs).

### Design

A cross-sectional survey was used. Data were collected between February and March 2011. The data were collected using a self-administered, structured questionnaire. One open-ended question was added at the end of the questionnaire.

### Setting

The study was conducted in NMDs representing five Kuwaiti governmental general and specialised hospitals and centres.

### Subjects

This study comprised twenty one non-Kuwaiti female nurses who worked in NMDs.

### Results

Nearly all of the nurses did not attend any radiation protection courses, they were not aware of the ALARA principle and they were not familiar with Geiger-Mueller counter. Most of these nurses were not able to read the dosimetry reports and they were not familiar with the terms RSO, RSC, and the 10 day rule concept.

### Conclusion

Nearly all nurses working in NMDs in Kuwait are not aware of radiation protection and risks. This lack of awareness has serious implications on both patients and nurses. Courses on radiation risks and protection should be provided to nurses during and after their formal nursing education.

## INTRODUCTION

The use of ionizing radiation in medicine has led to major improvements in the diagnosis and treatment of human diseases. More than 3,600 million X-ray examinations are performed, 37 million nuclear medicine procedures are carried out, and 7.5 million radiotherapy treatments are given every year worldwide (World Health Organization 2008). As the benefits for patients gain recognition, the exposure to ionizing radiation increases causing potential health hazards for patients and staff (Pearce et al 2012; Huda 2010). Exposure to ionizing radiation can result in cancer, genetically determined ill health, developmental abnormalities, and degenerative diseases (Carlton and Adler 2012; Brent 2009).

In Nuclear Medicine Departments (NMDs), nurses care for patients undergoing diagnostic or therapeutic treatments. This involves patient preparation, administering radioactive and non-radioactive medications, explaining the procedure, comforting and ensuring patient safety (Brown, 2012; Goodhart and Page 2007; Vijayakumar et al 2007). These nurses are vulnerable to the damaging effects of ionizing radiation (Bento et al 2012). However, they can reduce the risks of radiation by using different principles of radiation protection such as ALARA and the 10-day-rule. In addition, they may use the principles of time, distance, and shielding as well as various monitoring devices such as Geiger Muller (GM) counter and Thermoluminescent Dosimeters (TLDs). ALARA refers to As Low As Reasonably Achievable, in other words, to receive the maximum benefits by using the minimum of radiation dose to avoid its risks. The 10-day-rule on the other hand recommends that in women of child bearing age, non-urgent examinations that involve pelvic radiation should be limited to the first 10 days of the menstrual cycle. Time refers to the length of exposure to radiation, in that short exposures will produce less radiation dose. Distance refers to the distance between an individual and the radiation source. Increase in distance can result in dose reduction. Shielding refers to both fixed protective barriers and personal protective equipment such as lead aprons (Bushong 2012; Saia 2012; Sherer et al 2010; ICRP 2007).

Kuwaitis represent only 7% of the total nursing profession with the majority being Asian, the largest group are from India (Department of Nursing services 2012). There are seven NMDs in the Ministry of Health and the total number of nurses working in these departments is 26 (Department of Nursing Services 2010).

Through reading national and international publications, the researchers found one old reference regarding annual radiation doses received by radiologists, radiology nurses, medical radiographers, and industrial radiographers in Kuwait (Mustafa et al 1985). In addition, only one reference regarding awareness of radiology nurses on radiation risks in Kuwait hospitals (Alotaibi and Saeed 2006) was found. The purpose of this study is to explore the awareness level of radiation risks among nurses working in NMDs in Kuwait.

## METHOD

A cross-sectional survey was used. Data were collected between February and March 2011 using a self-administered, structured questionnaire comprising of two sections, A and B developed by the researchers. Section A comprised of questions regarding demographic data and section B comprised of 15 questions about radiation awareness. One open-ended question was added at the end of the questionnaire. Before the research began, the necessary written permission was obtained from Ministry of Health to conduct the research in the five hospitals and centres. The questionnaire was distributed to the 26 non Kuwaiti female nurses working in NMDs representing five Kuwaiti governmental general and specialised hospitals and centres, namely Mubarak Hospital, Al-Amiri Hospital, Chest Hospital, Organ Transplant Centre (OTC) and Kuwait Cancer Control Centre (KCCC). Nurses who were available, in the various locations at the time of the study and who were willing to participate completed the questionnaire. The aim of the study was explained,

participation was voluntary, that confidentiality would be maintained, and the information given would be used for research purposes only. In addition, no pressure was applied to any nurse to participate and they were offered a chance to ask questions. At the end of data collection period, a total of 21 completed, self-administered questionnaires were returned, yielding a response rate of 80.7%.

Content validity was assessed by a doctorally prepared radiologic technologist and a radiologic technologist who were experts in radiologic sciences as well as a doctorally prepared nurse and a registered nurse who were experts in radiology nursing. To ensure the reliability of the selected list of questions the original version of the questionnaire was analysed by SPSS version 19 for Windows (SPSS Inc 2010). To maximise the Cronbach's alpha ( $\alpha$ ) estimates the complete list of 15 questions were analysed and all split-half estimates were calculated from the same sample. All 15 questions selected according to ( $\alpha$ ) were tabulated in sequence and weighted by demographic data as shown in table 2. A p-value of <0.05 was considered as a cut off point for significance.

## RESULTS

Table 1 shows a summary of demographic data of nurses. Over one third, nine (43%) were aged between 30 and 39 years. Eight (38%), were 40 years and above. The balance, four (19%), was made up of nurses who were between 26 and 29 years. More than half of the sample, 15 (71.4%), hold a diploma in nursing while the remaining six (33.3%) hold a bachelor's degree. Regarding their experience in nursing, one third, seven (33.3%) had more than 20 years of experience. Less than one third, six (28.6%) had between 11 to 20 years' experience. A further five (23.8%) had only five years or less. The remaining two (9.5%) had 6 to 10 years experience. One person did not respond to this question. Regarding their experience in NMD, more than half of the sample 14 (66.7%) had only five years or less. Four (19%) had 6 to 11 years of experience. A further two (9.5%) had more than 16 years of experience. The remaining one (4.8%) had 12 to 16 years of experience.

**Table 1: Summary of demographic data of nurses**

Characteristics	N	%	Mean
<b>Age</b>			2.19
≤ 25	0	0	
26-29	4	19.0	
30-39	9	42.9	
40 and > 40	8	38.1	
Total	21	100.0	
<b>Education</b>			1.29
Certificate	0	0	
Diploma	15	71.4	
Bachelor's	6	28.6	
Other	0	0	
Total	21	100.0	
<b>Experience in nursing</b>			1.86
≤ 7.5	5	23.8	
6-10	2	9.5	
11-20	6	28.6	
> 20	7	33.3	
Missing	1	4.8	
Total	21	100.0	
<b>Experience in NMD</b>			0.57
≤ 5	14	66.7	
6-11	4	19.0	
12-16	1	4.8	
> 16	2	9.5	
Total	21	100.0	

In table 2 this study found statistically significant differences in nurses' responses for all questions except for Questions 1, 8, and 10. In response to Q2, nearly all of the nurses did not attend any radiation protection courses during work (mean=0.95, p=0.00). In response to Q3, the vast majority of the nurses were not aware of the ALARA principle (mean = 0.90, p=0.00). However, nearly all of the nurses were able to identify the TLD badge as a measure of occupational and patient doses (mean = 0.05, p=0.00). Most of the nurses were not able to read the dosimetry report (mean=0.76, p=0.02). Nearly all of the nurses were not familiar with Geiger-Mueller (GM) counter (mean=0.95, p=0.00).

Regarding decontamination of radioactive spills, the vast majority of nurses knew how to decontaminate themselves (mean=0.14, p=0.001). In response to Q 8 most of the nurses were not familiar with the terms Radiation Safety Officers (RSO) and Radiation Safety Committee (RSC) (mean=0.67, p=0.13 and). In response to Q 9 most of the nurses were not familiar with the term 10 day rule (mean=0.86, p=0.001). In response to Q11 most of the nurses said the Department always make sure nurses wear the TLD badges (mean=0.48, p=0.001).

Regarding the transfer of pregnant nurses to another department as shown in Q12, most nurses said they were transferred in the 1<sup>st</sup> trimester (mean=0.62, p=0.00) and do not return to NMD before delivery as shown in Q 13 (mean=2.48, p=0.00). In response to Q14 nearly all of the nurses said they always wear the TLD badges (mean=0.24). In response to Q15 nearly all of the nurses were unable to classify doses whether it is high or low for scans of the lung, heart, and bone (mean from 0.1 to 0.14).

**Table 2: Reliability and Chi-square overall questionnaire data**

List of questions	N	Mean	P-value	( $\alpha$ )
Q1. Are you familiar with radioactive materials half-life (T1/2)?				
Yes (0)	10			
No (1)	11			
(Means range from 0 to 1)		0.52	0.83	0.65
			NS	
Q2. Have you attended any radiation protection courses?				
Yes (0)	1			
No (1)	20			
(Means range from 0 to 1)		0.95	0***	0.65
			VHS	
Q3. Do you know the term ALARA?				
Yes (0)	2			
No (1)	19			
(Means range from 0 to 1)		0.90	0***	0.65
			VHS	
Q4. Do you know what TLD badge is?				
Yes (0)	20			
No (1)	1			
(Means range from 0 to 1)		0.05	0***	0.65
			VHS	
Q5. Do you know how to read dosimetry reports?				
Yes (0)	5			
No (1)	16			
(Means range from 0 to 1)		0.76	0.02*	0.65
			S	

Q6. Are you familiar with Geiger-Muller counter?				
Yes (0)	1			
No (1)	20			
(Means range from 0 to 1)		0.95	0***	0.65
			VHS	
Q7. Do you know how to decontaminate radioactive spills?				
Yes (0)	18			
No (1)	3			
(Means range from 0 to 1)		0.14	0.001**	0.65
			HS	
Q8. Are you familiar with the terms Radiation Safety Office (RSO) and Radiation Safety Committee (RSC)?				
Yes (0)	7			
No (1)	14			
(Means range from 0 to 1)		0.67	0.13	0.65
			NS	
Q9. Are you familiar with the 10 day rule concept?				
Yes (0)	3			
No (1)	18			
(Means range from 0 to 1)		0.86	0.001**	0.65
			HS	
Q10. Are you familiar with the following terms?				
Time	3			
Very familiar (0) Familiar (1) Unfamiliar (2)		1.19	0.1	0.69
			NS	
Distance	11			
Very familiar (0) Familiar (1) Unfamiliar (2)		1.14	0.28	0.69
			NS	
Shielding	7			
(Means range from 0 to 2)		0.86	0.28	0.69
			NS	
Q11. Does the NMD make sure that all nurses wear TLD?				
Always (0)	15			
Sometimes (1)	2			
Never (2)	4			
(Means range from 0 to 2)		0.48	0.001**	0.69
			HS	
Q12. If a nurse gets pregnant will she be transferred to another department? Yes, on:				
1st trimester (0)	16			
2nd trimester (1)	1			
3rd trimester (2)	1			
No. Never transferred (3)	3			
(Means range from 0 to 3)		0.62	0***	0.69
			VHS	

Q13. If a pregnant nurse is transferred will she be returned to NMD during pregnancy? Yes, after:				
1st trimester	(0)	1		
2nd trimester	(1)	4		
3rd trimester	(2)	1		
No. Never transferred	(3)	15		
			2.48	0*** 0.69
(Means range from 0 to 3)				VHS
Q14. How often do you wear TLD badge?				
Always	(0)	18		
Sometimes	(1)	1		
Never	(2)	2		
			0.24	0*** 0.69
(Means range from 0 to 2)				VHS
Q15. Which of these nuclear medicine examinations would give the highest dose to a person close to patient?				
Lung dose				
Yes	(0)	3		
No	(1)	18		
			0.14	0.001** 0.69
(Means range from 0 to 1)				HS
Heart dose				
Yes	(0)	3		
No	(1)	18	0.14	0.001** 0.69
				HS
(Means range from 0 to 1)				
Bone dose				
Yes	(0)	2		
No	(1)	19		
			0.10	0*** 0.69
(Means range from 0 to 1)				VHS

NS (Not Significant "P-value > 0.05"); \*S (Significant "P-value ≤ 0.05"); \*\*HS (Highly Significant "P-value ≤ 0.005"); \*\*\*VHS (Very Highly Significant "P-value ≤ 0.0005")

Finally, nurses were asked to answer one open-ended question: what suggestions do you have to improve the awareness level of radiation risks among nurses working in nuclear medicine departments? Of the 21 nurses, the vast majority, 18 (86%) suggested at least a course on radiation protection as well as a NM procedures course before joining the NMD. The remaining, three (14%) suggested provision of frequent classes and seminars in radiation protection.

## DISCUSSION

To the best of the researchers knowledge, this study is the first to explore the awareness level of radiation risks among nurses working in NMDs in Kuwait. It showed nearly all of the nurses did not attend any radiation protection courses. This explains why nearly all of the nurses were not familiar with the ALARA principle and the GM counter. It shows that most of these nurses were not able to read a dosimetry report and they were not familiar with the terms RSO, RSC, and 10 day-rule. In addition, nearly all of the nurses were unable to classify whether doses are high or low for scans of the lung, heart, and bone. It can be assumed that the information provided to these nurses about the effects of radiation and the protective measures needed were

inadequate. These knowledge deficits are supported by previous studies (Morishima et al 2012; Ohno and Kaori 2011; Melaih 2008; Alotaibi and Saeed, 2006). Several studies showed similar findings among medical students, junior and referring physicians (Salih et al 2014; Yurt et al 2014; Ricketts et al 2013; Sarah et al 2011; Heyer et al 2010; Zhou et al 2010).

These knowledge deficits can be explained by the fact that in Kuwait nurses working in NMDs were deployed at the radiology departments without any formal training in radiology nursing. This agrees with similar findings of recent studies conducted in South Africa, Turkey and Malaysia (Makanjee et al 2014; Yunus et al 2014; Yurt et al 2014). However, in some countries, for example, Sweden and Poland, there is a formal Bachelor of Science Degree in diagnostic radiology for nurses (Teresińska et al 2014; Lunden et al 2012). Interestingly, in other countries like Saudi Arabia and Guatemala, formal radiography education and training used to be offered to nurses as a supplement with the absence of professional radiographers. However, after the need for qualified graduate radiographers had been identified, academic radiography education and training were introduced (Alaamer 2012; Cowling 2008).

Nearly all of the nurses knew what a TLD badge was and the vast majority knew how to decontaminate themselves from radioactive spills. This knowledge may be acquired from their working experience in NMDs and that the TLD is placed in front of their pocket and analysed once every month (Leide-Svegborn 2010). Most of these nurses said NMDs always make sure nurses wear TLD badges. This explains why nearly all nurses answered they always wear their TLD badge. All the nurses showed their interest in learning about radiation protection. This is consistent with results of other studies (Morishima et al 2012; Kunugita 2008; Melaih 2008).

Nurse performance is fundamental to improve patient safety in the health care system (Kohlbrenner et al 2011). Patient safety is widely believed to be protecting the patient from injury (WHO 2010). Any threat to patient safety may result in negative outcomes such as long lengths of hospital stay, high rates of infection, injury and death (Shaffer and Tuttas 2009; Gregory et al 2007). According to the International Council of Nurses (ICN) code of ethics, patient safety is a fundamental responsibility of nurses (ICN code ethics for nurses, 2012). Unfortunately, the results of this study showed a lack of awareness level of radiation risks among nurses working NMDs in Kuwait. This means these nurses are unable to effectively protect themselves or their patients from ionizing radiation (Yurt et al 2014). Ultimately, this lack of knowledge compromises the quality of nursing services (Urushizaka et al 2013). Therefore, it is essential that nurses working in NMDs should have some basic knowledge of radiation, radioactive materials and the different effects of radiation. This is supported by previous studies that suggested implementing courses in radiation protection in basic nursing education and frequent classes, seminars and training programs for those who work in radiology departments (Yunus et al 2014; Yurt et al 2014; Ohno and Kaori 2011; Alotaibi and Saeed 2006).

## **LIMITATIONS OF THE STUDY**

The results of this study are limited to NMDs representing five governmental general and specialised hospitals and centres. It is also limited to the time period in which the study was conducted. The study is also confined to a small sample of non-Kuwaiti female nurses. Therefore, generalisability of the results is always a question. Despite the small sample used, the study yielded important evidence on radiation awareness among nurses in NMDs in Kuwait. Future studies in different cultures and contexts should be conducted to help us recognise various aspects of radiation awareness among nurses working in NMDs. It could also analyse the awareness level of radiation risks among nurses working in NMDs, on the basis of those variables examined in the current study, which have not found to be statistically significant and to validate significant relationship found in this study.



## CONCLUSION

Nearly all nurses working in NMDs in Kuwait are not aware of the radiation protection and risks. This lack of awareness has serious implications on both patients and nurses. The researchers believe that nurses should be provided with courses on radiation protection and risks during and after their formal nursing education.

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# A nurses' guide to Qualitative Research

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## KEY WORDS

Research methodology, Qualitative research, evidence based practice (EBP).

## ABSTRACT

### Objective

This article provides a breakdown of the components of qualitative research methodology. Its intention is to simplify the terminology and process of qualitative research to enable novice readers of research to better understand the concepts involved (Benner 1984).

### Primary Argument

Current Competency Standards for Australian Registered Nurses and Midwives include a requirement to evaluate and implement research as part of their care (Borbasi and Jackson 2012, p.22; Nursing and Midwifery Board of Australia 2012). They are also expected to be actively involved in research studies (Borbasi and Jackson 2012, p.22). Evidence, when available, can enhance clinical judgement (Hamer and Collinson 2014, p.9). As evidence and research are threaded through professional work and study in the health sciences (Wright-St Clair et al 2014, p.5) nurses, particularly novice nurses, may benefit from a discussion that helps them understand the sequence of a research paper (Moxham 2012) using qualitative methodology.

### Conclusion

A systematic and logical approach will be used to discuss the content of a typical qualitative research paper. A comparative grid at the end of this paper (appendix 1) comparing the qualitative research designs, may lead the nurse to better understand the differing components of several qualitative research methods (Ingham-Broomfield 2014).

## INTRODUCTION

An expectation of nurses graduating is that they will become critical consumers of research (Wright-St Clair et al 2014). Liamputtong (2013, p. 5) and Wright-St Clair et al (2014, pp.4-5) agree Evidence Based Practice (EBP) can be defined as the conscientious integration of best research evidence with clinical expertise, patient values and needs in the delivery of high-quality, cost effective health care. Assessment tools are used on a regular basis by clinicians in clinical practice, and during research (Imms and Greaves 2013) to ultimately improve patient care. In this paper main components of qualitative research will be discussed as one paradigm for researching health related problems and issues.

## THE QUALITATIVE RESEARCH PAPER

### Definition and meaning of Qualitative research:

Qualitative research is used to examine subjective human experience by using non-statistical methods of analysis (Borbasi and Jackson 2012). It is associated with naturalistic inquiry which explores the complex experience of human beings (Moxham 2012, p.32). Qualitative research is underpinned by several theoretical perspectives namely Constructivist-Interpretive, Critical, Post-positivist, Post-structural/Postmodern and Feminism or by its research design, Phenomenology, Ethnography, Grounded Theory (Glaser and Strauss 1967) Historical method and Case study (Borbasi and Jackson 2012, p.127). The definitions will be explored in more depth as this paper unfolds. The paper also acknowledges that not all forms of qualitative research can be discussed due to the word limitation.

Qualitative research explores a subjective, holistic pathway which helps to develop theory (Burns and Grove 2009). Whereas quantitative research is based on scientific method, qualitative research suits behavioural and social sciences as it aids in understanding the unique nature of human beings (Burns and Grove 2009). Qualitative research can generate information that can help nurses by informing clinical decisions. Qualitative nursing research focuses on patients and/or health professionals' experiences. Through this approach the reality of people's experiences and lives are not over simplified and subsumed into a number or a statistic (Hoffmann et al 2013, p.223).

### Abstract/Summary

An abstract or summary of a qualitative paper is a brief objective summary of the research report, in fact, the language and material is often pared back to the bare minimum (Polit and Hungler 2013, p.253; Borbasi and Jackson 2012, p.178; Nieswiadomy 2012). It must contain information on the rationale and background of the study as well as the theoretical and methodological processes for gathering the information (Borbasi and Jackson 2012). This will include the method to collect data, the results, conclusion and recommendations. The qualitative abstract is more narrative in form and less likely to use the obscure research and specialty clinical language of quantitative research (Borbasi and Jackson 2012, p.178).

### Identifying the problem

Qualitative designs do not use hypotheses. They may state an observational question to be explored. Ideally the topic is narrowed down to a specific one sentence statement of the problem (Nieswiadomy 2012). Qualitative research views reality as a subjective and multi-faceted experience using questions more closely tied to the human experience such as "What is it like to be lonely?" (Borbasi and Jackson 2012, p.125) or, even more generally, "How do you feel?" (Hoffmann et al 2013, p.23)

### Literature Search

The literature review is generally in the introductory section (Polit and Hungler 2013). The function of a literature search in qualitative research varies depending on the classification of the study. A Phenomenological

investigator may conduct a search to ascertain whether a subject area, such as lived experience, has been researched, as well as identify other ideas in design and conduct (Borbasi and Jackson 2012, p.133). In Historical research the literature search is an essential and integral component which may be an extensive undertaking to narrow the event from overwhelming proportions to a more manageable time frame (Borbasi and Jackson 2012, p.133). Alternately, a Grounded Theory investigator may make a point of avoiding the literature before beginning the study to avoid 'contamination' of the data with preconceived concepts and notions about what might be relevant (Borbasi and Jackson 2012, p.133). The Critical Theorist, who attempts to confront social injustices, will, by the nature of their research, need to conduct a literature review as previous events such as socio-political ideologies, shape their research.

## **METHODOLOGY**

### **Deductive and Inductive Reasoning**

Deductive reasoning is also known as 'top down' approach where the investigator works from more general information to something more specific. The investigator uses a logical statement, a hypothesis, to test a theory (Jirojwong et al 2011; Burns and Grove 2009). This is used in quantitative methodology. Inductive reasoning, also known as 'bottom up', works the opposite way, moving from the specific to the general, ending up with general conclusions or theories (Jirojwong et al 2011; Burns and Grove 2009). This is the basis of qualitative methodology.

### **Theoretical Perspectives**

A theoretical perspective is based on the underlying beliefs that helped inform the research. Put simply, a theory is a perspective, or point of view, also known as a paradigm. Qualitative research is underpinned by several theoretical perspectives, or paradigms, namely, Constructivist-Interpretive, Critical, Post-positivist, Post-structural/Postmodern and Feminist (Liamputtong 2013; Borbasi and Jackson 2012; Jirojwong et al 2011). Constructivist-Interpretive approaches have the intention of understanding the human world of experience relying on the participants view of the situation being studied using an interpretive understanding called hermeneutics (Liamputtong 2013, p.118). It helps explore practical concerns of everyday living, examining the way people develop interpretations of their life, in relation to their experiences (Liamputtong 2013, p.118). Critical theorists are agents of change who are interested in the social construction of experience, particularly inequality and social injustice, who develop knowledge to help create positive and empowering change (Borbasi and Jackson 2012, p.124; Jirojwong et al 2011). The Post-positivist perspective grew out of disenchantment with the radical objectivity of the quantitative research style. The Post-positivist style, which is interpretive, seeks to understand people through lived experiences (Borbasi and Jackson 2012). Post structural, or postmodern studies, are concerned with the everyday life with concepts such as culture, gender, power and oppression (Borbasi and Jackson 2012). Feminism is concerned with women's issues recognising women's experiences, beliefs, views, ways of being and ways of knowing as legitimate and authoritative sources of knowledge as well as raising awareness of gender inequality and oppression (Jirojwong et al 2011, p.125).

### **Designs**

Qualitative research falls in to five main designs, namely, Phenomenology, Ethnography, Grounded Theory (Glaser and Strauss 1967), Historical method and Case study (Borbasi and Jackson 2012; Burns and Grove 2009). Phenomenology searches for multiple meanings attributed to a phenomenon and tries to provide a comprehensive description rather than an explanation (Liamputtong 2013, p.117). It is used to describe the everyday world of human experience (Jirojwong et al 2011, p.113). Ethnography has its origins in anthropology with its focus on the study of humans from the evolutionary and social perspectives (Jirojwong et al 2011, p.121) and focuses on the scientific study of the lived culture of a group of people (Liamputtong 2013,

p.86). Grounded theory is a systematic form of enquiry which generates social theory through the study of social systems present in human interaction (Jirojwong et al 2011, p.118). Historical method is the process of establishing facts and principles through chronology and to the evolution or historical course of what is being studied. A significant part of historical research is to analyse a defined event and then understand the impact of that event on the present (Borbasi and Jackson 2012, p.131). The Case Study method occurs in both qualitative and quantitative research. The focus of a case study is on a particular phenomenon or issue of concern in a particular person, group or institution and is recorded over time (Jirojwong et al 2011, p.224).

### **Instruments**

Qualitative instruments may include self-reporting tools and observation (Polit and Hungler 2013). Commonly used methods in nursing research also include focus groups and interviews (Moxham 2012). There are many different instruments available for the qualitative investigator, more of which are identified in the grid below. Using interviews as an example there are many differing styles for example, a one to one interview, a group interview, a focus group interview, a brainstorming interview and telephone interviews (Jirojwong et al 2011). The interview itself may be structured, semi-structured or unstructured (Jirojwong et al 2011).

With observation techniques the method may be overt or covert. Overt observation requires full disclosure to the participants that they are being observed for the purpose of the research (Jirojwong et al 2011). One drawback of this method is that the participant may change or modify their behaviour due to being observed. This is known as the 'Hawthorne effect' (also referred to as the Observer effect) whereby the participants in the research respond to the attention given to them by the investigators (Babbie 2013, p. 232). Covert observation captures the natural everyday behaviour of the participants but can be viewed as unethical as the participant is being monitored without knowing what is being recorded (Jirojwong et al 2011).

In quantitative research the reliability and validity of the instruments is essential (Borbasi and Jackson 2012; Burns and Grove, 2009) however qualitative investigators are concerned with the accuracy and comprehensiveness of the data. They favour terms such as 'confirmability'. "Confirmability comprises three attributes : credibility, auditability and transferability" (Borbasi and Jackson 2012, p. 138).

### **Sample**

The sample population is very variable in qualitative research. It can vary from one individual to small groups to institutions to historical data. It does not have to involve a living person specifically as qualitative methodology lends itself to using a number of different sources of data such as diaries, old newspapers and letters. Subjects of qualitative research are often called participants or informants rather than subjects as the word 'subject' is associated with experimentation or laboratory like conditions (Borbasi and Jackson 2012, p.140).

There are many differing forms of sampling such as convenience or purposive, snowballing, or intensity sampling to name a few (Polit and Hungler 2013; Borbasi and Jackson 2012; Jirojwong et al 2011). Samples tend to be small and often selected using convenience or purposive techniques means the sample was specifically chosen to ensure the data gathered is 'information-rich' (Borbasi and Jackson 2012, p.135). As an example of how different the samples may be is as follows. Grounded Theory uses a sampling technique called theoretical sampling whereby the researcher begins by collecting and analysing data on a single sample (Borbasi and Jackson 2012, p.135). As further data is collected and coded concepts begin to emerge. This is totally different to Historical research where the information required comes from data sources rather than from people (Borbasi and Jackson 2012, pp.135-136).

### **Ethics**

The participating subjects, their families and society must be informed by the investigator regarding the implications of being involved in any research (Burns and Grove 2009). An appropriate ethics committee is

required to grant permission before undertaking any study (Elliott et al 2012, p.93; Jirojwong et al 2011, pp.63-66). Ethical guidelines outline the standards required for conducting research. Nurses have a moral and legal obligation to protect any individual's privacy (Moxham 2012, p.32; Nursing and Midwifery Board of Australia 2012 Conduct Statement 5). Equally important is the need to protect individuals from significant harm (Nursing and Midwifery Board of Australia 2012 Conduct Statement 8). Consent can be obtained after full explanation of the study's intent (Borbasi and Jackson 2012) and that the participants know they can withdraw at any time (Jirojwong et al 2014 p.70).

### **Pilot Study**

The purpose of a pilot study is conducted to refine the methodology (Burns and Grove, 2009). It is a smaller version of the main study and is used to assess the adequacy and feasibility of the main research (Moxham 2012, p.35). The pilot study can identify problems and strengthen the qualitative methodology by identifying practical and methodological issues as well as highlighting modifications that should be made for the main study (Kim 2011).

### **Main Study**

Conducting research requires a lot of time and attention over many months and possibly years (Borbasi and Jackson 2012, p.139). Data analysis and collection may occur simultaneously. Due to the nature of some research, such as lived experiences, the focus is personal and may be emotional and even traumatic in nature (Borbasi and Jackson 2012). In qualitative studies most approaches recognise the role of the investigator in shaping data collection and in data analysis (Jirojwong et al 2011, p.274).

### **Results**

Analysis of data in qualitative studies involves an inductive process so it involves examining words, descriptions and processes (Borbasi and Jackson 2012, p.140). The investigator uses inductive reasoning to sort and make sense of their data. Essentially the investigator immerses themselves in the data looking for relationships (Grounded Theory), importance (Historical research), patterns (Case studies) or theory in general (Borbasi and Jackson 2012). Jirojwong et al (2011, p.264) discuss the stages of qualitative analysis following the collection of data. Analysis may go through some or all of the stages of familiarisation with the data, transcription of recorded material, organisation of data, coding, de-identifying, re-coding, categorising, exploration of relationships between categories, refinement and development of theory and incorporation in to pre-existing knowledge.

### **DISCUSSION/RECOMMENDATIONS**

The research may offer insight in to a specific experience, for example, of a particular group of women (Feminist) or a group of people in a small tribal village (Ethnography). The discussion may provide a picture of life in a specific environment. The investigators may claim certain findings. This section usually tries to unravel what the results mean. There should be an interpretation of the results, the study limitations and possible implications for further research to advance knowledge (Polit and Hungler 2013).

### **CONCLUSIONS of the Qualitative research paper**

The conclusions may be very broad purely highlighting an issue by raising awareness or further understanding of a human experience. Consumers of the research, such a nurses, need to be able to satisfy themselves that the findings of the qualitative research are credible and trustworthy (Borbasi and Jackson 2012, p.143). Often, due to the nature of qualitative papers and the extensive information provided, they are difficult to summarise adequately for publication (Polit and Hungler 2013; Moglia et al 2011; Stenius et al 2008).

## REFERENCE LIST

Research papers conclude with a list including books and other journal articles used to support the concepts outlined (Ingham-Broomfield 2014). The reference list provides an excellent starting place to further search a topic as it allows the reader to locate and retrieve sources cited in the paper (Polit and Hungler 2013).

## ARTICLE CONCLUSION

The methodological approach used in this paper has discussed qualitative research which typically involves the collection and analysis of loosely structured information regarding people in naturalistic settings although approaches such as Historical research do not necessarily involve humans (Jirowong et al 2014, p.131). The content of this article is intended to support the novice investigator to move towards higher levels of clinical competence (Benner 1984) with regard to understanding and using research.

## Appendix 1

### The Grid: An overview of the Research Designs of Qualitative Research

Content	Phenomenology	Ethnography	Grounded Theory	Historical Method	Case Study
<b>Sample</b>	Individuals or groups	Groups or individuals in a culture although more likely to involve groups (Borbasi and Jackson 2012 p128)	Individuals or groups	Sources of historical significance	Single person or single problem, small group or institution
<b>Example of types of instruments/tools used</b>	Interviews and descriptions, observation (Borbasi and Jackson 2012 p129)	Observation and documentation of daily life – the investigator immerses themselves in the culture or group being studied (Borbasi and Jackson 2012 p128)	Observation, field notes, intensive interviews, review of documents, analysis of literature and research on the topic, memo-writing (Jirowong et al 2011 p118)	Historical material such as letters, memos, diaries, handwritten materials, old books, newspapers, books, audio or videotapes, government records, archives (Borbasi and Jackson 2012 p131)	Interviews, observation, records, historical documents and statements (Borbasi and Jackson 2012; Burns and Grove 2011)
<b>Ethics permission</b>	Essential	Essential	Essential	Essential	Essential

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# Development of a Nurse Practitioner led Carpal Tunnel Syndrome clinic

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## KEY WORDS

Ambulatory care; neurosurgery; Nurse Practitioner; Carpal Tunnel Syndrome; outpatients

## ABSTRACT

### Objective

This paper aims to examine how the role of nurse practitioner was implemented within a public hospital Department of Neurosurgery carpal tunnel syndrome clinic.

### Setting

Tertiary referral centre outpatient clinic.

### Findings

The paper informs practice describing the process of developing, implementing and the requirements to become a nurse practitioner role within a public hospital's Department of Neurosurgery within Australia.

### Conclusions

The introduction of a nurse practitioner role within the Department of Neurosurgery has resulted in more timely access and cost effective care for patients referred to this specialised service. Opportunities to further expand this and similar roles in the future should be considered as demand increases.

## INTRODUCTION

Australia's public health networks have attempted to address the growing concern of timely access and more affordable specialised care with a variety of initiatives (Anonymous 2014; Health Professionals Workforce Plan Taskforce 2012; South Australian Government 2006). To meet the changing needs of health care nurse practitioner (NP) models of care have been introduced in practice in Australia since 2000 (Australian College of Nurse Practitioners 2014). These roles have been many and varied and practiced within both the public and private health care system. In late 2007, with increasing pressure for access to specialised care within the neurosurgical outpatient clinics, the Department of Neurosurgery at Austin Health a public health service in Victoria Australia, choose to pursue a NP role to tackle this problem. The following article describes the development of part of the overall NP role within the Department of Neurosurgery focusing on the NP led Carpal Tunnel Syndrome (CTS) clinic, and benefits to date.

## IDENTIFYING THE PRACTICE

In 2005, to address the problem of increased acuity and activity a comprehensive independent review of the neurosurgery services at Austin Health was conducted. Recommendations from this review included the expansion of the current service, building on core strengths and establishing others as well as the need for the implementation of the Neurosurgery Nurse Practitioner (NP) role to assist in this expansion (Donnan et al 2005).

In April 2007, using the recommendations from the 2005 review on neurosurgical services, initial seed funding was found from within Austin Health's Specialty Clinical Service Unit's own budget to create a position Neurosurgery Nurse Practitioner candidate (NPc), an advanced nursing practice training role. During the training period, the NPc utilised the neurosurgical comprehensive review (Donnan et al 2005), developed and conducted a staff survey on the role, participated in clinical practice through direct observation, and supervised practice in most aspects of the neurosurgical care at Austin Health (Scanlon 2007). This role was formalised as an endorsed NP role in late 2011 with responsibilities in both inpatient as multiple areas of outpatient care.

Austin Health's Department of Neurosurgery treats over 3,000 outpatients per year (Gonzalvo 2014). The service referral base not only includes the north-eastern Melbourne but also rural Victoria and nationally, and continues to experience increasing growth in the delivery of ambulatory and acute care service. This exceeds its funding for through the capped Victorian Ambulatory Classification and Funding Systems (VACS) (Victorian Government Department of Human Services 2008c). Currently Victorian public hospital specialist outpatient services are block funded in keeping with previous VACS funding levels until the national Activity Based Funding (ABF) system is finalised (Department of Health 2014). Additional patients attract no further income for the department and in 2007 had extended the waiting times to be seen at these clinics in some cases to over six months, which was twice the national norm (Australian Institute of Health and Welfare 2007). This not only affected patients waiting for specialist neurosurgery assessment and treatment, but also the hospital through penalties imposed by not achieving the set Key Performance Indicator (KPI) of timely access to care (Victorian Government Department of Human Services 2008a). A clear need was identified to reduce the number of patients and their waiting times to be seen in the Department of Neurosurgery outpatient clinics whilst maximizing VACS funding for as many patients as possible.

A partial solution to this increasing problem was the development of an unfunded Carpal Tunnel Clinic by the Department of Neurosurgery. The NP model of care for the ambulatory care setting was considered to be appropriate and compliment the current funded outpatient services (including two general neurosurgery

outpatient clinics) as well as a means to gain funding for an additional clinic for CTS patients. CTS is one of the most common peripheral neuropathies (Scanlon and Maffei 2009) and the prevalence of CTS is approximately 3.8% of the general population; women are three to four times more likely to develop the condition (Uchiyama et al 2010). CTS is commonly seen in a variety of surgical units. Its diagnosis is well established, requiring both clinical assessment and neuro-diagnostics to determine its severity and treatment modality.

It was perceived that treating patients through the use of an autonomous practitioner from a nursing background with the ability to assess patients at an advanced level, order and interpret diagnostic tests (ie nerve conduction tests, magnetic resonance imaging tests and ultrasounds etc), formally diagnose, prescribe treatments (including medications and other conservative regimes) as well as refer to other speciality units and health professionals would enhance the entire Department of Neurosurgery outpatient service. This would be achieved through not only increased throughput and continuity of care, but also patient outcomes and satisfaction through improved education of medicines and alternate treatment options as well as self-management which is recognised as strengths of a NP model of care (Sarro et al 2010; Challenor et al 2006; Williams et al 2003; Faithfull et al 2001; Garfin et al 1988). Specifically the CTS clinic was put forward as a standalone NP run clinic for funding as a part of the overall NP role within the Department of Neurosurgery.

A submission was put forward to the hospital executive to support a proposal for a VACS funded Nurse Practitioner Carpal Tunnel Syndrome clinic. The purpose of this clinic had two primary aims:

1. Decrease overall waiting time for patients to be seen in all Department of Neurosurgery outpatient clinics.
2. Capture appropriate VACS funding for the Department of Neurosurgery and Austin Health.

Although it was a standalone clinic it only represents a small part of the overall role that the NP has developed in other areas of outpatients as well as inpatient care (Scanlon 2013; Scanlon and Cheshire 2012).

## THE PROCESS

All patients referred to neurosurgery outpatient clinics have an associated referral from either their general practitioner or specialist service (acute care or ambulatory setting), outlining the presenting complaint and any treatment or diagnostic tests initiated. This information is triaged by the Director of Neurosurgery to determine the appropriate clinic and if it is considered to be CTS they are placed on the waiting list for the NP clinic.

Within the clinic the NP conducts a comprehensive advanced assessment through the utilisation of their defined scope of practice (Scanlon et al 2014). For the purposes of this clinic the patient's diagnosis is formally determined by the NP, who through the syntheses and interpretation of available historical information, focused physical assessment findings and diagnostic data (if available) is authorised provide appropriate treatment for patients. If further diagnostics tests need to be performed to confirm or rule out differential diagnosis then the NP orders and interprets them. This information is then used to formulate a person centred therapeutic intervention based on potential or actual response to treatment. All patients who require surgical intervention are discussed with and signed off by the Director of Neurosurgery.

If this thorough assessment suggests a diagnosis, which is not a peripheral nerve entrapment syndrome, for example cervical radiculopathy thoracic outlet syndrome or multiple sclerosis, then the patient is referred to the appropriate service for ongoing management.

## BUDGET

There were very few startup costs associated with the NP led CTS. The outpatient clinic space at Austin Health in which the NP led CTS clinic presides was not utilised by any other clinic during this time. The related

infrastructure costs and operating costs (electricity, telephone, rent) associated with a running a public clinic, in a public hospital in Victoria are currently absorbed into the overall hospital operating budget.

**Table 1: Cost for Nurse Practitioner led Carpal Tunnel Syndrome Clinic**

Item	Expense per year	Income
NP time \$48.71 per hour X 3 (plus on costs ie long service leave, superannuation etc)	-\$4,556.00	
Consultant time \$118.90 x 0.3 hours a week x 46 weeks	-\$1,640.82	
Clerical time per year \$20 x 1 hour a week x 46 weeks	-\$920.00	
Outpatient space and utilities	N/A already existing	
2013-2014 financial year 470 VACs patients seen		+\$134,189.70
Neurosurgery VACS weight of 1.595 X \$179 or \$285.51 per patient.		
<b>Total</b>	<b>\$7,716.82</b>	<b>\$134,189.70</b>
		<b>\$126,472.88</b>

(Fair Work Australia 2012; Victorian Government Department of Human Services 2008b; Department of Human Resources 2006)

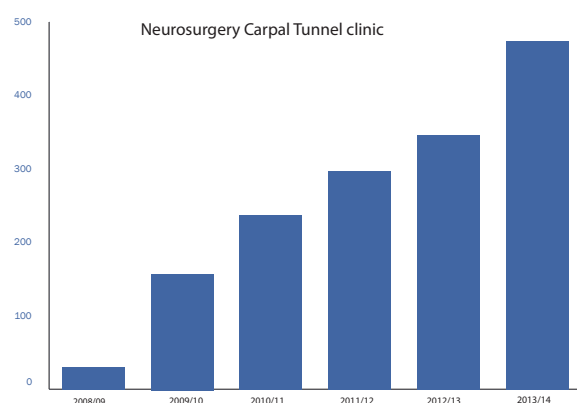
The cost estimates presented in table 1 was based on data provided by the Department of Human Services Victoria (Victorian Government Department of Human Services 2008b; 2008c; 2007), the Department of Human Resources at Austin Health (Department of Human Resources 2006), Nurses and Midwives (Victorian Public Sector) (Single Interest Employers) Enterprise Agreement 2012-2016 (Fair Work Australia 2012). These figures were verified by the manager of the Specialty Clinical Service Unit.

#### Gains made since the implementation of the NP role

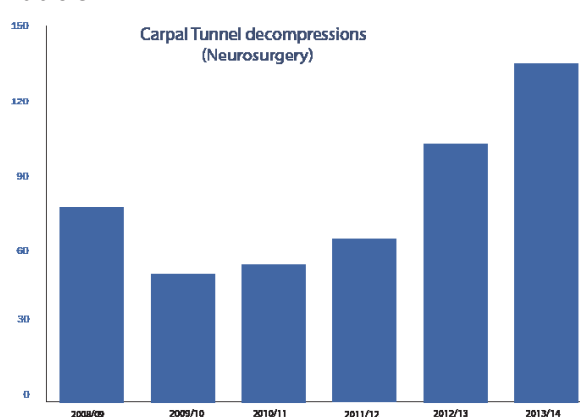
A direct measure of the contribution the NP has made to the CTS Clinic can be seen when comparing the Neurosurgery Annual Audit data 2013-2014 (most recent data) to that of the period of 2008-2009 (which was the period prior to the endorsed NP taking over this clinic).

The CTS waiting time for assessment and intervention was more than 12 months at July 2009 and has decreased to currently eight weeks (as of July 2014). Also 2014 data shows an increase in numbers of patients seen in the CTS Clinic from 31 in 2008-2009 to 470 in the period 2013-2014 (table 2) with a projected increase again in forthcoming years.

**Table 2**



**Table 3**



To address increased numbers of patients diagnosed with CTS and awaiting Carpal Tunnel release (CTR) a dedicated surgical list was introduced. This surgical list was performed by a junior registrar at a low acuity surgery centre for one or two sessions per month, allowing 135 CTRs to be performed on these lists in 2013-2014, an increase from 78 in 2008-2009 (table 3). This has led to a reduction in waiting time to undergo CTR to an average of four weeks.

Although it is clear this increase in CTRs performed by the Department of Neurosurgery would also have associated increase in funding for the hospital it is difficult to calculate the exact remuneration in relation to efficiency costs and improved utilisation of theatre time and staff (medical, nursing and associated staff).

To date there have been no adverse events identified through the use of the NP led CTS clinic. These adverse events related to the NP led clinic maybe defined as patient complaints, misdiagnosis, inappropriate diagnostic utilisation, missed postoperative complications or delay in treatment related to this process as defined by the neurosurgery auditing process or other feedback processes in place at Austin Health.

## DISCUSSION

The Neurosurgery NP will further develop and refine the role within the neurosurgical service at Austin Health. Supervision has continued to be provided by the extended neurosurgical team on a weekly basis and interdisciplinary and consumer focused review of the NP and the role will continue as to ensure the role is not only achieving what it was originally set out to do but also improve and expand the current service through the review of clinical data currently collected for auditing/safety/quality purposes.

As the number of patients seen in this clinic (table 2) is far more than the number treated with CTR (table 3) it would suggest that many patients are being effectively treated with conservative measures or some may not be referred correctly. This number of patients having been separated from the general neurosurgery outpatient clinic has effectively decreased the waiting time for other outpatient appointments which would otherwise clog up outpatient services.

Moreover the work performed within the NP clinic allows not only timely access to treatment and surgical workup but also frees up surgeons and surgical trainees from outpatient work providing them with available time to utilise their surgical skills to perform these and other surgeries. This additional indirect (or direct) benefit of NP led clinic can be seen in the accompanying revenue associated with the increased number of CTRs performed (an increase of 73%). The exact income is difficult to estimate given the complexity of public health funding arrangements whilst taking into account the associated expenditure to deliver the service.

Additionally projected increase in utilisation of the service and possible funding attached to it may allow the department to consider employing another NP or NP candidate in the future to allow for succession planning.

Previously Newey et al developed a NP led management service in an effort to increase access to treatment for CTS (Newey et al 2006). This was a single (nurse) practitioner pathway (diagnosis, surgery and follow-up), which was audited for the clinical outcomes and effect on waiting times. It also involved a clinic with Consultant supervision. It showed low complication rates of 2.5% and only 1.3% of patients complaining of no resolution of symptoms with waiting list times decreasing from 105 weeks to just six weeks (Newey et al 2006). However this would be a difficult model to implement within the current structure given the priority given to surgeon training and the already proven efficiencies of the current model.

Although no formal patient satisfaction surveys have been completed to date, patients seen and cared for by this service appear to be satisfied. Additionally there has been very few questioning the need for a medical doctor to be part of this outpatient process.

## CONCLUSION

As more NPs are endorsed throughout Australia further opportunities for innovative models of acute and ambulatory care will be delivered. The implementation of a NP led CTS clinic at Austin Health has shown to be a successful means of reducing clinic waiting times, whilst maximising available funding and possibly increase patient satisfaction. An additional indirect benefit of the service included a 73% increase in surgical output for CTR and the associated income for the hospital. This study shows that NP led clinics are a valuable adjunct to the provision of medical care, and represent a feasible model to help ease the burden of busy hospital outpatient clinics.

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