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Designing simulation learning experiences to reduce technological burden on nursing academics: a discussion paper

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KEY WORDS

simulation, nursing, satisfaction, medium fidelity, engaged

ABSTRACT

Objective

The literature reports nursing academics avoid manikin-based simulation because they feel intimidated by the technology. With that in mind we sought to design a manikin-based simulation learning experience for nursing students, with low technological burden for those nursing academics expected to work with the technology.

Setting

A multi-campus Australian regional university school of nursing.

Subjects

Nursing academics with little or no experience in manikin-based simulation.

Primary argument

Nursing academics are encouraged to use manikins in their clinical teaching but little has been done to address their fears and concerns around the technology. We argue that taking simple steps to decrease the technological burden will help to encourage nursing academics uptake of manikin-based simulations, as a favoured pedagogy in clinical teaching.

Conclusion

The technological burden around manikin-based simulation was reduced by: (1) choosing medium level fidelity simulations, (2) designing simulations where students operate the equipment, (3) preparing participants for the SLE with a pre-brief video and instruction handouts, (4) offering academics roles as observers, and (5) providing on-site technological support. Nursing academics were encouraged by the process and more inclined to engage with manikin simulations. Designing simulations that address nursing academics' fears and concerns around simulation technology encourages simulation uptake.

INTRODUCTION

Professional bodies and advisors involved in nursing education are placing greater emphasis on incorporating simulation based learning experiences (SLE) throughout nursing curricula (International Nursing Association for Clinical Simulation and Learning [INACSL] 2015; Rudd et al 2010; Benner et al 2009). In Australia and elsewhere, patient safety and limited opportunities for nursing students to have clinical experiences contributes to this demand (Bogossian 2016; Nestel et al 2014; Harder 2010; Rudd et al 2010). As most Australian universities have already invested in manikins for use in simulation, this places added pressure on nursing academics to use the manikins available rather than leave them 'laying idle' (Rudd et al 2010, p3). This may cause stress for those who are unfamiliar and intimidated by the associated pedagogy and technology because internationally, nursing research literature has reported nursing academics do not engage with manikin simulation equipment because they feel incompetent with simulation pedagogy and lack understanding of the manikins' technology (Hollema 2015; Rudd 2013; Blazeck 2011). In particular, nursing academics report they are fearful students will not engage or be satisfied with SLE when technological mishaps occur and they do not feel confident in their capabilities to troubleshoot or solve technological problems (Simes et al 2015; Blazeck 2011). Harder et al (2013) confirmed student satisfaction with manikin simulation learning is significantly impacted when simulation teaching staff lack technological expertise, and are not adequately prepared or supported.

Attempts to address these concerns have been reported. Coleman et al (2011) enlisted skilled SLE champions as support persons and found American nursing academics were more inclined to embrace high fidelity manikins with this support in place. Similarly, in North America, Anderson et al (2012) reported professional development in simulation to be effective when skilled simulation facilitators offer less skilled colleagues active learning with debriefing and feedback. Earlier, King et al (2008) also investigated ways of supporting American nursing academics with simulation. This team recommended one way to overcome barriers around computer manikin-based SLE is to provide increased technological support in the simulation laboratory. This strategy meant nursing staff could spend time focusing on facilitating the SLE, rather than becoming concerned with the technological aspects of the SLE. In the United Kingdom, Berragan (2011) found when nursing teachers were introduced to SLE, using lower fidelity equipment, the technological responsibility and the technological problems they were likely to encounter were reduced. More recently, in Australia, evaluations of a national professional development program, NHET-Sim, found employing simulation experts to facilitate workshops focussing on the equipment, the technology and the pedagogy, improved uptake, integration and quality of simulation into health curricula (Nestel and Bearman 2014). Thus, there is evidence that nursing academics are more likely to engage with manikin -based simulation when their fears and concerns are addressed and support is available.

DISCUSSION

After learning that nursing academics in our own multi-campus university were uncomfortable with the use of manikins for simulation, our research team secured a grant to design and evaluate a SLE aimed at addressing their concerns by providing pedagogical and technological support. Ethical approval for the study was obtained from the university ethics committee. Each member of the research team had undertaken NHET-Sim training and were experienced in scenario writing and other facets of simulation pedagogy. The literature was further perused for guidance on how to design the SLE. The required SLE design components, considerate of the student perspective and recommended by Australian and American simulation training and education institutes, were included such as; students' level of knowledge, needs assessment, setting learning objectives, creating scenarios to meet learning objectives, and debrief (Edlington et al 2014; Howard

et al 2013). However, consideration was also given as to how to help nursing academics become more comfortable in manikin SLE. We did this in our study by: (1) choosing medium level fidelity simulations, (2) designing simulations where students operate the equipment, (3) preparing participants for the SLE with a pre-brief video and instruction handouts, (4) offering academics roles as observers, and (5) providing initial on-site technological support.

Choosing medium level fidelity

The degree of fidelity was carefully considered. Fidelity is defined as the extent to which the simulation experience approaches realism and is determined by a number of factors such as environment, simulation equipment and learner engagement (Meakim et al 2013). High fidelity experiences are most desired because they are extremely realistic and provide a high level of interactivity and realism for the learner. One example is the computerized patient simulators or manikin. These manikins are operated with computer software and when manipulated by a human operator are capable of simulating bodily functions such as coughing, crying, bleeding and cardiac rhythms (Meakim et al 2013). Thus, when working with these computerised manikins, nursing academics must be familiar with the technology to enable effective operation and provide participants realistic experiences. Medium fidelity experiences also rely on computer-based systems and human-like manikins, and are capable of some level of realism for participants, but the operating systems and the computerised components are not as sophisticated (Meakim et al 2013). SimPads are an example of a medium level fidelity device. Erlam (2014) suggested SimPad™ are easier to use because the technology resembles smartphones and tablets, and is familiar technology to most people.

Students operate the equipment

The technological burden was further reduced for the nursing academics because the student nurses participating in the SLE were given roles that required them to control the SimPad™ technology. In a study of New Zealand undergraduate nurses participating in manikin simulation for the first time Erlam (2014) designed SLE by relying upon traits of the contemporary millennial learner. Millennial learners make up the majority of numbers in higher education classrooms and they are known to be technologically savvy, unaverred by technological troubleshooting and able to multitask whilst also taking command of technological equipment (Prensky 2013). Prensky (2013) further explained millennial learners learn best by doing, all the while looking for immediate gratification from, and feedback on, their performances. Erlam described nursing students “flocking in droves” to the manikin SLE featuring technology, not dissimilar to their smart phones, and “requesting more” (Erlam 2014, p13). Thus, with this in mind and in addition to findings from the literature review, we designed a medium fidelity SLE using full-size, life-like manikins connected to a Laerdal SimPad™.

Pre-brief instructional handouts and video

To further reduce the technological burden for academics and students, instructional handouts explaining the scenarios and the equipment, were created and made available online before the SLE, using the university online teaching platform, Moodle. Laminated copies of the handouts were also placed at the bedsides, in the simulation ward, for use during the SLE. The scenarios created for the SLE were designed to be completed by groups of 4-5 nursing students. Each scenario comprised five roles (SimPad™ device operator, nurse, physician, observer and patient’s voice for the manikin) and focused on assessing nursing students’ capabilities in pain assessment, communication, hand washing, medication administration, recognition of deteriorating patients and basic life support. The length of time given to complete the scenario enabled nursing students to experience the scenario from multiple perspectives as they rotated through the roles. This also gave the students time to become familiar with the equipment. Thus, nursing academics’ responsibilities around the technology was minimal.

To further reduce technological concerns and support the nursing academics' understanding of the pedagogy, a 20-minute, real-to-time video was developed to inform the pre-brief stage for both the student cohort and the participating nursing academics. The video portrayed three volunteer nursing students participating in a medium fidelity manikin SLE for the first time. Prior to making the video the students attended a pre-brief session and were orientated to the environment, the equipment and the manikin. The video showed the students utilising the laminated instructional handouts and demonstrating how to operate the equipment, as they completed one scenario. The video captured the nursing students troubleshooting and resolving technological incidents. These incidents were indicative of the typical challenges the students might encounter with the manikin and the hand-held device. The incidents were resolved when the students referred to the laminated instruction guide or followed the prompts on the hand-held devices. This video did not require editing, attesting to the usefulness of the laminated handouts and the pre-brief students had attended. The video was circulated to the participating student cohort and all nursing academics in the school, two weeks prior to the scheduled SLE, in an effort to address any fears or concerns about the equipment or the activity.

Offering observer roles

In the days prior to the SLE taking place, nursing academics, inexperienced in SLE, were invited to participate in the SLE as passive onlookers and asked to report their observations of the SLE to the research team. Four nursing academics accepted. These nursing academics participated in a special workshop style pre-brief, facilitated by the research team members and designed to introduce the pedagogy and address the nursing academics' concerns around equipment technology. During this pre-brief, the nursing academics engaged with the manikin and the SimPad™ as they rotated through the scripted roles in the SLE scenarios. This pre-brief mimicked the pre-brief offered to the volunteer nursing students, with slightly more information around simulation pedagogy.

Initial on-site technological support

On the day of the SLE, the four nursing academics were asked to present to the simulation laboratories one hour before the nursing students arrived, for another pre-brief. During this repeat pre-brief the nursing academics were again invited to interact with the manikin, the SimPad™ device, and the SLE scenarios to address any final concerns or questions arising from the initial pre-brief. When the nursing academics indicated they were satisfied and comfortable to proceed, they were orientated to their roles as passive onlookers.

Nursing academics' first impressions

The research team invited the nursing academics to share their observations of the SLE. Informal conversations took place between the two SLE facilitators and the participating nursing academics to discover their first impressions, experiences and perceptions of the SLE. The nursing academics each verbalised they would be interested in adopting the medium fidelity manikin SLE in their teaching. They reported the introduction to medium fidelity manikin SLE in this way was beneficial. In particular, the support provided by the more experienced simulation facilitators alleviated their fears as they did not feel burdened by the simulation pedagogy or technology. Their observations of nursing students' engagement with the SLE, and also the nursing students' ability to troubleshoot minor problems independently, was a motivating experience for these nursing academics. They found the video especially helpful because it introduced them to the pedagogy in advance of the actual experience, giving them time to reflect and prepare for the actual experience. Thus, the nursing academics who participated in the SLE were encouraged and enthusiastic about engaging with medium fidelity manikin SLE because of all the steps that prepared them for the experience. This anecdotal feedback was later used to plan the focus groups that were conducted in other phases of the project (O'Neill et al 2016; Simes et al 2015).

Looking to the future

The nursing academics' reflections, and the previously reported high student satisfaction with this SLE (Curtis et al 2016), suggest that reducing the technological burden and providing support resulted in a positive experience for both students and nursing academics. The SLE was designed to address academics' fears around technology from the onset. Resources were provided for their preparation and on the day they were freely able to engage with or observe the SLE as recommended by others (Anderson et al 2012; Coleman et al 2011; King et al 2008).

The choice of a medium fidelity simulation also helped to decrease technological burden. Berragan (2011) had suggested using lower fidelity SLE may reduce nurse teachers' technological capabilities required for successful simulation experiences and this was the case in this project. With medium fidelity manikin SLE, like the one used in this study, nursing academics facilitating the simulations are relieved of the burden of high technological expertise associated with computerised manikins. The burden on nursing academics is further relieved when students are given control of the equipment and in this SLE students managed minor troubleshooting of the equipment easily perhaps because it is not unfamiliar to them (Curtis et al 2016; Erlam 2014). Harder et al (2013) cautioned faculty must feel supported and undergo adequate preparation. Without such preparation, including technological support, they may not offer students worthwhile and effective learning experiences. In the SLE presented here, nursing academics received support, with the technology and the pedagogy, prior to and during their initial experiences with medium fidelity manikin SLE.

Subsequent to this study and based on the student evaluations there has been increased interest in using medium fidelity manikin SLE's amongst this university's nursing academics. A new curriculum has been designed featuring high and medium fidelity manikin based SLE's in most clinical courses (CQ University 2015). At this university, the scenarios are banked in a central digital repository to further support the usage of SLE. The digital repository also contains simulation information and resources to encourage and support uptake (O'Neill et al 2016).

CONCLUSION

Nursing academics wanting to prepare and provide engaging and worthwhile manikin SLE for undergraduate nursing students, with a focus on delivering quality teaching, benefit when the technological burden is lessened. This type of support is needed as more and more pressure is put on them to embrace simulation and, in particular, manikin based SLE as a favoured pedagogy for teaching clinical skills in nursing.

RECOMMENDATIONS

Since some nursing academics feel burdened by the technology around manikin-based simulations we recommend steps, like the ones taken in this study, are followed to help alleviate their fears and concerns. We also recommend that there be further research into alternative ways to reduce technological burden when designing manikin based SLE. This would serve to ascertain ongoing increased uptake and nursing academics' impressions of implementing this kind of manikin simulation learning experience. Finally we recommend longitudinal studies to further explain students' learning and academics evaluations of utilising SLE where technological burden has been greatly reduced for the nursing academics.

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Profiling Australian school students' interest in a nursing career: insights for ensuring the future workforce

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KEY WORDS

aspirations, career, school students, nursing, nurses

ABSTRACT

Objective

Given that the current shortage of nurses threatens the quality of health care globally, we urgently need to find new ways to bolster recruitment. This paper aims to understand patterns and predictors of interest in a nursing career among school students in order to inform ways of ensuring a viable future workforce.

Design

A four-year longitudinal mixed methods study undertaken in New South Wales, Australia.

Setting and subjects

Survey data collected annually (2012–2015), involving 6,492 students in Years 3–12 in government schools, were analysed using logistic regression. Focus group data (2013–2015) involving 553 students and open-ended survey responses were analysed to investigate reasons for interest in nursing.

Results

Significant predictors of interest in nursing included being female and having a parent in a nursing occupation. A 'helping orientation' and prior experiences with nurses or nursing were key factors underpinning students' interest in this career. Some students perceived nursing as a 'safe' career choice, balancing practical concerns, such as job security, with their desire to care. Other students expressed ambivalence, with nursing but one of many 'caring' careers to which they were drawn.

Conclusion

Given that early experiences with nursing or nursing-related activities influenced the desire to pursue this career, developing new experiential strategies that engage school student interest are important for ensuring the growth and stability of the Australian nursing workforce.

INTRODUCTION

A viable healthcare system capable of providing optimum population health outcomes relies on a healthy and sustainable nursing profession (Gaynor et al 2008). However, concerns about a global nursing shortage have been repeatedly raised over the last decade (World Health Organization 2011; Price 2009; Oulton 2006). As the nursing workforce deficit adversely impacts health care systems around the world, nursing recruitment and retention are now top priorities for both healthcare services and the nursing profession (McLaughlin et al 2010).

A number of factors influence the choice of nursing as a career, ranging from the tangible (such as pay, workload, convenience, and family responsibilities) to the intangible (such as job satisfaction, status, and psychological rewards) (Eley et al 2010). A decline in the number of applicants to nursing schools has also been identified as influencing the nursing shortage (Drury et al 2009; Oulton 2006). As supply fails to meet demand, the need to understand what motivates people to choose nursing as a career becomes more important than ever (Usher et al 2013).

The question of motivation has been explored internationally in studies involving school students (Neilson and Jones 2012; Neilson and McNally 2010; Cohen et al 2004), student-nurses (Jirwe and Rudman 2012; McLaughlin et al 2010; Mooney et al 2008), and registered nurses (Genders and Brown 2014; Gambino, 2010). These studies found the decision to enter the nursing profession was influenced by gender, culture, experiential knowledge, self-concept and a desire to help others (Price et al 2013). Pre-held beliefs about nursing, an idealistic view of caring, and the influence of others (Price 2009), including a family history of working in health (Eley et al 2010), were also significant incentives.

In Australia, where a shortfall of 85,000 nurses is projected by 2025 and 123,000 nurses by 2030 (Health Workforce Australia 2014), researchers have also sought to understand why individuals enter nursing (Hickey and Harrison 2013; Eley et al 2012; Eley et al 2010). This work, however, has focused almost exclusively on the perspectives of student-nurses and registered nurses. As a result, little is known about the kinds of school students interested in a nursing career. Dockery and Barnes (2005) reported 'registered nurse' as the seventh most popular occupation for Year 10 females, and altruism, flexibility, and the influence of a parent in the occupation as factors shaping Year 12 female students' decision to undertake nursing studies. Another small-scale study explored gender and career aspirations, but provided no insight into why nursing appealed to the two students in their sample who chose nursing (Ford 2011).

Our study contributes to this growing body of research by taking an 'upstream' focus to explore the perspectives of primary and high school students. We argue that research on younger students is needed because: (i) nursing aspirations often form early in life (Hoke 2006) and (ii) fewer school leavers, traditionally the core of pre-registration nursing programs, are choosing nursing as a career (Drury et al 2009).

METHODS

The four-year longitudinal mixed methods study aimed to investigate demographic and other characteristics of students interested in specific careers requiring university education, with nursing the focus here. Schools were selected with variance in socio-economic status and geographic location (50% metropolitan, 50% provincial) in order to generate a comprehensive profile of the aspirations of students aged 8 to 18 years. In each school, all students commencing in Years 3, 5, 7, and 9 in 2012 were potential participants, with each cohort followed until 2015. This is the first Australian study to explore aspirations of students across the entire Year 3 to 12 range.

DATA COLLECTION

Student surveys

Participants came from 64 schools in New South Wales, Australia. Surveys were conducted annually during the period 2012–2015. Informed consent from students and parents/carers was obtained, with 6,492 students completing the survey at least once. Survey formats varied for primary and secondary students to account for different levels of education. 5,925 students nominated at least one occupational aspiration.

Focus group interviews

Focus group participants were purposively sampled in order to deepen our understanding of students' career interests. Focus groups with 553 students were conducted between 2013 and 2015, during school hours and lasting 30–60 minutes. Students discussed: their post-school plans, their job thoughts, with whom they discuss their plans, and their thinking about university and/or Technical and Further Education (TAFE). All interviews were digitally recorded and transcribed.

Data analysis

Potential predictors of interest in nursing were grouped into student-related variables (table 1) and school-related variables (table 2), identified as follows:

Table 1: Student background variables

Variable	Source	Measure
Gender	School enrolment form	Categorised as male or female.
Indigenous status	Enrolment form	Categorised as Indigenous or non-Indigenous.
Student cohort	Survey	Year 3 Cohort: Years 3–6 Year 5 Cohort: Years 5–8 Year 7 Cohort: Years 7–10 Year 9 Cohort: Years 9–12 Measures differences between students of different ages.
School location	NSW Department of Education	Determined by school postcode and dichotomised as metropolitan or other.
Language background	Enrolment form	Categorised as English-speaking background or language background other than English (LBOTE).
Socio-economic status	Enrolment form	Calculated by combining the highest parental education and occupation levels for each student into an equally weighted proxy for student SES. Data for all NSW government schools were used to separate scores into quartiles.
Cultural capital	Survey	Calculated by student responses to the question: How often do you do the following activities? (Listen to classical music; talk about music; go to the theatre to see a play, dance or opera performance; go to art galleries or museums; go to the cinema to watch a movie; go to a library; talk about books; play a musical instrument or sing; participate in dancing, gymnastics or yoga; talk about art)
Parental occupation	Survey	Determined by responses to questions: What is your parent's/carer's job? Please describe what your parent/carer does in this job.
Survey year	Survey	Survey participation year. Measures changes in student aspirations over time.
Prior achievement	NSW Department of Education	Calculated from the most recent National Assessment Plan for Literacy and Numeracy (NAPLAN) test scores for each student. Attainment was taken as the equally weighted composite of individual student Reading and Numeracy scores. Data for all NSW government schools used to separate scores into quartiles.

Table 2: School-related variables

Variable	Source	Measure
ICSEA	My School (www.myschool.edu.au)	The Index of Community Socio-Educational Advantage (ICSEA) is a standardised scale measuring school advantage based on summarising student level data. A higher score indicates a relative lack of disadvantage. ICSEA scores were categorised using cut-offs from the state quartile values in each year.
Self-perception of relative academic performance	Survey	Perceived achievement relative to peers was a self-assessment item: How are your marks this year compared with other students? (Well below average, Below average, Average, Above average, or Well above average?)
Access to tutoring	Survey	Determined by response to question: Do you attend any out-of-school tutoring?

Statistical analysis

Univariate logistic regression analysis was undertaken to investigate determinants of career aspirations for nursing. All student-related and school-related variables were included as potential predictors in a regression model, reported as adjusted odds ratios and adjusted p-values. To adjust for the correlation of outcomes within students due to repeated measures, a logistic regression model was fitted within a Generalized Estimating Equation (GEE) framework, a method robust against violations of normality and missing data assumptions. The GEE model was compared to an equivalent random effects Generalized Linear Model employing the same data and variables, both of which produced similar estimates and p-values. Data were analysed using SAS software, version 9.4. Statistical significance was set at 0.05.

Qualitative analysis

To understand the factors underpinning school students' reasons for an interest in nursing, open survey responses and focus group data were subjected to thematic analysis. Data were coded by a team of researchers using inductive and deductive logic (Creswell 2013) and analysed with the assistance of NVivo software version 10. A continuous process of reflection and discussion among coders ensured consistency and group consensus (Harry et al 2005) about emerging themes. Identified themes were included in a codebook as a reference point for use by all members of the research team (Guest et al 2011). Multiple methods were used to increase validity by providing multiple perspectives on the same phenomenon (Yin 2009). Reliability was ensured through a well-established protocol documenting each step of the research process (Yin 2009).

FINDINGS

Nursing was the 15th most popular career interest of all student-identified occupations, with 207 students (9 males, 191 females, 7 not stated) expressing an interest in nursing in at least one survey year (3.19% of all students). During focus group discussions, 14 students (2 males and 12 females, 2.5% of all students) from Years 5 to 11 indicated an interest in nursing. Results are reported in three main sections: (1) predictors of interest in nursing, (2) patterns of interest over time, and (3) reasons for interest. Quantitative and qualitative data are combined in the latter two sections.

Predictors of interest in nursing

The only statistically significant predictors of interest in nursing were sex, age, and a parent in a nursing occupation, as shown in table 3. Females were nearly 25 times more likely to choose nursing than males (OR = 24.70). Students interested in nursing had greater odds of being in the Year 7 (OR = 1.98) or Year 9 (OR = 2.27) cohorts than in the Year 3 cohort, and of completing the survey in either 2014 (OR = 2.49)

or 2015 (OR = 2.87) rather than 2012, indicating that nursing becomes a more attractive career option as students mature. Students with a parent who worked as a nurse were more than twice as likely to express an interest in nursing (OR = 2.17) than those with parents in other occupations. Notably, no other variables were significant predictors, including SES, prior achievement, Indigenous status, or location.

Table 3: Results of logistic regression analysis

Characteristic	Nursing career choice		Odds ratio
	No n (%)	Yes n (%)	
Indigenous status			
Indigenous ^a	643 (97)	18 (3)	
Non-Indigenous	9,103 (98)	227 (2)	
Student cohort			
Year 3 ^a	2,884 (99)	42 (1)	
Year 5	2,842 (98)	66 (2)	
Year 7	2,785 (97)	87 (3)	1.98*
Year 9	1,700 (96)	62 (4)	2.27*
Cultural capital quartile			
1 ^a	2,444 (98)	51 (2)	
2	2,382 (97)	72 (3)	
3	2,502 (98)	61 (2)	
4	2,414 (98)	61 (2)	
Language			
English ^a	8,753 (97)	235 (3)	
Other	1,078 (99)	15 (1)	
School location			
Metro ^a	5,971 (98)	99 (2)	
Non-metro	4,314 (96)	158 (4)	
Parent in nursing occupation			
No, or unknown ^a	9,844 (98)	231 (2)	
Yes	442 (94)	26 (6)	2.17**
SES quartile			
1 ^a	2,178 (97)	63 (3)	
2	2,580 (97)	81 (3)	
3	2,193 (97)	60 (3)	
4	2,472 (99)	29 (1)	
Sex			
Male ^a	5,077 (100)	10 (0)	
Female	4,754 (95)	240 (5)	24.70***
Survey year			
2012 ^a	2,541 (99)	31 (1)	
2013	3,916 (98)	80 (2)	
2014	1,843 (97)	65 (3)	2.49***
2015	1,986 (96)	81 (4)	2.87***

ICSEA national quartile		
1 ^a	2,505 (97)	73 (3)
2	4,133 (97)	146 (3)
3	1,064 (98)	19 (2)
4	2,584 (99)	19 (1)
NAPLAN quartile		
1 ^a	1,943 (98)	43 (2)
2	2,385 (96)	93 (4)
3	2,597 (97)	82 (3)
4	2,685 (99)	21 (1)
Self-rated ability		
Below/Well below average ^a	773 (97)	24 (3)
Average	3,804 (97)	130 (3)
Above average	3,030 (98)	66 (2)
Well above average	1,246 (99)	11 (1)
Tutoring		
Yes ^a	1,685 (98)	31 (2)
No	8,373 (97)	223 (3)

Note. ^a reference category. *p < .05, **p < .01, ***p < .001.

Patterns of interest in nursing

The longitudinal nature of the data enabled analysis of individuals' interest in nursing across the survey years, 2012–2015 (see table 4). Of the 115 students who completed more than one survey and named nursing at least once, more than 74% were moving towards or holding a steady interest in nursing. However, more than 24% of the students disengaged from nursing during the study.

Table 4: Patterns of interest in nursing

Pattern of interest	Description / explanation	%
'Towards'	First expressed interest in a non-nursing job, then interest in nursing in each subsequent survey	49.6
'Steady'	Expressed interest in nursing in every survey	25.2
'Away'	Expressed interest in nursing in one survey but not in subsequent surveys	16.5
'Brief'	First chose a job other than nursing, then chose nursing in a later year, then returned to a non-nursing job in the last survey	7.8
'Returned'	First chose nursing, then jobs other than nursing, but returned to nursing in their last survey	0.9

Some indeterminacy about nursing was also apparent in the focus groups. For example, students described nursing as one of several possibilities, including as a 'back-up plan':

"I had a lot of different, like, decisions and choices that I've been tossing up between." (Shyanne, Year 11)

"[I've been considering nursing since] last year [because] I like helping people and nursing seems like one of the options to do as a career." (Gabriella, Year 9)

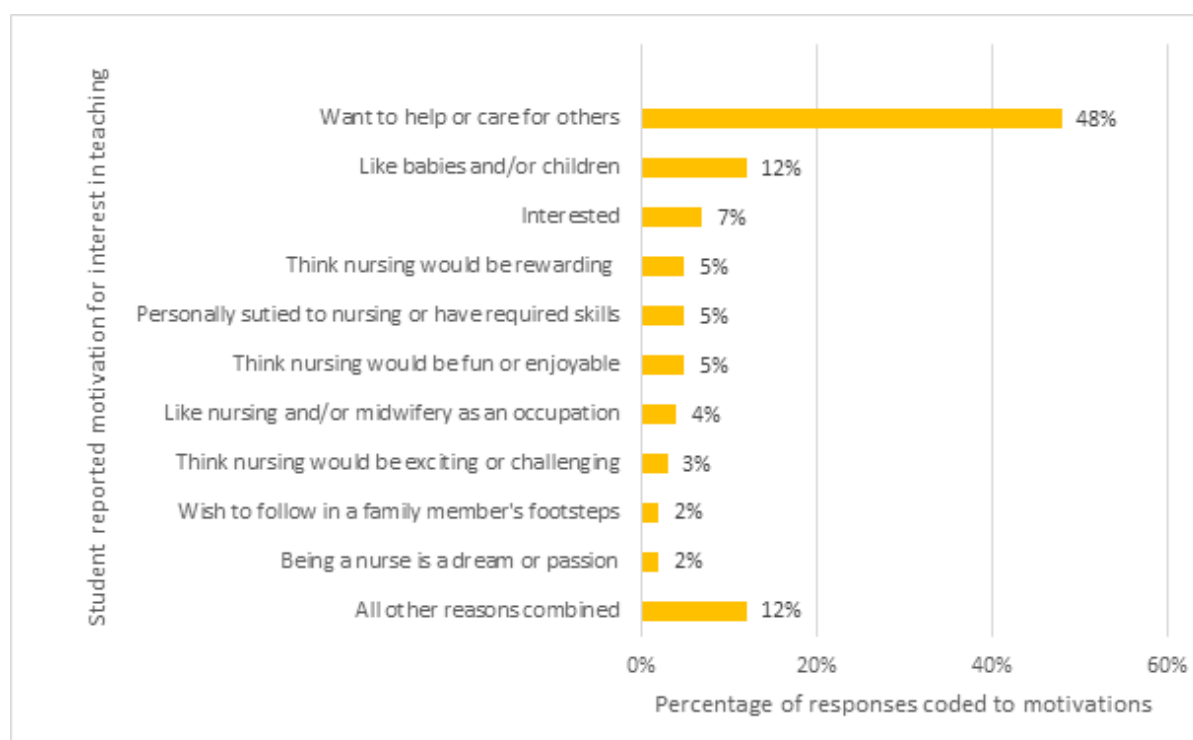
"They are kind of the same thing [nursing and teaching] because you get to help kids when you're a teacher and you get to help kids when you're a nurse." (Ilyssa, Year 5)

"Hopefully a nurse but also a vet or something like that But I know that a vet ... there's a lot into it. Hopefully I'll find an easier way but a nurse will do me good." (Neil, Year 9)

Reasons for interest in nursing

Analysis of the reasons given by students for their interest in nursing (in open survey responses) yielded 11 distinct categories (figure 1). Nearly half of all students who expressed an interest in nursing cited a desire to care for and help others. They wanted to “save lives, help people” (Grace, Year 9), “have a positive influence in their life” (Amber, Year 10).

Figure 1: Students’ interest in a nursing career by reason



At the same time, students tended to describe nursing as a ‘win-win’ career, providing intrinsic reward through helping others as well as providing secure and flexible employment:

“I really want to help people and by being a nurse I benefit from making people better.” (Janelle, Year 10)

“[It’s] a stable career. I’d like to help people every day and come home from work knowing I’ve made a difference.” (Louise, Year 10)

“[My parents] think it’s good because they said I’ll always have a job and I can go up into nursing [from Aged Care] if I want to.” (Christina, Year 11)

Favourable perceptions of the profession were also conveyed as students talked about a future in nursing. They believed it required extraordinary qualities, and was a worthwhile career that could provide diversity and freedom from monotony:

“[Being a nurse is the] closest thing to a super hero.” (Bettina, Year 11)

“You’ve got so many opportunities... you can specialise in a certain ward that you really like because you can... experience them all.” (Shyanne, Year 11)

“I would wake up every morning not dreading to go to my job.” (Trish, Year 9)

“[It’s] unpredictable which would make every day unique.” (Claire, Year 11)

While only two males discussed nursing as a career during the focus groups, they conveyed positive, if more tentative, perceptions of “probably” wanting to be a nurse:

"I wanted to do something in the medical region... a nurse would probably be my place where I want to be." (Neil, Year 9)

When another boy laughingly mentioned a film where a male nurse is a figure of ridicule, Neil was not deterred: "I wouldn't mind. It would be good". His friend then acknowledged Neil's suitability for nursing, with an appropriate disposition for carrying out caring work:

"You've got a very caring nature. As soon as someone is hurt, you are always there and comforting them even if you don't know what happened." (Jaylen, Year 9)

Students often drew on personal experiences with nursing as they explained their interest in this kind of work. Some students identified with and wanted to emulate other nurses:

"I'd love to take after my mum. I have been to work with her plenty of times. I love taking care of people and to think I'd be helping someone who needs my helping hand." (Narelle, Year 9)

"My mum's family friend actually just finished her nursing stuff... She gives me questions and I answer it... she's just getting me warmed up for it. ... So I'm really excited to do that." (Georgie, Year 6)

Students' experiences with illness also brought them into close contact with the world of nursing work and strongly influenced their interest:

"Helping people out, like, the kids ... that have cancer and stuff I've always wanted to be a nurse since my cousin died of cancer." (Zoey, Year 7)

Exposure to nursing through work experience and part-time work also shaped interest in nursing:

"I did work experience in a hospital and loved it. I currently work in an Aged Care facility and I'm hoping to move up in the nursing industry as an RN." (Wendy, Year unknown)

DISCUSSION

Results of this study depart from prior research in two main ways. First, although a previous Australian study found that average to below-average academic ability predicted interest in nursing (Dockery and Barnes 2005), prior achievement was not a significant variable in our analysis, indicating that students from across the achievement quartiles, including high-achieving students, were interested in nursing. Second, nursing was neither an unpopular career choice (Neilson and Jones 2012) nor of limited appeal (Dockery and Barnes 2005) to the primary and secondary students in this study. It was considered a worthwhile, rewarding, and stimulating career, requiring exceptional, even 'heroic', qualities.

Nursing remains one of the most persistently feminised workforces in Australia, with nine out of every ten nurses and midwives being women (Australian Institute of Health and Welfare 2013). Our study reinforces the dominant perception of nursing as caring work, with gender continuing to influence intentions to enter the profession (Price et al 2013). As found in previous studies, a "helping orientation" (Miers et al 2007, p.1198), or desire to help and care for others (Jirwe and Rudman 2012; Mooney et al 2008; Hemsley-Brown and Foskett 1999), was the primary driver of interest in a nursing career. On the other hand, it was encouraging that nine male students were among our sample of 207 who expressed interest in nursing. Their positive talk about nursing runs counter to a previous study which found that 15-year-old boys were openly antagonistic towards nursing as "a girl's job" (Hemsley-Brown and Foskett 1999, p.1346).

Prior direct contact with nursing also provided strong motivation for entering the profession. Personal experiences and interpersonal interactions with nurses served to shape students' visions of possible futures in nursing. In particular, a parent working in the field afforded students personal experience of what was likely

to be achievable for themselves. Family and friends, work experience, and other interactions with nurses and healthcare settings, gave students a sense of what nursing entails, which in turn strengthened their interest in nursing.

Aspiration in formation: a contested space

Longitudinal research enables a comprehensive analysis of how career reasoning develops over time (Howard et al 2015). Students' ambivalence about nursing as a career choice, exemplified through shifts toward and away from nursing over the course of the study, is noteworthy.

Students explore, and are open to a variety of career options, especially during their middle school years (Cohen et al 2004). Gottfredson (2002) proposed that children develop an awareness of occupational roles and reject occupations they perceive as more suited to the opposite sex, as low status, or too difficult for them to attain. Others suggest that, over time, children 'learn their place' and align their aspirations with classed, gendered, or racialised paths that effectively fit family-class backgrounds (Archer et al 2014). Similarly, our study showed that as students advanced through schooling, they aligned altruism with the practical realities of careers.

Implications for building the nursing workforce

Our study underscores the importance of engaging future nurses early in their career decision-making process. If we are to enhance recruitment and retention within the profession, we need to understand that competition exists from related 'caring' careers, such as teaching and veterinary science. Although there was a stronger trend towards rather than away from nursing during our study, nearly 25% of once-interested students disengaged from this career choice. While nursing remains unique amongst health professions in its capacity to foster early commitment to the profession, it is no longer the only career option for students with a helping orientation. Graduate programmes in non-medical health professions including physiotherapy, occupational therapy, radiotherapy, and diagnostic imaging, are emerging as strong competitors for nursing recruits (Miers et al 2007). Thus, school students' inclination for and interest in nursing needs to be nurtured if their caring predisposition is to translate into nursing enrolments.

Student aspirations are often set well before Year 10 (Gore et al 2015). By late primary school, many young people have rejected certain jobs, including nursing, on the basis of perceptions. Our study indicates that experiential activities that give young people a sense of what the world of nursing work involves, are instrumental in increasing nursing's appeal beyond the 'traditional' aspirant. Innovative strategies overseas have involved: partnerships within industry; prime-time television advertisements; video and print recruitment materials; fund-raising for student scholarships; and grants to expand capacity in nursing schools to (Buerhaus et al 2005) as well as a 'Nursing Exploration Summer Camp' whereby participants gained hands-on experiences of what a nursing career will involve (Matutina 2008).

Our findings also signal an important role for Australian universities in actively promoting nursing as a career choice (Stanley et al 2016). As student work experience in nursing becomes increasingly challenging for public teaching hospitals to resource, there are new opportunities for cross-sector collaboration between universities, schools, and hospitals. Strategies that showcase the world of nursing work to school students have clear potential to engage their interest in and broaden their understanding of nursing.

This paper offers new understandings of predictors of nursing student recruitment, with its unique sample of primary and secondary school students. While childhood aspirations do not necessarily predict future outcomes and participation, they can indicate the types of careers young people are likely to pursue later in life (Archer et al 2013). By better understanding the motivations of school students drawn to a nursing career, we can develop more targeted approaches to recruitment. This study, however, also highlights key

challenges in recruiting the next generation of Australian nurses. It is critical to appreciate that nursing is not the only career that will appeal to students with a strong helping orientation and that other 'caring' careers are strong rivals for nursing recruits. Innovative strategies that promote and nurture school students' interest in nursing are essential if we wish to ensure growth and stability in the profession.

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Improving diabetes control in the community: a nurse managed intervention model in a multidisciplinary clinic

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KEYWORDS

Nurse, chronic disease care interventions, disease manager, diabetes, primary care, multidisciplinary clinic

ABSTRACT

Objective

To assess diabetes management and control measures in a central multidisciplinary primary care clinic, conducted by a nurse.

Design

A cross sectional study.

Setting

Central, multidisciplinary, primary care clinic.

Subjects

Randomly selected 100 people with diabetes.

Interventions

People with diabetes with suspected non-optimal glucose control ($HbA1c > 7\%$), were invited to the clinic nurse to discuss optimal personal diabetes control, treatment and follow up. All were provided the necessary referrals to consultants and were called in for follow up visits, and received telephone reminders. All interventions were made according to the current American Diabetes Association Standards of Medical Practice recommendations.

Main outcome measures

Retrospective data were collected. Data included demographics and diabetes control measures (e.g. $HbA1c$, LDL, blood pressure, ophthalmologic examination etc.). Data was collected for three x 6 months periods: 1) six months before the nurse visit; 2) six months following the first nurse visit (the intervention); and 3) for patients who were followed up for at least one year after the intervention, the last six months of follow-up.

Results

With a median follow up of 25 months, $HbA1c$, LDL and systolic blood pressure levels dropped significantly from before starting the clinic through the intervention and remained low in the last half year of follow up. GP, Ophthalmologist and Dietician visits increased significantly during the study. Non-significant trends were observed with total and diabetes-related hospitalisations decreased, foot examination rates increased and mild weight loss.

Conclusion

Multidisciplinary intervention managed by a nurse, improve diabetes management and control measures. Observed changes persisted after the intervention period.

INTRODUCTION

The treatment of chronic disease such as Diabetes Mellitus (DM) is not a simple task for the staff in the Primary Care clinic. A number of models have been created to improve quality of care and counseling chronic patients utilising either physicians only, or in a physician-nurse combination. Bodenheimer et al (2002) surveyed the results of research that studied intervention based on a model of treatment of chronic disease in people with diabetes. Most (32 out of 39 studies) found a positive effect on the process or in at least one result in people with diabetes. In addition, 18 of 27 studies that examined treatment cost in three chronic diseases (diabetes, hypertension, and heart disease) found a drop in costs or health services usage. Studies that compared nurse care manager to primary care physicians showed equivalent or even better results in diabetes control (Watts and Lucatorto 2014).

Many studies have attempted to identify and characterise the management of chronic diseases, and the role of case managers as certified educators in such a program (e.g. baseline assessment, economic analyses, guidelines implementation, educational interventions and outcomes assessment) (Watts and Sood 2016; Jones 2015; Aliha et al 2013; Huston 2001). These studies have also shown that telephone follow-up by a nurse leads to metabolic parameters improvement and better adherence to treatment recommendations in people with diabetes. Changes in the management of chronic diseases have opened up the opportunity for significant professional development for nurses working with chronic patients (Brown et al 2016; Chamberlain-Webber 2004). In evaluating the nurse's contribution to the management of chronic diseases, it was found that nurses have the ability to develop professionally in the field of managing care in the health system; work with other professionals including the primary care physicians; to implement and maintain the process in a multidisciplinary team (Kim 2016; Forbes and While 2009; Watts et al 2009; Witter 2005) and partnership with the patient's close family circle with home assessment, education and support and facilitate access to community resources (Aliotta et al 2008).

It was found that nurses have a major effect when counseling patients on self-management of their disease, particularly when combined with the proactive care management model (Watts and Sood 2016; Aliha et al 2013; Washburn and Hornberger 2008; Hainsworth 2005) and decision-making support. The effect was both on diabetes control (glucose and HbA1c) and on patient adherence to disease management (visits, self-monitoring, and adherence to treatment).

Berra et al (2011) have shown that nurses' structured personal supervision, based on guidelines, can significantly contribute to lowering cardiovascular morbidity and mortality. Other studies have shown that care management delivered by a nurse or team of nurses' increases use of health services for people with diabetes and improved short-term quality of care measurements. However, long-term effects on DM control have not been studied (Wilson et al 2005; Loveman et al 2003). Comparison of care provided by a physician alone and care provided by a physician – nurse combined, showed a greater contribution with combined team work in chronic illnesses (Litaker et al 2003), in treatment of Type 2 Diabetes patients (Luzio et al 2007; Stevenson et al 2001) and in patients with hypertension and Type 2 Diabetes (Gross et al 2009; Hendrix and Wojciechowski 2005). Furthermore, an organised systemic plan utilising a multi-disciplinary team was shown to lower the number of hospitalisations and improve follow up rates and balance of blood glucose, HbA1c and blood pressure results (Domurat 1999). However, the overall results from research of disease management by nurses' have not been published (Watts et al 2009) except for long term HbA1c (Watts and Sood 2016).

Maccabi Healthcare Services is the second largest health maintenance organization (HMO) in Israel, insuring about 2,000,000 patients. All medical follow up and care are performed through a common computerised medical file used by all the Maccabi health care staff.

In Maccabi Healthcare Services, some clinics function with a multidisciplinary team including primary care physician, nurse, social worker, pharmacist, physical exercise consultant and other medical specialists. These clinics care for chronic disease patients and can perform specific interventions for predefined populations. The clinic nurse leads the intervention process and manages the care according to the model of chronic disease management, which combines patient education and follow-ups of both medical (direct disease measures and medications) and process (self-monitoring, staff visits and scheduling). Over the last years, an emphasis has been put on care and control of DM, watching specific parameters that enable follow up and evaluation of patient disease control. This study allows us to examine the efficacy of diabetes care management by a nurse in a multidisciplinary clinic.

METHOD

The purpose of this study was to assess diabetes management and overall control measures in a central primary care clinic, conducted by a nurse. The study used a retrospective, cross sectional design.

In Maccabi Health Services, Sharon District, a multidisciplinary team clinic has been active since November 2008. The clinic cares for about 10,000 patients, 800 of whom have diabetes. People with diabetes receive specific interventions according to a predetermined protocol and the clinic nurse performs the treatment management. All medical data regarding patients (clinic visits, medications, lab results, etc.) are in the medical file, and the research was carried out by systematic data retrieval from the central medical database. The intervention procedure consisted on identifying people with diabetes with non-optimal control (HbA_{1c} > 7% or personal goal as set by the physician), inviting them to come and see the clinic nurse (who has specialty training in diabetes), either by direct summoning by the nurse or by referral from the patient's physician. Patients received personal guidance regarding the disease, the importance of treatment and control, avoiding complications, explanations on self-management and empowerment, correct use of blood glucose meter and home sphygmomanometers, and were provided referrals to consultants and the necessary providers for continued care and follow up (ophthalmologist, dietician, social worker, physical exercise counselor etc.). During the intervention, the patients were called in for follow up visits, and received telephone reminders and counseling to monitor themselves according to the accepted recommendations. All interventions (management, follow ups and goals) were made according to the current American Diabetes Association Standards of Medical Practice recommendations and were personalised by the diabetes consultant. The multidisciplinary process was conducted and managed by the clinic nurse.

The sample was a convenience sample. In accordance with the research protocol, the first 100 eligible patients to visit the clinic during the study period, who had been diagnosed at least one year before the intervention were selected.

We collected, directly from the medical records, demographics and diabetes control measurements (cholesterol and HbA_{1c} levels, urinalysis for microalbumin/creatinine ratio, blood pressure and weight measurements taken by the trained study nurse, eye and feet exams and the clinic staff follow-up) at three points in time at 6 month intervals each (figure 1).

"Time 0", the initial start of the study, was defined individually per patient according to the patient's first nurse visit (the beginning of the intervention). The time periods were defined as (figure 1):

1. The six-month interval starting one year before the intervention until six months before the intervention. This baseline period was selected to establish the patient's baseline rather than the immediate pre-intervention status that might be argued as affecting the recent patient compliance (the actual summoning for the study, for example).

2. The six-month interval after the initial clinic nurse visit (the intervention period).

3. We also collected data from the last six-month period as follow-up, where available, for patients whose intervention period started over one year before gathering the data. For each time period, the last measurement was recorded for each variable.

In addition, we collected data from the last blood tests before the intervention period (pre-visit 1). In order to create uniformity, the measurement taken was the last performed in each time period.

The research was approved by the institutional research committee and by the institutional review board (IRB).

We used descriptive statistics to evaluate the different variables, and compared the results of the baseline, intervention and follow up by a paired student T test for continuous variables and chi square for the categorical variables. The data was collected and analysed anonymously using SPSS version 16.

FINDINGS

Our research collected data on 100 people with diabetes who were randomly selected from all the people with diabetes in the clinic. Fifty-two percent were male. The average age was 63.1 (± 11.92) years, with a median age of 63 years. For every patient medical data was collected for each of the three defined periods as well as an additional pre-visit. Median follow up (for period 3) was 25 months. Patient data during the study periods is presented in table 1. For the various measurements, comparisons were made between baseline period and the pre-intervention visit, and the measurements in intervention and follow-up periods. HbA1c averages before the intervention were $8.31\% \pm 1.86$ mg%, during the intervention were 7.19 ± 1.11 , and in the final six months of follow up $7.22\% \pm 1.41$ ($p < 0.01$). LDL levels were 105.45 ± 3.88 , 90.99 ± 29.16 , and 90.74 ± 25.85 respectively ($p < 0.05$). Systolic Blood pressure levels also dropped from 140.06 ± 18.85 to 134.33 ± 16.08 and 134.8 ± 19.15 respectively ($p < 0.01$). A weight loss was also observed.

Table 1: baseline and follow-up

	period 1 (-1 - ½) yr n=82		pre-visit 1 n=100		period 2 (0 - ½)yr n=97		period 3 # last ½yr n=94	
	average	median	average	median	average	median	average	median
LDL-Cholesterol**	98.33 ± 33.52	92	105.45 ± 36.88	99	90.99 ± 29.16	89	90.74 ± 25.85	84.5
HbA1c*	7.74 ± 1.66	7.25	8.31 ± 1.86	7.7	7.19 ± 1.11	6.95	7.22 ± 1.41	6.9
microalbumin/ albumin ratio (U)	40.91 ± 68.26	10			45.19 ± 82.13	10	45.68 ± 82.74	12
systolic Blood pressure**	147.51 ± 24.18	142	140.06 ± 18.85	135	134.33 ± 16.08	130	134.9 ± 19.15	129
weight	87.48 ± 18.99	84.3	86.07 ± 14.35	84.5	85.89 ± 15.04	83	84.6 ± 13.6	83.8
BMI	33.11 ± 6.71	31.74	31.56 ± 4.9	31.05	31.52 ± 5.16	31.02	31.5 ± 4.9	31.01
foot examination**	26%				94%		66%	
phone reminders/ visits (n)	<0.1				1.69 ± 2.53	1	1.06 ± 1.87	0
nurse visits (n)	none				2.7 ± 1.91	2	0.85 ± 1.54	0
dietician visits (n)	0.26 ± 0.76	0			1.17 ± 1.29	1	0.35 ± 0.91	0
physician visits (n)**	5.57 ± 4.58	5			8.78 ± 4.98	7	7.68 ± 5.11	7
ophthalmologist visits**	48%				92%			
hospitalisations (DM related)	0.04 ± 0.24	0			0.01 ± 0.1	0	0.01 ± 0.01	0
hospitalisations (all cause)	0.06 ± 0.28	0			0.03 ± 0.17	0	0.07 ± 0.36	0

* $p < 0.05$

** $p < 0.01$

median follow up (period 3) 25 months

The rate of preventive foot examinations increased from 26% to 94% during the intervention and increased to 66% in the final follow up period ($p < 0.01$).

The number of dietician visits increased during the study (N.S.), as did the rate of ophthalmologist ($p < 0.01$) and family physician visits ($p < 0.01$). Conversely, the rate of both all cause and diabetes related hospitalisations dropped. Approximately half of the patients were referred to a dietician during the Intervention period (53%). Of those who actually consulted a dietician, average HbA1c values dropped from $8.62\% \pm 2.08$ to $7.28\% \pm 1.32$ ($p < 0.01$).

Of those referred to a dietician, but did not go a similar drop was found, with HbA1c levels dropping from $8.49\% \pm 1.74$ to $7.26\% \pm 0.94$ ($p < 0.01$). There was not a significant difference found between dietician attendees and non-attendees.

According to accepted clinical guidelines for diabetes, a yearly visit to the ophthalmologist is recommended. Almost half of the patients (48%) fulfilled this recommendation in the year preceding the intervention period. Of these, at the end of intervention and follow up periods, 94.64% and 76.79% respectively visited the ophthalmologist. Patients who were noncompliant with this measure in the past were instructed to see the ophthalmologist, and an appointment was made for them. Of these, at end of intervention and follow up periods, 88.64% and 54.55% respectively visited an ophthalmologist during the year.

Comparably, clinical guidelines for diabetes recommend a yearly foot examination. This examination is done and recorded in the medical records by the nurse, at least once a year, for every person with diabetes who visits the clinic. Twenty six percent of the patients had a recorded foot examination in their medical records during the baseline period. Of these, 84.6% had a recorded foot exam by end of the intervention period, and 73.1% by end of the follow up period. Conversely, of those whose foot examination was not recorded during baseline period, 96% completed the examination during period 2, and 62.2% during period 3.

Some of the intervention patients also participated in a support group workshop for diabetes, in addition to the intervention process. On comparing these two subgroups, no significant difference was found in HbA1c and Blood pressure levels between these groups.

DISCUSSION

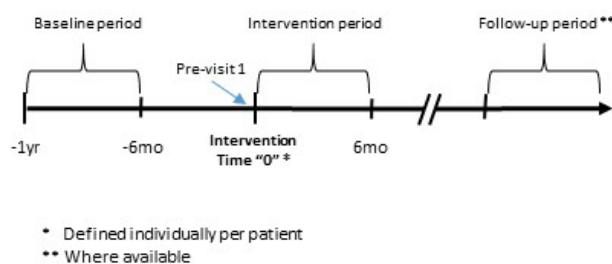
The control of diabetes in people with diabetes is one of the significant tasks confronting the health care staff. Cooperation between the staff members can contribute to both the quality of care and result in better diabetes control markers. Various studies have examined the role of the disease care manager (Watts and Sood 2016; Jones 2015; Watts and Lucatorto 2014; Aliha et al 2013). Our study examined the utility of diabetes care management by a nurse in a multidisciplinary urban clinic.

In our study, people with diabetes in the clinic who were either not achieving optimal control markers or who had not been performing the recommended follow up for diabetes were proactively invited to come and see the diabetes disease control nurse. During the intervention, the patients were given personal counseling that included knowledge about the disease and were empowered regarding disease control. The counseling was made according to the patients' needs and optimal disease care and follow up targets, and included clinic visits, counseling sessions and telephone supportive talks. We collected data on 100 randomly selected people with diabetes at three 6 months intervals with a median follow up of 25 months (figure 1).

A significant improvement was observed following the intervention, through the follow up period in LDL cholesterol, HbA1c and systolic blood pressure. We also found a lasting improvement in annual eye exams and annual foot exams as well as a drop in diabetes-related and non-diabetes-related hospitalisations and an

increase in dietician visits. The lasting changes we observed in the follow up period represent the maintenance of the control achieved in the intervention period by the patients themselves and show success in patient empowerment. These results are consistent with the literature of chronic disease management by a team manager; however, it also shows the effectiveness of the nurse as the disease manager.

Figure 1:
3 defined study periods



One should note the improvement of systolic blood pressure after the intervention and during follow up to levels of less than 135mmHg (median of 130mmHg during follow up). Although these blood pressure levels are considered well controlled for people with diabetes (especially with a high urine microalbumin/creatinine ratio) it raises a question of future risk to the study population, with a median age of 63 years. We assume the improvement in blood pressure was mainly due to the nurse's intervention and patient empowerment, which may result in better adherence to diet, exercise and medications. Medical systems will need to address this issue.

The nurse intervention averaged 2.7 clinic intervention visits and 1.69 phone calls per patient over the 6 months period. The number of visits with the family physician rose by 37.8% between baseline and follow up periods. Although this large increase in visits may be seen as a burden on the system, we must remember that these are people with poorly controlled diabetes and there is a definite advantage to closer family physician supervision, at least initially, until optimal long-term control is achieved. The overall improvement in these patients health should eventually cut morbidity, costs and finally clinic visits. Furthermore, if we examine the increase in referrals to the dietician, we see a significant increase during the intervention period, which dropped close to baseline levels during the follow-up period. This supports the hypothesis that patients continue the consultants visits "according to need" so the burden to the system caused by a high referral rate is necessary. Further study is needed to examine continued follow up and care of these patients, optimal referral rate and the long-term cost in terms of clinic burden.

About half of the patients were referred to the dietician during the intervention period. However, there was no significant difference in HbA_{1c} levels between those who actually visited the dietician and those who did not. This may imply that basic counseling given by the nurse may be sufficient for a large portion of the patients, although there may be differences in tools for a healthy diet provided to those who consulted the dieticians, which may become evident in longer follow-ups. Further research is needed to investigate if these long-term differences can be elucidated. We found that almost all patients who had not consulted the dietician before intervention, complied with the referral if an appointment was made for them, and some continued with the dietician follow up visits in the follow up period. This implies that disease management and the nurse's influence holds an important role for people with diabetes.

Multidisciplinary support workshop is offered to all people with diabetes at a nominal cost; however, there was no significant change in the control measures. Here too, it may be that the long-term tools for dealing with diabetes provided by this workshop would contribute to the long-term control of the disease.

LIMITATIONS

Our study has several limitations. First, the study is retrospective and the population was composed of people with diabetes from a central urban multidisciplinary clinic, which may not represent rural or peripheral clinics. Further prospective research could be conducted in a wider geographical range. Second, the study was conducted in a multidisciplinary clinic with a nurse specialised in diabetes. The study results show the advantages of the nurse as a disease manager, however, further studies should test if non-diabetes-specialised nurses can also achieve similar results. Third, chronic disease such as diabetes may also be related to other chronic diseases such as depression. We did not test the patients mental status at the baseline, however, following studies may address this issue as well as other clinical lab measures. Fourth, we did not collect any medicines information. Further studies, with far larger sample will be needed to assess medicines education, which is also a core nursing activity. Finally, median follow up in this study was 25 months. More research is needed to further investigate longer lasting effect of the intervention.

CONCLUSIONS AND RECOMMENDATIONS

The results of our study show that intervention by a multidisciplinary team managed proactively by a nurse significantly improves diabetes control in almost all measures examined. These improvements are observed in the post intervention follow up period. As expected, these changes include an immediate improvement in Diabetes control markers, but also in the patients' ability to manage their illness, as exhibited in the continued visits to the multidisciplinary staff. Other than improving clinical outcomes, management of chronic diseases is also an important professional development for community nurses in the field of managing care in the healthcare system. Individualized focus on the patient and personal professional accompaniment by the nurse contribute to this achievement of goals. We suggest policymakers should consider a nurse as the chronic disease manager of diabetes in the community setting.

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Is it time to re-examine the doctor-nurse relationship since the introduction of the independent nurse prescriber?

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KEY WORDS

Non-medical prescribing, power, professional relationship

ABSTRACT

Objective

The aim of this paper is to stimulate a debate and discussion into how the nurse-doctor relationship needs to change.

Setting

The National Health Service, United Kingdom.

Primary argument

The nurse-doctor relationship needs to be re-evaluated in light of the expanding role of nurse`s into areas that traditionally had been considered a doctor`s role. While the medical profession has been willing to relinquish some control to nurses in areas such as wound or incontinence care because these aspects do not threaten their authority, position or power. The issue of non-medical prescribing remains for some in the medical profession a topic of concern. Despite non-medical prescribing being discussed widely in the literature very little has been mentioned about how the introduction of the nurse prescriber has impacted the professional relationship between the nurse and the doctor.

Conclusion

The blurring of the roles between nurses and doctors requires a re-evaluation of this relationship. As nurses take on more responsibility such as prescribing medication the old traditional view of this relationship is no-longer viable, if we are to maximise patient health care in the 21st century.

INTRODUCTION

In order to explore the relationship it's important to understand the context of how this relationship has changed. The Introduction of nurse prescribing has had a profound effect on how a patient can obtain a prescription (Courtenay et al 2011; Jones et al 2011; Watterson et al 2009). This has resulted one might say in the inevitable blurring of the professional boundaries between the medical and nursing professions (Kroezen et al 2014; Kroezen et al 2013; Natan et al 2013; Bowskill et al 2012). What made doctors unique from other health professionals was the authority to prescribe medication and as a result the medical profession opposed granting prescribing rights to non-medical professionals. They had used similar tactics during the introduction of the National Health Service (NHS) to maintain a position of privilege and power. However by the 1990`s the political as well as medical landscape had changed. Politically the UK government faced numerous challenges on the public purse, cutting funding to the NHS would be seen as a vote loser. However making the resources already available to the NHS more accessible was something the public could understand. While secondly acknowledging that health care had become more technical and multifaceted requiring a much more co-ordinated approach. As a result, according to McCartney et al (1999), the UK government shifted its policy to reflect these views. A key component of this new policy was to extend prescribing rights to nurses and then use these nurses to make up the shortfall in doctors within the NHS. The government pushed through these plans despite the objections of the medical profession as a step too far and an attack on their authority (BBC 2005; Day 2005; Horton 2002).

The concept of the nurse prescriber is not unique to the UK but can be found worldwide from America, Australia, Europe and New Zealand. But what is unique is how extensive these rights are in the UK compared to other countries. In the UK a nurse can prescribe medication via two mechanisms. The first is as a supplementary prescriber (SP), under this method a tripartite agreement called a Clinical Management Plan (CMP) is drawn up between the doctor, the supplementary prescriber (a nurse or pharmacist) and the patient. This plan outlines the care and treatments that all parties agreed to with regard to the patients' illness and under what circumstances the SP could adjust or amend a patient's prescription without necessarily seeking the doctors' permission. It also outlined when the SP had to refer back to the doctor if the patient's condition fell outside of the parameters agreed.

Although the mechanism had many advantages (Carey et al 2014; Carey and Courtenay 2008; Morrison and Weston 2006; Hennell 2004), it allowed the SP to prescribe any drug as long as the drug or class of drug was mentioned in the CMP. Its main strength was that it worked well for patients with long standing health issues such as Diabetes, Asthma, Hypertension or COPD under the care of a dedicated doctor (Bissell et al 2008; Cooper et al 2008; Courtenay and Carey 2008; Courtenay et al 2007). However this mechanism had a number of weaknesses, it was cumbersome and time consuming because each patient needed to have a CMP before the SP could prescribe any drugs. If the patient presented with a new health problem not covered in the CMP the SP could not offer any treatment and would have to refer the patient back to the doctor. It was this inflexibility that eventually led to the UK government to introduce the independent non-medical prescriber in 2006. The key advantage of the Nurse Independent Prescriber (NIP) over the SP was the ability to prescribe drugs without the need of a CMP or requiring medical approval first. The success of NIP can be measured in terms of an improvement in the effectiveness of health care delivery, and being more responsive to the patients' needs (Jones et al 2011, Oldknow et al 2010).

As a result of the success of NIP the medical profession has shifted its argument away from the loss of medical authority. Instead they have moved to questioning non-medical prescribing in terms of its safety, its comparability to medical prescribing and even whether it is really necessary (Funnell et al 2014; Carey et

al 2009; Watterson et al 2009; Bradley and Nolan 2007; Ladd 2005; Latter et al 2005; Fisher et al 2003; Rodden 2001; Luker et al 1998). While these questions are legitimate concerns, it's surprising that the same arguments have not been used to highlight similar concerns about the prescribing habits of junior medical staff compared to more senior medical staff. Which raises the possibility the medical profession is using non-medical prescribing concerns to re-impose its medical domination. But what has not been debated or discussed to any great depth is the effect of the introduction of non-medical prescribing on the relationship between nurses and doctors. However before we can discuss this relationship we first need to understand the backgrounds of these two professions.

THE ORIGINS OF MEDICAL POWER

Any attempt to analyse how the medical profession became so dominant in health care, must as a starting point understand that this dominance was not achieved overnight. It was in fact a long process. Michel Foucault one of the greatest philosophers and social theorists of the 20th century identified that the origins of medical power began to flourish from the 17th century onwards in what he called the "Disciplines". These disciplines began to develop alongside the developing institutions such as schools, hospitals and military organisations. The introduction of Disciplines not only standardised behaviour (Hardin 2001) but it was through this disciplinary power that one can meticulously control the body and use subtle coercions, to produce a docility-utility (Foucault 1995). This docility-utility is the means by which a person has hold over others so that they operate in a desired manner, with the techniques and efficiency that the person determines (Foucault 1995). This power was clearly identified in the seminal work of Freidson (1970) who argued that the medical profession had achieved this position of dominance by successfully negotiating considerable state sanctioned autonomy and self-regulation. In other words the medical profession over time began to slowly exert itself in areas over health and medicine. This control resulted firstly in dictating who should enter the profession to eventually who could legally treat a sick person. This dominance resulted in occupations such as Nursing and Pharmacist to fall under medical control.

However the very success with which the medical profession now controlled health care delivery, began to come under scrutiny from the government in the face of growing demands for improvements in health care delivery and a more efficient use of resources. This was most clearly indicated by the Wanless Review (Welsh Assembly Government, 2003) that assumed that 20% of work undertaken by medical staff will eventually be carried out by nurses. Some of these roles have been supported by the medical profession such as - wound care specialists, incontinence nurses; and diabetic nurses because they work within a framework of protocols and formularies, developed and approved by the medical profession that restricts and places the nurse in a subordinate position to the medical profession still (Creedon et al 2015). The government however was looking for a more radical solution to improve patients' access to timely treatments. What was highlighted was that patients at times faced delays in treatment, because doctors were not available to prescribe medication the patient needed. While experienced nurses who understood what was needed could not give that care. The government's response was to propose expanding prescribing rights to suitable qualified and experienced nurses, a response not universally supported by the medical profession.

ORIGINS OF THE NON-MEDICAL PRESCRIBER

The attraction for the government of the introduction of the nurse prescribers' role was to make the NHS more responsive to the needs of the patient (NHS Plan 2000). However to implement this plan would require the government to undertake a complex legislative program of drafting new legislation and amending current legislation governing prescribing authority. The government also faced strong opposition from the medical

profession to the development of the non-medical prescriber (Keighley 2006; Avery and Pringle 2005; Horton 2002). The medical profession viewed the introduction of the nurse prescribers' role, as a direct challenge to both their authority and power (Elsom et al 2009; Waring 2007; Avery and Pringle 2005; Day 2005). This opposition to nurse prescribers should not be considered as unique to the United Kingdom; similar arguments were put forward in Australia (AMA 2005), New Zealand (Mackay 2003) and America (Hales 2002; Sharp 2000). The medical profession opposition to nurse prescribing in the UK however failed to appreciate that it was not solely about improving patient's access to timely health care. The UK government was in fact seeking ways to improve the efficiency of the NHS, in the face of an aging population with multiple complex health care needs that require multiple agency co-operation. It was an acknowledgement by the UK government that the medical profession could no-longer be the sole provider of health care. The solution to this problem according to the UK government was the nursing workforce. Nursing had become a graduate-entry profession and many nurses have undertaken a Master's degree giving them specialist qualifications. Coupled with the increasing technical skills required to perform many nursing tasks, expanding prescribing rights to suitably qualified and experienced nurses seemed a most logical solution to the UK government.

Having lost the argument the medical profession has seen an extensive legislative program put forward by the UK government. This initially gave prescribing rights to just nurses and pharmacists, but with this success it eventually saw it expand to include chiropodists/ podiatrists, physiotherapists, optometrists and radiographers. The nurse prescriber is now a vital part of delivering health care to-day. As the number of Nurse Prescriber`s have increased 43,000 in 2006 to 72,000 in 2015 (Merrifield 2015) many institutions such as hospitals, walk-in centres and GP practices routinely have nurse prescribers present. Despite the opposition of the medical profession to the concept of nurse prescribing, none of their dire predictions, such as patients coming to harm due to a non-medical prescriber over prescribing medication or inappropriate prescribing, have occurred. What has yet to be determined is how the introduction of the Nurse Prescriber has affected the professional relationship between the two health professionals.

DISCUSSION

"A nurse must begin her work with the idea firmly implanted in her mind that she is only the instrument by whom the doctor gets his instructions carried out: she occupies no independent position in the treatment of the sick person" McGregor-Robertson (1902).

This statement, despite being over 115 years ago, demonstrates quite clearly the dominant position the medical profession had procured for its self with regard to health care delivery. Echoes of this dominance can still be found in the medical professions continued opposition to non-medical prescribing. However in the 115 years since this statement health care has undergone a dramatic change in terms of treatments and technology, but so too has societies views on gender stereotyping. Health care does not live in a vacuum and as society began to change so did health care, women were no-longer held back to being just nurses they were now physicians and surgeons. As a result from the late 1960`s through the 1970`s marked an important turning point in the field of social science research. This research was not solely related to society, health care also came under investigation. The work of Stein (1967) looked at the professional relationship between nurses and doctors in his article called "The doctor-nurse game". This article explored this relationship, starting from the superficial stereotypical idea dramatised in numerous novels and television series, to the game model, that demands participation. The attitudes created cause serious obstacles in the path of meaningful communication between physicians and nonmedical professional groups.

This idea of the nurse-doctor relationship has been further developed by numerous authors such as Freidson (1970), Abbott (1988) and Adamson et al (1995) who suggested that the relationship between the medical

and nursing profession display the classical case of a dominant profession (medicine) controlling a subordinate profession (nursing). The drive to maintain a dominant position continues to be the focus point of the nurse-doctor relationship (Apesoa-Varano et al 2011; Fisher 2009; Hirschhorn 2006; Fisher 2005). However despite this continuing need to impose themselves on other health professionals authors such as Copper et al (2008) and Kroezen et al (2013) have suggested that with the introduction of nurse prescribing the professional boundary between the medical and nursing professions need to be reassessed.

Prescribing had been traditionally an indication of the clinical autonomy and professional power of the medical profession within the wider structure of society (Weiss et al 2006). With the introduction of the nurse prescriber the medical profession has attempted to limit the sharing of knowledge with other health professionals, as well as making the medical profession the sole arbiter of health care management. The dichotomy between the perception (of what the medical profession believes is the extent of their power) and the reality (of how this power has been eroded) has become in effect what Fagin and Garelick (2004) described as the ongoing conflict around the doctor nurse working relationship. The medical profession has in response to nurse prescribing shifted its self from its prescribing role to one of a diagnostician in an attempt to re-impose its dominance over other health professionals. This action could be interpreted as the medical profession's failure to accept that it is no-longer in charge (Dent 2006, Willis 2006).

Health care is now viewed as a partnership between health professionals (a doctor or a nurse) and the patient. This change has also seen a shift in the relationship between health professionals. In part this is due to the blurring of roles between doctors and nurses. This has resulted in numerous authors suggesting that doctors should no longer be regarded as top of the health hierarchy nor thought of as indispensable to the delivery of healthcare (Crow and Smith 2003, Rosen and Dewar 2004, Barr and Ross 2006). This change in the professional relationship has also raised a question over power. Does the medical profession retain its power (over other health professionals still) or is this power now shared with the nurse prescriber.

CONCLUSION

Despite overwhelming evidence of the benefits of nurse prescribing, the full potential of the role has yet to be attained. In part this is due to the continuing opposition of the medical profession to the idea of non-medical prescribers. This disparity not only strengthens the idea that medical prescribers are superior, but fosters the idea that the medical profession retain power over all health professionals. This opposition continues to hold back further development of nurse prescribing. Nurses need to take ownership of non-medical prescribing, by addressing the inequalities within the professional relationship. It is only by challenging this behaviour that will see nursing no-longer viewed as subservient to the whims of the medical profession. This will not be an easy task, challenging any behaviour is not easy however as more and more doctors become exposed to the work of non-medical prescribers, the concept of the nurse prescriber will no-longer be seen as an inferior to the medical prescriber and true equal partnership will develop between the two professions.

RECOMMENDATIONS

- That nurse prescribers have the same educational opportunities as their medical counterparts' e.g in-house lectures, presentations from pharmaceutical companies.
- That nurse prescribers are given the opportunity to work with more experienced medical prescribers to develop not only their prescribing skill, but to foster a better understanding between the two professions.

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Nurses plastering and splinting in the emergency department: an integrative review

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KEY WORDS

emergency department, plastering, splinting, nurses practice

ABSTRACT

Objective

Increasing numbers of presentations, high acuity of patients and a decreased access to hospital beds contribute to lengthy waiting times in Emergency Departments (EDs). Implementing models of care to improve patient flow through EDs is imperative. This integrative review was undertaken to evaluate existing evidence regarding the impact of nurses' plastering and splinting in EDs.

Setting

Data included in the review was drawn from five International databases that include publications exploring acute care interventions using PRISMA guidelines. An unbiased search and then application of exclusion criteria by three independent researchers delineated 11 papers for inclusion. Full-text analysis using a predefined framework enabled development of the primary outcomes.

Primary argument

The research question guiding this integrative review is:

What is the impact on patient and staff satisfaction, cost, ED length of stay, ED re-presentation rates when ED nurses apply plasters and splints to patients who present to ED with a fractured or sprained limb?

While no literature focused specifically on outcomes from nurses applying plasters or splints, studies indicated that plastering, as part of a suite of nursing skills, had positive effects on patient outcomes such as reduced waiting times to treatment.

Conclusions

There is insufficient evidence to inform protocols for nurses to perform plastering and splinting. Further research evaluating the impact of nurses using this skill in their practice is required to support evidence-based practice.

BACKGROUND

Emergency Department (ED) health care workers are consistently under pressure due to increasing numbers of presentations, high acuity, complexity of patients and a decreased access to inpatient beds, all of which lead to crowding and lengthy waiting times (AIHW 2015; Sun et al 2013). These issues increase ED crowding in Australia and internationally (Green et al 2014; Perera et al 2014; Geelhoed and de Klerk 2012). In addition to a lower level of patient and staff satisfaction (Tekwani et al 2013; Pines et al 2008), ED crowding has been shown to increase patient morbidity and mortality (Sun et al 2013) and ED staff stress (Johnston et al 2016).

Various policy initiatives have been introduced to help manage ED crowding including the development and implementation of governmental key performance indicators that measure individual institution's performance against designated minimum Australian standards (Hudson and Marshall 2008). The National Emergency Access Target (NEAT) was introduced in Australia in 2012, with the goal that 90% of all patients be discharged or transferred from the ED within four hours (Keijzers 2014). While evidence suggests that NEAT has been beneficial in the generation and implementation of initiatives that address the problem of ED crowding and patient flow (Green et al 2014; Geelhoed and de Klerk 2012), more attention is required to address the specific needs and expectations for timely, quality care of the non-urgent group of patients, that often make up the majority of ED patient load (AIHW 2015; Muntlin et al 2006).

The Clinical Initiatives Nurse (CIN) role has been shown to support non-urgent patients by improving patient flow through the department, decreasing ED length of stay (due to early initiation of pain relief and pathology) and reducing workload for the medical officers (Fry et al 2012; Cant et al 2011; Combs et al 2006). The introduction of another advanced practice nursing role such as the Nurse Practitioner (NP) has also shown positive outcomes including increased patient satisfaction and decreased time to completion of advanced health assessments, investigations and symptom control (Martin-Misener et al 2015; Considine et al 2012a; Considine et al 2012b; Hudson and Marshall 2008). It has been suggested that nurses, working in minor injury and fast track units, be trained in plaster application and aftercare as part of quality delivery of patient services (Combs et al 2006; Rogers et al 2004; Cooke et al 2002).

Thus, the aim of this integrative review is to evaluate existing evidence to support the plastering and splinting application practices performed by ED nurses. The review focused on ED nurses (regardless of roles such as CIN or NP) and the skill of plastering and splinting application for patients who present to ED with a fractured or sprained limb. The research question that guided this review is: What is the impact on patient and staff satisfaction, cost and time-effectiveness of nurses applying plasters and splints, patient's length of stay, ED re-presentation rates and the frequency of patients who did not wait for treatment or who left after treatment commenced?

SEARCH STRATEGIES

This integrative review used the parallel, multi-stage process outlined by Pluye and Hong (2014) and included three assessors to ensure an unbiased application of key search, inclusion/exclusion and quality assessment strategies. This methodology, coupled with Whittemore and Knafli's (2005) framework, allowed for the inclusion of diverse literature which is critical in undertaking a review in which little is published. All studies were considered eligible for review including published, unpublished and grey literature.

The search strategy is represented in figure 1. The search terms used were: ED/EDs, Emergency department/s, Emergency room/s, ER/s OR A&E coupled with (AND) plastering, splinting, plasters, splints, fast track, fracture care, sprain, strain (AND) nurses. Activation of 'smart text' and automatic word variation options during searches ensured that word combination options including USA and UK spelling variations and plural terms were

detected. Reference chaining (snowballing) was undertaken (Ellis 1989). All final searches were conducted in June 2015. The search processes and study selection conformed to PRISMA guidelines (Liberati et al 2009).

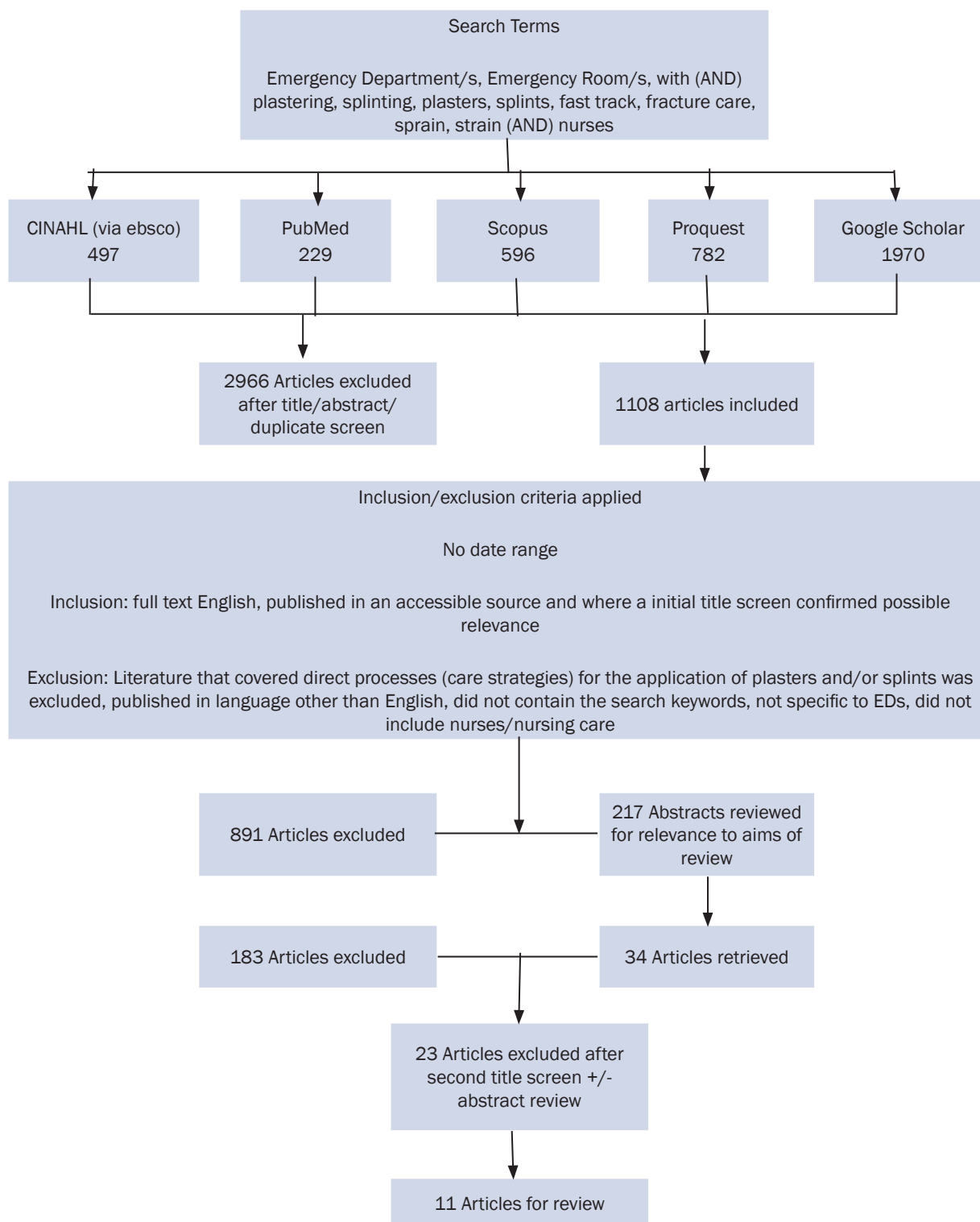


Figure 1: Schematic representation of the literature search strategy

Inclusion/exclusion criteria

Inclusion and exclusion criteria are presented in figure 1. Discussion papers and opinion pieces were included. A date range for inclusion/ exclusion was not applied in order to include any historical basis for nurses' application of plasters.

Two reviewers screened 217 titles and abstracts initially retrieved for potential inclusion using specific criteria. From those, 34 full text articles were retrieved. Review of the full text articles and a final moderation process indicated that 11 articles met the criteria. Library searches were unable to obtain full text for two older studies (<1993) which were excluded. Data were extracted by two authors, summarised and reviewed by a third author to ensure unbiased extraction processes (Whittemore and Knafel 2005). The literature was summarised and is presented in table 1.

Study evaluation

This review used the Mixed Methods Appraisal Tool (MMAT) (Souto et al 2015; Pluye and Hong 2014) to evaluate the quality of evidence. MMAT scores were calculated to determine the level of evidence for each article. There was a 90% match rate in the quality appraisal scores between the three authors who undertook the assessment of included articles. Where differences arose, a consensus resolution approach was used to agree on a final rating.

RESULTS

Eleven articles were included in the review however two articles were published from progressive sections of the same project (see table 1). Five of the articles were general discussion/opinion papers rather than formal research studies (Azbug 2015; Hudson and Marshall 2008; Miles 2004; Smith 1994; Purnell 1991;). These articles were included due to the integrative review approach taken (Whittemore and Knafel 2005).

There were no studies that focused specifically on outcomes resulting from nurses applying plasters or splints. However, some studies (Hudson and Marshall 2008; Combs et al 2006; Miles 2004; Smith 1994) included plastering as part of a suite of advanced nursing skills that showed positive efficiency gains for patients and EDs. These gains included decreased numbers of patients who did not wait for treatment. Two studies showed evidence that suggested nurses who performed plastering in addition to other advanced skills improved the clinical team's performance indicators by reducing waiting times to assessment/treatment as well as the 'Did Not Wait' rates in Fast Track care models (Considine et al 2010; Considine et al 2008; Combs et al 2006; Purnell 1991). The Fast Track models were described as processes whereby patients with low acuity (Australasian Triage Scale 4 and 5; the standardised system for patient priority allocation used in Australian public hospitals) would be seen and treated in a dedicated area by either a nurse or a doctor. There was no focus on the impact of specific individual skill sets like nurses' plastering/splinting in the contribution to the overall efficiency of such models of care (Miles 2004), although a broad economic evaluation study of nurses work in such areas indicated they could potentially be cost effective (Dochterman et al 2001).

While discussion papers explored various advanced practice nursing roles within Australia, with a focus on the CIN role in the ED setting, there were no evaluations of the impact of nurses performing plastering or splinting on patient flow, nurse satisfaction with performing these skills or workload management (Hudson and Marshall 2008; Combs et al 2006; Miles 2004; Smith 1994). Purnell (1991) made reference to emergency nurses applying plasters and splints which improved patient flow, however did not examine the impact of this procedure on staff satisfaction, morale or retention. Another article discussed case presentations used to demonstrate that plasters and splints were often applied incorrectly by all clinician groups (doctors, nurses and technicians), causing adverse events (Azbug 2015). Similar to another discussion paper, a recommendation

was to provide adequate training and education in plaster application through a formal certification process (Miles 2004).

Two studies evaluated overall quality of care delivered by an ED Fast Track unit together with patient satisfaction with care delivery in comparison of medical officer and nurse practitioner (Lutze et al 2014; Dinh et al 2012). The studies found high patient satisfaction scores for a Fast Track unit functioning with senior medical and nursing staff in advanced practice roles, with satisfaction scores being slightly higher for care provided by a nurse practitioner than a medical officer. Whilst the studies had some relevance for this review, due to the focus on patient satisfaction with care delivered by an advanced practice nursing role, there was no correlation to plastering and/or splinting. It was acknowledged that there were different skills, training and knowledge held by NPs than other advanced practice nursing roles and therefore the applicability of these results is limited.

Within the applied search parameters, there was only one article found that considered evaluating the cost of nursing interventions, for which plastering and splinting were included (Dochterman et al 2001). There were no papers found that evaluated or discussed the role of nurses in performing plaster aftercare or reviews on patients with unscheduled re-presentations to ED with a plaster or splint related concern. The studies varied widely in quality, from those that did not conform to a research process, including discussion papers such as Hudson and Marshall (2008) and were unable to be rated using MMAT, to studies with an excellent methodological basis such as that by Dinh et al (2012).

DISCUSSION

Despite the number of plasters and splints applied in EDs nationally and internationally, there is limited literature to support development of an evidence-based model for plastering and splinting in EDs, particularly by nurses. Very few studies examined patient and staff satisfaction with plaster/splint application, evaluated the cost and time-effectiveness of nurses applying plasters and splints, or undertook comparative evaluation of the impact of nurses application of plasters and splints on patient's length of stay, re-presentation rates, the rates of patients who did not wait for treatment or who left after treatment was commenced. Thus our review has identified several gaps in the literature in regards to the application of plasters and splints in ED and specifically the impact of nurses gaining the skills of plastering and splinting to treat patients with simple sprains/fractures in EDs.

There is literature discussing the benefits of nurses developing and using skills such as plastering and suturing in a Fast Track model of care to gain efficiencies in ED patient flow (Considine et al 2010; Combs et al 2006; Purnell 1991). Advanced practice nursing roles that include plastering and splinting are suggested as a way to develop the nurse's clinical assessment skills and can lead to improved documentation skills (Hudson and Marshall 2008; Smith 1994). Lutz et al (2014) suggested that enhancing ED nurses skill-sets could offer genuine benefit to patient care and satisfaction. Some studies were more focused on the multidisciplinary model of care with a range of potential contributing factors such as seniority of clinician, than on the specific skill sets and any evidence based merit for inclusion in such a model of nursing care. Findings of the studies included in this review can be contextualised within broader literature that discuss advanced practice nurses and medical staff in the care of patients with 'minor' injuries (Considine et al 2012a; Considine et al 2010) and with the overall nurse skill set and scope of practice (Gray 2016; Campbell et al 2015; Stauber 2013).

There were several discussion papers that supported advanced practice skill sets for emergency nurses in order to improve assessment, documentation and care delivery (Hudson and Marshall 2008; Smith 1994). However, these were primarily opinion or anecdotally-based pieces that could be strengthened with clinical research on this topic. While speculation and anecdotal reports about the benefits of nurses applying plasters

and/or splints, and/or review of patients' plasters are interesting (Kelly et al 1996), evidence is required in order to support nurses who perform these procedures.

Where nursing roles have been extended in EDs, assessing and evaluating outcomes underpin the development of skill sets and further implementation of such roles within clear frameworks (Bryant-Lukosius et al 2016; Gray 2016; Stauber 2013). With increasing ED patient presentations and subsequent ED crowding, it is important that effective patient flow strategies be implemented and evaluated to ensure they support the health service, staff and quality patient care. This includes examination of different types of nursing skills on the efficacy and cost-effectiveness of EDs (Bryant-Lukosius et al 2016; Gray 2016).

LIMITATIONS

This review was limited to articles published in English. Due to the paucity of literature available, this review used an integrative framework that allowed inclusion of discussion/opinion papers that were not evidence-based, highlighting the need for quality research in this area.

CONCLUSION

This integrated review of the literature on the effectiveness of nurses plastering and splinting in EDs found a lack of evidence to support the anecdotal benefits of this practice. However, the perceived benefits that have been reported are potentially significant and warrant further attention. There is limited evidence to guide protocol development for nurses to perform plastering and splinting on patients who present to ED with limb sprains or fractures. Further research is recommended to evaluate the impact of ED nurses plastering and splinting on patient satisfaction, ED length of stay, re-presentation rates, patient flow and health care costs.

RECOMMENDATIONS

Given the ongoing pressures faced by EDs both in Australia and internationally to improve patient throughput, reduce waiting times to treatment, and maintain a high quality of patient care, it is recommended that further research be undertaken to explore the role of nurses applying plasters and splints with a view to developing an evidence based approach to this practice (Bryant-Lukosius et al 2016).

Table 1: Data extraction summary

Author, year country	Aim/s	Sample	Research design/tools/analysis type†	Rigor, reliability, validity	Findings	Strengths	Limitations§	Recommendations/implications	MMAT* %
Abzug 2015 Baltimore, USA	Evaluation of splints applied in community hospital EDs and urgent care centres	275 patients	A discussion paper describing new research from University of Maryland No method or tools mentioned.	N/A	90% of splints were applied incorrectly from all clinicians including doctors, technicians and nurses.	Discussion to stimulate further research	Final study not found in peer-reviewed journal.	Study suggests the need for more training and education on proper splinting techniques.	N/A
Dinh et al 2012 Sydney, Australia	1. Describe overall quality of care delivered by a fast track unit 2. Compare quality of care provided by ED NPs vs Drs	Convenience sample of 320 patients triaged to fast track.	Observational design. Pt satisfaction measured on self-administered satisfaction survey instrument completed prior to discharge.	Descriptive statistics used to summarise overall quality of care. Study group comparisons using inferential statistics.	High patient satisfaction scores for care in the fast track unit. Patient satisfaction scores slightly higher for NP pt group than Dr group. Shorter waiting time to treatment in NP group.	Assessment of patient satisfaction.	Uses NPs not RNs. Doesn't specify impact of skills such as plastering. May have selection bias due to convenience sampling with only 75% response rate.	Useful for comparison of patient satisfaction - could translate to RN vs. Dr/ other plastering and pt satisfaction.	100
Considine et al 2008 Melbourne, Australia	Examine the effect of fast track on emergency department (ED) length of stay (LOS) in a public teaching hospital	ED Fast Track patients (1.1.07-31.3.07) Usual ED patients (controls) (1.7.06 to 15.11.2006 (n = 822 matched pairs).	Pair-matched case-control design.	Power calculations undertaken. Robust design.	ED fast track decreased ED LOS for non-admitted patients who were significantly more likely to be discharged within 2 hours without compromising waiting times and ED LOS for other ED patients.	Case control Quantitative study exploring a legislative requirement (NEAT)	Unmatched data periods, no adjustment for increasing patient numbers. Study conducted immediately after the implementation of fast track. No assessment of service quality.	Implementation of a Fast Track area can help reduce ED crowding and access block.	50

Hudson & Marshall 2008 NSW, Australia	Article discussing the different roles of advanced practice nursing in Australia and examines advantages/limitations. Discusses the CIN role with brief inclusion of plastering/splinting as a skill.	Nil specific. Discusses NP role along with CIN role.	Discussion / literature review of advanced nursing roles in ED.	N/A	Clinical Initiative Nurse/ advanced practice nurse role programs that include plastering/ splinting were believed to develop nurses' clinical judgement & assessment skills, improve documentation and referral to ED medical officers.	Quality literature review strategy Good historical perspective	No reference to LOS.	A descriptive study is recommended to provide knowledge on various skills performed and educational preparation involved. N/A
Coombs et al 2007 Part 2 Perth, Australia	1. Reduce patient delays for receiving treatment; 2. Decrease DNW rate; 3. Reduce the journey time for ED patients. 4. Predict the daily bed requirements for ED patients waiting to be admitted to ward areas.	All patients presenting to an outer-metropolitan ED in WA between 1 Aug 2004- 31 May2005.	Pilot study- 12 month evaluation Patient Flow Collaborative Methodology	Limited data (pilot test)	Steadily decreasing DNW numbers. ED throughput of admitted patients <12 hrs LOS. Initial improvement not sustained. ED patient journey times remained stable. Fast Track length of stay remained stable. Authors state that implementation of Fast Track and enhancement of nursing roles (suturing and plastering) reduced patient waiting times and DNW rate	Quantitative, data exploring.	Despite claiming that enhancing nursing roles through an education program encompassing suturing and plastering led to reduced patient waiting times and DNW rates- there was no data results displayed. No staff satisfaction surveys taken.	Change process is sensitive and requires pre and post monitoring. Dedicated resources are required to ensure process change is well supported – including an executive staff member. 75

<p>Coombs et al 2006 Part 1 Perth, Australia</p>	<p>Discusses the process of identifying the need for Fast Track and the journey undertaken to implement the initiative. (see also Part 2 above)</p>	<p>All patients presenting to an outer-metropolitan ED in WA - No exact sample size given.</p>	<p>Discussion paper.</p>	<p>N/A</p>	<p>Reduction in DNW- no figures provided. Staff identified need for nursing staff to be upskilled in suturing and plastering to ensure patients seen in a timely manner- no further data given. Patients identified as having minor injuries and or illnesses were being seen, treated and discharged within two hours- during pilot study period. Improved staff recruitment and retention rates due to nursing staff being able to advance their skills in plastering and suturing. The authors assert the introduction of fast track led to: increased staff morale and offering better opportunities for nursing staff.</p>	<p>Acknowledge advanced nursing skills part in improving LOS and DNW.</p>	<p>Fast Track was staffed by senior registrars or consultants and a senior nurse with suture and plastering skills- no data to differentiate if advanced nursing skills improved LOS or flow.</p>	<p>Fast-track decreases ED length of stay. Nurses increased their clinical skills by undertaking advanced practice education and training. Increased staff morale.</p>	<p>N/A</p>
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Lutze et al 2004 NSW, Australia	Compare patient satisfaction of ED Fast Track care between Dr run and NP run	Convenience sample of 353 pts: 212 in Dr group, 141 in NP group. 4 week period. Multi-centre- 2 x sites.	Observational study This pilot study was the foundation for subsequent study by Dinh et al 2012. Pt satisfaction measured on self-administered satisfaction survey instrument completed prior to discharge.	Univariate analysis to compare study groups based on treatment site.	Most patients were satisfied with ED fast track, irrespective of model of care. Pt satisfaction was greater in NP group.	Quantitative data using patient satisfaction survey.	Uses NPs not RNs. Doesn't specify impact of skills such as plastering. May have selection bias as only 1/3 of pats at one site completed surveys.	Useful mainly for comparison of patient satisfaction tool- could translate to RN vs Dr.	75
Miles 2004 UK	Opinion paper from RN/ Plaster technician on the requirement for adequate education and training of nurses and doctors in applying plasters.	Nil	Opinion paper/ discussion only	N/A	Used multiple case studies to emphasise the potential adverse events of inappropriately applied plasters. Advises the importance of adequate training and education in plaster application- recommends formal certificate training.	Advises the need for adequate training for staff.	Based on opinion and a few case studies. No discussion of impact on LOS or nurse satisfaction.	Appropriate education and training- preferably formal certificate.	N/A
Dochterman et al 2001 Iowa, USA	Determine the costs of nursing service performed by nurses).	433 Nursing Intervention Classifications (NIC) were reported. (Actions performed by nurses).	Nursing experts evaluated each intervention in order to assign the time and minimum level of education required to perform each task.	Validated economic models and assessment tools used systematically.	Identifying costs for specific nursing interventions allow for evaluating the cost effectiveness of nursing care.	Broad approach to costing of nurses' work using sophisticated economic modelling.	Study design was unclear. A review of the NICs and to confirm that these NICs were true and accurate.	Economic evaluation of care processes is a key part of evaluation of service delivery	75

Smith 1994 UK	Opinion paper on skill advancement for ED nurses.	Nil	Opinion paper/discussion	N/A	Opinion that ED nurses gaining specialist knowledge including plastering and suturing can offer 'genuine benefits to patient care, as junior A&E medical staff often lack them'.	Takes a strong nursing advocacy position.	Based on opinion. No data/ studies or reference to support this assertion. No definition of what constitutes benefits to patient care. Doesn't mention LOS or nurse satisfaction.	Increasing nursing skill set can improve morale and self-efficacy.	N/A
Purnell 1991 USA	Examining the characteristics of existing triage systems in 5 mid-Atlantic US States. Including the qualifications and training of triage nurses and skills performed	185 surveys of nurses from 5 different EDs.	44- item questionnaire	Non-validated survey	The presence of a Fast Track system significantly decreased patient waiting time by 20%. In some facilities- triage nurses applied plaster casts and sutured.	Cross departments providing a broad picture	No focus on the impact of nurses plastering on LOS, pt or staff satisfaction.	Recommended expanded study outside of State.	75

‡Data type (quantitative/qualitative) is identified in the study and/or on the basis of the analysis performed

§ Note: All survey and interview data is subject to potential prevarication bias and response falsification. Additionally, there may be a response bias based on the psychological wellbeing of participants (single point in time survey)

*Mixed methods assessment tool (MMAT) classification system

Abbreviations: DNW, did not wait; N/A, not applicable; NEAT, National Emergency Access Target; pt, patient; LOS, length of stay

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The non-medical surgical assistant in Australia: who should contribute to governance?

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KEY WORDS

surgical assistant; non-medical surgical assistant; governance; Australian Health Practitioner Regulatory Agency; advanced practice nursing

ABSTRACT

Objective

This paper focuses on the role of the Non-Medical Surgical Assistant (NMSA) in Australia. Registered Nurses predominately perform this role. This paper will articulate a position to:

- validate this role as an Advanced Practice Nursing (APN) role in Australia through regulation and governance by the Nursing and Midwifery Board of Australia (NMBA) who sit under the umbrella of the Australian Health Practitioner Regulation Agency (AHPRA);
- lobby AHPRA to recognise, regulate and protect the title of Advanced Practice Nursing (APN) roles other than the Nurse Practitioner (NP) in Australia; and
- as a result of sanctioned regulation, facilitate APN (including NP) to seek appropriate remuneration for undertaking this role in the private sector in Australia.

Setting

The Australian Healthcare system.

Subjects

Clinicians performing the role of the NMSA in Australia.

Primary Argument

The NMSA is well established with clear mechanisms for governance internationally. This role has been practiced in Australia for more than 20 years, and while clinicians function under the guise of advanced practice, the role is not clearly defined, standardised or regulated. This is partially attributed to lack of sanctioned governance from AHPRA.

Conclusion

While the AHPRA via the NMBA are reluctant to formally recognise and regulate this role, the overwhelming majority of clinicians in Australia are nurses. Without regulation it is difficult to quantify the role as APN. Lack of governance excludes NMSA (including the NP) from access to the Medicare Benefits Schedule and private health funds for intraoperative reimbursement thereby rendering a potentially cost-effective role unsustainable to many clinicians.

INTRODUCTION

International Context of the NMSA Role

The international role of the Non-Medical Surgical Assistant (NMSA) is well recognised and has many titles (Hains et al 2017a). Differences in the role, between countries and within a country, can be attributed to content of curriculum, the underlying qualifications of the personnel who perform these roles and support of implementation from key stakeholders and state/national authorities. The literature is teeming with innumerable titles for this role. Arguably the most notable of the international titles for this role reside in the United States of America (USA) in the form of the Physician Assistant (PA) and Nurse Practitioner (NP). In the USA in 2015, 35,000 PAs worked in the surgical environment (American Association of Surgical Physician Assistants 2015) and more than 15,000 NPs worked in the Acute Care setting (American Association of Nurse Practitioners 2015).

The roles of the NP and the PA on first inspection seem similar but are very different. The simplest contrast is that PAs must work under the supervision and delegation of a physician unlike NPs who work independently (Nurse Practitioner Schools 2015). The courses for both roles are currently a minimum of a Master's degree. NPs in the USA seek certification through the American Nurses Credentialing Centre or the American Academy of Nurse Practitioners. PAs are required to pass the Physician Assistant National Certifying Examination available through the National Commission on Certification of Physician Assistants. Both of these roles enjoy title protection, a standardised curriculum and national regulation (Hains et al 2017a). Both roles are required to obtain individual state based licensure (Nurse Practitioner Schools 2015).

Possibly the most fundamental difference in the roles of the NP and PA in the USA is that the NP graduates from a School of Nursing, whereas the PA graduates from a medical school or 'Centre of Medicine'. These institutions focus on very different philosophies with the nursing school concentrating on a patient centred model of care while the medical school applies a disease centred model (Nurse Practitioner Schools 2015).

Regardless of their differences, both of these roles provide cost-effective perioperative care within the USA. Similarly, both of these roles are eligible for certification with the American medical reimbursement systems Medicare and Medicaid. In the USA both of these roles receive favourable reimbursement from commercial (private) healthcare funds (Practicing Clinicians Exchange 2015).

Australian Context of the NMSA Role

In the Australian healthcare system there is one overriding agency for registration, setting national standards, auditing and accrediting training and education of healthcare professionals. (Australian Health Practitioner Regulation Agency 2016) This entity is the Australian Health Practitioner Regulation Agency (AHPRA). Under the umbrella of AHPRA, as outlined in table 1, sit 14 National Boards.

The Medical Board of Australia regulates Australia's medical practitioners. The Nursing and Midwifery Board of Australia (NMBA) regulates the practice of nurses and midwives in Australia. The NMBA recognises the following categories of nurses (Nursing Midwifery Board of Australia 2016):

- Enrolled Nurse
- Registered Nurse
- Midwife
- Nurse Practitioner

Table 1: National Boards of the Australian Health Practitioner Regulation Agency

Aboriginal and Torres Strait Islander Health Practice Board of Australia
Chinese Medicine Board of Australia
Chiropractic Board of Australia
Dental Board of Australia
Medical Board of Australia
Medical Radiation Practice Board of Australia
Nursing and Midwifery Board of Australia
Occupational Therapy Board of Australia
Optometry Board of Australia
Osteopathy Board of Australia
Pharmacy Board of Australia
Physiotherapy Board of Australia
Podiatry Board of Australia
Psychology Board of Australia

In reference to the role of the NMSA in Australia, while the role has been practiced for over 20 years, there is little published and no formal legislation with national governing bodies (Hains et al 2016). Only Registered Nurses (RN) and NPs responded to a recent practice audit on the role of the NMSA in Australia (Hains et al 2016). A 2016 survey of Australian surgeons regarding the role of the NMSA in Australia indicated that the majority of clinicians were RNs or NPs. Some Enrolled Nurses (EN), PAs and Allied Health Professionals were also being utilised by surgeons in the NMSA role (Hains et al 2017b). As outlined in table 2, the notion of clinicians other than RNs and NPs fulfilling the role of the NMSA in Australia was also supported in a recent survey of perioperative staff attending the national Australian College of Operating Room Nurses (ACORN) conference (Hains et al 2017c).

Table 2: Non-medical surgical assistants in the Australian healthcare system: a review of three surveys

Survey Question: Personnel undertaking the role of the NMSA in Australia

	NMSA Practice Audit 2015	NMSA Surgeon Survey 2016	NMSA Perioperative Staff Conference Survey 2016
	<i>n=77(%)</i>	<i>n=332(%)</i>	<i>n=122(%)</i>
Enrolled Nurse	0(0)	24(7)	19 (15)
Registered Nurse	77(100)	160(48)	118(96)
Nurse Practitioner	11(14)	39(12)	14(11)
Physician Assistant	0(0)	18(5)	6(5)
Allied Health Professional	0(0)	2(1)	10(8)
I have not worked with a NMSA in Australia	-	146(44)	49(40)
Other	-	8(2)	2(2)
I don't know the qualification of the NMSA	-	6(2)	-

As of December 2015 there were 1,319 NPs in Australia (Nursing Midwifery Board of Australia 2016). NPs are endorsed by AHPRA and this endorsement appears online in a register (Australian Health Practitioner Registration Agency 2013). From the practice audit of NMSAs administered in 2015, of the 83 respondents, 11(14%) were NPs working in the role of the NMSA. The role of NP was well represented from the surgeon survey in 2016, where out of 334 respondents 39(12%) surgeons had worked with an NP in the role of the NMSA in Australia.

The role of the PA is difficult to quantify in Australia as the role is not registered with AHPRA. A recent consultation paper published by the Queensland Government states there are approximately 40 Australian trained PAs. However, not all of these clinicians are working as PAs (Queensland Government 2016). In addition to this there may be PAs who were trained overseas working in the Australian healthcare system. In the 2016 surgeon survey 18(5%) surgeons said they had worked with a PA as a NMSA in Australia. The only PA course in Australia is administered as a Bachelor of Health Science (Physician Assistant) from a medical platform through the College of Medicine and Dentistry at James Cook University (James Cook University 2015). This course is not accredited by an Australian accreditation body (Queensland Government 2016).

Without doubt, the qualification with the greatest representation in the role of the NMSA in all surveys mentioned here is that of the RN. While many of the RNs who responded to the practice audit possessed post-graduate qualifications specific to the role of the NMSA, called the Perioperative Nurse Surgeon's Assistant (PNSA), this data is not formally recorded in Australia nor is it able to be retrieved from AHPRA. Similar to the PA course, the post graduate NMSA course in Australia is not accredited by an Australian accreditation body. These clinicians with specialist qualifications are solely RNs in the eyes of the national regulating body AHPRA.

As noted in table 2 aside from RNs, NPs and PAs, ENs and Allied Health Professionals e.g. Physiotherapists are also fulfilling the role of the NMSA in Australia. This makes the range of qualifications of clinicians performing this role vast. However, the number of clinicians in some categories is quite small.

Similar to the USA, NMSAs in Australia are from either a medical based model or, for the vast majority, a nursing based model. In contrast to NMSAs in the USA, NMSAs in Australia do not receive any intraoperative reimbursement from the Medicare system or private healthcare funds (Australian Government Department of Health 2017).

DISCUSSION

While there are many different clinicians performing this role, which clinicians are appropriate to perform the role of the NMSA in Australia? Similarly, should the national regulatory body AHPRA provide (and impose) governance for this role?

In consideration of the three objectives of this paper:

1. Validate this role as an Advanced Practice Nursing (APN) role in Australia through regulation and governance by the Nursing and Midwifery Board of Australia (NMBA) who sit under the umbrella of the Australian Health Practitioner Regulation Agency (AHPRA).

The Australian Association of Nurse Surgical Assistants (AANSA) recently approached the NMBA requesting endorsement of the specialty/advanced practice nursing role of the NMSA as a means to validate and regulate the role of the nurse as NMSA in Australia. The practice of the NMBA is to only endorse those nursing roles it is required to under national law (Nursing Midwifery Board Australia 2016). The NMBA's rationale for this is that recognition of specialty/advanced (nursing) practice other than that of the NP and eligible midwife does not reduce risk to the public and:

“Organisations representing specialty nursing groups in Australia have developed processes for recognising specialty practice” (Nursing Midwifery Board of Australia 2015).

The points made by the NMBA pose several questions:

- What is the difference between specialty practice nursing and advanced practice nursing?

The difference between specialty and advanced practice outlined in a paper “*Discerning the Differences*” is that the differences lie in the depth and complexity of the role which is addressed by varying levels of education of the clinician (Thoun 2011). The International Council of Nurses states entry level for APN of a Master Degree is essential (International Council of Nurses 2009). It is clearly defined in the recent surveys cited here that the levels of education of the nursing based NMSA vary greatly in Australia.

- What authority do specialty organisations have to enforce their standards?

Specialty organisations do not have any authority to enforce their standards. This is elaborated on under Objective 2.

- Are there factors in addition to patient safety that warrant a role being recognised and regulated as APN?

The results of a recent Australian surgeon survey highlight that when surgeons were asked who should govern the role of the NMSA in Australia, an equivalent number thought that AHPRA either via the Nursing and Midwifery Board of Australia 140(43%) or via the Medical Board of Australia 133(41%) would be applicable (Hains et al 2017b). This split reflects a Surgical Workforce Census Report published by the Royal Australasian College of Surgeons (RACS) where an equal number of surgeons espoused the NP (nursing based model) or the PA (medical based model) as a surgical assistant (Hass 2016). Governance via the NMBA would ensure this role evolves within the domain of nursing. Governance through AHPRA via the NMBA could mandate a Masters level qualification is required to perform this role and commence establishing the role as advanced practice.

2. Lobby AHPRA to recognise, regulate and protect the title of Advanced Practice Nursing (APN) roles other than the Nurse Practitioner (NP) in Australia.

While ACORN has a standard for the role of the NMSA (The Australian College of Operating Room Nurses 2015) and RACS has a position statement (Royal Australasian College of Surgeons 2015) for the surgical assistant, these documents are guidelines. Neither has been adopted by a national regulating body, neither is uniformly adopted by health care facilities, and neither is enforced at a state or national level. As the titles NMSA or PNSA are not protected in Australia, any clinician may use these titles. ACORN’s standard states that the PNSA must:

“hold current registration as a registered nurse with Australian Health Practitioner Regulation Agency (AHPRA) in Australia” (The Australian College of Operating Room Nurses 2015).

Clearly this is not the case in practice when 24(7%) surgeons are working with an EN as NMSA. Specialty organisations with the best intentions of regulating the specialty area of practice lack the authority to enforce any of their guidelines. Without legislated title protection any clinician is able to call themselves a NMSA or PNSA.

3. As a result of sanctioned regulation, facilitate APN (including NP) to seek appropriate remuneration for undertaking this role in the private sector in Australia.

A recent Australian paper investigating APN outlines that the extensive size of the nursing workforce, coupled with the flexibility of roles, places nurses to the optimum setting to improve health services (Gardner 2016). It has been shown that the RN/NP NMSA is cost-effective in the intraoperative phase within the Australian healthcare system. (Hains et al 2016; Smith et al 2016). Whether the NMSA is an NP or holds a PNSA Masters degree, lack of formal, national governance by the appropriate entities of roles such as the NMSA excludes the role from uniformly meeting the APN educational benchmark and gaining validation. As a consequence of lack of uniformity gained through regulation, entities such Medicare and the healthcare funds remain resistant to allowing access by the Australian NMSA to intraoperative remuneration. In the recent surgeon

survey 188(69%) of respondents were “Very Supportive” or “Supportive to some degree” of the role of the NMSA in the private sector in Australia. Lack of access to Medicare and healthcare funds renders the cost effective NMSA role in the private sector not financially viable to many clinicians (Yang and Hains 2017; Hains et al 2016).

CONCLUSION

While professional bodies such as ACORN and RACS have guidance statements on the role of the NMSA in Australia these provide little weight in relation to whom healthcare facilities will let practice the role on a daily basis.

Though AHPRA via the NMBA is reluctant to formally recognise and regulate this role, the overwhelming majority of clinicians in the role of NMSA in Australia are nurses. As the spread of qualifications varies so greatly within the nursing based NMSA, it is difficult to categorise the role as APN.

The lack of formal regulation of the role of the NMSA in Australia excludes NMSA (including the NP) (Yang and Hains 2017) from access to Medicare and healthcare fund intraoperative reimbursement, thereby rendering a cost-effective role unsustainable to many clinicians.

RECOMMENDATIONS

1. To ensure advanced practice roles such as that of the NMSA evolve within the nursing domain, the NMBA must recognise and regulate APN roles in addition to the role of the NP in Australia.
2. Protect the title of APNs. Title protection in conjunction with regulation would limit the clinicians who are able to gain credentialing as an NMSA within Australian healthcare facilities. This would ensure all clinicians practicing as an NMSA have a minimum education qualification and have met the NMBA criteria for APN.
3. Medicare and therefore the private healthcare funds recognise the role the APN have regarding cost savings to the healthcare system. APNs who meet a set of criteria regulated by the NMBA should have the ability to be remunerated for intra-operative assisting.

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