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EDITORIAL

RESEARCH & EVALUATION

HEALTH EDUCATION IN PRACTICE

From the Editor

Prof Kichu Nair[1]
Editor-in-Chief

Welcome to the 4th Volume, 1st Issue of *Health Education in Practice: Journal of Research for Professional Learning.* We have a very interesting series of articles in this volume.

The article from Magin et al discussed the decision making by GP registrars. We all know medicine is not black and white; it is often gray. There are lots of uncertainties in managing multimorbid patients and this is the bulk of medicine we see daily in a generalist setting. The authors studied over 70,000 consultations in general practice by 589 trainee registrars. This study has implications on trainees, trainers and training.

One of the major workforce issues in Australia is our workforce shortage in rural areas. Approximately 1/3 our population live outside major cities. However, this population has less access to medical care, even though they have higher rate of risk factors and chronic health conditions. This so-called Inverse Health care had been described by in 1971, by Julian Tudor Hart. McDonald and Duncanson have done a systematic review on this issue. Their conclusion of increasing the rural placement during training in addition to looking after human factors may improve the retention is worth pursuing.

Bringing more fidelity into simulation is important. Bissett et al used MASK-ED simulation for physiotherapy students. This program before clinical placement improved the confidence amongst trainees. What is more interesting is the immediate feedback from the experienced trainer was valuable for students.

Mackay and colleagues' article on the "SEED" program during the 2019-20 bush file season highlights the "CORE" values in health. The paper highlights the need for person centred participation, leadership, mentorship and reflection for health care professionals for transformational learning. I am sure (and keen to hear) how this program helped in the current COVID pandemic.

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Research & Evaluation article (double blind peer-review)

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General practice registrars' clinical uncertainty, and in-consultation information- and assistance-seeking

Parker Magin [1], Amanda Tapley [2], Georga Cooke[1], Susan Wearne [4], Elizabeth Holliday [1], Simon Morgan[5], Jean Ball [6], Neil Spike [7], Mieke van Driel [3]

Abstract

Purpose: *To explore the association of Australian general practitioner (GP) registrars' responses to uncertainty with their in-consultation information-, advice- and assistance-seeking.*

Design/methodology/approach: *A cross-sectional analysis of data from the Registrar Clinical Encounters in Training (ReCEnT) cohort study in four Australian states. In ReCEnT, GP registrars record details of 60 consecutive consultations, six-monthly, three times during training.*

Outcome factors in logistic regression models included whether the registrar sought in-consultation information or assistance from (i) their supervisor or (ii) an electronic or paper-based source. Independent variables were the four independent subscales of the Physicians' Reaction to Uncertainty (PRU) instrument, as well as registrar, practice and consultation variables.

Findings: *589 registrars contributed details of 70,412 consultations.*

On multivariable analysis, scores on the two 'affective' PRU subscales 'anxiety regarding diagnosis/management' (OR 1.03; 95% confidence intervals [CIs] [1.01, 1.05], p *= 0.003) and 'concern about a bad outcome' (OR 1.03; 95% CIs [1.01, 1.06],* p *= 0.008) were significantly associated with seeking supervisor assistance. There was no association with 'behavioural' subscales 'reluctance to disclose uncertainty to patients' and 'reluctance to disclose mistakes to physicians'.*

None of the PRU subscales were significantly associated with information-seeking from electronic or hard copy sources.

Research implications: *Further research is required to explore the role of uncertainty within registrar–supervisor interactions and to define the role of supervisors in registrars' functional adaptation to clinical uncertainty (including how best to support and train supervisors in this role).*

Practical implications: *GP registrars' 'affective' responses to clinical uncertainty are associated with assistance-seeking from clinical supervisors. While in-consultation assistance-seeking may promote registrars' tolerance of uncertainty, it may also contribute to supervisor workload.*

Originality/value: *This is the first study to examine trainees' levels of uncertainty and their seeking of information and assistance.*

Limitations: *We have not investigated whether registrars' seeking assistance resolved or attenuated, for the index problem, their anxiety or concern*.

Keywords: Family Practice; General Practice; Education, Medical, Graduate; Uncertainty; Preceptorship; Clinical Decision-Making.

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BACKGROUND

Uncertainty is unavoidable in clinical practice (Domen 2016; Gerrity et al. 1992; Han, Klein & Arora 2011), particularly general practice (Gerrity et al. 1992; O'Riordan et al. 2011). Undifferentiated illness and presentation earlier in the course of illness are more common in generalist practice than in specialist settings, increasing levels of uncertainty (Alam et al. 2017). Uncertainty also arises from general practitioners ([GPs], family physicians) applying single disease guidelines in the setting of generalist care of multimorbidity (Wallace et al. 2015). Clinical uncertainty can have deleterious effects across multiple domains (Strout et al. 2018), including effects on both the clinician (influencing professional satisfaction and burnout [Bovier and Perneger 2007; Cooke et al. 2013]), and on the health system in which they practise (e.g., greater health costs [Allison et al. 1998] including increased test-ordering [Pedersen et al. 2015; van der Weijden et al. 2002]).

Management of the uncertainty intrinsic to general practice is a core clinical skill of GPs (Malterud et al. 2017), but both established GPs (Stone 2014) and GP registrars (vocational trainees/residents in general practice) struggle with the effects of uncertainty (Cooke et al. 2013; Danczak & Lea 2014). Registrars' tolerance of uncertainty may influence decisions to seek information and assistance, including during consultations (Sturman, Jorm & Parker 2020). Answering clinical questions generated during clinical consultations is a vital aspect of patient care (Del Fiol, Workman & Gorman 2014; Ely, Burch & Vinson 1992). Failure to find answers to the questions may lead to suboptimal patient care decisions (Del Fiol, Workman & Gorman 2014). Some questions can be pursued post-consultation but some must be answered in-consultation (Gonzalez-Gonzalez et al. 2007). Given the breadth of their practice, generalist clinicians have a particular need for answering in-consultation clinical questions, and GPs when using online resources are more likely to seek answers to patient-related questions than are specialist physicians (Bennett et al. 2005).

As well as informing immediate patient care, answering in-consultation clinical questions is a rich source of clinician learning (Brown et al. 2018; Phillips & Glasziou 2008). Registrars are early-career generalist clinicians and have limited expertise and experience, needing 'real-time' answers to address knowledge gaps in immediate patient care (Brown et al. 2018; Phillips & Glasziou 2008). They also have an overarching educational need to improve their clinical knowledge levels and move towards competence in independent practice (Brown et al. 2018).

In many countries, GP registrars or trainees learn within an apprenticeship-like model whereby they undergo a structured program of centralised education (in Australia, a minimum total of 125 hours in the first year of training). However, most learning takes place in individual (mainly small, geographically dispersed) general practices under the supervision of designated experienced GP supervisors (Thomson et al. 2011; Wearne et al. 2012). Australian GP registrars practise with considerable clinical autonomy, but have recourse to advice or assistance from their supervisor if requested. The responsibility for initiation of this assistance lies with the registrar (Brown et al. 2018).

Registrars seek answers in-consultation to clinical questions (in 21% of consultations) more often than do established GPs (Magin et al. 2015). The most common sources of information or advice are the supervisor (9.2% of consultations [Morgan et al. 2015]; 6.9% of individual problems managed [Magin et al. 2015; Morgan et al. 2015]) and electronic sources (6.5% of problems managed [Magin et al. 2015]). Supervisors are preferentially consulted for more complex problems (Magin et al. 2015). Appropriateness of advice- and assistance-seeking has implications for registrar

learning, patient safety, and efficient use of resources (supervisor time) (Ingham et al. 2020; Morrison et al. 2015; Partanen 2018).

It is axiomatic that seeking in-consultation answers to clinical questions entails some element of uncertainty on the GP registrar's part (Clement et al. 2015). It is also plausible that the registrar's individual response to clinical uncertainty influences decisions to seek information and assistance. In this study, we sought to establish the association of registrars' responses to uncertainty with their in-consultation information-, advice- and assistance-seeking.

METHODS

This paper provides a cross-sectional analysis of data from the Registrar Clinical Encounters in Training (ReCEnT) study.

RECENT

ReCEnT is an ongoing, multicentre cohort study of GP registrars' in-practice clinical experiences. Data included in the current analysis were collected in four of Australia's then 17 Regional Training Providers (RTPs) spanning four states. A total of five six-monthly rounds of data collection were conducted from 2011 to 2013. RTPs during this period were government-funded, not-for-profit, geographically defined educational and training organisations. Participants were GP registrars in general practice-based training terms.

The detailed ReCEnT methodology has been described previously (Morgan et al. 2012). Briefly, registrars complete paper-based forms recording details of 60 consecutive consultations around the midpoint of each of their three general practice training terms (six-monthly for full-time registrars) as part of their training. This exercise is part of their routine educational program, with registrars receiving detailed feedback on their recorded clinical and educational activity. As well as this educational use, registrars may also provide signed consent for research use of their data. Some registrars at one of the four RTPs also collected data during an optional fourth training term. Patient demographics, clinical details and educational actions (including in-consultation information- and assistance-seeking) are recorded for each of the 60 patient encounters per term.

Registrar and practice demographics are documented in each six-monthly collection period through a separate questionnaire. During five data collection rounds (2011–2013), clinical uncertainty scales were included in this questionnaire.

OUTCOME VARIABLE

The outcome variables in analyses were whether during a consultation:

i. the registrar sought advice or assistance from their supervisor or the supervisor's delegate GP if the supervisor was unavailable (hereafter, 'supervisor')

ii. the registrar sought information from an electronic or paper-based source.

MAIN VARIABLES OF INTEREST: RESPONSES TO CLINICAL UNCERTAINTY

The variables of interest in this analysis were scores on the Physicians' Reaction to Uncertainty (PRU) subscales (Gerrity et al. 1995). These subscales, each ranked on a 6-point Likert scale, measure a doctor's 'affective' response to uncertainty (the first two subscales) and a 'behavioural' response of coping in response to uncertainty (the third and fourth subscales). The PRU subscales are:

i. anxiety due to uncertainty about diagnosis/treatment: 'anxiety' (5 items)

ii. concern about a bad outcome for the patient: 'concern' (3 items)

iii. reluctance to disclose diagnosis/treatment uncertainty to patients: 'reluctance to disclose to patients' (5 items)

iv. reluctance to disclose mistakes to physicians: 'reluctance to disclose to physicians' (2 items).

Responses to each item are scored from 'strongly disagree' (scored 1) to 'strongly agree' (scored 6), with relevant items reverse scored and items summed to create total subscale scores. The subscales are independent constructs, and no overall 'uncertainty' score is calculated. The PRU subscales have shown good reliability and validity (Gerrity et al. 1990; Gerrity et al. 1995; Schneider et al. 2007).

OTHER INDEPENDENT VARIABLES

Other independent variables included registrar, patient, practice and consultation variables. These variables are included in Supplementary Table S1. Practice postcode was used to define the Australian Standard Geographical Classification-Remoteness Area classification (the degree of rurality) of the practice location, and to define the practice location's Socio-Economic Index for Areas' 'Index of Relative Socio-Economic Disadvantage' decile.

The unit of analysis was the individual consultation. Proportions of consultations for which (i) supervisor advice or assistance were sought and (ii) information was sought from electronic or hard copy sources were calculated with 95% confidence intervals (CIs), adjusted for clustering within registrars.

To test associations of a registrar seeking (i) supervisor advice or assistance and (ii) information from electronic or hard copy sources, simple and multiple logistic regression were used within a generalised estimating equations framework to account for clustering of patients within registrars. An exchangeable working correlation structure was assumed. Covariates with a p-value of < 0.2 on univariate analysis were included in the multivariable analyses. Covariates that had a small effect size and a p-value > 0.2 in the multivariable model were tested for removal from the model. If the covariate's removal did not substantively change the resulting model, the covariate was not included in the final multivariable model.

We conducted separate analyses for each of the four separate PRU subscales for each of the two outcomes. For the fourth PRU subscale, 'reluctance to disclose mistakes to physicians', a printing error resulted in only two rounds of complete data being collected. Only these complete data were used in analyses involving this subscale.

Mean substitution was used to reduce the number of missing values for the three uncertainty scores 'anxiety', 'concern' and 'reluctance to disclose to patients', dependent on no more than half of the items being missing. Revised total scores were

created for all outcomes using the recoded items. For 'reluctance to disclose to physicians', mean substitution was not employed, as there are only two items in this scale.

To assess the magnitude of associations with information- or assistance-seeking that were statistically significant, we calculated Cohen's *d* as a standardised measure of effect (using univariate findings).

Analyses were programmed using STATA 13.1 and SAS V9.4. *P*-values < 0.05 were considered statistically significant.

Ethical approval was obtained from the University of Newcastle Human Research Ethics Committee (Ref. No. H-2009–0323).

RESULTS

A total of 589 individual registrars (response rate 93.6%) contributed details of 70,412 individual consultations. The characteristics of the participating registrars and practices are presented in Table 1.

Table 1: Characteristics of participating registrars and participating general practices.

Variable	Class	n (%)*
Registrar variables (n=589)		
Registrar Gender	Female	387 (66%)
Qualified as a doctor in Australia		439 (76%)
Registrar or practice variables by term (n=1184)		
Registrar Training Term	Term 1	435 (37%)
	Term 2	440 (37%)
	Term 3	255 (22%)
	Term 4	54 (4.6%)
Registrar age (years)	Mean (SD)	33.1 (6.8)
Registrar worked at the practice previously		360 (31%)
Registrar works fulltime		911 (79%)
Does the practice routinely Bulk Bills all patients		208 (18%)
Number of GPs† working at the	1-4	373 (32%)
training practice	5-10+	786 (68%)
Rurality classification of practice	Major City	717 (61%)
	Inner Regional	317 (27%)
	Outer regional, remote or very remote	150 (13%)

SEIFA‡ Index (decile) of practice	Mean (SD)	5.5 (2.9)

*Numbers may not add up to 1184 for registrar/practice variables by term due to missing data.
†General Practitioners (GPs)
‡SEIFA – Socio-economic Index for Area (Index of Disadvantage).

Advice or assistance was sought from the registrars' supervisor in 8.8% (95% CI: 8.1–9.5) of consultations (n = 6,184). Information was sought from electronic (8.4%) or hard copy (1.7%) sources in 9.8% (95% CI: 8.8–10.7) of consultations (n = 6,869). More than one source of information or assistance could be sought in the one consultation.

UNIVARIATE ANALYSES

The characteristics associated with seeking advice or assistance from a supervisor and seeking information from an electronic or hard copy source are presented in Supplementary Tables S1 and S2, respectively. 'Anxiety' ($p < 0.001$), 'concern' ($p < 0.001$) and 'reluctance to disclose to patients' ($p = 0.019$), but not 'reluctance to disclose to physicians' ($p = 0.98$), were significantly associated with seeking help from a supervisor on univariate analysis. 'Anxiety' ($p = 0.002$), but neither 'concern' ($p = 0.12$) nor 'reluctance to disclose to patients' ($p = 0.84$), nor 'reluctance to disclose to physicians' ($p = 0.92$), was significantly associated with seeking information from an electronic or hard copy source on univariate analysis.

MULTIVARIABLE ANALYSES

Seeking supervisor advice or assistance

The regression models including 'anxiety', 'concern', 'reluctance to disclose to patients' and 'reluctance to disclose to physicians', respectively, are presented in Tables 2, 3, 4 and 5. On multivariable analysis, 'anxiety' (OR 1.03; 95% CIs [1.01, 1.05], $p = 0.003$) and 'concern' (OR 1.03; 95% CIs [1.01, 1.06], $p = 0.008$) were significantly associated with seeking supervisor advice or assistance. 'Reluctance to disclose to patients' (OR 1.00; 95% CIs [0.98, 1.02], $p = 0.90$) and 'reluctance to disclose to physicians' (OR 1.01; 95% CIs [0.96, 1.06], $p = 0.73$) were not significantly associated with seeking supervisor advice or assistance.

Table 2: Univariate and adjusted associations with *seeking advice or assistance from a supervisor* and with *seeking information from an electronic or hard-copy source*, including associations with the scores on the Physicians' Reaction to Uncertainty subscale *'Anxiety due to uncertainty about diagnosis/treatment'*.

		Seeking assistance from a Supervisor				**Seeking assistance from a book or electronic resource**			
		Univariate		**Adjusted**		**Univariate**		**Adjusted**	
Variable	**Class**	**OR (95% CI)**	**P**	**OR (95% CI)**	**P**	**OR (95% CI)**	**P**	**OR (95% CI)**	**P**
Uncertainty Variables									
Anxiety due to uncertainty		1.07 (1.05, 1.10)	<0.001	1.03 (1.01, 1.05)	0.003	1.03 (1.01, 1.05)	0.002	1.00 (0.99, 1.02)	0.61
Patient Variables									
Patient age group	0-14	1.06 (0.98, 1.15)	0.16	1.26 (1.15, 1.38)	<0.001	1.05 (0.98, 1.14)	0.18	1.19 (1.09, 1.31)	0.001
Referent 15-34	35-64	1.06 (1.00, 1.14)	0.067	1.06 (0.98, 1.14)	0.14	0.87 (0.82, 0.93)	<0.001	0.85 (0.79, 0.92)	<0.001
	65+	1.12 (1.03, 1.22)	0.006	1.22 (1.11, 1.34)	<0.001	0.70 (0.64, 0.77)	<0.001	0.69 (0.62, 0.76)	<0.001
Patient gender	Female	0.89 (0.85, 0.94)	<0.001	0.86 (0.82, 0.91)	<0.001	1.04 (0.98, 1.09)	0.20	1.05 (0.98, 1.11)	0.15
Patient/practice status	New to practice	0.96 (0.86, 1.06)	0.41	0.77 (0.68, 0.87)	<0.001	1.10 (0.99, 1.22)	0.066	1.00 (0.89, 1.11)	0.96
Referent: Existing patient	New to registrar	0.85 (0.79, 0.91)	<0.001	0.88 (0.82, 0.95)	0.001	1.09 (1.03, 1.15)	0.002	1.05 (0.98, 1.11)	0.14
Registrar Variables									
Registrar gender	Female					1.21 (0.95, 1.54)	0.12	1.17 (0.94, 1.45)	0.16
Training term/post	Term 2	0.53 (0.47, 0.60)	<0.001	0.66 (0.58, 0.76)	<0.001	0.70 (0.61, 0.81)	<0.001	0.83 (0.72, 0.95)	0.008

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		Seeking assistance from a Supervisor				Seeking assistance from a book or electronic resource			
		Univariate		Adjusted		Univariate		Adjusted	
Variable	Class	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Referent: Term 1	Term 3	0.33 (0.26, 0.42)	<0.001	0.49 (0.38, 0.62)	<0.001	0.68 (0.58, 0.80)	<0.001	0.86 (0.72, 1.03)	0.11
	Term 4	0.18 (0.13, 0.26)	<0.001	0.31 (0.21, 0.44)	<0.001	0.62 (0.37, 1.03)	0.067	0.68 (0.46, 1.00)	0.050
Worked at practice previously	Yes	0.60 (0.53, 0.68)	<0.001	0.91 (0.79, 1.05)	0.21				
Registrar age	Mean(SD)	0.96 (0.94, 0.98)	0.001	0.97 (0.95, 0.99)	<0.001				
Practice Variables									
RTP*	RTP 2	1.04 (0.77, 1.40)	0.79	1.28 (0.92, 1.78)	0.15	0.66 (0.48, 0.92)	0.014	0.62 (0.43, 0.88)	0.008
Referent: RTP 1	RTP 3	1.40 (1.02, 1.93)	0.040	1.09 (0.78, 1.53)	0.61	1.28 (0.92, 1.79)	0.15	0.95 (0.69, 1.31)	0.76
	RTP 4	1.30 (1.03, 1.63)	0.028	1.62 (1.29, 2.02)	<0.001	0.83 (0.66, 1.04)	0.11	0.81 (0.64, 1.02)	0.075
Practice routinely bulk bills	Yes	0.80 (0.63, 1.02)	0.068	0.74 (0.60, 0.92)	0.007	-	-	-	-
Consultation Variables									
Follow-up ordered	Yes	1.66 (1.53, 1.79)	<0.001	1.17 (1.07, 1.27)	<0.001	1.39 (1.31, 1.47)	<0.001	1.19 (1.11, 1.27)	<0.001
Learning goals generated	Yes	6.43 (5.79, 7.15)	<0.001	4.55 (4.07, 5.08)	<0.001	3.82 (3.38, 4.33)	<0.001	3.50 (3.12, 3.92)	<0.001
Pathology ordered						1.19 (1.11, 1.27)	<0.001	1.05 (0.97, 1.13)	0.25

		Seeking assistance from a Supervisor				Seeking assistance from a book or electronic resource			
		Univariate		Adjusted		Univariate		Adjusted	
Variable	Class	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Medication prescribed	Yes	0.90 (0.86, 0.95)	0.001	1.06 (1.00, 1.13)	0.040	1.79 (1.66, 1.92)	<0.001	1.97 (1.81, 2.13)	<0.001
Consult duration	Mean(SD)	1.06 (1.05, 1.06)	<0.001	1.05 (1.05, 1.06)	<0.001	1.02 (1.02, 1.02)	<0.001	1.01 (1.01, 1.02)	<0.001
Chronic disease	Yes	1.09 (1.03, 1.17)	0.007	0.81 (0.75, 0.88)	<0.001				
Imaging ordered	Yes	1.80 (1.66, 1.96)	<0.001	1.24 (1.12, 1.37)	<0.001				
Referral made	Yes	2.03 (1.90, 2.18)	<0.001	1.37 (1.26, 1.49)	<0.001				
Number of problems	Mean(SD)	1.06 (1.02, 1.10)	0.003	0.82 (0.77, 0.86)	<0.001	1.09 (1.05, 1.12)	<0.001	0.96 (0.93, 1.00)	0.078

*RTP – Regional Training Provider

Table 3: Univariate and adjusted associations with *seeking advice or assistance from a supervisor* and with *seeking information from an electronic or hard-copy source*, including associations with the scores on the Physicians' Reaction to Uncertainty subscale *'Concern about a bad outcome for the patient'.*

		Seeking assistance from a Supervisor				Seeking assistance from a book or electronic resource			
		Univariate		Adjusted		Univariate		Adjusted	
Variable	**Class**	**OR (95% CI)**	**P**	**OR (95% CI)**	**P**	**OR (95% CI)**	**P**	**OR (95% CI)**	**P**
Uncertainty Variables									
Concern about a bad outcome	Mean(SD)	1.07 (1.04, 1.10)	<0.001	1.03 (1.01, 1.06)	0.008	1.02 (0.99,0.12 1.06)		1.00 (0.98,0.76 1.03)	
Patient Variables									
Patient age group	0-14	1.06 (0.98, 1.15)	0.16	1.26 (1.15, 1.38)	<0.001	1.05 (0.98,0.18 1.14)		1.19 (1.09,0.001 1.30)	
Referent 15-34	35-64	1.06 (1.00, 1.14)	0.067	1.06 (0.98, 1.14)	0.14	0.87 (0.82,<0.001 0.93)		0.85 (0.79,<0.001 0.92)	
	65+	1.12 (1.03, 1.22)	0.006	1.22 (1.11, 1.34)	<0.001	0.70 (0.64,<0.001 0.77)		0.69 (0.62,<0.001 0.76)	
Patient gender	Female	0.89 (0.85, 0.94)	<0.001	0.86 (0.82, 0.91)	<0.001	1.04 (0.98,0.20 1.09)		1.05 (0.98,0.14 1.11)	
Patient/practice status	New to practice	0.96 (0.86, 1.06)	0.41	0.77 (0.68, 0.87)	<0.001	1.10 (0.99,0.066 1.22)		1.00 (0.89,0.97 1.12)	
Referent: Existing patient	New to registrar	0.85 (0.79, 0.91)	<0.001	0.88 (0.82, 0.95)	0.001	1.09 (1.03,0.002 1.15)		1.05 (0.98,0.14 1.11)	
Registrar Variables									
Registrar gender	Female					1.21 (0.95,0.12 1.54)		1.18 (0.95,0.15 1.46)	

		Seeking assistance from a Supervisor						Seeking assistance from a book or electronic resource					
		Univariate			Adjusted			Univariate			Adjusted		
Variable	**Class**	**OR (95% CI)**		**P**	**OR (95% CI)**		**P**	**OR (95% CI)**		**P**	**OR (95% CI)**		**P**
Training term/post	Term 2	0.53	(0.47, 0.60)	<0.001	0.67	(0.59, 0.77)	<0.001	0.70	(0.61, 0.81)	<0.001	0.83	(0.73, 0.95)	0.007
Referent: Term 1	Term 3	0.33	(0.26, 0.42)	<0.001	0.48	(0.38, 0.60)	<0.001	0.68	(0.58, 0.80)	<0.001	0.86	(0.72, 1.02)	0.078
	Term 4	0.18	(0.13, 0.26)	<0.001	0.31	(0.21, 0.45)	<0.001	0.62	(0.37, 1.03)	0.067	0.68	(0.46, 0.99)	0.047
Worked at practice previously	Yes	0.60	(0.53, 0.68)	<0.001	0.89	(0.77, 1.02)	0.098						
Registrar age	Mean(SD)	0.96	(0.94, 0.98)	0.001	0.97	(0.95, 0.99)	0.001						
Practice Variables													
RTP*	RTP 2	1.04	(0.77, 1.40)	0.79	1.33	(0.96, 1.85)	0.087	0.66	(0.48, 0.92)	0.014	0.62	(0.44, 0.89)	0.009
Referent: RTP 1	RTP 3	1.40	(1.02, 1.93)	0.040	1.08	(0.77, 1.52)	0.66	1.28	(0.92, 1.79)	0.15	0.94	(0.68, 1.31)	0.72
	RTP 4	1.30	(1.03, 1.63)	0.028	1.63	(1.30, 2.05)	<0.001	0.83	(0.66, 1.04)	0.11	0.81	(0.64, 1.02)	0.077
Practice routinely bulk bills	Yes	0.80	(0.63, 1.02)	0.068	0.74	(0.60, 0.91)	0.005						
Consultation Variables													
Follow-up ordered	Yes	1.66	(1.53, 1.79)	<0.001	1.17	(1.07, 1.27)	<0.001	1.39	(1.31, 1.47)	<0.001	1.19	(1.11, 1.27)	<0.001
Learning goals generated	Yes	6.43	(5.79, 7.15)	<0.001	4.53	(4.06, 5.07)	<0.0001	3.82	(3.38, 4.33)	<0.001	3.50	(3.13, 3.92)	<0.001

		Seeking assistance from a Supervisor						Seeking assistance from a book or electronic resource					
		Univariate			Adjusted			Univariate			Adjusted		
Variable	**Class**	**OR (95% CI)**		**P**	**OR (95% CI)**		**P**	**OR (95% CI)**		**P**	**OR (95% CI)**		**P**
Pathology ordered								1.19	(1.11, 1.27)	<0.001	1.05	(0.97, 1.13)	0.25
Medication prescribed	Yes	0.90	(0.86, 0.95)	<0.001	1.07	(1.00, 1.13)	0.037	1.79	(1.66, 1.92)	<0.001	1.97	(1.81, 2.13)	<0.001
Consult duration	Mean(SD)	1.06	(1.05, 1.06)	<0.001	1.05	(1.05, 1.06)	<0.001	1.02	(1.02, 1.02)	<0.001	1.01	(1.01, 1.02)	<0.001
Chronic disease	Yes	1.09	(1.03, 1.17)	0.007	0.81	(0.75, 0.88)	<0.001						
Imaging ordered	Yes	1.80	(1.66, 1.96)	<0.001	1.24	(1.12, 1.36)	<0.001						
Referral made	Yes	2.03	(1.90, 2.18)	<0.001	1.36	(1.25, 1.49)	<0.001						
Number of problems	Mean(SD)	1.06	(1.02, 1.10)	0.003	0.82	(0.77, 0.86)	<0.001	1.09	(1.05, 1.12)	<0.001	0.96	(0.92, 1.00)	0.075

*RTP – Regional Training Provide

Table 4: Univariate and adjusted associations with *seeking advice or assistance from a supervisor* and with *seeking information from an electronic or hard-copy source*, including associations with the scores on the Physicians' Reaction to Uncertainty subscale *'Reluctance to disclose diagnosis/treatment uncertainty to patients'*

		Seeking assistance from a Supervisor				**Seeking assistance from a book or electronic resource**			
Variable	**Class**	**Univariate OR (95% CI)**	**P**	**Adjusted OR (95% CI)**	**P**	**Univariate OR (95% CI)**	**P**	**Adjusted OR (95% CI)**	**P**
Uncertainty Variables									
Reluctance to disclose uncertainty to patients	Mean(SD)	1.03 (1.01, 1.06)	0.019	1.00 (0.98, 1.02)	0.90	1.00 (0.97, 1.02)	0.84	0.99 (0.97, 1.01)	0.26
Patient Variables									
Patient age group	0-14	1.06 (0.98, 1.15)	0.16	1.26 (1.15, 1.37)	<0.001	1.05 (0.98, 1.14)	0.18	1.19 (1.09, 1.31)	<0.001
Referent 15-34	35-64	1.06 (1.00, 1.14)	0.067	1.06 (0.98, 1.14)	0.13	0.87 (0.82, 0.93)	<0.001	0.85 (0.79, 0.92)	<0.001
	65+	1.12 (1.03, 1.22)	0.006	1.22 (1.11, 1.33)	<0.001	0.70 (0.64, 0.77)	<0.001	0.69 (0.62, 0.76)	<0.001
Patient gender	Female	0.89 (0.85, 0.94)	<0.001	0.86 (0.81, 0.91)	<0.001	1.04 (0.98, 1.09)	0.20	1.05 (0.98, 1.11)	0.15
Patient/practice status	New to practice	0.96 (0.86, 1.06)	0.41	0.77 (0.68, 0.87)	<0.001	1.10 (0.99, 1.22)	0.066	1.00 (0.89, 1.12)	0.98
Referent: Existing patient	New to registrar	0.85 (0.79, 0.91)	<0.001	0.88 (0.82, 0.95)	0.001	1.09 (1.03, 1.15)	0.002	1.05 (0.98, 1.11)	0.14
Registrar Variables									
Registrar gender	Female	1.39 (1.11, 1.73)	0.004	1.15 (0.93, 1.43)	0.21	1.21 (0.95, 1.54)	0.12	1.20 (0.96, 1.49)	0.10

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		Seeking assistance from a Supervisor						Seeking assistance from a book or electronic resource			
		Univariate			Adjusted			Univariate		Adjusted	
Variable	**Class**	**OR (95% CI)**		**P**	**OR (95% CI)**		**P**	**OR (95% CI)**	**P**	**OR (95% CI)**	**P**
Training term/post	Term 2	0.53	(0.47, 0.60)	<0.001	0.67	(0.59, 0.77)	<0.001	0.70 (0.61, 0.81)	<0.001	0.83 (0.72, 0.95)	0.006
Referent: Term 1	Term 3	0.33	(0.26, 0.42)	<0.001	0.47	(0.38, 0.59)	<0.001	0.68 (0.58, 0.80)	<0.001	0.85 (0.71, 1.01)	0.065
	Term 4	0.18	(0.13, 0.26)	<0.001	0.30	(0.21, 0.44)	<0.001	0.62 (0.37, 1.03)	0.067	0.67 (0.45, 0.98)	0.039
Worked at practice previously	Yes	0.60	(0.53, 0.68)	<0.001	0.89	(0.77, 1.03)	0.11				
Registrar age	Mean(SD)	0.96	(0.94, 0.98)	0.001	0.97	(0.95, 0.98)	<0.001				
Practice Variables											
RTP*	RTP 2	1.04	(0.77, 1.40)	0.79	1.39	(0.99, 1.96)	0.057	0.66 (0.48, 0.92)	0.014	0.63 (0.44, 0.89)	0.010
Referent: RTP 1	RTP 3	1.40	(1.02, 1.93)	0.040	1.07	(0.76, 1.50)	0.70	1.28 (0.92, 1.79)	0.15	0.92 (0.67, 1.28)	0.63
	RTP 4	1.30	(1.03, 1.63)	0.028	1.63	(1.30, 2.03)	<0.001	0.83 (0.66, 1.04)	0.11	0.82 (0.65, 1.04)	0.096
Practice routinely bulk bills	Yes	0.80	(0.63, 1.02)	0.068	0.73	(0.59, 0.91)	0.005				
Consultation Variables											
Follow-up ordered	Yes	1.66	(1.53, 1.79)	<0.001	1.16	(1.07, 1.26)	<0.001	1.39 (1.31, 1.47)	<0.001	1.19 (1.11, 1.27)	<0.001
Learning goals generated	Yes	6.43	(5.79, 7.15)	<0.001	4.52	(4.03, 5.06)	<0.001	3.82 (3.38, 4.33)	<0.001	3.51 (3.13, 3.92)	<0.001
Pathology ordered								1.19 (1.11, 1.27)	<0.001	1.05 (0.97, 1.13)	0.242

		Seeking assistance from a Supervisor				Seeking assistance from a book or electronic resource			
Variable	Class	Univariate OR (95% CI)	P	Adjusted OR (95% CI)	P	Univariate OR (95% CI)	P	Adjusted OR (95% CI)	P
Medication prescribed	Yes	0.90 (0.86, 0.95)	0.001	1.06 (1.00, 1.13)	0.038	1.79 (1.66, 1.92)	<0.001	1.97 (1.81, 2.13)	<0.001
Consult duration	Mean(SD)	1.06 (1.05, 1.06)	<0.001	1.05 (1.05, 1.06)	<0.001	1.02 (1.02, 1.02)	<0.001	1.01 (1.01, 1.02)	<0.001
Chronic disease	Yes	1.09 (1.03, 1.17)	0.007	0.81 (0.75, 0.88)	<0.001				
Imaging ordered	Yes	1.80 (1.66, 1.96)	<0.001	1.23 (1.12, 1.36)	<0.001				
Referral made	Yes	2.03 (1.90, 2.18)	<0.001	1.36 (1.25, 1.48)	<0.001				
Number of problems	Mean(SD)	1.06 (1.02, 1.10)	0.003	0.81 (0.77, 0.86)	<0.001	1.09 (1.05, 1.12)	<0.001	0.96 (0.92, 1.00)	0.075

*RTP – Regional Training Provider

Table 5: Univariate and adjusted associations with *seeking advice or assistance from a supervisor* and with *seeking information from an electronic or hard-copy source*, including associations with the scores on the Physicians' Reaction to Uncertainty subscale *'Reluctance to disclose mistakes to physicians'*

		Seeking assistance from a Supervisor				**Seeking assistance from a book or electronic resource**			
Variable	**Class**	**Univariate OR (95% CI)**	**P**	**Adjusted OR (95% CI)**	**P**	**Univariate OR (95% CI)**	**P**	**Adjusted OR (95% CI)**	**P**
Uncertainty Variables									
Reluctant to disclose uncertainty to other doctors	Mean(SD)	1.00 (0.94, 1.07)	0.99	1.01 (0.96, 1.06)	0.73	1.00 (0.96, 1.05)	0.92	1.03 (0.98, 1.09)	0.20
Patient Variables									
Patient age group	0-14					1.05 (0.94, 1.17)	0.42	1.20 (1.06, 1.35)	0.003
Referent 15-34	35-64					0.85 (0.78, 0.94)	0.001	0.84 (0.75, 0.93)	0.001
	65+					0.69 (0.60, 0.79)	<0.001	0.68 (0.59, 0.78)	<0.001
Patient gender	Female	0.90 (0.84, 0.97)	0.004	0.85 (0.78, 0.92)	0.001				
Patient/practice status	New to practice	0.97 (0.83, 1.14)	0.75	0.78 (0.66, 0.92)	0.003				
Referent: Existing patient	New to registrar	0.80 (0.74, 0.88)	<0.001	0.87 (0.78, 0.96)	0.007				
Registrar Variables									
Registrar gender	Female	1.29 (0.97, 1.71)	0.081	1.30 (0.98, 1.73)	0.068				
Registrar FTE* status	Part-time	1.40 (0.99, 1.99)	0.058	1.23 (0.93, 1.63)	0.15				
Training term/post	Term 2	0.51 (0.43, 0.59)	<0.001	0.65 (0.53, 0.80)	<0.001				
Referent: Term 1	Term 3	0.19 (0.15, 0.25)	<0.001	0.31 (0.24, 0.42)	<0.001				
	Term 4	0.11 (0.07, 0.17)	<0.001	0.25 (0.14, 0.42)	<0.001				
Worked at practice previously	Yes	0.49 (0.39, 0.62)	<0.001	0.77 (0.61, 0.99)	0.038				
Registrar age	Mean(SD)	0.98 (0.96, 1.00)	0.12	0.96 (0.95, 0.98)	<0.001				
Practice Variables									
Rurality	Inner regional	1.04 (0.74, 1.47)	0.81	0.88 (0.66, 1.17)	0.38				

		Seeking assistance from a Supervisor				Seeking assistance from a book or electronic resource			
Variable	**Class**	**Univariate OR (95% CI)**	**P**	**Adjusted OR (95% CI)**	**P**	**Univariate OR (95% CI)**	**P**	**Adjusted OR (95% CI)**	**P**
Referent: Major city	Outer regional, remote, very remote	0.72 (0.53, 0.99)	0.041	0.67 (0.47, 0.95)	0.026				
RTP†	RTP 2					0.52 (0.35, 0.75)	0.001	0.52 (0.34, 0.79)	0.002
Referent: RTP 1	RTP 3					1.25 (0.84, 1.87)	0.27	1.27 (0.85, 1.89)	0.24
	RTP 4					0.72 (0.54, 0.96)	0.025	0.81 (0.60, 1.09)	0.16
Consultation Variables									
Follow-up ordered	Yes	1.88 (1.72, 2.05)	<0.001	1.33 (1.21, 1.47)	<0.001	1.33 (1.24, 1.43)	<0.001	1.17 (1.08, 1.28)	<0.001
Learning goals generated	Yes	7.19 (6.22, 8.31)	<0.001	4.86 (4.21, 5.60)	<0.001	4.20 (3.60, 4.90)	<0.001	3.94 (3.32, 4.67)	<0.001
Pathology ordered						1.19 (1.08, 1.31)	0.006	1.10 (0.98, 1.24)	0.098
Medication prescribed	Yes					1.85 (1.69, 2.04)	<0.001	1.97 (1.77, 2.19)	<0.001
Consult duration	Mean(SD)	1.06 (1.05, 1.06)	<0.001	1.05 (1.04, 1.05)	<0.001	1.02 (1.02, 1.02)	<0.001	1.01 (1.00, 1.01)	<0.001
Chronic disease	Yes	1.09 (0.99, 1.20)	0.075	0.82 (0.73, 0.93)	0.001				
Imaging ordered	Yes	1.92 (1.71, 2.16)	<0.001	1.27 (1.11, 1.45)	0.001				
Referral made	Yes	2.11 (1.92, 2.32)	<0.001	1.41 (1.25, 1.59)	<0.001				
Number of problems	Mean(SD)	1.06 (1.01, 1.11)	0.0287	0.80 (0.75, 0.86)	<0.001				

*FTE – full-time equivalent

†RTP – Regional Training Provider

Seeking information from an electronic or hard copy source

The regression models including 'anxiety', 'concern', 'reluctance to disclose to patients' and 'reluctance to disclose to physicians', respectively, are also presented in Tables 2, 3, 4 and 5. On multivariable analyses, neither 'anxiety' (OR 1.00; 95% CIs [0.99, 1.02], $p = 0.61$), nor 'concern' (OR 1.00; 95% CIs [0.98, 1.03], $p = 0.76$), nor 'reluctance to disclose to patients' (OR 0.99; 95% CIs [0.97, 1.01], $p = 0.26$), nor 'reluctance to disclose to physicians' (OR 1.03; 95%CIs [0.98, 1.09], $p = 0.20$) were significantly associated with seeking information from an electronic or hard copy source.

EFFECT SIZES

For advice- or assistance-seeking from a supervisor, Cohen's *d* for 'anxiety' and 'concern' were 0.32 and 0.21, respectively.

CONCLUSIONS

MAIN FINDINGS

We found that 'affective' responses to uncertainty ('anxiety' and 'concern'), but not 'behavioural' responses (reluctance to disclose uncertainty to patients or mistakes to physicians), were associated with registrars seeking in-consultation advice or assistance from their supervisor. The effect sizes for these associations were modest (small or small-to-moderate Cohen's *d* of 0.32 and 0.21). There were no significant associations of responses to uncertainty with seeking information from electronic or hard copy sources.

We are not aware of any previous studies examining the association of clinical uncertainty and information- or assistance-seeking.

IMPLICATIONS FOR CLINICAL AND EDUCATIONAL PRACTICE

'Affective' responses to uncertainty

'Direct supervision' is central to the registrar–supervisor educational model (Cottrell et al. 2002; Ingham et al. 2020; Partanen 2018). An initial implication of our findings is that high levels of registrar 'affective' responses to uncertainty create work for supervisors. How they interpret or manage this work is likely to be context dependent. In Australia, supervisors are engaged in care of their own patients concurrently with supervising registrars and have finite remunerated teaching time (Ingham et al. 2020).

This interpretation may suggest high levels of 'affective' responses to uncertainty may be problematic for supervisors (Sturman, Jorm & Parker 2020). However, the association may also reflect a functional response of the supervisor–registrar dyad to registrar uncertainty. Higher 'affective' responses with less tolerance of uncertainty in doctors (including trainees) are associated with less professional satisfaction (Bovier & Perneger 2007) and higher risk of burnout (Cooke et al. 2013). Lower tolerance of uncertainty has also been associated with generation of greater health costs (Allison et al. 1998) including increased test-ordering. As well as financial consequences, increased test-ordering has patient safety implications (Deyo 2002). A particular consideration concerning the uncertainty–anxiety nexus in trainee clinicians is that

anxiety and stress can impair learning (Conrad et al. 2012; Pekrun et al. 2002). Observation of interactions between registrars and supervisors suggests registrars often seek reassurance that their plans for patients are appropriate rather than seek information per se (Brown et al. 2018). Thus, if registrars seeking in-consultation supervisor assistance were to allay anxiety and concern arising from uncertainty, there would be benefits to registrars, patients and health systems. This would be especially so if these registrar–supervisor interactions educationally addressed coping with uncertainty generically (O'Riordan et al. 2011; Sturman, Jorm & Parker 2020), as well as the specific uncertainty prompting the assistance-seeking.

Our previous analyses in this registrar population have demonstrated that seeking advice or assistance from a supervisor declines markedly as registrars progress through training (Morgan et al. 2015). The decline in seeking information from an electronic or hard copy source is not as marked (Magin et al. 2015). The causes for the decline in seeking supervisor assistance are likely to include greater experience in the general practice clinical environment (Sturman, Jorm & Parker 2020) and greater knowledge levels (leading to less uncertainty). Given our findings of an association with 'affective' responses to uncertainty, any declines in levels of these responses to uncertainty might also lead to less assistance-seeking. However, a further likely cause of the decline in registrars' recourse to supervisor assistance may be 'supply-driven' rather than 'demand-driven'. The time supervisors within the Australian general practice training program are remunerated for registrar teaching decreases appreciably for each term of their registrar's training program. This creates benchmarks for approximately how much time is appropriate for registrars to require (and for supervisors to provide) at each stage of training. A schedule of reducing supervisor–registrar interaction is consistent with the need for registrars' progression to autonomy within the apprenticeship-like model (Wearne et al. 2012) in preparation for unsupervised practice (Kennedy et al. 2005). But any mismatch in individual registrars between decreases in uncertainty and/or responses to uncertainty and reduced supervisor availability could be problematic (if supervisory support does, indeed, attenuate the negative effects of responses to uncertainty on registrars and their practice behaviours).

The lack of association of responses to clinical uncertainty with information-seeking from electronic or hard copy sources contrasts with the associations of 'affective' responses we found with seeking supervisor assistance. This may reflect electronic and hard copy (non-human) resources being better at addressing clinical uncertainty itself, rather than the affective responses to uncertainty. These 'affective' responses may be best addressed within the supportive context of the registrar–supervisor 'community of practice' (Clement et al. 2015; Morrison et al. 2015)—although, for some registrars this may be more comfortable out of the patient's hearing (Sturman et al. 2020).

'Behavioural' responses to uncertainty

Reluctance to disclose uncertainty to patients and reluctance to disclose mistakes to physicians, as suggested by some qualitative research (Sturman, Jorm & Parker 2020), would be problematic in terms of patient safety (and registrar learning) if they led to registrars failing to seek appropriate advice or assistance from their supervisor (Kennedy et al. 2009; Partanen 2018). However, we found no evidence for such an association of 'reluctance' responses and seeking supervisor advice or assistance.

Addressing the problem programmatically

How specialist GP vocational training programs should address the issue of responses to clinical uncertainty is an important question. Reducing uncertainty itself is desirable. Providing access to, and training in, utilisation of clinical information sources

may reduce clinical uncertainty (Axelson et al. 2007). We have found 'affective' responses to uncertainty to be associated with inappropriate antibiotic prescribing by GP registrars (manuscript in preparation). Reducing uncertainty (e.g., by point-of-care testing) could improve antibiotic prescribing rates (Stanton, Francis & Butler 2010). However, a certain amount of uncertainty is inevitable in medicine, and helping registrars learn to manage uncertainty and their own affective responses to uncertainty is key.

It has been noted that attenuation of responses to uncertainty with time in practice, rather than formal educational intervention, may be the essential element (White & Williams 2017). Later training terms in our registrar population are certainly associated with lower scores on the PRU (Cooke, Doust & Steele 2017), but it is unclear how much of this attenuation of PRU scores may be due to educational intervention rather than amount of in-practice experience. It is certainly proposed that more functional responses to uncertainty can be taught within educational programs (Danczak & Lea 2018; Domen 2016; O'Riordan et al. 2011; Taylor et al. 2018; Wray & Loo 2015). Particular educational methodologies have been proposed to develop tolerance of uncertainty. For example, this includes small group structured exercises designed to promote reflection (Danczak & Lea 2018). Educational methodologies have also been proposed to facilitate teaching (e.g., 'tactical decision games' [Drummond et al. 2016]) and assessment (e.g., script concordance testing [Lubarsky et al. 2013]) within the context of clinical uncertainty.

GP supervisors are identified as having a vital role in education around management of clinical uncertainty (O'Riordan et al. 2011; Sturman, Jorm & Parker 2020). It has also been proposed that assessment of learners' level of responses to uncertainty (using the PRU) would facilitate education to enhance tolerance of uncertainty (Wray & Loo 2015). Even in the absence of individual–registrar-level information, our previous findings (Cooke, Doust & Steele 2017) on the demographic 'phenotypes' of registrars with higher levels of affective responses to uncertainty may inform educational approaches.

IMPLICATIONS FOR FUTURE RESEARCH

We have established a role for 'affective' responses to uncertainty in registrars electing to access in-consultation advice and assistance. Further research is required to explore the role of uncertainty within the 'social space' of the resulting registrar–supervisor interaction (Brown et al. 2018) and to define the role of supervisors in registrars' functional adaptation to clinical uncertainty (including how best to support and train supervisors in this role). There may be a role for research examining supervisors' affective responses to uncertainty and how this influences the interactions of the supervisor–registrar dyad. Research could also establish if educational interventions can reduce 'anxiety' and 'concern', and what effects this would have on the registrar–supervisor relationship, including frequency of advice- or assistance-seeking.

STRENGTHS AND LIMITATIONS

A strength of this study is the linking of valid measures of registrars' responses to uncertainty (the PRU subscales) with detailed data on registrars' in-consultation educational behaviours. The large number of relevant independent variables measured and the large sample size of consultations allowed for fine-grained multivariable analyses. The high response rate, unusual in studies of GPs (Bonevski et al. 2011), is also a strength.

A limitation is that due to a printing error, complete data for one of the four PRU subscales were available for only two rounds of data collection. A further limitation is that while we have data on how often and for what problems/diagnoses registrars seek information or assistance (and can analyse these in relation to constitutional responses to uncertainty), we do not know how satisfactorily their seeking assistance addressed their anxiety or concern in that consultation for that problem.

CONCLUSIONS

GP registrars' 'affective' responses to clinical uncertainty are associated with frequency of advice- or assistance-seeking from their clinical supervisor. The registrar–supervisor relationship may help registrars respond functionally to clinical uncertainty, but increased demands on supervisors related to 'affective' response to uncertainty also create extra work for supervisors.

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Conflict of Interest

A/Prof. Susan Wearne is also an employee of the Department of Health. The views expressed in this article are her own and are not necessarily those of the Australian Government.

The other authors report no conflicts of interest.

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THE EFFECT OF RURAL PLACEMENTS ON FUTURE RURAL GENERAL PRACTICE

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Abstract

Background: Providing health care to rural populations is a major issue in Australia. Disease burden and health risk factors increase with remoteness, but the access to appropriate service decrease. The introduction of Rural Clinical Schools, rural locations for internship and residency, and decentralisation of the Australian General Practitioner Training Program aim to address this disparity. This systematic review aimed at determining if rural placements throughout medical training are associated with future rural general practice in Australia.

Methods: Medline (Ovid), Pubmed, CINAHL and Science Direct were searched for the period January 2000 to July 2019. Included studies related specifically to rural general practitioners in Australia and studies were excluded if they reported only on intention to practice rurally. Evidence was assessed using the Standards for Quality Improvement Reporting Excellence Guidelines.

Results: Eleven articles met the inclusion criteria. Three studies examined the effect of rural placements in medical school on future rural general practice. Three studies looked at placements as a junior doctor on future rural general practice. Four studies looked at the effect of rural general practitioner training on future rural general practice. One study reported on the effect of rural placements during both medical school and junior doctor years on future rural general practice. The studies supported an association between rural placements and future rural general practice, particularly for Australian born doctors, Australian graduates and individuals from rural backgrounds.

Discussion: This review suggests that rural placements during medical training increase the likelihood of future rural general practice. The interplay of personal and professional life influence whether rural intention is sufficient to result in rural practice. Addressing human factors that influence rural practice will contribute to achieving equitable rural health care.

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Keywords: rural, general practitioner, training, recruitment, retention

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INTRODUCTION

The disparity between health outcomes and access to medical services between urban and rural Australia is an ongoing area of health care concern (AIHW 2017). The 29% of Australians who live outside major cities (AIHW 2017) have higher rates of health risk factors and chronic disease compared to people in major cities (AIHW 2018). Disease burden and age-standardised mortality rates increase with remoteness (AIHW 2017). Rural populations rely more on general practitioner services as a result of reduced access to local specialists (Department of Health 2016). General practitioner supply is maldistributed across different remoteness areas, with the number of general practitioner services provided per capita decreasing with remoteness (AIHW 2019). Therefore, the issue of providing adequate health care to rural and remote populations is a major issue in Australia.

In response to these concerns, rural placement pathways have been introduced into different levels of medical education across Australia in recent decades. These include the introduction of Rural Clinical Schools for university medical students (Eley et al. 2012), providing rural locations for internship and residency (Dunbabin, McEwin & Cameron 2006) and decentralisation of the Australian General Practitioner Training Program (Kitchener 2019). In their 2018 review, O'Sullivan et al. showed that medical school rural immersion programs have a positive effect on rural practice immediately after graduation and in early clinical practice. Parlier et al. (2018) conducted a narrative review of factors involved in recruiting and retaining rural primary care physicians across Australia, Canada and the United States. They identified that rural exposure during medical school and residency contribute towards general practitioners choosing rural practice (Parlier et al. 2018).

This systematic review aims to determine if rural placements in medical school, internship and residency and registrar training are associated with future rural general practice in an Australian context.

METHODS

SEARCH STRATEGY

A systematic review of the literature was conducted for the period January 2000 to July 2019. The year 2000 was selected as the search start date based on the establishment of the Rural Undergraduate Support and Coordination program in 1997 and the Rural Medical Workforce Strategy in 2001. Terms relating to the effect of rural general practitioner training programs and rural placements during medical training on future rural general practice were searched as keywords (appearing in the title, abstract subject and keyword fields) and mapped against Medical Subject Headings (MeSH) keywords (Appendix 1). The electronic databases used were Medline (Ovid), Pubmed, CINAHL and Science Direct. Bibliographies of relevant articles were also hand searched.

INCLUSION AND EXCLUSION CRITERIA AND CRITICAL APPRAISAL

Papers identified in database searches were exported to Rayyan for screening. Duplicates were removed, then title and abstract screening against inclusion criteria

was conducted by one reviewer (AM). Full text screening was completed independently by two reviewers (AM, KD), with conflicts resolved by consensus. Studies were included in this review if they met the following criteria: related specifically to the recruitment or retention of general practitioners, presented findings from primary research, were from Australian data and were available in English. Qualitative and quantitative studies were included. Studies were excluded if they reported on participants' intention to practice rurally rather than providing data on actual rural general practice.

The included studies were summarised using a piloted and revised data extraction form, including a combination of the following items: study design, data type, sample size, population, placement type and results. The strength of evidence for each of the studies included for review was assessed using the Standards for Quality Improvement Reporting Excellence Guidelines (Ogrinc et al. 2016) (Appendix 2).

SYNTHESIS

Study characteristics and critical appraisal outcomes were collated for comparative purposes (see Table 1). Quantitative results and qualitative findings concerning the effects of rural placements on recruitment and retention of rural general practitioners were grouped according to the timing of rural placement during medical training. The methods and reporting in this systematic review were completed in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al. 2009) (Appendix 3).

RESULTS

The electronic database search identified a total of 953 studies (see Figure 1). Three additional articles were identified while hand-searching bibliographies. Of these studies, 404 duplicates were removed, leaving 552 studies for screening title and abstract. Four hundred and eighty-eight studies were excluded based on title and abstract, resulting in 64 studies for full text assessment. A total of 11 articles remained that met the inclusion criteria of this review (Eley et al. 2012; Dunbabin, McEwin & Cameron 2006; Kitchener 2019; Kwan et al. 2017; Playford, Ng & Burkitt 2016; Wilkinson et al. 2003; Lewis et al. 2016; Peach, Trembath & Fensling 2004; McGrail, Russell & Campbell 2016; Robinson & Slaney 2013; Wearne et al. 2010).

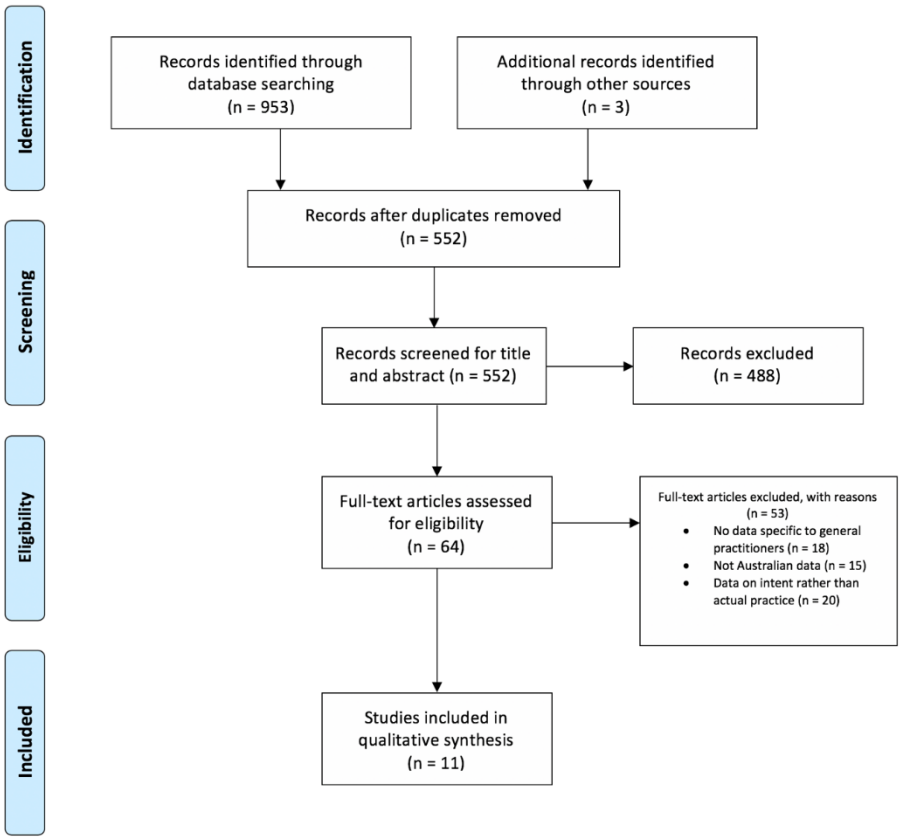

Figure 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses Flowchart

Studies were grouped according to the time in training at which the rural placement occurred. Three studies examined the effect of rural placements in medical school on future rural general practice (Eley et al. 2012; Kwan et al. 2017; Playford, Ng & Burkitt 2016). Three studies looked at placements as a junior doctor on future rural general practice (Dunbabin, McEwin & Cameron 2006; Lewis et al. 2016; Peach, Trembath & Fensling 2004). Four studies looked at the effect of rural general practitioner training on future rural general practice (Kitchener 2019; McGrail, Russell & Campbell 2016; Robinson & Slaney 2013; Wearne et al. 2010). One study reported on the effect of rural placements during both medical school and during junior doctor years on future rural general practice (Wilkinson et al. 2003). The study characteristics and findings of these studies are summarised in Table 1. The studies were assessed using the Standards for Quality Improvement Reporting Excellence Guidelines (Ogrinc et al. 2016), and, overall, they partially achieved the guidelines, indicating low to moderate study quality (Appendix 2).

Table 1. Summary of studies

Study	Study Type	Population	Placement Type	Results
Eley et al. (2012)	Longitudinal mixed methods	UQ RCS	Medical School	40% working outside major city GP most frequent specialty choice (24%) Encouraged 70% of students towards rural medicine
Dunbabin et al. (2006)	Survey	NSW RMO Cadetship	Internship/Residency	43% working rurally Practice location influenced career choice (p<0.01)
Kitchener et al. (2019)	Operational audit	AGPT QLD	GP Training	55% Practising in rural locations Significant (p<0.01) increase in retention compared to before AGPT program(OR = 2.1; 95%CI [1.2-3.7])
Kwan et al. (2017)	Cross sectional cohort	UQ RCS	Medical School	Independent and duration dependent predictor of rural GP Additive effect of rural background
Playford et al. (2016)	Survey	UWA RCS	Medical School	17% practising rurally Majority general practitioners Equivalent for urban and rural origin alumni
Wilkinson et al. (2003)	Case-control	National GP database	Medical school and internship/residency	Rural GPs more likely to report rural medical school training (OR = 1.61; 95%CI [1.32-1.95]) and rural internship/residency training {OR = 3.14; 95%CI [2.57-3.83]) Increased duration increased likelihood of GP

Study	Study Type	Population	Placement Type	Results
Lewis et al. (2016)	Survey	NSW RMO Cadetship	Internship/Residency	GP most popular specialty choice (43%) 53% practising rurally Practice location influenced career choice (p<0.01) 44% indicated cadetship influenced decision
Peach, Trembath & Fensling (2004)	Retrospective follow-up	Ballarat Base Hospital Interns	Internship/Residency	BBH interns more likely to be practising as GPs in non-metropolitan areas than were interns from metropolitan hospitals (p<0.01, 95% CI [17%-45%])
McGrail, Russell & Campbell (2016)	Cohort	Nationwide	GP Training	Rural training pathway significantly associated with subsequent rural practice Odds of rural practice decreased with time, but retained across the five years
Robinson & Slaney (2013)	Survey	Bogong GP Registrars	GP Training	42% in rural practice, 32% in Bogong region Significant relationship between country of birth and remaining in rural practice (χ^2 = 13.68, p<0.01)
Wearne et al. (2010)	Survey	Remote Training Graduates	GP Training	81% currently working RRMA3 or above 47% currently working RRMA4 or above 41% currently working RRMA5 or above 20% currently working RRMA6 or above

RURAL PLACEMENTS AT UNIVERSITY PREDICT RURAL PRACTICE

Four studies reported on the effect of rural placements during medical school on future rural general practice (Eley et al. 2012; Kwan et al. 2017; Playford, Ng & Burkitt 2016; Wilkinson et al. 2003). Study types included a longitudinal cohort study (Playford, Ng & Burkitt 2016), a longitudinal mixed-methods sequential exploratory design (Eley et al. 2012), a cross-sectional cohort study (Kwan et al. 2017) and a case-control study (Wilkinson et al. 2003). Overall, the studies supported an association between rural placements during university and future practice as a rural general

practitioner. Two of these studies included a control group with which to compare rates of rural general practice (Kwan et al. 2017; Wilkinson et al. 2003). Kwan et al. (2017) reported that attendance at a rural clinical school (RCS) to be an additive predictor of future rural general practice, with higher odds of rural practice after one year (OR = 2.85; 95% CI [1.77–4.58]) and two years (OR = 5.38; 95% CI [3.15–9.20]) compared to those attending a metropolitan clinical school, independent of whether students had a rural background. The highest association between rural training and rural practice was 84% for general practitioners who had both a rural background and two years attending an RCS (Kwan et al. 2017). Wilkinson et al. (2003) found rural general practitioners were more likely to report rural placements during university (OR = 1.61; 95% CI [1.32–1.95]) than urban general practitioners.

Survey data from RCS graduates was reported in two studies that did not include a control group. Seventeen per cent of RCS graduates from Western Australia (Playford, Ng & Burkitt 2016) and 40% of RCS graduates from Queensland (Eley et al. 2012) were practising rurally, and general practice was the most commonly reported specialty (Eley et al. 2012; Playford, Ng & Burkitt 2016). Follow-up interviews with 29 participants revealed that rural experience in the RCS was a primary driver of influence on early career decisions but was often overridden by personal and family motivators (Eley et al. 2012). New graduates and doctors in training are in an age range where they are commonly confronted with major life decisions (Eley et al. 2012), and these affect career decisions.

RURAL PLACEMENTS DURING INTERNSHIP AND RESIDENCY PREDICT RURAL PRACTICE

Four studies reported on the effect of rural placements during internship and residency (Dunbabin, McEwin & Cameron 2006; Wilkinson et al. 2003; Lewis et al. 2016; Peach, Trembath & Fensling 2004). Study types included a case-control (Wilkinson et al. 2003), retrospective follow-up (Peach, Trembath & Fensling 2004) and two surveys (Dunbabin, McEwin & Cameron 2006; Lewis et al. 2016). Although only two out of the four studies presented control group data (Wilkinson et al. 2003; Peach, Trembath & Fensling 2004), overall rates of rural general practice were promising. In a retrospective follow-up, 44% of rural interns had continued to become general practitioners outside metropolitan areas compared to 13% of metropolitan interns (difference, 31%; 95% CI [17%–45%]; $p < 0.001$) (Peach, Trembath & Fensling 2004). Rural general practitioners were more likely to report having rural training as junior doctors (OR 3.14; 95% CI [2.57–3.83]), with the likelihood of working as a rural general practitioner increasing with time spent rurally during training (OR 10.52; 95% CI [5.39–20.51]) (Wilkinson et al. 2003).

Two studies reported on data from the Rural Resident Medical Officer Cadetship Program (Dunbabin, McEwin & Cameron 2006; Lewis et al. 2016). When cadets were followed up in these studies, 42% (Dunbabin, McEwin & Cameron 2006) to 53% (Lewis et al. 2016) of cadets were working in a rural area. The most common choice of vocational training was general practice (Lewis et al. 2016), and 58% of those practising rurally were general practitioners (Dunbabin, McEwin & Cameron 2006).

A notable finding in two studies was the effect of practice location on career choice, with those practising rurally tending towards general practice than other specialties, $p < 0.001$ (Dunbabin, McEwin & Cameron 2006; Wilkinson et al. 2003).

RURAL PLACEMENTS DURING REGISTRAR TRAINING PREDICT RURAL PRACTICE

Four studies reported on the effect of rural placements during general practitioner registrar training on future rural practice (Kitchener 2019; McGrail, Russell & Campbell 2016; Robinson & Slaney 2013; Wearne et al. 2010). Studies included two surveys (Robinson & Slaney 2013; Wearne et al. 2010), an operational audit (Kitchener 2019) and a cohort study that compared the retention rates of rural training registrars to metropolitan trainees (McGrail, Russell & Campbell 2016). They reported that 74–91% of rural training/rural origin and 87–95% of metropolitan training/metropolitan origin groups remained in their location type for the five years post-training (McGrail, Russell & Campbell 2016). The cohorts with mixed geographical combinations (rural training/metropolitan origin and metropolitan training/rural origin) tended to remain in the training location type initially and gradually move towards their origin type over the following years (McGrail, Russell & Campbell 2016). Rural general practitioner training was significantly associated with future rural practice when compared to metropolitan training for both rural origin (OR 159; 95% CI, 45–558, $p < 0.05$;) and metropolitan origin (OR 68; 95% CI, 26–175, $p < 0.05$) groups (McGrail, Russell & Campbell 2016). This effect decreased with time but remained significant (McGrail, Russell & Campbell 2016).

The remaining studies presented rates of retention from rural trainees only. Results ranged from 42% (Robinson & Slaney 2013) to 55% (Kitchener 2019) retained in rural general practice. Thirty-two per cent remained in their area of rural training (Robinson & Slaney 2013). Australian medical program graduates were more likely to be practising rurally than international graduates (Kitchener 2019), and Australian born doctors were more likely to be practising rurally than overseas-born doctors ($\chi 2 = 13.68$, $p < 0.001$) (Robinson & Slaney 2013). Wearne et al. (2010) presented retention rates for different categories or rurality. Overall retention rates were 81% in RRMA 3 or above, 47% in RRMA 4 or above, 41% in RRMA 5 or above, 20% in RRMA 6 or above and 16% in RRMA 7 (Wearne et al. 2010). Participants in this study all felt that the Remote Vocational Training Scheme had prepared them to some degree for rural practice (Wearne et al. 2010).

DISCUSSION

The results of this systematic review indicate that there is preliminary evidence that exposure to rural placements during medical training is associated with future rural general practice. This finding was consistent across rural placements while at university, during internship and residency and during registrar training. Australian born doctors and Australian medical graduates were reported as being more likely to be rural general practitioners following rural placements than overseas-born or international medical graduates (Kitchener 2019; McGrail, Russell & Campbell 2016; Robinson & Slaney 2013). The effect of rural placements also appears to be enhanced by an individual or their spouse or partner being of rural background (Lewis et al. 2016; McGrail, Russell & Campbell 2016; Robinson & Slaney 2013). Other life decisions that were reported to substantially affect practice location were opportunities for children and proximity to family. These factors may prevent doctors who intended on practising as rural general practitioners from being able to do so (Eley et al. 2012; Robinson & Slaney 2013).

This review lends further evidence in support of the pipeline metaphor (Murray & Wronski 2006), which suggests a sequence of rurally orientated programs linking the

stages of medical training from medical school through to completion of specialist training and beyond. Provision of training opportunities also contributed towards a tendency toward rural general practice (Eley et al. 2012; Dunbabin, McEwin & Cameron 2006; Wilkinson et al. 2003; Robinson & Slaney 2013) and this tendency was further amplified among those of rural origin (Kwan et al. 2017; Wilkinson et al. 2003; Lewis et al. 2016; McGrail, Russell & Campbell 2016). The results of this study are consistent with those of a 2018 review (O'Sullivan et al. 2018), which also suggested rural immersion during medical school was associated with rural practice in career but lacked control data. Our findings also align with a multidimensional theoretical model of rural primary care physician recruitment that includes rural background, rural exposure, training opportunities and family receptivity to a rural location (Parlier et al. 2018).

Further research involving nationally delivered programs and randomisation of participants to control, as well as rural training groups, would be beneficial to inform policy decisions, but this is unlikely to be feasible. Given the different levels of training in which rural placements can be undertaken, it would also be beneficial to investigate which of these individually and in combination have the greatest effect on rural retention. The issues commonly raised in qualitative analysis, such as family and the effect of personal factors on rural practice, would also benefit from undergoing quantitative exploration with larger participants so that targeted approaches can be introduced and assessed. It would also be interesting to investigate whether rurally trained doctors are more likely to move to rural localities to practice later in their careers when family circumstances may have changed.

LIMITATIONS OF THIS STUDY AND QUALITY OF INCLUDED STUDIES

While this review indicates that rural placements during medical training increase the likelihood of future rural general practice, there were limitations to the review and included studies.

The majority of the studies were observational and lacked a control group. This limitation was reflected in the low to moderate study quality ratings of included studies. As a result, it is difficult to determine if the reported rates of rural practice are due to rural placement during training or other contributing factors. Included studies were susceptible to self-selection bias, as participants who chose rural placements may be more likely to practice rurally regardless of exposure during training. Methodological rigour could be increased in future studies by controlling for known confounders so that the effect of rural placements can be isolated.

While the methods and reporting of this systematic review adhered to the PRISMA guidelines, the generalisability of findings beyond Australia are somewhat limited due to country-specific training pathways. Due to study heterogeneity, it was not possible to further consolidate results or conduct meta-analyses.

CONCLUSIONS AND IMPLICATIONS

Rural placements during medical training increase the likelihood of future rural general practice. The issue of sustaining a rural general practice workforce is complex. Positive experiences and intentions from rural placements can be outweighed by personal and professional factors that thwart intentions for future rural practice. Rural general practice is vital to improving health service delivery in underserved rural and remote populations. A model for incorporating rural placements in all stages of

medical training could improve rural general practitioner recruitment and retention and redress this imbalance.

Acknowledgements

Conflict of Interest

The authors have no conflicts of interest to declare

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Student perceptions of MASK-ED™ simulation in physiotherapy education: A mixed-methods cohort study

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Abstract

Introduction*: MASK-ED™ simulation is a novel educational approach in which a clinically experienced educator dons a high-fidelity silicone mask and plays the role of a patient. MASK-ED™ simulation has not yet been evaluated in physiotherapy education. The purpose of this study was to describe physiotherapy students' perceptions of the value of MASK-ED™ simulation and its effect on perceived preparedness for clinical placements.*

Methods: *Design: Mixed-methods cohort study, using questionnaires and focus groups over 12 months.*

Setting: Entry-level Physiotherapy course at an Australian university.

Participants: Eighty-one physiotherapy students enrolled in their first unit of cardiorespiratory Physiotherapy.

Intervention: MASK-ED™ simulation in five tutorials across two semesters, practising skills including history-taking and secretion clearance techniques.

Main outcome measures: Questionnaires pre- and post clinical placement; thematic analysis of focus group data following clinical placement exposure.

Results*: One hundred per cent of students described MASK-ED™ as helpful in developing manual handling skills (mean 3.8/4.0, SD 0.4), establishing rapport and empathy with patients (mean 3.7/4.0, SD 0.5), and communicating with an older patient (mean 3.4/4.0, SD 0.6). Following exposure to clinical placement, students perceived MASK-ED™ as slightly less helpful in enhancing readiness for clinical placement (MD –0.20 out of 5, 95% CI –0.54 to –0.04) compared with before clinical exposure. However, they still considered MASK-ED™ somewhat helpful (mean 3.2/4.0). Three themes were identified: the safety of the learning environment with MASK-ED™, the importance of communication in MASK-ED™ simulation and the performative aspects of MASK-ED™ simulation. All three themes were underpinned by the importance of authenticity in learning and practice.*

Conclusions: Physiotherapy students perceive MASK-ED™ simulation as valuable in enhancing learning relating to clinical practice, particularly prior to clinical placement.

Keywords: education, simulation, physiotherapy (techniques)

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INTRODUCTION

Like many health students, physiotherapy students must learn a wide range of skills for effective clinical practice. The clinical skills required in physiotherapy are extensive and include a range of communication strategies, clinical reasoning skills, manual techniques and exercise strategies. Simulation is an effective approach for enhancing learning across health professions (Barsuk et al. 2009; Fraser et al. 2009; Sturm et al. 2008).

Simulation often mimics the clinical environment and can encompass various activities, from role play to interactive computer games to high-fidelity mannequins (Jeffries 2005). MASK-EDTM is a novel simulation technique where expert clinicians don a high-fidelity silicone mask to play the role of an older patient, allowing students to interact with a life-like older 'patient' (Reid-Searl et al. 2011; Reid-Searl et al. 2012). MASK-EDTM simulation allows the experienced clinician beneath the mask to steer the interaction with the student, capitalising on spontaneous teaching moments and then debriefing with the student afterwards (McAllister, Levett-Jones et al. 2013).

The perception of MASK-EDTM simulation has been evaluated in nursing students, appearing to increase confidence and preparedness for clinical practice while decreasing anxiety (Reid-Searl et al. 2012). Kable et al. (2013) compared MASK-EDTM with simulation using live actors and high-fidelity mannequins in nursing students. They found that students perceived MASK-EDTM to be more effective for learning and preparedness for clinical practice and significantly more authentic in relation to clinical practice than other forms of simulation. However, the utility of MASK-EDTM in physiotherapy has not yet been evaluated.

In our university, we have five years' experience using MASK-EDTM. 'Joyce', our MASK-EDTM character, is a 76-year-old lady with pulmonary fibrosis (Figure 1). Joyce has a carefully curated past medical history, including hypertension, osteoporosis and arthritis, as well as a realistic social history. In line with MASK-EDTM methodology, each component of Joyce's story is linked with the cardiorespiratory physiotherapy unit's learning objectives (Reid-Searl et al. 2011). Importantly, the educator behind the mask has more than 15 years' experience working in the hospital setting as a cardiorespiratory physiotherapist and over 10 years' experience in clinical education. Thus, the educator can steer interactions with physiotherapy students and prompt spontaneous and relevant learning more readily than a trained actor. Although student surveys have indicated that students enjoy MASK-EDTM (unpublished data), we have not yet ascertained which specific aspects of skill development students

perceive to be enhanced by this form of simulation. We have also not yet explored the relationship between classroom MASK-EDTM exposure and perceived readiness for clinical placement.

Figure 1. The MASK-ED™ educator 'Joyce' in simulation with a physiotherapy student

Therefore, this study aimed to explore students' perceptions of the experience of MASK-ED™ in a physiotherapy classroom context, including perceptions of whether MASK-ED™ enhanced specific aspects of learning. Further, we sought to ascertain whether MASK-ED™ affects students' perceptions of readiness for clinical placement, particularly in a hospital-based setting where students encounter many older patients.

METHODS

DESIGN

A mixed-methods cohort study design was used to collect quantitative data using rating scales within questionnaires and qualitative data through focus groups. Mixed-methods research allows the research question to be answered through both quantitative and qualitative data (Creswell 2009). A qualitative descriptive approach underpinned the study (Braun & Clarke 2008; Cooper & Endacott 2007).

PARTICIPANT RECRUITMENT

Participants were recruited from students enrolled in a four-year undergraduate physiotherapy program and a two-year graduate-entry physiotherapy program. These students had no previous exposure to MASK-ED™ simulation or other forms of simulation or clinical placement. All students enrolled in their first cardiorespiratory physiotherapy unit of study were invited to participate. Students were approached at the end of a tutorial and given verbal and written information about the study. Subsequently, all students who completed a hospital-based placement were invited to participate in the focus groups. The study was conducted in accordance with the university's human research ethics committee, and all participants provided written informed consent.

SETTING

This study was undertaken in an Australian university. Participants were enrolled in their first cardiorespiratory physiotherapy unit of study, which primarily addresses the physiotherapy assessment and treatment of basic medical and surgical conditions. There is a strong emphasis on practical skills such as mobilising patients with multiple attachments (i.e., drips and drains) following surgery, and secretion clearance techniques such as postural drainage, percussion and positive expiratory pressure therapy. This unit of study occurs prior to any clinical placements. Students are required to complete five different clinical placements during the degree, not all of which are hospital based (i.e., some occur in community settings, such as private practice). Allocation to these clinical placements is dependent on availability, and not all students have a hospital-based placement at the same time. As such, only a proportion of students complete a hospital-based clinical placement immediately after the cardiorespiratory physiotherapy unit of study.

INTERVENTION

Students were exposed to the MASK-ED™ character Joyce during five tutorials (three tutorials in Semester 2 2015 and two tutorials in Semester 1 of 2016), resulting in five separate simulation scenarios (Table 1). Students were provided with the relevant medical history, observations and medical reports, as well as Joyce's most recent physiotherapy assessment findings. In groups of four, students had the opportunity to either treat Joyce directly or play the supervisors' role. Students had

10 minutes in which to provide treatment. Each tutorial also included group debriefing, reflection and peer feedback after the simulation scenario.

Table 1. Summary of simulation scenarios undertaken by students during the intervention

Exposure to MASK-ED™ simulation	Simulation scenario
Exposure 1	Joyce arrived in the classroom to meet the students, ostensibly to give them the opportunity to ask questions about her health. The students were exposed to the challenging tangential nature of history-taking with a talkative patient who likes to ask questions of their own.
Exposure 2	Students encountered Joyce in a mock hospital ward scenario, where she had been admitted with community-acquired pneumonia, on a background of pulmonary fibrosis. Students were required to implement an evidence-based intervention for Joyce.
Exposure 3	Students encountered Joyce in another mock hospital ward scenario, where she had undergone major abdominal surgery. Students were required to implement an evidence-based intervention for Joyce.
Exposure 4	Joyce arrived in the classroom as the students were learning how to implement a respiratory questionnaire (the Chronic Respiratory Disease Questionnaire), so they practised with Joyce.
Exposure 5	Joyce arrived in the classroom as the students were learning motivational interviewing skills, and she agreed to be interviewed in front of the class by the classroom tutor.

Data collection

The first questionnaire was completed by all participants at the end of a tutorial, following their third exposure to MASK-ED™ simulation. The second questionnaire was completed only by students who had completed their first hospital-based clinical placement (Figure 2b). This was also completed at the end of a tutorial. The questionnaires were distributed and collected by a researcher who was not involved in teaching the cardiorespiratory unit or in the provision of MASK-ED™ simulation to reduce bias. Students who did not want to participate were allowed to leave the room. The first questionnaire aimed to determine participants' perception of MASK-ED™ simulation in relation to in-class learning before participating in any clinical placements. This questionnaire contained 15 items rated from 0–4 (0 = 'very unhelpful' and 4 = 'very helpful'). The second questionnaire aimed to determine participants' perception of MASK-ED™ simulation in preparing them for a hospital-based clinical placement; it was collected after they had completed a hospital-based clinical placement. The eight items relating to clinical skills were repeated in both questionnaires (Figure 2a).

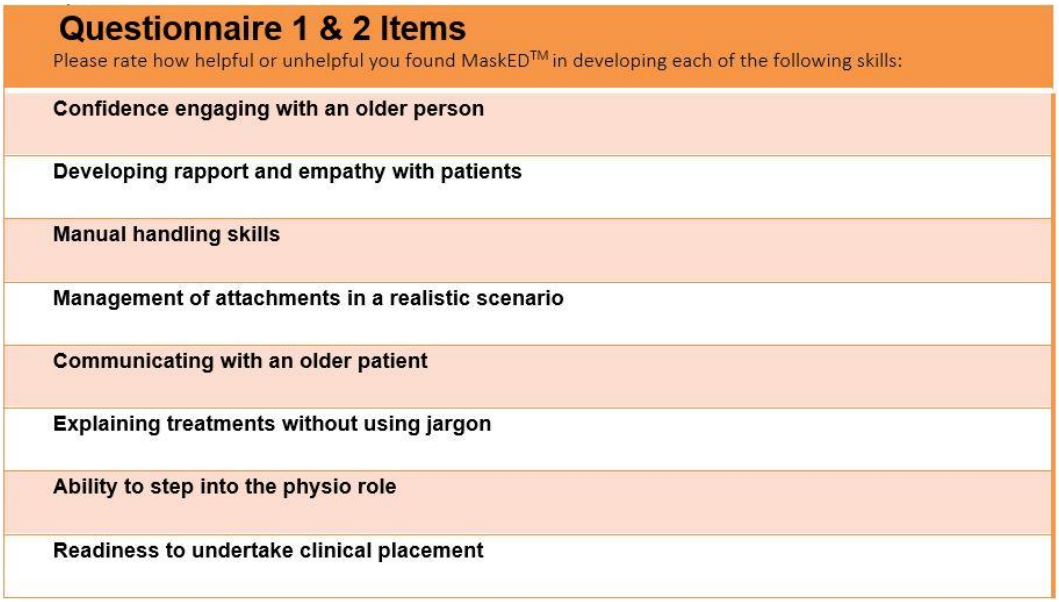

Figure 2a. Questionnaire items

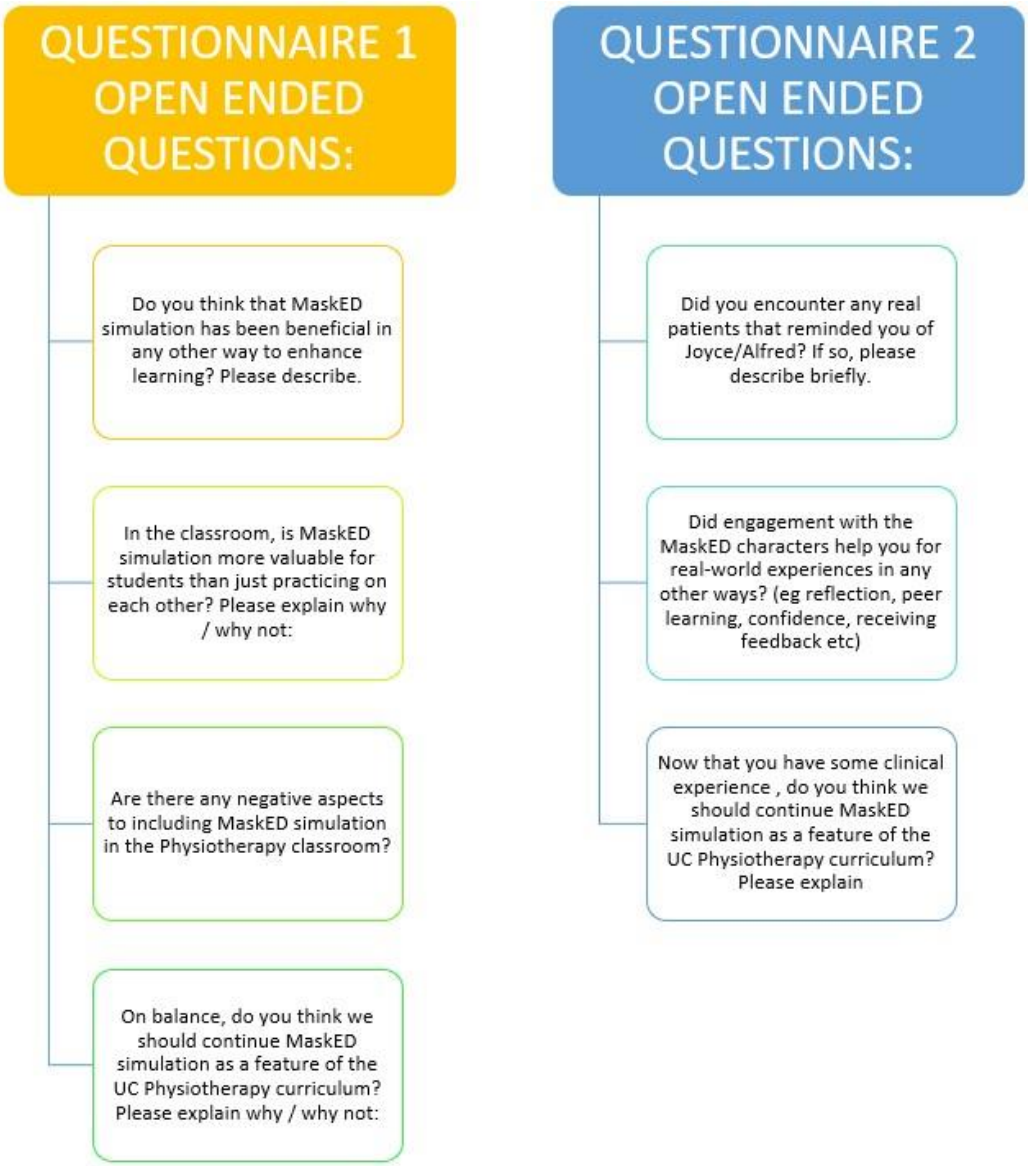

Figure 2b. Questionnaire questions aimed at determining participants' perception of MASK-ED™ simulation

All students who completed a hospital-based clinical placement were invited to participate in the focus groups. Focus groups aimed to include 10 students and were conducted at the university within a month of students completing their clinical placement. They were facilitated by a researcher who was experienced in running focus groups and involved in teaching some physiotherapy units. Focus groups were audio-recorded for transcription. Students were asked open-ended, predetermined questions (Figure 3) developed based on responses to the first two questionnaires and

previous literature on MASK-ED™ (Kable et al. 2013; McAllister, Levett-Jones et al. 2013; Reid-Searl et al. 2011; Reid-Searl et al. 2012).

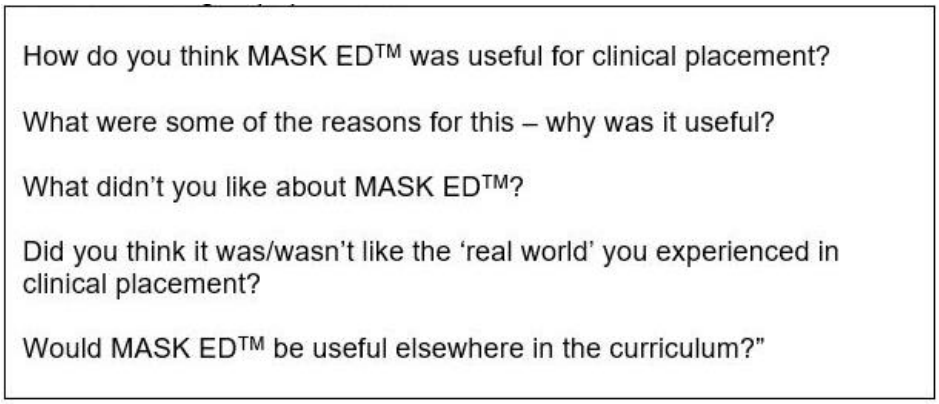

Figure 3. Focus group questions

Data analysis

Quantitative and qualitative data were analysed separately. Quantitative data are presented as mean (SD) and 95% confidence intervals. The focus group discussions were professionally transcribed verbatim and checked for accuracy by the focus group facilitator to minimise bias. The transcripts were then analysed thematically using an inductive approach. Two research team members independently read and listened to all audio-recorded qualitative data and coded the transcripts, identifying potential themes. A further phase of defining and analysing themes was undertaken, including establishing a coherent thematic map that was retested against original data extracts (Braun & Clarke 2008). These final themes were then discussed and verified by all researchers until consensus was reached.

RESULTS

FLOW OF PARTICIPANTS, THERAPISTS THROUGH THE STUDY

Eighty-one students were invited to participate in the study, and all initially consented to participate (Figure 4). All 81 students completed the first questionnaire, and 48 students (all those who had completed a hospital-based clinical placement) completed the second questionnaire. In total, 35 students took part in four focus groups.

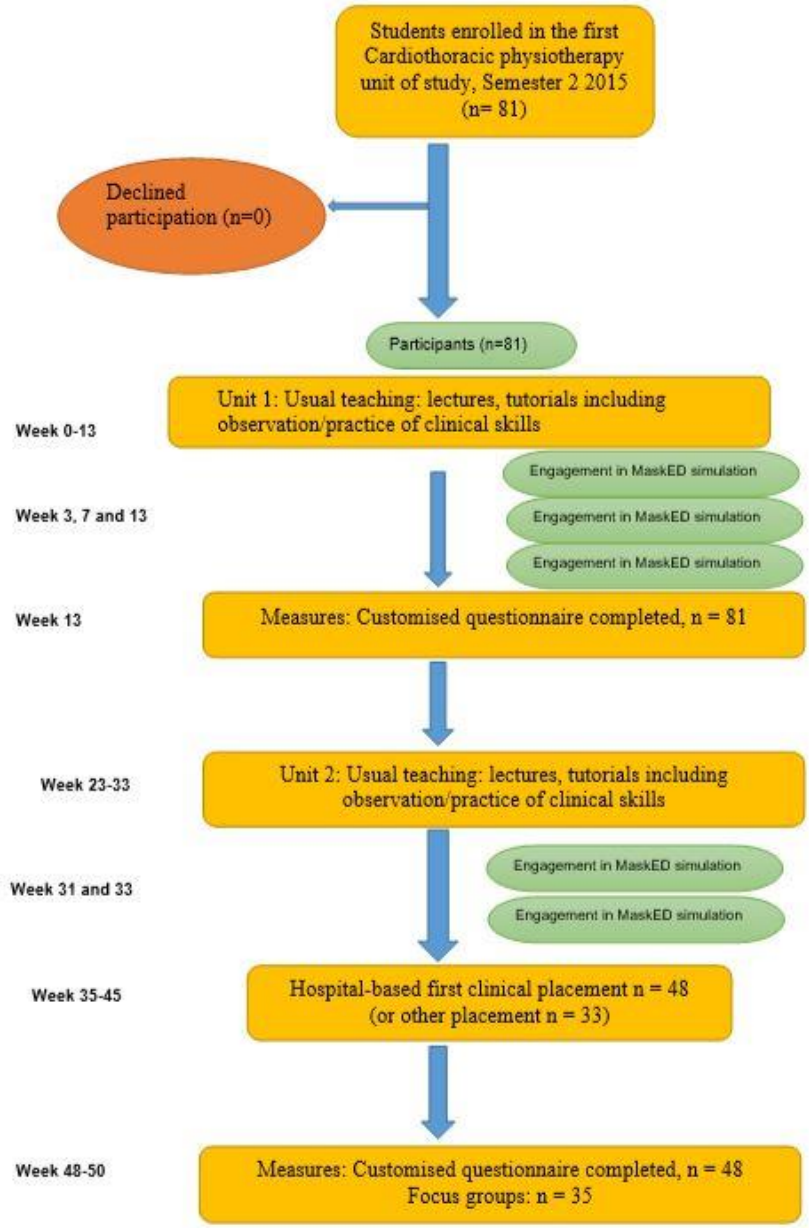

Figure 4. Number of participants throughout the study

Perception of MASK-ED™ prior to clinical placement

Quantitative results are presented in Table 2. One hundred per cent of students described MASK-ED™ as helpful in improving their ability to apply theory to practice, engage with the material covered in the unit, remember practical aspects of the lesson, prepare for practical exams, self-reflect and learn from mistakes in a safe environment, receive effective feedback and utilise peer learning.

Table 2. Mean (SD) perception before clinical placement and after clinical

placement and mean (95% CI) difference between perception before and after clinical placement.

Criteria (0–4) **0 = very unhelpful** **4 = very helpful**	**Score before clinical placement, Mean (SD)** **(n = 81)**	**Score after clinical placement, Mean (SD)** **(n = 48)**	**Difference between scores (after clinical minus before clinical), Mean (95% CI)** **(n = 48)**	**p value**
Interest/engagement with the material covered in the unit	3.59 (0.61)			
Ability to apply theory to practice	3.66 (0.57)			
Self-reflection and learning from mistakes in a safe environment	3.80 (0.43)			
Potential to learn from other students' experiences (peer learning)	3.66 (0.57)			
Ability to give/receive feedback	3.55 (0.59)			
Readiness to undertake the practical exam	3.55 (0.61)			
Remembering practical lessons from the classroom	3.65 (0.57)			
Confidence engaging with an older person	3.52 (0.55)	3.40 (0.64)	–0.13 (–.36 to 0.12)	0.391
Developing rapport and empathy with patients	3.71 (0.50)	3.47 (0.58)	–0.24 (–0.46 to –0.02)	**0.029***
Manual handling skills	3.85 (0.41)	2.69 (0.80)	–0.17 (1.42 to 0.9)	**0.000***
Management of attachments in a realistic scenario	3.81 (0.39)	3.27 (0.82)	–0.54 (–0.80 to –0.28)	**0.000***
Communicating with an older patient	3.44 (0.62)	3.31 (0.55)	–0.13 (–0.37 to 0.11)	0.228
Explaining treatments without using jargon	3.52 (0.62)	3.46 (0.62)	–0.06 (–0.31 to 0.19)	0.574
Ability to step into the physio role	3.79 (0.46)	3.08 (0.85)	–0.71 (–0.99 to –0.43)	**0.000***
Readiness to undertake clinical placement	3.46 (0.62)	3.17 (0.63)	–0.29 (–0.54 to –0.04)	**0.021***

One hundred per cent of students perceived that MASK-ED^{TM} was helpful for clinical skills. This included increasing their confidence in engaging with an older person; developing rapport, empathy and communication skills; implementing manual handling skills; managing attachments (e.g., drips and drains in a post-surgical patient);

and a sense of preparedness for their physiotherapist role in a clinical placement setting. Students perceived MASK-ED™ to be most helpful in developing manual handling skills (mean = 3.85/4.0). Students also reported that MASK-ED™ was somewhat helpful in developing their self-perceived readiness for clinical placement (mean = 3.5/4.0).

Perception of MASK-ED™ after clinical placement

Relative to pre-placement ratings, there was a significant decrease in students' perception of the ability of MASK-ED™ simulation to develop rapport and empathy with patients (MD –0.24 out of 4, 95% CI –0.46 to –0.02), manual handling skills (MD –1.16 out of 4, 95% CI –1.42 to –0.9), management of attachments in a realistic scenario (MD –0.54 out of 4, 95% CI –0.80 to –0.28), the ability to step into the physio role (MD –0.71 out of 4, 95% CI –0.99 to –0.43) and readiness to undertake clinical placement (MD –0.20 out of 4, 95% CI –0.54 to –0.04). There was no difference in students' pre- and post-clinical placement perception of the ability of MASK-ED™ simulation to contribute to confidence in engaging with older persons, communicating with older patients and explaining treatments without using jargon.

Focus groups

Analysis of the qualitative data from the focus groups resulted in the identification of three distinct themes: 1) the safety of the learning environment; 2) the importance of communication skills; and 3) the performative aspect of the simulation experience. These three themes were all underpinned by the concept of authenticity (Figure 5) and each will be explored through that lens.

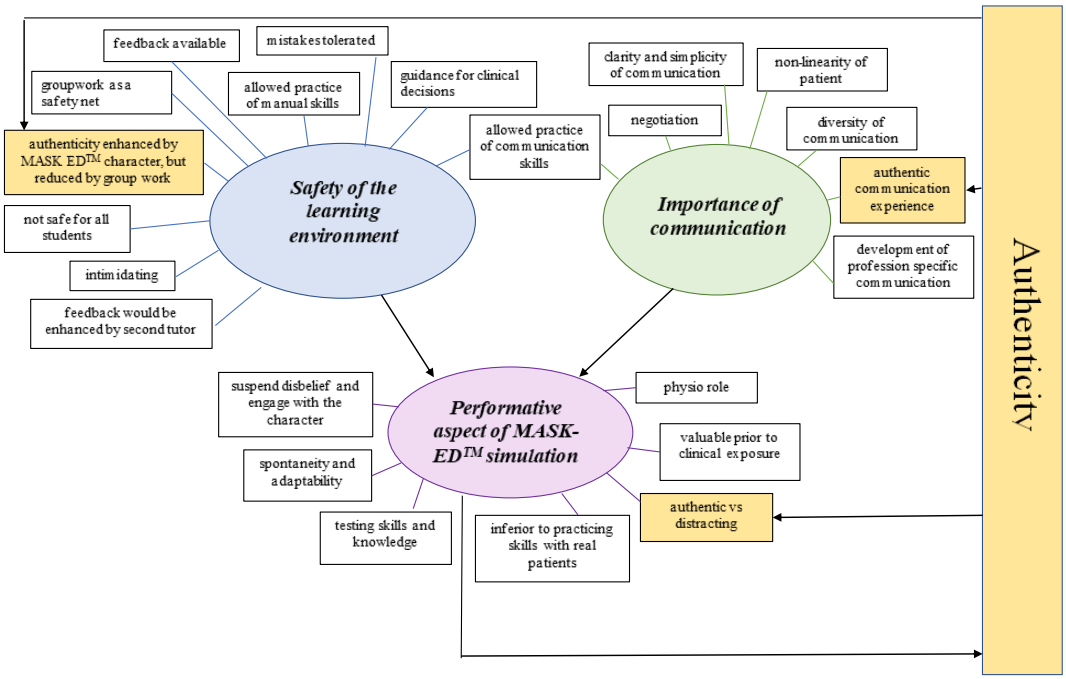

Figure 5. Focus groups qualitative data analysis

Theme 1: The safety of the MASK-ED™ learning environment

Many students perceived that the learning environment was enhanced by MASK-ED™ simulation because it allowed skill learning to be undertaken in a safe environment (where mistakes would be tolerated) and feedback would be readily available to guide clinical decisions. Skill acquisition in this safe learning environment encompassed both manual skills (e.g., physical handling of the patient) and communication skills. The presence of an expert guiding the MASK-ED™ simulation was regarded as highly valuable by many students, particularly as they could ensure the safety of that learning experience:

'Very useful that the person wearing the mask knows what is going on and can guide the situation appropriately'.

'And if you put the mask on it makes it not [the lecturer] we're talking to, but also not an actual old person, so if we do say something stupid … your lecturer goes "don't say that" [laughs] You're not offending anyone'.

Further, some students identified that authenticity of the MASK-ED™ character could be achieved safely in the learning environment and that this was inherently different from practising with their peers:

'Good to build confidence in a safe, non-confronting environment with no pressure'.

'It was really good to practice communicating, because just having the mask on I'd forget it was [lecturer], you'd think it was a whole different person'.

'It's very different practising with a friend to actually practising with a realistic patient. It's nice, she's more realistic than talking to your tutor or other classmates'.

In contrast, some students found MASK-ED™ simulation less safe and even intimidating. Some students felt disconcerted in the initial simulation session by not knowing who was wearing the mask. Later, when students were aware that the mask was being worn by one of the lecturers, some students reported feeling intimidated by the potential for such detailed judgement of their performance:

'If it was an actual old person, I would be more OK to talk to them, but because it was my teacher, and I knew she would be analysing everything I was saying, I was a bit more hesitant to say certain things'.

The group work setting was perceived by some students as a safety net, as they could 'hide' from engagement with the character if they were observing the situation rather than physically performing skills in the scenario. This group setting may jeopardise the authenticity of the learning experience for some, particularly with more introverted or less confident students:

'In a group situation you can hide very easily … But in the real world it's just you and this person'.

'I remember when we did the first session everyone was going "no I'm not doing it, I just want to watch" … I guess if you force people to do it, you say groups of two, … everyone's going to have the talk'.

'Because that's the thing, when you're on placement it's not as if you're in a group of four and you can hide behind anyone else'.

Further to this, students would have liked more expert guidance from a second tutor in preparing to interact with the MASK-ED™ character. A majority of students mentioned that group feedback after the simulation session was inadequate because it was not sufficiently personalised:

'I thought there would have been a lot better if each individual group had a separate time allocated to receive their feedback rather than just having it as like a sort of general one'.

Theme 2: The importance of communication skills in MASK-ED™ simulation

There were several aspects of the importance of communication that students reported. Many described how MASK-ED™ simulation helped them refine the clarity and simplicity of their interpersonal communication, both in extracting information from their patients and providing instructions to them:

'Even the instructions were like "you've got to take five steps forwards", instead of saying … a huge sentence … [this] is something that I had to learn to … make an adjustment to'.

'About jargon especially with explaining treatment techniques … simplified as much as possible … although … you didn't really understand it at the time, you are … learning those skills'.

'Just explaining things in simple terms … A lot of people found it took like a couple of weeks to get good at just doing it really simple'.

Two students further raised that the character's background (i.e., a retired physiotherapist) was a potential barrier for students to reduce jargon in their communication with her as they presumed she understood the various terms. They pointed out that most patients would not have that background and, therefore, simpler communication might be required:

'I think it has its advantages in terms of her being able to communicate to us what we need to know and when we need to know it. But in terms of the real world, it's not helpful'.

'Even in terms of wording, jargon, that kind of thing … as a physio she gets that, but if she's not a physio, which you know 99% of the populations aren't, they're not going to understand half the things you're saying'.

Students also highlighted the non-linearity of patient communication as an authentic aspect of learning to communicate with the MASK-ED™ character, particularly for their subsequent experiences on clinical placement:

'Whereas a real patient might go off on one tangent or you ask them one question and they tell you everything, and you have to pick out little bits for your subjective and it doesn't flow like how you want it to'.

'The benefit of Joyce to me was that she talked so much, and you had to interrupt her'.

'I felt semi-prepared, but we could have done more on it … People not being able to shut up … it's just such a real thing and there are so many times where getting better at interrupting is what we need to work on because it's tough'.

Students also reported the value of learning how to negotiate with the MASK-ED™ character regarding treatment goals:

'Not like she's angry or aggressive, but doesn't want to do something in particular, and you have to like negotiate a different sort of treatment'.

Some students also linked the challenges of this negotiation with their real-world clinical experiences and perceived the MASK-ED™ character could be even more resistant to better reflect patient reluctance in the real world:

'I would have preferred Joyce perhaps to give you a bit more resistance and you have to kind of talk around why she needs to get out of bed, why she needs to do this and convince her into it … it's just … not how I found it on placement. You often have to do a lot more talking around why we need to do this … and convince them into it'.

Many students mentioned a feature of MASK-ED™ simulation was the opportunity to practise communicating with an older person, which was inherently different from the communication style they would use with their peers:

'[MASK-ED™ helped in] getting your language jargon-free, and general skills of talking to people and talking to an older generation'.

'It was also good having exposure because we saw a lot of older patients, and I talk very casually and I caught myself out a lot of times on placement … sometimes they didn't really like the way I talk, because I'm just so casual. So think it helps … Probably in speaking a little bit more nicely … [laughs]'.

Students further highlighted that MASK-ED™ simulation could be used to learn more diversity in communication skills, beyond that which they had encountered in their experiences in the classroom:

'Going out on placement, all my patients had non-motor impairments. You went from being able to speak and get informed consent from people, to people with unreliable yes/no [responses], people who couldn't communicate, or communicated in a different language without realising it'.

'I think bringing Joyce in [for learning about health literacy would be helpful] because I didn't realise how poor people's health literacy is'.

Finally, students highlighted opportunities for scaffolding more communication skill development as part of the MASK-ED™ experience, for example, requiring them to practise documentation after an interaction, using appropriate terminology and abbreviations:

'I think a bit more exposure to the terminology as well, because I don't know if it was just me, but I found that I didn't really realise that we had to document that kind of stuff when we went on placement'.

'Yeah, and learning the abbreviations a lot more, because my notes by the end [of placement] were a lot more abbreviated than they were at the start'.

Theme 3: The performative aspects of the MASK-ED™ simulation experience

Two perspectives on performativity emerged from the student responses: 1) the 'teacher in role' and 2) students' emerging professional identities. However, students also asserted that there were some limitations in terms of their professional development stage at which the MASK-ED™ performativity was most useful.

Teacher in Role

The participating students expressed a range of perceptions of the masked teacher in the role of a patient, in response to what McAllister, Searl et al. (2013, p. 1456) call the 'power of the personal artistry and … the multi-faceted aspects of the role, and the planned but improvised nature of the encounters'.

For example, the MASK-ED™ simulation was frequently described by students in terms of the authenticity of the teacher-in-role performance and how the mask itself allowed students to suspend disbelief and engage with the character:

'I thought it was just like having a different visual there, means you separated the two. Like she was a proper character instead of being [the lecturer]'.

'Everyone was laughing, and I was like "Why are they laughing at this poor [person]?"'

'I didn't know if it was [the lecturer] or not, it took me like 10 minutes'.

In contrast, some students found the mask somewhat distracting as they tried to guess who was behind it:

'A disadvantage for a lot of people was the initial shock of trying to figure out what was behind the mask. That was really distracting. So a lot of people missed out on a lot of vital information at the start'.

Students' Emerging Professional Identities

This perspective was concerned with performativity in terms of the participating students' construction and performance of their professional identities. It resonates with Doran and Setchell's (2018, p. 127) assertion that 'what constitutes a physiotherapist is not pre-existing: through repetition of particular bodily gestures, attitudes and acts of speech, the recognisable identity of a "physiotherapist" is formed'.

For instance, participating students described the MASK-ED™ encounter in terms of their need to perform physically in the role, demonstrating spontaneity and adaptability within the task's physical aspects:

'Like with students it's fine because you're seeing them all day but going in with [the MASK-ED™ character] you're like … I don't know if I could touch just there to help you sit up. So that was good to practise'.

'You kind of have to think on your feet, so it worked on those skills'.

'There are differences in potential of what I would have wanted to do with Joyce versus what she actually wanted out of me'.

'[The lecturer] would act a lot frailer or sort of surprise you and keep you on your toes which is real life, and I felt like that was a good simulation to prepare'.

'At the time I didn't realise how beneficial it would have been to actually jump in and do it'.

Many students raised their appreciation of needing to step into the physiotherapist role and develop confidence using their 'physio voice' as an additional feature to engage with the simulated character. This included mindfulness of the patient's psychological and cultural safety, for example, preserving their modesty when

mobilising them out of bed after surgery. Often the first step in this interaction was establishing rapport and ensuring they interacted with the character in an appropriately respectful way:

'Just sort of like that rapport and that interaction, just between the two of you'.

'Cause we were in class and we just take our shirts off and run over. But I remember going to get Joyce out of bed and we had to put the gown over and everything … and like we'd have ladies who were like, "Oh I'm wearing my singlet, I don't want to wear just my singlet" '.

Students also described other ways that the MASK-ED™ simulation tested their skills and knowledge during their performance in a formative way:

'So it kind of made us test what we already knew, and I thought that was really helpful to see what stage you were at and that you were actually able to conduct a subjective [assessment] on just what you knew'.

However, while students recognised the value of testing their manual handling skills, several articulated that more practice, and with different types of characters, would be valuable to prepare them for clinical placement:

'We did mobilising of Joyce so we got to practise those skills and looking for attachments'.

'I think one thing we could have done a bit more is the manual handling side of things … [on clinical placement] we had a lot of obese patients that were like three max assist to sit out of bed … so being able to work as a team … if you're the one coordinating, who should go where and what to do. We were all a bit timid at the start but once you get into placement you realise you need to get like right on top of them basically'.

Stage of Development Limitations

While the performative nature of the MASK-ED™ simulation was seen to bring many advantages, there was also a clear consensus from the students that the simulation was not superior to practising skills with real patients:

'I believe the real patients in neuro classes were more helpful than MASK-ED™'.

'However [I] learnt the majority of how to cope within first two weeks of placement'.

'When you're in hospital and you're having to do it all the time it kind of sticks more'.

More specifically, students indicated that the value of MASK-ED™ simulation is greater prior to authentic clinical exposure:

'Now that I've seen real patients, I don't think that MASK-ED™ would be that helpful'.

'I think earlier [in the curriculum] is better, once you get back from placement, I think you have more of an understanding about how the patients actually are'.

DISCUSSION

This study suggests that, on the whole, physiotherapy students perceive MASK-ED™ simulation as highly valuable for enhancing classroom learning and in preparing for clinical placement before attending their first clinical placement. In particular, students felt that MASK-ED™ simulation improved their ability to apply theory to practice, engage with material covered in the unit, remember practical aspects of the lesson, prepare for practical exams, self-reflect and learn from mistakes in a safe environment, receive effective feedback and engage with peer learning. They also reported an increase in confidence in engaging with an older person; developing rapport, empathy and communication skills; implementing manual handling skills; managing attachments; and their sense of preparedness for their physiotherapist role in a clinical setting. This enhanced self-reported readiness for practice in the real world is consistent with evidence from studies of MASK-ED™ in nursing students (Kable et al. 2013).

However, physiotherapy students felt the usefulness of MASK-ED™ diminished somewhat after completing a clinical placement. It is perhaps not surprising that students perceived the utility of classroom-based simulation to be lower after real-world clinical learning due to several inherent limitations of simulation that become evident after real-world clinical exposure. Firstly, while MASK-ED™ allows students to interact with an authentic patient in an authentic physical environment, it is not in an authentic context. For example, there were no other health professionals, patients, volunteers, or visitors present for the MASK-ED™ simulation in our model. Secondly, in contrast to ongoing episodes of care, the MASK-ED™ simulation occurred as isolated episodes of care. As such, MASK-ED™ simulation did not provide the same

experience of continuity of care that clinical placements provide. Thirdly, while MASK-ED™ is relevant and authentic, it is still a form of simulation. Even the most sophisticated simulation experience is unlikely to fully replicate the multifactorial immersive experience of the authentic clinical environment. Students' perception that MASK-ED™ is less useful after clinical placement suggests that care should be taken in selecting the timing of MASK-ED™ within the course of student learning. Giving students exposure to MASK-ED™ prior to any clinical placements is likely to be most useful and may increase students' confidence when commencing clinical placements. It suggests that students valued clinical placements more highly for learning clinical skills. Therefore, MASK-ED™ simulation, as applied in this study, should only be used as an adjunct and not an alternative to clinical placement. Thus, the value of MASK-ED™ in the current sequence appears to be that of students' developmental preparation prior to placement. Once they have reached the necessary level of preparedness to go on placement, the real-life experience of clinical contact with patients is likely to supersede the simulated patient experience.

The importance of authenticity was evident across the key themes identified in the analysis of focus group discussions. While creating a safe learning environment was clearly a pillar of MASK-ED™ simulation's success, the perceived authenticity of the activity had different meaning for different students in terms of psychological safety. There were varying degrees to which students could suspend their knowledge about the educator's identity under the mask; this affected their willingness to engage and take risks within the learning activity. Nonetheless, most students recognised the value of practising both practical and communication skills in a setting that more closely mirrored that which they would encounter on clinical placement. We know that adult learners are motivated to learn when the learning activity is perceived to be relevant and has real-world application (Knowles 1984). In this way, MASK-ED™ meets the requirements of being a motivating learning strategy.

The performative aspect of MASK-ED™ simulation afforded spontaneous learning moments, which students valued as more authentic than practising with peers. The students described developing confidence in stepping into the physio role that extended beyond simple technical proficiencies to an appreciation of how to approach the character as a person deserving of dignity and respect (e.g., ensuring the preservation of patient dignity). Through interacting with the MASK-ED™ character, students could refine their 'physio voice' in a safe learning environment in tandem with developing communication and technical skills. Overall, the performative aspects

of the MASK-ED™ simulation, while unscripted and unique for each student, may provide rich opportunities for developing a physiotherapist professional identity—treating not just pathology but also people.

Some students' suggestions to improve the authenticity and value of MASK-ED™ are insightful (e.g., increasing character complexity and incorporating a broader range of communication limitations), while some are challenging to implement (e.g., a ratio of two students for each character encounter). A crucial feature of MASK-ED™ character development is ensuring it is student friendly and that the student never feels rebuked or shamed by the character in any way, such that the student can develop confidence throughout the simulation (Reid-Searl et al. 2011). Adding more challenging patient attributes (such as limited verbal communication) might only be appropriate once students have established confidence in the MASK-ED™ process. The higher ratio of character to students (i.e., interacting in pairs rather than groups) could be unfeasible due to the educator's fatigue inside the mask, particularly for larger cohorts. Thus, the scalability of MASK-ED™ remains a limiting factor for future simulation design based on these insights.

Students acknowledged that the presence of an academic behind the mask during MASK-ED™ simulation allows for accurate and timely feedback. For many, this also enhanced the perceived safety of the learning environment. The presence of an expert is also supported by Vygotsky's (1978) sociocultural theory of education, particularly, his concept of the zone of proximal development that he defined as 'the distance between the actual developmental level [of the learner] as determined by independent problem solving, and the level of potential development as determined through problem solving under guidance … or in collaboration with more capable peers' (p. 86). The suggestion that having a second tutor present would enhance the quality of feedback has merit, although resource limitations in the university context may hamper implementation.

This study explored students' perceptions of the value of MASK-ED™, including perceived readiness for clinical placement. Still, future research should examine whether MASK-ED™ exposure affects clinical performance as measured by a standardised clinical assessment tool. A robust test of the efficacy of MASK-ED™ would be valuable to physiotherapy educators around the world who strive to optimise curriculum design to best prepare their students for real-world experience.

CONCLUSION

Physiotherapy students perceive MASK-ED™ simulation as valuable in enhancing classroom-based learning relating to clinical practice across various skills, including manual handling, developing rapport and empathy, and communicating and engaging with an older person. Prior to clinical placement, MASK-ED™ helps develop a student's ability to step into the physiotherapist role through honing the performance of both technical and communication skills in a safe learning environment. Future studies should explore the utility of MASK-ED™ in other clinical areas of physiotherapy and its effect on clinical performance in the real world.

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SEED PROGRAM: THE DEVELOPMENT OF A PROGRAM THAT HAS ENABLED THE LEARNING AND GROWTH OF STAFF IN THE RESPONSE TO A COMMUNITY CRISIS

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Abstract

This paper aims to share a program that took a whole-hospital approach in considering the wellbeing of staff at a time of recovery following the 2019–2020 bushfires. The SEED Program enlisted a person-centred participatory methodology that was embedded within a transformational learning approach. This methodology included collaboration, authentic participation, critical reflection, critical dialogue and listening where the staff voice was the driving factor in the development of strategies for recovery. The SEED Program resulted in the development of five initiatives that included four strategies and a celebration event where staff celebrated their New Year's Eve in February 2020. The four strategies included the establishment of a quiet room, coffee buddies, Wellness Warriors and 24/7 Wellness. The outcomes from the SEED Program resulted in the development of a more person-centred culture and transformation of staff perspectives in how they understood their role in their learning and learning of others in recovery and support at a time of crisis. The key learnings were the effect of authentic collaboration, the benefit from enabling authentic leadership at all levels within a hospital, and the power of a staff connection to the 'CORE' values of the hospital and Local Health District. In conclusion, the staff involved hold the hope that others may benefit from their experience of transformational learning in creating more person-centred workplace cultures while supporting each other to move forward during a crisis. The limitation of the SEED Program was that it was a bespoke practice innovation designed in the moment, responding to an identified need for the staff following a crisis in the local community rather than a formal research approach to meeting the needs of this group of staff.

INTRODUCTION AND BACKGROUND

Focusing on the wellbeing of staff has become a priority for workplaces recently. During the recent bushfires in NSW (2019–2020), a collaborative project to address the wellbeing of staff was undertaken in a rural hospital on the South Coast. The project outlined within this paper involved the co-design and implementation of the SEED Program. This paper shares the collective learnings of the hospital executive and staff who came together as a community to support and nurture each other through

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a community crisis. The project aimed to support and enable the staff in a small rural hospital to create learning opportunities, both about themselves and others, from their shared experience during the bushfires.

The project was initiated by the Local Health District (LHD) Chief Executive (CE), supported by the LHD Executive and led by the Director of Nursing & Midwifery Services. The town where the hospital is situated on the South Coast of NSW and the surrounding areas were unprecedently devastated by the 2019–2020 bushfire season. Members of the local community predominantly staff small rural hospitals. Therefore, the project was developed with an embedded assumption that there may be a broader effect of support felt across the local community by supporting the hospital staff.

Wellness programs for healthcare staff have been evaluated in limited peer-reviewed research studies, emphasising health professionals. Archibald et al. (2011) explores online resources for healthcare workers and finds the advantages of online tools in programs that anonymise the staff. Gengoux and Roberts (2018) focus on physician wellbeing and self-care from both individual and system approach. They advocate that organisations have a responsibility to be proactive in initiating wellness programs (Gengoux & Roberts 2018). The SEED Program considered staff from all aspects of the healthcare organisation. There is currently no literature evidence that takes this holistic and whole-hospital approach to staff wellbeing.

There is limited evidence regarding the wellness programs for healthcare professionals for post-disaster recovery and support for healthcare workers. O'Halon and Budosan (2019) argue that resources are required to improve communities' mental health in the immediate response and over a long period of time to assist people with recovery. For health professionals, the current focus within the literature aims to prepare staff for the next disaster (Rokkas, Cornell & Steenkamp 2014). Specifically, related to bushfires recovery, research after the Black Friday bushfires found that the nurses' role expanded to include care coordination, problem-solving and psychosocial care for the community (Ranse & Lenson 2012). Support for the nurses themselves or other healthcare staff was not discussed. There is a pause in the current literature in addressing wellness in healthcare staff following a crisis.

The theoretical lens that influenced the development and implementation of the SEED Program was a combination of transformational learning and person-centredness. McCormack and McCance (2017) would argue that transformation is inherent within the concept of person-centredness. Transformational learning can be viewed as an opportunity to create new knowledge and new ways of experiencing the world (Mezirow 2009). It recognises that disorienting dilemmas are the foundation for transformative learning. Respecting personhood is a fundamental concept within person-centredness. Personhood is defined by McCormack and McCance (2017, p. 60) as 'enabling others to live their life plan without placing our values and beliefs upon them.' Person and personhood are fundamental elements in working in creating person-centred cultures. For this project, transformational learning and person-centredness guided the collaborative and participatory nature in which staff experienced the SEED Program.

METHODOLOGY

The SEED Program was conducted using a person-centred participatory approach. In line with person-centred research principles, authentic participation and transformation is the desired outcome (McCormack & McCance 2017). The participants remained in control of the level to which they engaged and were free at any time to stop participation (Hahtela et al. 2017). Collaborative participation was a

principle that also fed through the development, implementation and evaluation of the SEED Program. Finally, the principle of criticality was significant in the person-centred participatory approach to applying the methodology. Critical reflection and critical dialogue were utilised in the methods to enable the staff to consider their current understanding or worldview with the hope that this would enable movement and transformation in their understanding through their engagement with the elements within the SEED Program (Mezirow 1990). Listening to others and to self was an element that emerged as being important. Having patience for people to participate in a way that enabled their personhood stood out as aspects of the methodology that emerged naturally. Below represents the methodological approach taken.

Figure 1. Person-centred participatory methodology for developing SEED Program.

THE DEVELOPMENT AND IMPLEMENTATION OF THE SEED PROGRAM

Based on suggestions from 42 staff through their active participation in focus groups and individual consultations, the SEED Program was developed. It encompassed four initiatives (the quiet room, coffee buddies, Wellness Warriors and 24/7 Wellness); see Figure 2. The notes from each of the focus groups were themed by the project lead in collaboration with a sample of the participants. Following this, all participants had an opportunity to review and comment on the themes. The themes were then used to create the four initiatives (Hahtela et al. 2017). It was hoped that by staff influencing the development of the initiatives within the SEED Program, they would engage with and learn from the disorientating dilemmas they had experienced (Mezirow 1990).

In the implementation phase of the project, one initiative was implemented each week over a four-week period. An additional 5th initiative was a celebration that was held following suggestions from the staff. In the focus groups and interviews, many staff expressed concerns that they were not able to end 2019 due to the timing of the bushfires. To address this, the hospital executive coordinated a party that was attended by many staff and their families entitled 'SEE YA 2019'.

Figure 2. SEED Program Poster

The first initiative launched was the 'Quiet Room', which was created to provide staff with a safe space to take a moment for some quiet reflection. The creation of the quiet room was done collaboratively and creatively, with staff and community members donating furniture, art and aromatherapy oils to fill the space. The room is located at the end of the ward, promoting easy accessibility for staff during their busy work schedules. A significant art feature of the room is a hand-crafted wooden tree placed on the wall, created and donated by a staff member, resembling the hospital's growth following the bushfires. An important outcome of the quiet room is that staff were given an option to write a personal reflection. Reflections are written on a sticky note shaped like an apple on the tree. There are currently more than 250 reflections on the tree, and the tree continues to grow.

The second initiative, titled 'Coffee Buddies', was the use of three local cafes. They joined in the project to form a partnership and provide a safe space for staff to informally interact, have a weekly coffee, and check in on each other's wellbeing. A deliberate attempt was made to match each staff member with a person they would not usually work closely with and send them for a free coffee to connect on a human level. This has resulted in learning from each other through vulnerability (Brown 2010). Staff have shared that they have connected with people that they have never spoken to before. Their learning has been in a new understanding that regardless of your role in the hospital, we are all people, and we share the same challenges. Three months post the inauguration of the coffee buddies, and there has been an evident culture change at the grassroots level, with 210 coffees consumed.

The third initiative implemented was 'Wellness Warriors'. Eighteen staff across all areas of the hospital attended a two-day peer support training in the 'Art of Companioning'. This program was developed and delivered in collaboration with the local University partner. Underpinned by a strengths-based approach of peer support, the focus of the training was on being a better listener, listening to understand and hold space for others. Learning shared by participants included an understanding that leadership is a shared responsibility across all staff. Staff who participated found that

developing skills in holding space for others was an empowering and learning experience for both the person who spoke and the person who was listening.

The final initiative implemented was the '24/7 Wellness' sessions. These sessions were held twice a week, run by staff members themselves and open to all staff to attend. The sessions provide a safe space to discuss a variety of topics around staff wellness and self-care. The program links to a recent successful 'Imagine Program' that was run across the LHD. A total of 305 staff attendances at the wellness sessions. The success of this program can be observed in the attendance, with many staff attending on days they were not rostered to work.

CONCLUSIONS AND IMPLICATIONS FOR PRACTICE

In conclusion, the SEED Program has positively affected the hospital culture, with several key learnings for the leadership team and staff being evident. Transformational learning enabled the staff to reconsider their worldview and be open and emotionally ready to take steps forward (Howie & Bagnall 2013; Mezirow 2009). It is hoped that some of these learnings may be relevant for other hospitals and health services in times of community crisis.

A significant learning has been the realisation of the effect of authentic participation among staff at all levels within the hospital. Authentic collaboration and participation were evident from the development through to the implementation of the SEED Program. Staff were actively involved in determining their needs and designing a program that would suit their community. Gengoux and Roberts (2018) advocate that organisations have a responsibility to initiate wellbeing programs; however, in line with person-centred perspectives, the provision of these programs needs to be undertaken in a collaborative and participatory way where staff feel they are seen and heard (McCormack & McCance 2017). Authenticity is defined by Brown (2010, p. 50) as a 'daily practice of letting go of who we think we're supposed to be and embracing who we are'. This enabled the cultivation of a shared understanding that everyone was doing the best they could to participate, creating a sense of acceptance among all the staff (Brown 2019). An example of respecting the personhood of others in them determining their own participation involved a Wardsman who participated in all the elements of the program. He reported that he had never seen himself as a leader; however, by becoming a Wellness Warrior, he could see that his small part in connecting with others was making a difference.

The next key learning was the effect that authentic leadership had on creating a sense of shared leadership in the hospital. Authentic leadership focuses on transparent and ethical leader behaviour and encourages open sharing of the information needed to make decisions while accepting followers' inputs' (Avolio, Weber & Walumbwa 2009). Leadership within the SEED Program was initially at an executive level, recognising the need in a community devastated by the bushfires and the provision of resources to support the community. This flowed to recognising the need to develop leaders at all levels within the hospital community and support staff on their leadership journey. Ranse and Lenson (2012) identified a need to provide a suite of support at the time of the disaster. This was realised in the SEED Program with funding being provided for additional experienced staff, including a project lead, and to enable then initiatives to be implemented.

The final key learning connects authenticity with living the organisation values. This aligns closely with the pre-requisites of the Person-centred Practice Framework 'knowing self' (McCormack and McCance 2017). The 'CORE' Values of NSW Health drove the approach to enable the empowerment of this hospital community to move

towards recovery. The significance of living their values was at the forefront of the development and implementation of each of the initiatives. The memories created through this project remain evident in the hospital with the continuation of the quiet room and 24/7 wellness sessions, coffee buddies continuing to meet, and the effect the Wellness Warriors continue to have.

The limitations of this project include the responsive and organic nature of the SEED Program. This is a strength in that it has allowed the program to be responsive to the need and the crisis. However, it is also a limitation in that the learning in the development and implementation of the program was not formally evaluated or approved through an ethics committee. It was deemed that ethical approval was not required as this was an in the moment practice innovation. Further research is required to formally evaluate the SEED Program's effect on the experiences and learnings that staff have gained.

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Conflict of Interest

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