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Can DVD simulations be used to promote empathic behaviours and interprofessional collaboration among undergraduate healthcare students?

Final Report 2014

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List of acronyms used

IPE	Interprofessional Education
IPL	Interprofessional Learning
IPC	Interprofessional Collaboration
JSE-HP-S	Jefferson Scale of Empathy – Health Profession – Student version
RIPLS	Readiness for Interprofessional Learning Scale

Executive summary

Empathy is a key behavioural characteristic for all health professionals to possess and apply. This importance is reflected in universities and other education providers listing empathy as one of its key generic graduate attributes. Evidence suggests that improved empathetic behaviours among healthcare professionals directly impact on the provision of healthcare services and patient outcomes (Hardee, 2003; Lewin, Skea, Entwistle, Zwarenstein, & Dick, 2001; Moore, Wilkinson, & Mercado, 2004). This improvement in healthcare outcomes is also highlighted by several recent landmark studies, where Hojat and colleagues and Del Canale and colleagues determined that physicians with high empathy levels contributed to better clinical outcomes in their patients with diabetes than other physicians with lower empathy levels (Canale, 2012; Hojat, Louis, et al., 2011).

However, it is also a difficult characteristic to define, conceptualise, teach, monitor, and assess. The 'nebulous' properties of empathic behaviour as a theoretical construct often mean that educators fail to incorporate the explicit teaching and assessment of empathy within health science curricula. This represents a potential mismatch between what is taught by universities and what is actually needed within the healthcare workforce. Health professionals rely on establishing a provider-patient/client relationship and rapport with patients/clients (and their families and caregivers) in order to promote communication, trust, patient satisfaction, and delivery of appropriate patient/client assessment and intervention services. In other words, the health professional must have an ability to empathise with the patient/client and their family members as well as to understand a patient's/client's perspective to develop a successful health provider-patient/client relationship with attitudes of commitment and compassion to the other person's situation (Lauder, Reynolds, Smith, & Sharkey, 2002). A growing number of writers claim that teaching empathy in an interprofessional education setting is an effective educational approach in developing empathic behaviours (Crandall & Marion, 2009; Leaviss, 2000; O'Connell, Fuhrel-Forbisb, & Dangb, 2007).

This project had two aims:

1. Develop an interprofessional empathy behaviour education toolkit that includes a range of interprofessional empathy DVD simulations and workshop resources, and
2. Evaluate the effectiveness of the interprofessional empathy behaviour education toolkit when used with students from a range of healthcare disciplines through exploring empathy and interprofessional levels before and after the DVD simulation workshop.

An online and hard-copy toolkit has been developed and includes three DVD simulations, teaching and learning resources for workshops and over ten additional assessment tasks that can be tailored to individual needs and different educational contexts (i.e. undergraduate, postgraduate or continuing professional development). The empathy education toolkit was evaluated using a mixed methods approach.

A total of 31 interprofessional empathy workshops were delivered at four universities with over 300 students from 13 different healthcare professions. Quantitative and qualitative data analysis highlight this project has been a valuable learning experience that has added to baseline understanding of empathy and interprofessional collaborative learning. Before and after results show that self-reported empathy levels statistically improved at six weeks following the interprofessional empathy workshops, and that statistically significant improvements were also shown in teamwork and collaboration, professional identity, and better clarification of their roles and responsibilities in the healthcare system.

Qualitative findings also suggest greater understanding of their personal perceptions of empathy, patient centredness and workshop impact. These mixed methodological results suggest the workshops and the toolkit have both statistically and practically had an effect on the promotion of empathy and students' readiness for interprofessional collaboration.

A number of recommendations have arisen from this project:

Recommendation 1:
It is recommended that healthcare stakeholders from the various levels of higher education interested in empathy consider using the DVD-simulation toolkit in guiding and promoting empathy and interprofessional collaboration in undergraduate curricula.

Recommendation 2:
It is recommended that ongoing continuous quality evaluation of the workshops and the curricular integration of additional assessment tasks be carried out across the different healthcare professions.

Recommendation 3:
It is recommended that ongoing continuous quality evaluation of the workshops and the curricular integration of additional assessment tasks be carried out across both undergraduate and postgraduate levels of study and also across both tertiary and vocational educational sectors.

Recommendation 4:
It is recommended that tertiary institutions provide ongoing financial support for further examination of self-reported empathy levels among healthcare students and curricula renewal. This support should also foster collaborative opportunities with other non-cognate professions.

Recommendation 5:
It is recommended that other toolkits involving non-technical skills (such as listening, communication, teamwork, situational awareness and leadership etc.) that are important graduate attributes for healthcare professionals be developed and integrated into national curricula.

Recommendation 6:
It is recommended that future work compare and contrast empathetic behaviours with different patient/client diagnostic groups across different healthcare environments.

Table of Contents

Acknowledgements.....3
List of acronyms used.....4
Executive summary.....5
Tables.....9
Background.....10
Empathy.....10
Interprofessional learning.....18
Aims of the project.....24
Project team.....24
Stakeholders.....25
DVD Simulation and workshop development.....26
Project Evaluation Methodology.....29
Design.....29
Participants.....29
Procedures.....29
Instrumentation.....29
Data management and analyses.....30
Ethics.....30
Results.....32
Workshop demographics.....32
Participant demographics: Follow-up results.....32
Standardised Scale Evaluation Results: Empathy.....34
Standardised Scale Evaluation Results: Interprofessional Learning.....34
Word Cloud.....36
Thematic Analysis.....36
Project resources.....44
Recommendations.....47
References.....49

Tables

Table 1: Professions involved in workshops ..... **Error! Bookmark not defined.**

Table 2: Age distribution of workshop participants ..... **Error! Bookmark not defined.**

Table 3: Pre and post empathy mean scores ..... **Error! Bookmark not defined.**

Table 4: Readiness for interprofessional learning before and after mean scores **Error! Bookmark not define**

Table 5: Project outcomes ..... **Error! Bookmark not defined.**

Table 6: Project resources ..... **Error! Bookmark not defined.**

Background

Empathy

Empathy is the ability to stand in the shoes of another and view the world from his/her perspective (Hojat et al., 2002). It improves communication and paves a road to better understanding of a person's feelings (Hojat et al., 2002). Despite being considered an ambiguous concept (Berg, 2011), it has been recognised as the key behavioural element in patient-professional health provider interactions (Winefield & Chur-Hansen, 2000), the 'building block' in patient care (Del Canale et al., 2012) and key component of healthcare professional professionalism (Gosselink & Witteveen, 2012).

Hojat (2011), a major researcher in the area of empathy in medical, nursing and allied health professionals and students, describes empathy (in the healthcare setting specifically) as "a predominantly cognitive attribute that involves an understanding of the patient's experiences, concerns and perspectives, combined with a capacity to communicate this understanding and an intention to help" (p. 360). This 'cognitive' feature is the main attribute differentiating empathy from sympathy, which is considered 'affective' and emotional (Hojat, 2009). Where sympathy is related to feeling the intensity of an individual's experience, empathy relates more to understanding the kind and quality of the experience (Hojat et al., 2009). While empathy, even in excess, is beneficial to patient care (Hojat, Spandorfer, Louis, & Gonnella, 2011), too much sympathy can be detrimental (Hojat et al., 2009; Hojat, Louis, Maio, & Gonnella, 2013). Empathy is associated with personal growth, career satisfaction and optimal clinical outcomes (Linley & Joseph, 2007) and, as a result of its cognitive element, can be a taught skill (Hojat, 2009). In contrast, sympathy is less amenable to change as a result of education (Hojat, 2009).

At the psychosocial level, engaging empathetically is central to a establishing and maintaining a trusting relationship (Hojat et al., 2013). At a bio-neurological level, it is "analogous to a synchronised dance" (Hojat et al., 2013, p. 6). Empathy has been found to be a key component in establishing rapport (Brown et al., 2010; Squier, 1990) and communicating effectively (Sherman, 2005). There is evidence to suggest it increases patient motivation (Squier, 1990), satisfaction (Bertakis, Putnam, & Roter, 1991; Hojat, 2007; Zachariae et al., 2003) and engagement (Nunes, Williams, Sa, & Stevenson, 2011). It also increases compliance with treatment (DiMatteo et al., 1993; Nunes et al., 2011; Zachariae et al., 2003) and is associated with lower rates of litigation (Adler, Hilborne, Kwon, Moore, & Robertson, 2000; Beckman, 1994; Levinson, 1997) and more accurate prognosis (Hojat et al., 2002) and diagnosis (Berg, 2011).

Empathy has been found to be positively and directly related to patient enablement.

Stewart et al. (2008) conducted a pilot prospective study which included 136 patient-participants from a five-doctor health centre in Glasgow, Scotland. These participants completed initial and follow-up questionnaires one month later. The Consultation and Relational Empathy (CARE) Measure was used to assess patients' perception of general practitioner (GP) empathy. Results identified that there was a positive and direct relationship between GP empathy and patient enablement at initial consultation. Further, enablement was associated with outcomes one month after the initial consultation. Price et al. (2006) also used the CARE measure in a study involving 41 patients visiting one of 15 acupuncturists. Each patient completed a questionnaire within two days of their first consultation, and another eight weeks later. Like Mercer et al. (2006), it was found that patient enablement was positively related to patient perception of practitioner empathy at the initial consultation, and predicted changes in health outcomes two months later that were directly related to patients' perceptions of practitioner empathy.

These findings are supported by two recent studies (Del Canale et al., 2012; Hojat, et al., 2011) which also indicated that empathy was significantly and positively associated with better clinical outcomes. Del Canale et al. (2012) found that physician empathy was significantly associated with positive clinical outcomes for patients with diabetes. This was a retrospective correlational study which included 20, 961 patients with type one or two diabetes mellitus from Parma, Italy. Del Canale et al. (2012) noted that the patients of physicians with high empathy scores had a significantly lower rate of acute complications than patients of physicians with moderate or low empathy levels. These results are supported by the findings of Hojat et al. (2011) who noted that patients of physicians who had high empathy scores were significantly more likely to have good control of haemoglobin A1c than patients whose physicians had low empathy scores. Hojat et al. (2011) included 891 patients with diabetes affiliated with an outpatient clinic that was associated with Thomas Jefferson University, Pennsylvania. Both studies used the Jefferson Scale of Physician Empathy (JSPE) (Hojat et al., 2002).

These landmark studies and their results have implications for the education and training of healthcare students and professionals. Not only could they optimise patient care and management, they may very well reduce financial demands on both patient and system. Del Canale et al. (2012) for example, found that those patients who had fewer metabolic complications as a result of being treated by physicians with high empathy levels consequently had fewer periods of hospitalization (Hojat et al., 2013). This, of course, is associated with lower costs for both clients and healthcare services.

These studies have not only reiterated the importance of empathy in the healthcare setting, but the importance of ensuring students are educated and trained accordingly so that these advances and benefits are maximised (and potentially extrapolated on) in the future. Similarly, given the significance of the aforementioned findings, it is worth investigating

whether these results can be generalised to other healthcare providers.

Several studies have examined empathy amongst different healthcare professions. Key papers have been briefly summarised below to give an indication of research and findings. To maximise comparison, only those using variations of the JSPE as an assessment tool have been included.

Paramedics

A recent study by Williams et al. (2012) assessed empathy levels amongst undergraduate paramedic students from seven Australian universities. The cross-sectional study using a convenience sampling technique included a total of 783 participants (of which 57% were female). The mean JSPE-(Health-Professional)(HP) score was found to be 106.74 (SD=14.8); females reported significantly higher empathy levels than males (108.69 v 103.58, p=0.042); and empathy levels increased from first year to second year (106.29 v 107.17). The authors noted that "the overall findings provide a framework for educators to begin constructing guidelines focusing on the need to incorporate, promote and instil empathy into paramedic students in order to better prepare them for future out-of-hospital healthcare practise" (Williams et al., 2012, p. 1).

Williams et al. (2013) also looked at empathy levels among undergraduate paramedic students. A total of 94 students from an Australian university were involved in the cross-sectional study, of which 62.8% were female and 34% were male. Thirty-seven participants were aged between 21 and 25 years; thirty were younger than twenty-one. Seventeen participants were in their first year of the course; 38 were in second year; and 39 were in third year. Male participants were found to have significantly higher empathy scores than the female participants (male mean score: 113.25, female mean score: 107.05; p=0.042). This finding contradicts several other empathy-related papers (Berg, 2011; Boyle et al., 2010; Fields et al., 2011; Fjortoft, Van Winkle, & Hojat, 2011; Hojat et al., 2002; Kataoka, 2009; Nunes et al., 2011; Williams et al., 2012; Sherman, 2005; Suh, Hong, Lee, Gonnella, & Hojat, 2012; Ward et al., 2009) which noted that the empathy level of females was significantly higher than that of the males included in the study. While empathy scores were lowest amongst first year students, there were no statistically significant differences noted between year levels, nor was there any significant results relating to age.

Nursing

A number of studies have examined empathy levels in nursing students; while several others have compared the empathy levels of nurses to those of physicians. Ward et al. (2012) conducted a longitudinal study which was designed to examine changes in empathy levels in undergraduate nursing students over the course of one academic year. There were 214 students who completed the JSE (adapted from the JSPE specifically for nursing students), of which 84% were women. It was found that, of the total sample, there was a statistically

significant (though not practically important [effect size=-0.16]) decline in empathy levels. However, the decline amongst students with more clinical exposure was practically important, compared to those with limited clinical experience. The mean pre-test score was 114.6 while the mean post-test score was 112.7. It was suggested that further research is needed to ascertain why empathy levels declined amongst nursing students.

Ward et al. (2009) looked at empathy levels amongst nursing students from a United States (US) university who were at various stages of their training (first year to fourth year). Of the 333 nursing students involved, 85% were women. It was found that women had significantly higher empathy levels than men (mean: 115.0 v 107.9) and that those with more clinical experience had higher empathy levels. Interestingly, this contrasts the findings of Ward et al (2012).

McKenna et al. (2012) considered the empathy levels of 106 undergraduate nursing students from an Australian university using the JSPE-HP version. Of these, 92.5% were female—a relatively representative cohort. Approximately one third of participants were younger than 21 years, and approximately one third were aged between 21 and 25. It was found that there was no statistically significant difference between students of different years ($p=0.215$), age ($p=0.795$) or gender ($p=0.088$). The mean empathy score was 107.34, SD=13.74.

Hojat et al. (2003) compared empathy levels between nurse practitioners and physicians. The nurses included were experienced and were attending an annual conference; the physicians were from the US, specialising in either paediatrics or hospital-based specialities (anaesthesiology, radiology and pathology). Nurse practitioners and paediatricians were found to have significantly higher mean empathy scores than hospital-based physicians ($p=0.05$). It was also concluded that the JSPE is a reliable research tool in assessing empathy levels among health professionals.

Fields et al. (2004) also compared the empathy levels of physicians and nurses. Fifty-six female nurses and 42 female physicians from a US hospital were recruited for the study. Whilst no significant differences were identified between nurses and physicians on total JSPE scores, nurses reported significantly higher scores on five of the twenty items.

Midwifery

McKenna et al. (2011) looked at empathy levels using the JSPE-HP in undergraduate midwifery students at a large Australian university. Fifty-two students were involved in the study. The ratio of students from each of the three year levels of the course (first year, second year, third year) was evenly distributed. All of the students were female and 50% of participants were aged between 18 and 25. It was found that there was a statistically significant difference between participants in different year levels ($p>0.05$), with empathy

scores increasing from first year to third year (first year mean score: 101.0; second year mean score: 110.35; third year mean score: 119.9).

Medicine

There are innumerable papers exploring empathy levels amongst physicians and medical students. Of these, many consider variations between gender, specialities, culture, personality and experience. Hojat et al. (2009) conducted a longitudinal study in the US which involved 456 medical students. They completed the JSPE at five different times: on entry to medical school and at the end of each successive academic year. A significant decline in empathy levels was noted at the end of the students' third year of study and this continued until graduation. This pattern of decline was similar for men and women, and across different specialities.

Hojat et al. (2004) also noted a decline in empathy as students progressed through medical school. The JSPE was administered to 125 medical students at the beginning and again at the end of their third year of medical school. The difference between pre and post test results was statistically significant on 5 of the 20 items on the JSPE (all five items were lower at the end of the third year).

Hojat et al. (2005) examined the relationships between empathy, speciality interest, personality and perceptions of mother and father in 422 first-year medical students at an American university. The JSPE results concluded that females had higher empathy levels than males ($p<0.01$) and that those students with interest in people-specialities had higher empathy levels than those who were more interested in technology or procedure-based specialities ($p<0.01$).

Pharmacy

Fjortoft et al. (2011) used the JSPE-HP to measure empathy levels in 187 first year pharmacy students at a US university. The questionnaire was administered as part of an empathy workshop, which in turn, was part of a required course for first year students. The mean JSPE-HP score was 110.7 (SD=12.1). A statistically significant difference was noted between male and female empathy levels, which was also of practical importance (effect size=0.61). The mean score for women was 112.8, while the mean score for men was 106.3. Fjortoft et al. concluded that the JSPE-HP is a valid instrument for assessing empathy levels in pharmacy students.

Occupational Therapy

Brown et al. (2010) looked at empathy levels in undergraduate occupational therapy students. Ninety-two students from an Australian university participated in the cross-sectional study. Of the participants 91.3% were women (a similar representation of the overall course cohort). The mean empathy score on the JSPE-HP was 115. Student year level

did not appear to have a significant impact on empathy levels and interestingly, students reported significantly lower empathy levels towards patients with known substance abuse histories than other patients. It was concluded that while occupational therapy students reported good levels of empathy, results were not as high as other health disciplines.

Dentistry

Sherman and Cramer (2005) assessed empathy changes in dental students at a US university. A total of 130 dental students were included in the study (45 women, 85 men), with relatively even spread of participants across the four years of the dental course. The mean age of participants was 26.4 years. The mean JSPE score was found to be 117.71. Females reported significantly higher empathy scores than the participating males ($p<0.01$). First-year students had significantly higher empathy levels than students of later years ($p<0.001$).

Beattie et al. (2012) considered empathy levels amongst first year dental students at a United Kingdom (UK) university. Sixty-six students completed the JSPE pre and post participation in a behavioural science course. Whilst there was no significant differences between students of different age or gender, there was a statistically significant difference between pre and post scores ($p<0.01$). The mean pre-course score was 78.74 (SD=6.77); the mean post-course score was 81.55 (SD=6.87), suggesting that participation in the behavioural science course had a positive effect on self-reported empathy levels.

Mixed

Nunes et al. (2011) investigated self-reported empathy levels in students enrolled in five different health-disciple courses at the University of the West Indies using convenience sampling. A total of 355 first year dentistry, pharmacy, medicine, veterinary medicine and nursing students were administered the JSPE in this cross-sectional study. Results indicated that female students and those older than 27 years had higher empathy levels than male students ($p<0.01$) and those younger than 21 years ($p<0.006$). Nursing and dental students were noted to have the highest empathy scores. When the students were re-tested at the years end, it was noted that empathy scores declined in all five groups (statistically significant declines were noted amongst medical, nursing and dental students).

Boyle et al. (2010) researched empathy levels amongst undergraduate students enrolled in health-discipline based courses from an Australian university. The 459 students who participated were enrolled in one of the following: paramedics, nursing, midwifery, occupational therapy, physiotherapy or health sciences. They were either in the first, second or third year of their course. Occupational therapy students were found to have the highest mean empathy score (111.55, SD=17.12), while paramedics had the lowest (106.32, SD=14.02). Females reported significantly higher empathy levels than males ($p=0.002$). No significant difference in empathy levels was identified between students of different health-

related courses.

Empathy Levels and Progression through a Course of Study

Several papers have examined changes in empathy levels in tertiary students enrolled in various health disciplines (Brown et al., 2010; Hojat, 2009; McKenna et al., 2012; Nunes et al., 2011; Sherman, 2005; Ward et al., 2012). Many of these noted a decline in empathy levels as students' progress through their studies (Hojat et al., 2009; Nunes et al., 2011; Sherman, 2005; Ward et al., 2012). Causal factors for noted declines are worth exploring. There is suggestion that overreliance on technology could contribute to a decline in empathy levels (Kataoka, 2009; Suh et al., 2012). Alternatively, it may be an adaptive response to stressors in the learning environment (Nunes et al., 2011). The stress of a very intense workload may also be responsible (Brown et al., 2010). Sherman and Cramer (2005), who noted that empathy levels declined through dental school, suggest that this might be a result of clinical experience and the realisation that non-compliance exists. They propose that students may find it hard to empathise with patients who are not willing to help themselves. Given the importance of empathy in the healthcare system, it is worth considering ways of alleviating this decline, whatever its cause may be.

Empathy and Life Experience

A correlation between life experience and higher empathy levels has been identified by a number of writers (Fields et al., 2011; Kataoka, Koide, Hojat, & Gonnella, 2012), as has age and higher empathy levels (Nunes et al., 2011). It may be that older individuals and those who have more life experience can relate to more people or situations, or have the wisdom and experience to be able to 'step in the shoes' of another. Nunes et al. (2011) who found that students older than 27 were more empathetic, suggests that age and life experience better help healthcare providers identify with the patient's perspective. Kataoka et al. (2012) identified that the correlation between physicians' empathy scores and age was positive, but negligible ($r=0.15$, $p<0.05$). They suggested that a greater variety of life experience would make a physician more insightful, thereby positively influencing their attitude and empathy towards patients. Kataoka et al. (2012) also considered the living arrangements of students. It was found that those students who lived at home with their parents reported higher empathy levels than those who lived alone or with a spouse only (JSPE mean: 113.0 v 109.6, $p<0.05$). It may well be that these students were influenced by the life experiences of their parents and that, through conversation and close living arrangements, their parent's life experiences and wisdom impacted their own ability to empathise. Those who have read widely over a lifetime may also exhibit higher levels of empathy, as it is thought that literature can increase a person's understanding of human pain and suffering (Fields et al., 2004).

Empathy and Gender

The literature has long recognised that females are more empathetic than males (Berg,

2011; Fields et al., 2011; Fjortoft et al., 2011; Hojat, 2009; Hojat et al., 2002; Kataoka, 2009; Nunes et al., 2011; Suh et al., 2012; Ward et al., 2009; Winefield & Chur-Hansen, 2000). This includes several empathy papers focusing on medical students and physicians, Hojat et al (2009) including 456 medical students in their longitudinal study, noted that women consistently outscored men in every year of medical school. This difference was statistically significant ($p<0.05$). Similarly, Berg et al. (2011) who conducted a study of 248 medical students found that the gender difference was statistically significant; the mean empathy score for males was 106.4, for women: 110.4. In another study Hojat et al. (2002) used a similar cohort: 371 medical students, noting a statistically significant difference between male and female empathy levels (mean male empathy score: 119, mean female empathy score: 122, $p<0.01$).

This pattern has also been identified in empathy papers considering other health disciplines. Sherman and Cramer (2005) who investigated changes in empathy levels during dental school identified that females reported significantly higher empathy levels than males (115.28 v 122.29, $p<0.01$). Fjortoft et al. (2011) whose study considered empathy levels amongst pharmacy students, also noted a significant difference between male and female empathy levels (mean female score: 112.8; mean male score: 106.3, $p<0.01$). Fields et al. (2011) also found that female participants in their paper (empathy levels amongst nursing students in their third and fourth year of study), reported higher empathy levels than male participants (112.5 v 104.1, $p<0.0002$). Similarly, Williams et al. (2012) identified that female paramedic students reported higher empathy levels than male paramedic students (108.69 v 103.58, $p=0.042$). Nunes et al. (2011) found that female participants in their study (which examined empathy levels amongst dentistry, pharmacy, medical, veterinary medicine and nursing students) reported higher empathy levels than the male participants (110.39 v 105.37, $p<0.01$).

It is suggested that this variation in empathy levels relating to gender develops because woman are ‘nurturers’ (Fields et al., 2004) and are more perceptive to emotion than men (Buss & Schmitt, 1993; Fields et al., 2004). Intrinsic (evolutionary, biological) and extrinsic (socialisation, gender role expectations) factors are thought to contribute to this trend (Kataoka et al., 2012).

Empathy-based training programs

The benefit of empathy on healthcare outcomes supports the promotion of empathetic behaviour in patient care. Similarly, it supports the teaching of empathy. A number of papers have considered the need and effect of empathy-based training programs. Winefield and Cher-Hansen (2000) examined changes in the empathy levels of medical students involved in communication skills program. The program included a practical task, wherein students were required to interview a stranger. This, naturally, involved introducing themselves, developing rapport, listening effectively and responding appropriately when the

interviewee showed signs of strong emotion. After the program, students completed a pencil-and-paper empathy test. Of the 107 participants, 81% felt better prepared after the communication skills program. Students also made significant gains in their ability to make empathetic responses. Similarly, Ozcan et al. (2012) suggested that effective educational programs might facilitate and improve empathic skills, while Warmington (2012) proposed that practising engagement will help students and doctors engage more empathetically. Hojat et al. (2005) contended that improving empathy levels of students during their medical training will enhance clinical skills.

Our recent research concurs: empathy-based training can improve the empathy levels of tertiary students studying different health disciplines. Given the findings above, further support and funding into empathic teaching modalities are warranted. Williams et al. (2012) suggest that the 'nebulous' properties of empathic behaviour means that healthcare profession educators often fail to incorporate the teaching and assessment of empathy into the curriculum. This infers that the need for a comprehensive empathy-based learning program is all the more necessary. Larson and Yao (2005) contend that the recent emphasis on 'holistic' treatment makes empathic behaviour in the healthcare setting paramount. Hojat et al. (2013) strongly encourage leaders in healthcare institutions and academic medical centres to "go further than just declaring the desirability of empathic engagement in patient care" (p. 7). They suggest implementing and assessing targeted educational programs to enhance empathy of both students in training and accredited practitioners is required.

Interprofessional learning

The provision of healthcare has become increasingly compartmentalised in recent years, due in part to the various health disciplines becoming more specialised and more autonomous (Haux, Ammenwerth, Herzog, & Knaup, 2002). As such the vast majority of patients are no longer cared for by a single practitioner in isolation, instead a team based approach is employed where allied health disciplines work alongside one another (Heinemann, 2002). The modern team based approach is used widely across the various healthcare spectrums; therefore it has become vital that healthcare providers are able to communicate effectively and efficiently with one another to ensure superior and complete patient care. Consequently, the need for standardised and continual learning which enhances collaboration between the professions, both in the professional and higher educational sectors is critical (Department of Health, 2007; World Health Organization, 2010).

The term interprofessional education (IPE) first began appearing in the literature in the 1960s; however it has grown exponentially in scope and prevalence over the past two

decades. Interprofessional education occurs when multiple students or practitioners from multiple professions learn about, from and with each other with the aim of improving interprofessional collaboration (IPC) (Barr, 2001; World Health Organization, 2010). The term interprofessional learning is synonymous with IPE. Interprofessional collaboration refers to multiple health workers from diverse disciplines providing comprehensive care by working together and with patients, their families, carers and communities (World Health Organization, 2010). The term interprofessional practice is synonymous with IPC. While reliable data remains limited, it has been widely argued that IPE leads to greater IPC between health professions (Begley, 2009; Chaboyer & Patterson, 2001; McPherson, Headrick, & Moss, 2001), and that IPC can improve healthcare processes and patient outcomes (Cheater, Hearnshaw, Baker, & Keane, 2005; Curley, McEachern, & Speroff, 1998; Schmidt, Claesson, Westerholm, Nilsson, & Svarstad, 1998; Wild, Nawaz, Chan, & Katz, 2004; Wilson, Marks, Collins, Warner, & Frick, 2004).

The diversity and scope of IPE interventions can vary widely between and within educational institutions and professional practices. Generally speaking IPE is delivered via two main streams: joint learning and interprofessional placements. Joint learning occurs when students or professionals from different health backgrounds learn together about a shared topic (e.g., anatomy and physiology, patient care, clinical guidelines) and at the same time learning about each other's scope of practice. This is distinct from common learning where students learn about a shared topic with no link to understanding the other's profession. Interprofessional placements are when a student or professional is given the opportunity to observe or take part in the clinical delivery of a health professional's work, generally with the aim of better understanding the scope and delivery of their practice.

The emergence of IPE and IPC

While the concepts of IPE and IPC have existed for decades, in more recent years there have been several seminal international papers published which recognise IPE as a valuable and necessary tool to achieve superior IPC. In 1988 The World Health Organisation (WHO) released two reports which together expressed the need for continuing education for physicians and the benefits of IPE within healthcare (World Health Organization, 1988a, 1988b). More recently in 2010 the WHO published the landmark paper titled *Framework for Action on Interprofessional Education* which describes much of the world's healthcare as operating in a fragmented and under-resourced environment. The WHO advocated for enhanced IPC as a key step towards addressing these issues and expounds IPE as an essential step towards creating a more conducive IPC environment. The authors believe that this will lead to improved patient outcomes through a more efficient use of resources and more effective delivery of services (World Health Organization, 2010).

Also in 2010, the Lancet commissioned a team of international academic leaders to explore potential strategies for educating health professionals (Frenk et al., 2010). The report

identified the mismatch of professional competencies, out-dated and static curricula, and poorly trained graduates as the main symptoms of what they termed the current healthcare crisis. The report also highlighted the lack of collaboration between the different health disciplines and identified IPE as a potential vehicle to create a more united healthcare system.

The message of the WHO and other advocates of IPE and IPC have been acted on by numerous national governments. In 2007 the United Kingdom's Department of Health released a framework aimed at healthcare agencies who were utilising IPE to create an interprofessional workforce capable of effective collaboration. The report identified what they believed were the essential competencies for healthcare providers to be able to engage in effective IPC, and advocated for greater use of IPE to achieve the their stated goals (Department of Health, 2007). A similar report was produced by the Canadian Interprofessional Health Collaborative in 2010 which listed essentially the same competencies, and again promoted the use of IPE to address many of the identified barriers to achieving the competencies (Canadian Interprofessional Health Collaborative, 2010).

In 2008 the Learning and Teaching for Interprofessional Practice Australia Project published a reported detailing a research agenda and framework for development of IPC within Australia (Learning and Teaching for Interprofessional Practice Australia, 2008). The framework detailed four key areas requiring improvement:

- National curriculum development,
- Establishing IPE and IPC as a core component of professional healthcare delivery and pre-registration education,
- Establishing and implementing a research program to support and inform the development of IPE and IPC, and
- Establishing an IPE/IPC knowledge management system.

The author's devised steps that they believed would enable the achievement of the above areas, providing an agenda for researchers to further the development and implementation of IPE within curricula. The authors also call for the establishment of a national forum and national summit to provide increase information sharing and research dissemination in support of the set goals.

While there has been considerable work conducted in the professional environment, the take up of IPE by higher education institutions has also been the subject of much debate and research (Zwarenstein, Reeves, & Perrier, 2005). In 2013 a survey was conducted on Australian universities to examine penetration of IPE within their curricula (The Interprofessional Curriculum Renewal Consortium Australia, 2013). The results found that while many universities are beginning to adapt their curricula to include IPE, thus far

changes for the bulk of institutions have been superficial only. The report also highlighted that without mechanisms to measure and share successful programs it will be difficult to develop an effective delivery of IPE in the higher educational environment. The authors provided recommendations to the Australian Federal government which included establishing accreditation standards and continuing professional development requirements across health professions, as well as the development of a national approach to the coordination of faculty capacity, research and knowledge sharing. These findings have been mirrored by three connected and ongoing studies which are examining the development and delivery of IPE in pre-registration health professional education in Australia (Dunston, 2011).

Therefore, the message that IPE is an essential step towards efficient and effective IPC has been heard by international governments, many of who have already acted in setting policy and delivering a research and implementation agenda. While the steps are indeed positive, not enough time has elapsed for the effectiveness of their respective plans to be thoroughly evaluated.

Evidence base for the use of IPE and IPC

Due to the relatively short period of time that IPE and IPC have been recognised as key elements for the improvement of healthcare to date there has been only limited evidence published which demonstrates a link. Nonetheless IPE and IPC has been the subject of several systematic reviews, and there has been an increasing availability of high quality studies which demonstrate their benefits, particularly the ability of IPE to enhance not only IPC but also patient care and satisfaction.

In 2007 a review conducted by the Best Evidence Medical Education Collaboration (BEME) where 21 primary studies were examined, it was found that data on formal educational initiatives attended by multiple health professions was provided. They concluded that the studies demonstrated IPE is generally well received by staff and is effective in enabling knowledge and skills necessary for collaborative practice to be learnt (Hammick, Freeth, Koppel, Reeves, & Barr, 2007). A similar review was released by the Cochrane Collaboration in 2013 which examined 15 primary studies and found evidence that IPE improves collaboration, clinical practice and patient outcomes for a variety of health professionals (Reeves, Perrier, Goldman, Freeth, & Zwarenstein, 2013). Both the BEME and Cochrane Collaboration studies noted that due to the limited studies available it was not possible to draw dependable conclusions.

There has been a steady increase over the past two decades of high quality studies which demonstrate significant improvements to the delivery of healthcare due to IPE interventions (Reeves et al., 2013; Reeves et al., 2008; Zwarenstein et al., 2000). While there is not sufficient data currently available to generate firm conclusions, there is certainly compelling

evidence for the effectiveness of IPE delivered to health professionals. For example, Morey et al. and Weaver et al. both conducted IPE interventional studies aimed at improving the collaborative behaviours of emergency department and operating theatre staff and found significant improvements (Morey et al., 2002; Weaver et al., 2010). Young et al. demonstrated that IPE delivered to a group of allied mental health professionals produced significant improvements in patient care, teamwork and overall competency (Young et al., 2005). Campbell et al. provided joint training for physicians, nurses and social workers in responding to victims of intimate partner violence and found significant improvements in knowledge, attitude, culture and patient satisfaction (Campbell et al., 2001), while in a similar study Thompson et al., found significant improvements in intimate partner violence screening rates (Thompson et al., 2000).

Barceló et al. (2010) conducted IPE between various allied health professionals in the management of patients with diabetes and found significant improvements in both work processes and outcome measures of patient care. Helitzer et al. conducted patient communication education to a group of primary care providers and found significant improvements in communication immediately post-training which remained strong at a two-year post study follow up (Helitzer et al., 2011). Hanbury et al. found that their IPE intervention generated improvements in adherence to clinical practice guidelines (Hanbury, Wallace, & Clark, 2009).

Additionally there is an emerging evidence base which links IPE and empathy in healthcare students. Empathy is an important aspect of healthcare and has been associated with improving the effective engagement of patients (Beach & Inui, 2006) and improving patient outcomes (Price, Mercer, & MacPherson, 2006), and is important in practitioner-patient relationships as well as practitioner-practitioner relationships. One study found that a two day interdisciplinary student intervention increased knowledge and awareness of the other health disciplines which in turn increased empathy for their skills (Leaviss, 2000). The author commented that this heightened the students' awareness and willingness to participate in the holistic nature of healthcare.

In a study by O'Connell et al., an IPE intervention was designed to improve IPC and to increase willingness to work with underserved communities (O'Connell et al., 2007). The authors found that a student's level of empathy predicted their intention to work in interprofessional teams, and they concluded that improving empathy in students could be a useful in increasing IPC. Sands, Stanley, and Charon (2008) evaluated the efficacy of IPE in improving empathy in the staff of a paediatric oncology service found positive results. The authors commented that IPE was particularly useful in a setting where staff were likely to feel high levels of stress as it helped to strengthen the team focused approach. They argued that it is essential in teams with a high emotional stake in the outcome to perform cohesively as any unresolved conflict or disagreement can lead to inefficiency and errors,

possibly resulting in negative patient outcomes.

In a published account of 24 health practitioners at a tertiary hospital it was discovered that developing high quality interprofessional empathy requires frequent and constructive contact between practitioners, which can be strengthened by IPE (Adamson, 2011). This was shown in a recent study which used IPE to improve interprofessional empathy in medical students and pharmacists (Van Winkle et al., 2012). The study demonstrated that interprofessional empathy can be improved through workshops designed to promote greater understanding of the role of healthcare collaborators. Furthermore a recent commentary exploring empathy in healthcare students noted that many of the barriers to teaching empathy can be overcome through IPE, where students learn to empathise with patients through instruction and modeling (Crandall & Marion, 2009).

It must also be noted that both the BEME and Cochrane Collaboration reviews identified several high quality studies which show no significant effect from IPE interventions in the professional arena. However contrary results can be expected due to the difficulties in measuring the delivery and outcomes of an educational concept which lacks standardised definitions, delivery procedures and processes (Thistlethwaite, 2012). Again further research is required before conclusions can be drawn.

Similarly there remains only scattered evidence for the effectiveness and acceptance of IPE delivered at a higher educational level to preregistered students. The authors of a 2005 analysis reported no reliable evidence for the effects of IPE delivered preregistration. However they did note that the absence of evidence can be largely attributed to the methodological difficulties with conducting large scale controlled evaluations (Zwarenstein et al., 2005). Nonetheless several reviews have been published which detail primary studies generating largely positive results from IPE programs (Freeth, Hammick, Koppel, Reeves, & Barr, 2002; Reeves, 2001). Furthermore there is evidence from both Australian and international studies that allied health students are generally positive about IPE delivered in higher education, and find such interventions useful (Hind et al., 2003; Horsburgh, Lamdin, & Williamson, 2001; McFadyen, Webster, Maclaren, & O'Neill, 2010; Williams et al., 2012). Researchers have also commented that there is a lack of sound instruments to measure the effectiveness of IPE interventions delivered pre-registration which further confounds attempts to improve the evidence base (Thannhauser, Russell-Mayhew, & Scott, 2010).

While the evidence for effective IPE programs delivered pre-registration is limited, it is important to note the pivotal role educators will have in preparing future healthcare professionals for IPE and IPC, and for developing, measuring and implementing successful IPE programs.

While theory and research behind IPE and IPC has increased dramatically in recent decades

the majority of key academics agree that there is still much that needs to be done before the expected benefits begin to show. While opinions vary in respect to the best methods of increasing the uptake of IPE, there is a strong consensus that IPE must be incorporated into higher educational and continuing professional educational curricula. Equally important according to many researchers is the need to create IPE standards for registration in healthcare and to developed and validate superior instruments to measure the effectiveness of IPE interventions. Finally it has been suggested that there is a need to create an international communication standard to share information and research on best practices more readily.

Aims of the project

This project had two aims:

1. Develop an interprofessional empathy behaviour education toolkit that includes a range of interprofessional empathy DVD simulations and workshop resources; and,
2. Evaluate the effectiveness of the interprofessional empathy behaviour education toolkit when used with students from a range of healthcare disciplines through exploring empathy and interprofessional levels pre- and post- DVD simulation workshop.

This project had several outcomes. We developed an empathy behaviour education toolkit that includes a range of interprofessional case simulations (recorded DVD package) and additional teaching and learning resources, such as instructor work instructions, and specific group activities. The interprofessional empathy behaviour education toolkit provided a pedagogical structure to administer a number of empathy workshops delivered on-campus during semester teaching periods. The DVD simulations provide the context based on an authentic event commonly encountered in the healthcare environment i.e. patient assessment following alcohol intoxication and physical assault, or working with a patient and their family following delivery of ‘bad news’ about their health.

Project team

The project team included academic members from Monash University, Deakin University, University of South Australia, and Edith Cowan University. Full biographical backgrounds of each team member can be found in Appendix 14.2.

Stakeholders

In addition to the project team and Office for Learning and Teaching, there were three other stakeholders: i) Participating universities, ii) Paramedics Australasia, and iii) Monash University, Sunway Campus, Malaysia.

i) The participating universities (Deakin University, University of South Australia, and Edith Cowan University) provided student recruitment for workshops and focus group participation and arranged scheduling and room bookings.

ii) Paramedics Australasia have provided support for the project allowing the project team to promote the project at their national conference last year and offering a plenary session for the project leader. They have also offered support for ongoing funding examining empathy in paramedic students across Australian universities.

iii) Monash University, Sunway Campus in Malaysia has recently provided support in replicating this project with their medical students. This has led to an invitation to present at their first year transition program in early 2012 and collect further data.

DVD Simulation and workshop development

DVD simulation development:

Following a project steering committee meeting in February 2012 it was decided that three DVD simulations would be developed, these decisions:

i) met the practical needs of workshop, funding and capacity of the project team,

ii) provided input from different human lifespan and,

iii) provided a broad cross-section of medical cases that would have direct application to the majority of healthcare professions who would participate at each workshop.

The three DVD simulations chosen would also provide students with an overview of the professional roles and responsibilities of multidisciplinary treatment team members at different phases when a patient/client might interface with the healthcare system (e.g., pre-hospital, emergency room visit, and hospital ward admission). It was also decided to include profession-specific "vox pop" interviews with each participating healthcare professional, and several with the actors. These short vox pop interviews (1-5 minutes in length) provide an overview why each clinician felt empathy and/or interprofessional collaboration was important for their respective profession. The project team felt these would provide an important resource for the project and ongoing use by others.

The three DVD simulations included:

- 15-year old with Asperger's syndrome with soft-tissue injury
- 35- year old pregnant women suffering from stroke
- 60-year Indigenous lady with possible fractures from fall

The majority of filming was undertaken at the School of Nursing and Midwifery, Berwick Campus, Monash University during April – May 2012. Filming for the Asperger's case was undertaken off-site at a private residence. The outlines for each case are attached in (Appendices 14.3-14.5). Each patient, relative or partners were paid actors. The clinicians in each DVD simulation were all practising clinicians. The outline of the project outcomes were provided to actors and clinicians two weeks prior to the filming date. No further scripting was provided. This decision not to script was based on previous studies the project team had completed and attempting to keep each simulation as realistic as possible without the chance of 'over-acting'. Clinicians were advised to read the case outline carefully and to "interact as they would in a normal patient/client interaction".

Editing of each simulation was undertaken by all members of the project team using a standardised editing proforma providing multiple sources of feedback. This inclusionary and consultative approach served several purposes, including allowing authors from different professions and work contexts to incorporate their specific learning outcomes into each simulation. It has also provided sound objectivity in each case, thereby eliminating the potential to deviate from the project objectives.

Each scenario, vox pop, and editing forms and instructions was uploaded online via Equella. Equella is a digital repository that is able to house large files that can be accessed anytime of the day (see: https://equella.med.monash.edu.au/institutions.do). All edits were completed and returned via Equella for the filming consultant to review. Final approval was made by the project leader.

Workshop development:

During early March 2012 the project team commenced planning for an outline of the empathy workshops. In consultation with a professional facilitator, the project leader developed the framework for each workshop with specific teaching and learning activities that would form the basis to the toolkit. Initial plans were focused on running two-hour workshops, however given all student recruitment would take place during normal academic semester 2 period it was decided to reduce this to 90-minutes in anticipation that this would minimise class clashes and improve attendance levels.

Given the time constraints for each workshop it was felt that a pre-workshop activity would be advantageous. In this activity students would be asked to watch one DVD (randomly selected) and reflect on the following four questions (see below). The same DVD simulation would be then shown during the workshop.

(i) What do you think the needs of the patient/client are?

(ii) Do you think the patients'/clients' needs were met in the clinical interaction?

(iii) What empathetic behaviours did you see or observe during the scenario?

(iv) And what was the impact of this behaviour on the patient/client interaction as they watch one of the DVDs.

To ensure the activities were i) appropriate and ii) manageable in the 90 minute period a pilot workshop was run in late May at Peninsula Campus, Monash University. This was attended by five academic colleagues (from nutrition and dietitics, paramedics, nursing and

occupational therapy) not involved in the project. The pilot workshop provided us with important feedback both in terms of timing, and also impact on some activities. This feedback was instrumental in slightly modifying two of the activities providing better clarity and better interprofessional collaboration.

The following is an outline of the activities for each empathy workshop:

1. *Pre-test survey:* (10 mins).
2. *Icebreaker:* Students are asked to continue this sentence on their post-it note: "Empathy is … ". Post-it notes are collected and read aloud either individually or in themes e.g. patient's shoes or emotional distance etc. (10 mins).
3. *Empathy matching cards:* Each card (term and definition) is randomly placed on a table. Participants must match each term with its definition. The intention is for participants to consider the nuances of the different terms and consider what this might mean for the different healthcare professions and holistic healthcare and teamwork (10 mins).
4. *DVD Simulation:* Participants refer to the four questions: (i) What do you think the needs of the patient/client are? (ii) Do you think the patients'/clients' needs were met in the clinical interaction? (iii) What empathetic behaviours did you see or observe during the scenario? (iv) And what was the impact of this behaviour on the patient/client interaction as they watch one of the DVDs. Participants are asked to make short notes as they watch (20 mins).
5. *Simulation Reflection:* Participants are asked to reflect on the DVD simulation and consider how they responded to the four questions (25 mins).
6. *"If I was the patient activity":* On a flip chart or whiteboard, participants are asked to consider "If they were the patient in the simulation how would they feel". They should use single words only for each clinical interaction with the different professions such as "happy", "relieved", "annoyed", "angry", "supported" (10 mins).
7. *Vox Pop:* Participants watch one Vox Pop (5 mins)
8. *Learning Gem and Wrap up:* Using second post-it note get participants to write down the one thing they learnt from the session or the one thing they will try and incorporate into their clinical practice (placements etc.). Wrap up session.

The full details of the workshop activities and additional resources can be found in the empathy toolkit. This can be found in Appendix 14.10 or accessed by either contacting the project leader or via our website: med.monash.edu.au/med/cehpp/altc

Project Evaluation Methodology

Design

A mixed methodological approach was used; including a before and after repeated measures design and focus group sessions. Using a mixed methods approach has strong support within the research literature and has been selected for the opportunities it provides to answer different research questions in a study and thus to present a more comprehensive understanding of the phenomena under investigation (Boet et al., 2012). All students were asked to participate in a workshop and complete a survey at two time points. A subgroup of students was also asked to take part in one of a series of focus groups.

Participants

Students eligible for inclusion in the project were those who enrolled in any year level from a number of different healthcare professional programs offered at Monash University, Deakin University, University of South Australia and Edith Cowan University.

Procedures

Students were recruited to participate in a 90 minute interprofessional empathy workshop led by a professional facilitator and the project leader. These workshops were offered during semester two 2012 (August-September) at each of the respective universities. Students were recruited via brief information sessions prior to lectures, emails and advertising posters placed around the universities.

Students' views and attitudes towards empathy and interprofessional learning were measured before the intervention (Time 1) via a paper-based questionnaire and 6 weeks after the intervention (Time 2) via an online questionnaire (Qualtrics). Based on the project team's previous work it was estimated that it would take participants between 8-10 minutes to complete the questionnaires. Each focus group ran for one hour and was facilitated by several members of the project team.

Instrumentation

All student participants completed a self-reporting survey package consisting of two established instruments that have been shown to be valid and reliable (Hojat et al., 2002; Reid et al., 2006) i) Jefferson Scale of Empathy – Health Profession – Student version (JSE-HP-S) (derived from the Jefferson Scale of Physician Empathy) and ii) Readiness for Interprofessional Learning Scale (RIPLS). An additional demographic section was also

included. Each of these can be found in Appendix 14.7.

The JSE-HP-S consists of 20-items that are rated via a 7-point unipolar Likert Scale (1=Strongly Disagree and 7=Strongly Agree). Ten of the items are reversed scored. The higher the self-reported mean score = higher empathy. The RIPLS includes 19-items that uses a 5-point unipolar Likert Scale (1=Strongly Disagree and 5=Strongly Agree). Three items are reversed scored. The RIPLS includes four subscales: i) teamwork and collaboration (9 items); ii) negative professional identity (3 items); iii) positive professional identity (4 items); and iv) roles and responsibilities (3 items).

Qualitative data were sourced using focus groups with students after the workshops had been completed.

Data management and analyses

The Statistical Package for Social Sciences (SPSS) was used for data storage and tabulation of the quantitative data. Descriptive statistics were used to describe the participant demographic information. A before and after repeated measures design was employed to evaluate the effect of the empathy workshops. Participants' views and attitudes were measured before the intervention (Time 1), and 6 weeks after the intervention (Time 2) using a self-reporting survey. A combination of parametric and non-parametric statistics was used in the analysis. The results were considered statistically significance if the p value was < 0.05, and effect sizes ($=d$) were calculated for practical significance.

For the qualitative component of the data collection, thematic analysis of the focus group was undertaken as described by (Liamputtong & Ezzy, 2005). For data analysis, three team members (not involved in the workshops) coded and organised the transcribed data into themes that emerged during the analysis (Liamputtong & Ezzy, 2005). Three researchers coded and categorised the data independently and then met and reviewed the data identifying relevant themes. After summarising all data, consensus was reached on the key themes identified by the data analysis. This approach assured the validity and reliability of our methods and core findings (Liamputtong & Ezzy, 2005).

Ethics

Participation in the study was voluntary and ethics committee approval for the study was received from each university ethics committee, Monash University Human Research Ethics Committee, Deakin University Human Research Ethics Committee, University of South Australia Human Research Ethics Committee, and Edith Cowan University Human Research Ethics Committee.

Participants were informed of the purpose of the project, the voluntary nature of their participation, and of the procedures to protect confidentiality and anonymity in all published outputs. Data were analysed on a group basis and therefore individual participants are not identifiable. For the focus groups, a subgroup of students was asked to take part in one session on a voluntary basis. Participants were informed that they could freely withdraw from participation in the project at any time and that there were no consequences if they withdrew. Participants were provided with an explanatory statement outlining the details of the project which they could keep.

Results

Workshop demographics

A total of 31 workshops were delivered over a 4-week period during August and September 2012 at each of the four universities. These workshops were attended by n=321 students from all year levels (1st year to 5th year) and included participants from 13 different healthcare professions. These professions included:

- Paramedic
- Midwifery
- Nursing
- Paramedics/Nursing
- Occupational Therapy
- Physiotherapy
- Medicine
- Nutrition and Dietitics
- Radiation Therapy
- Radiography
- Biomedical Sciences
- Social Work
- Podiatry

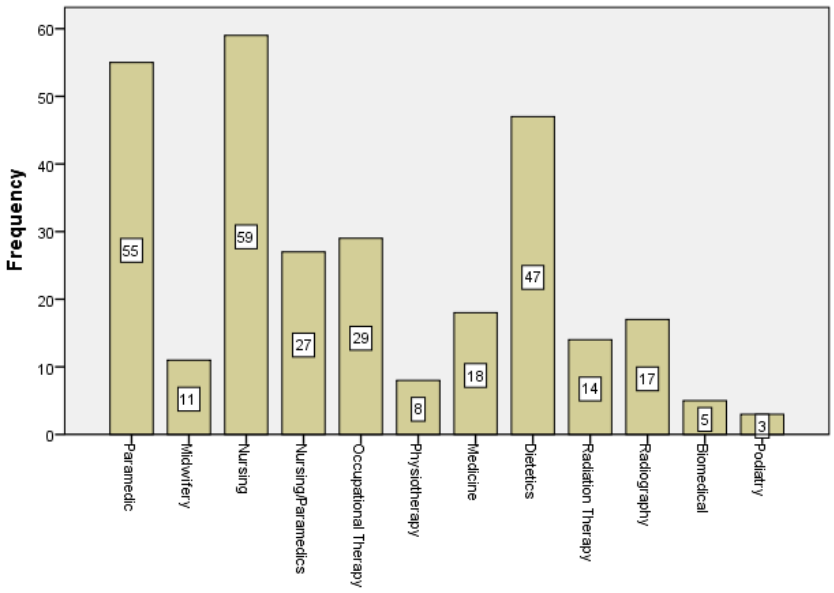
The vast majority of workshops were presented at Monash University (x20); followed by Edith Cowan University (x6); University of South Australia (x4) and Deakin University (x1). Please refer to Appendix 14.11 for dates, times and locations of each workshop.

Participant demographics: Follow-up results

A total of n=293 participants completed follow-up results at six weeks with ID matched pre-workshop questionnaires. We were unable to improve on the n=28 who did not complete the follow-up questionnaire.

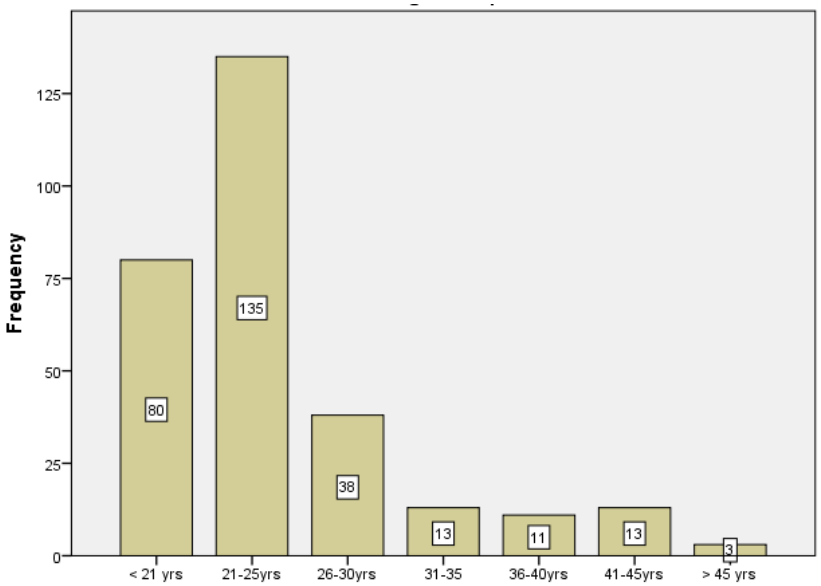
The vast majority of participants were enrolled at Monash University n=230 (78%); Edith Cowan University n=38 (13%); University of South Australia n=23 (7.8%); and Deakin University n=2 (0.7%). Participants from 12 professions completed the follow-up questionnaire with the majority being from nursing n=59 (20.1%), paramedics n=55 (18.8%) and nutrition and dietitics n=47 (16%). See Table 9.1 for full distribution. The majority of participants were female n=226 (77.1%).

Table 1: Professions involved in workshops



All year levels were represented from first to final year studies (1st to 5th year). First year students were represented most with n=123 (42%), followed by second years n=81 (27.6%). Fifth year students were represented least with n=8 (2.7%). The vast majority of participants were 25 years old or less n=215 (73.4%) with only n=16 (5.5%) older than 40 years of age. See Table 9.2 for the total age distributions.

Table 2: Age distribution of workshop participants



Standardised Scale Evaluation Results: Empathy

Subscale Results

The Jefferson Scale of Empathy – Health Profession – Student version (JSE-HP-S) is a self-report measure of empathy; the higher the mean score the higher the self-reported empathy. Analysing the matched data using a paired *t*-test there was a statistically significant difference between empathy scores before and after at 6 weeks 114.34 versus 120.32 ($p<0.0001$) and moderate effect size see Table 9.3 below.

Table 3: Pre and post empathy mean scores

EMPATHY	BEFORE	AFTER	SIG.	EFFECT SIZE
Jefferson Empathy Score	114.34	120.32	$p<.0001$	$d=4.7$

Item-level Results

Before and after item level mean scores and standard deviations (SD) are shown in Appendix 14.8. The vast majority of items were statistically significant at $p<.0001$. Two items: (item 7) "Attention to patients' emotions is not important in patient interview" and (item 18) "Healthcare providers should not allow themselves to be influenced by strong personal bonds between patients and their family members" were not statistically significant at $p<0.05$.

Comparisons Results:

The Mann-Whitney rank sum test was used to evaluate the differences between genders. There was a statistically significant difference between females and males pre-test $p=0.04$ and post-test $p=0.001$.

The Kruskal-Wallis Test was used to examine differences between the universities, healthcare professions and age groups. No statistical differences were noted between institutions pre-test $p=0.08$ or post-test $p=1.65$ or age groups pre-test $p=0.55$ or post-test $p=0.30$. There was however statistically significant differences between the healthcare professions pre-test $p<0.0001$ or post-test $p<0.0001$.

Standardised Scale Evaluation Results: Interprofessional Learning

Subscale Results

The Readiness for Interprofessional Learning Scale (RIPLS) is a self-report measure of students' readiness for interprofessional learning and collaboration. The RIPLS is based on four subscales (teamwork and collaboration; negative professional identity, positive professional identity, and roles and responsibilities) and is not globally scored like the JSE-HP-S.

Analysing the matched data using a paired *t*-test there was a statistically significant difference between each subscale at $p<0.0001$ (see Table 9.4) with effect sizes ranging from mild to moderate. These results suggest the empathy interprofessional workshops have played some part in improving the student views in each of the subscale areas. Perhaps most interesting are the results in subscale 4 (roles and responsibilities) which as can been seen highlight a reduction in mean scores from pre-test 6.41 to a post-test mean score of 5.62. We speculate the reason for this result is based on student's interactions with other students from different year levels during the workshops. A number of workshop activities engaged participants to consider their own positioning and professional roles within the healthcare sector and within other healthcare team settings. Again, results may suggest the interactions with others during the workshops have indeed clarified their professional roles and responsibilities that they otherwise may not have fully understood prior to the empathy workshops.

Table 4: Readiness for interprofessional learning before and after mean scores

SUBSCALE	BEFORE	AFTER	SIG.	EFFECT SIZE
Teamwork and Collaboration	36.0	41.4	$p<.0001$	$d=1.2$
Negative Professional Identity	4.54	5.16	$p<.0001$	$d=3.2$
Positive Professional Identity	16.7	17.6	$p<.0001$	$d=3.8$
Roles and Responsibilities	6.41	5.62	$p<.0001$	$d=3.9$

Item-level Results

Before and after item level mean scores and standard deviations (SD) are shown in Appendix 14.9. The vast majority of items were statistically significant at $p<.0001$. Only one item: (item 1) "Learning with other students will make me a more effective member of a healthcare team" failed to demonstrate a statistically significant difference.

Comparisons Results:

The Mann-Whitney rank sum test was used to evaluate the differences between genders. There were no statistical differences between females and males pre-test or post-test on any subscale.

The Kruskal-Wallis Test was used to examine differences between the universities, healthcare professions and age groups. The only subscale that produced a statistically significant difference across each of the variables was between healthcare professions and subscale 3 (positive professional identity) p=0.04.

Word Cloud

At the conclusion of each workshop participants were asked to describe the one thing they learnt from the workshop or the one thing they would try and incorporate into their clinical practice. We called this short session "gems". The following world cloud is a collection of over 300 participants' views on the "gems" they learnt over the 31 workshops. As can be seen the central point of this figure is patient; a number of non-technical skills are also listed, reflecting the multidimensional nature of empathy. The full list of "gems" can be found in Appendix 14.12.

Thematic Analysis

Students who attended the workshop were invited to participate in the subsequent post workshop interview. These students were enrolled in undergraduate degrees in nutrition and dietetics, paramedics or radiography and medical imaging and had been on clinical placements between the empathy workshop and focus groups. Thirteen students consented to take part in the focus group component of the study. The majority of participants were female (n=11).

The researchers who conducted the qualitative data analysis were not involved in facilitating the workshop. Data were collected using semi-structured focus group discussions. One focus group was conducted face-to-face and the other by telephone. These were facilitated by academic staff who were not involved in the delivery of the workshop. Data collection continued until those who volunteered within the project's timeframe had been interviewed. Each focus group was digitally recorded and professionally transcribed verbatim.

Three researchers coded and categorised the data independently in a first round of analysis and then met and reviewed the data identifying relevant themes. Consensus was then reached after discussion on the key themes identified. This approach assured the validity and reliability of our methods and core findings arising from the qualitative analysis (Liamputtong & Ezzy, 2005).

Results

The themes arising from the qualitative data analysis are presented under three key headings: personal perceptions of empathy, patient centredness and workshop impact.

1. **Personal perceptions of empathy**

The participants demonstrated a high level of self-reflection during the focus groups and it was evident they were aware of themselves in the patient/carer relationship and their specific discipline role. The following quotations illustrate participants' awareness of being patient-centred and a developing ability to self-reflect to aid their ongoing empathy development.

> *I think also reflecting on bad examples is good, because it really kind of hits you.*

> *I found it kind of useful at the start, because then when I started the placement, it was constantly, like, in mind to sort of observe how everyone, like, shows empathy, and pick up on it, kind of thing. Whereas, I think if I was not introduced to that beforehand, then not knowing what it was, it wouldn't really register, if that makes sense. So, now that I know what it is, I can pick it up and I can see where it hasn't been, you know, shown to patients and things like that. So, to me, it was very beneficial to have it at the start. (F4)*

Communication with patients was one area where the workshop had a positive impact. Participants described actively focusing on the need to look and listen when communicating with patients as evidenced by the following:

One thing that I'm more aware of since the workshop is talking over the patient. In one of the scenarios - like, I think it was a paramedic who said, "We're not ignoring you, we just have to transfer all the information across and whatever to the other person." So, yes, I think acknowledging the fact that we are speaking over them, but it is necessary - so, yes, just letting them know that. I try and do that more now than I did earlier. (F2)

The participants were aware of limitations in their abilities to communicate with patients as they develop and consolidate clinical and communication skills simultaneously:

All I could say was, "We're going to come back out and get you when everything is ready for you." So, I didn't really have the chance to say anything else, like, and I feel like if I'm rushing it - I do want to do a small talk and try to get to know the patient - I have to rush everything and say things quickly, which is not a good way of communicating. So, that's not really good. I mean, I've seen my supervisor doing all of these when the patient is on the table, doing all the mark-up, but I think that's because they're already, like, so good at what they're doing already, so they can actually focus on that. Whereas, I'm still - I can't do that now. (F1)

Participants described greater awareness of being accepting of both patients and situations and not approaching them with preconceived views:

I think my main focus has been to try and keep an open mind about everything - not going in there with that predetermined thought of how the job is going to turn out or how this person is going to be when we get there..... less judgemental. Like, you've gone in there more open-minded, and you can kind of see the - see it all a little bit better than going in with a predetermined idea of what's going to happen. (M-CP)

Students reflected on their roles in the healthcare team and how they could learn from other experienced clinicians.

...just seeing just how many people are actually involved with one patient and one situation and how that can be a really exhausting thing for the patient. (R-CP)

Participants were aware that empathy skills are demonstrated variably by different clinicians, with some perceiving that on occasion more experienced clinicians may demonstrate less empathy.

...sometimes be the paramedics who lose empathy because they perceive the patient to not be looking after themselves. I guess, yes, if they get a sense from the

patient's story that they're, I guess, playing the victim and not being proactive to look after their own health, it can definitely change their attitude toward the patient quite quickly (D-CP)

They expressed a desire to maintain their empathetic approach throughout their future careers

it kind of just gave me that - again, the not being complacent, like knowing that things can change in an instant. You go into it with open eyes, and you're not going to get kind of tunnel vision and treat it as you might. Like, there might be other complications that you won't pick up if you focus (M-CP)

Participants were mindful of the importance of the patient context and conditions when communicating.

I think, in the paramedic context, because you've got the patient for such a short amount of time, that patient/paramedic dynamic is really, really fragile, and you've got to be really vigilant that you don't sort of say something that's going to be misconstrued as offensive, or you know, taken the wrong way. (D-CP)

Participants were also aware of having to put the patient's needs before their own.

I think that a big one for me is just - it's kind of putting your feelings and how you are on the day aside, and just leaving any issues you have at home, and just really getting in there. Yes, so just your feelings and how your feelings can often end up as, I don't have time to deal with this, I'm too stressed. (F6)

In addition, participants were mindful that their ability to demonstrate empathy may become more challenging when tired or stressed.

... you tend to forget to be empathetic when you're tired and your body is really tired and you're exhausted mentally. So, it's a bit hard at those times, (J-CP)

It was a revolution to most participants that empathy could be acquired rather than be a fixed or established personality trait and that the development of empathy can take place in a variety of settings.

I just thought empathy things are quite natural for some people. They naturally have those kind of skills. But after that, I realised, actually, all of us, we can develop that kind of skill, … (M1)

Participants also suggested that it may be useful for clinical supervisors to be reminded about practising and demonstrating empathy.

> *Like, making our supervisors and placement supervisors aware of it and how they can kind of teach it to us is a good way. Like, if they're aware of it, they might be a little bit more conscious of it when they're dealing with patients as well, with us there. (M-CP)*

2. Patient centredness

This theme focused the needs of the patient and how the participants as future health professionals need to take the individual and environmental situation into consideration. The number of quotations here highlights the impact of participants' awareness of the patient as an individual whose behaviour may be outcome result of previous experiences.

> *The more we know about their history, the more we can understand why they are angry or cranky, or they could have just recently lost their whole family to cancer, or something. So, I think the more we can get about the history of the patient, the more background, that's easier to be empathetic to them. (F6)*

> *Someone who might be more aggressive or standoffish might make it a bit more difficult, or someone who decides just to be rude and obnoxious the whole time. That might make it more difficult to be empathetic. (D-CP)*

Empathy provided a framework for understanding patient reactions and participants had learned not to take a reaction personally.

> *Understanding where they come from and their background, and basically knowing what they are suffering from, and getting a better understanding of what they would go through if or when they are going through that, and then I would be able to empathise more with them..... Because it's hard to empathise if I don't get myself in there and understand what they are going through, if I detach myself from that and I'm trying to, you know, think that I understand what is going on instead of finding out myself what is really going on. . (J-CP)*

Some participants felt their discipline role impacted on the ability to build rapport with a patient, particularly in time-pressured situations.

> *I think being able to spend more time with the patient would help with that empathy. Like, we see them for such a short period of time, you don't really have time to - if they are being less open - to make any sort connection. (F6)*

Sometimes the environment and the facilities you have as well make a difference, because sometimes we find ourselves giving first day chats or whatever in a corridor, and it's hard to - there are some things that you don't particularly want to talk about in a corridor, or the patient might not feel comfortable doing.(F1)

But still, that's a very important - without giving someone time and slowing down a little bit, it's very hard to be empathetic. (R-CP)

The patient's condition also influenced the participant's approach to the patient, and some struggled to demonstrate empathy in an acute situation.

...empathise with a patient, it's actually a lot easier to do it when they're not acutely ill or injured. A lot of the time, empathy for paramedics and stuff sort of goes out the window when the patient is quite critically ill or quite acutely sick. You don't really have that time to be able to start up a conversation with them, or it may be seeming that we are being quite rude sometimes to patients and especially I think role-playing and putting yourself in the position rather than just sort of always watching and always reflecting is important, so that you have firsthand experience in whether you think someone is being empathetic towards you or vice versa. family members if the person that we're treating is acutely ill, because all we need to do is get them up and get them out. .....We don't have, as (D-CP) was saying, that extended amount of time. So, it's actually - I find it easier with patients and family members and stuff when they're not in that real critical, "we've got to go" life-threatening emergency - a real emergency, I should say. Because if we're in that type of environment, you don't really have that mind frame to be empathetic to them. (E-CP)

Participants were aware that each patient had the right to be acknowledged even when they did not like, or relate, to the patient.

But they still need to feel validated, regardless of whether you agree or not. ... Because sometimes it's really hard to, if you - yes, if you don't understand what a person has been through, you've never experienced it before and you don't know enough about that situation and the results of all those sorts of things. (R-CP)

Student's acknowledged cultural differences were important to consider when treating a patient as an individual.

I think that just being around other people's cultures - like, sometimes we know how we would like things done, so we just expect that's how it would be. But in the

workshop, we just discussed other people's cultures and how that may influence how they want to be treated and the things that they need

3. Workshop impact

Communication skills are considered 'soft skills' in a curriculum and some students are not overly keen to see them on the lesson plan.

When you get told that you're going to be learning about empathy, it sort of feels like one of those airy-fairy subjects. But it's not until, I think, you go out on placement and you realise how important it is to be able to talk to people and have that empathetic nature about you in caring for someone. (D-CP)

The workshop raised the student's awareness of empathy. . In addition the video scenarios had a positive influence on student learning.

I think it was the scenarios in the video that stayed with us (F3)

I think my levels of empathy have changed now that I've got a better understanding of the environment that paramedics work within. (D-CP)

So, yes, absolutely I think it's been a good - not a reminder, because I didn't really think about it as much as what I should have beforehand - but it's been something that I'm glad has come up earlier on in my degree (R-CP)

This latter comment also links to possible selection bias as respondents had given their experiences arising within and beyond the Empathy Workshop considerable thought.

...find your awareness and kind of see the whole issue. I think, because the workshop was an elective thing, people who had chosen to be there kind of were interested in following it up. I feel, you know, sometimes in class, you're told you have to do it; you're stuck with people who aren't willing to contribute and aren't willing to have a discussion about it because they don't see it as important. That's why I think I got a lot out of it, but I was also willing to be there as well. (M-CP)

As a result of their involvement in the workshop, participants reported being more aware of learning from others, with apparent ongoing learning resulting.

We can learn from some examples of what good role models - actually, through

the observation, I did notice that some of the staff had a high skill of empathetic, a high skill. (M1)

A number of suggested improvements were proposed by participants for future workshops.

I think role-playing and putting yourself in the position rather than just sort of always watching and always reflecting is important, so that you have firsthand experience in whether you think someone is being empathetic towards you or vice versa. (D-CP)

The students were able to describe having learned the difference between sympathy and empathy. They revealed an appreciation that empathy requires effort on the part of a carer and to be actively engaged with the patient.

I guess just being aware of it more - because I never even thought about it, and now I'm like, okay, empathy and sympathy is very different. Every time I try to be empathetic, then I actually have to sit down and reflect, am I really being empathetic or am I just being sympathetic? So, it kind of really gets you to start thinking instead of just talking at them. (F1)

Earlier in this report students acknowledged their awareness of being a member of a larger patient healthcare team. They suggested interprofessional groups for future workshops so they could also learn more about the roles of the other members of the team.

The six radiation therapists worked together, and then the nursing students worked together, and the dieticians worked together. I think it would have been beneficial to the point - one from each of those sub-groups, so that you were working with different people. (F3)

The students revealed that the workshop highlighted the bio-psycho-social approach to patient care and their role in shaping the quality of the experience.

I think it's just added importance to it. Like, it re-emphasised - like, because, yes, I'm kind of aware that patient care and everything - but it's really highlighted the impact it can have, and yes, just a good reminder. Yes, quite developing skills there to help you portray or communicate the empathy - so, I think that's where it made an impact. (F5)

Project resources

The following tables highlight the project outcomes and resources (and how they are accessed) developed over the course of the 18-month project.

Table 5: Project outcomes

Broad Project Aim	Achieved Outcomes
Promote better understanding and awareness of empathy across multiple healthcare professions	Final development of empathy-based DVD simulation toolkit Final report and recommendation
Specific Target Areas	**Achieved Outcomes**
To obtain baseline self-reported empathy and readiness for interprofessional learning among undergraduate healthcare students	Survey x 1
Develop empathy-based DVD simulation toolkit for the 90-minute workshops	The toolkit is available on the empathy website and/or hard-copies are available from the project leader
Develop empathy-based DVD simulation toolkit for the variations on the 90-minute workshops i.e. university part-semester	The toolkit is available on the empathy website and/or hard-copies are available from the project leader
To quantitatively examine if the empathy workshops had an effect on students empathy and readiness for interprofessional learning over time (6 weeks)	Survey – follow-up at 6 weeks (matched ID)
To qualitatively explore if the empathy workshops had an effect on students' attitudes following clinical placement learning	Focus groups x 2

Table 6: Project resources

Resources	Description	Accessibility
Empathy DVD #1	Josh - 15 year old teenager with Aspergers Syndrome	Empathy project website Project leader Conference presentations Peer-reviewed journal publications Appendix Final Report
Empathy DVD #2	Mrs. Shelley Palmer - 60 year old suffers a fall.	Empathy project website Project leader Conference presentations Peer-reviewed journal publications Appendix Final Report
Empathy DVD #3	Mrs. Sally Scott - 35 years old pregnant woman suffering a stroke.	Empathy project website Project leader Conference presentations Peer-reviewed journal publications Appendix Final Report
Empathy-based DVD simulation toolkit	Comprehensive toolkit with a number of teaching and learning activities and additional assessment tasks for further curricula integration.	Empathy project website Project leader Conference presentations Appendix Final Report
Conference presentations	Overview of project Overview of toolkit and findings	National and international scientific peer-reviewed conferences

Peer-reviewed journal publications	Overview of project and findings	Scientific peer-reviewed journals.

Recommendations

An online and hard-copy toolkit has been developed and includes three DVD simulations, teaching and learning resources for workshops and over ten additional assessment tasks that can be tailored to individual needs and different educational contexts i.e. undergraduate, postgraduate or continuing professional development.

A total of 31 workshops were delivered at four universities with over 300 students from 13 different healthcare professions participating in the interprofessional empathy workshops. Quantitative and qualitative data analysis highlight this project has been a valuable learning experience that has added to baseline understanding of empathy and interprofessional collaborative learning. Before and after results show that self-reported empathy levels statistically improved at 6 weeks following the interprofessional empathy workshops, and that statistical improvements were also shown in teamwork and collaboration, professional identity, and better clarification of their roles and responsibilities in the healthcare system.

Qualitative findings also suggest greater understanding of students' personal perceptions of empathy, patient centredness and workshop impact. These mixed methodological results suggest the workshops and the toolkit have both statistically and practically had an effect on the promotion of empathy and students' readiness for interprofessional collaboration.

A number of recommendations have arisen from this project:

Recommendation 1:
It is recommended that healthcare stakeholders from the various levels of higher education interested in empathy consider using the DVD-simulation toolkit in guiding and promoting empathy and interprofessional collaboration in undergraduate curricula.

Recommendation 2:
It is recommended that ongoing continuous quality evaluation of the workshops and the curricula integration of additional assessment tasks be carried out across the different healthcare professions.

Recommendation 3:
It is recommended that ongoing continuous quality evaluation of the workshops and the curricula integration of additional assessment tasks be carried out across both undergraduate and postgraduate levels of study and also across both tertiary and vocational educational sectors.

Recommendation 4:
It is recommended that tertiary institutions provide ongoing financial support for further examination of self-reported empathy levels among healthcare students and curricula renewal. This support should also foster collaborative opportunities with other non-cognate professions.

Recommendation 5:
It is recommended that other toolkits involving non-technical skills (such as listening, communication, teamwork, situational awareness and leadership etc.) that are important graduate attributes for healthcare professionals be developed and integrated into national curricula.

Recommendation 6:
It is recommended that future work compare and contrast empathetic behaviours with different patient/client diagnostic groups across different healthcare environments.

References

Adamson, K. (2011). Interprofessional Empathy in an Acute Healthcare Setting. (Doctor of Philosophy), Wilfrid Laurier University. Retrieved from http://scholars.wlu.ca/etd/1119/

Adler, N. E., Hilborne, L. H., Kwon, S. I., Moore, P. J., & Robertson, P. A. (2000). Medical malpractice: the effect of doctor-patient relations on medical patient perceptions and malpractice intentions. The Western Journal of Medicine, 173, 244.

Barceló, A., Cafiero, E., de Boer, M., Mesa, A. E., Lopez, M. G., Jiménez, R. A.,Meiners, M. et al. (2010). Using collaborative learning to improve diabetes care and outcomes: The VIDA project. Primary Care Diabetes, 4(3), 145-153.

Barr H. (2001). Interprofessional Education: Today, Yesterday and Tomorrow. Learning and Teaching Support Network Centre for Health Sciences and Practice from the UK Centre for Advancement of Interprofessional Education, London, UK.

Beach, M. C., & Inui, T. (2006). Relationship‐centered Care. Journal of General Internal Medicine, 21(S1), S3-S8.

Beattie, A., Durham, J., Harvey, J., Steele, J., & McHanwell, S. (2012). Does empathy change in first-year dental students? European Journal of Dental Education: Official Journal Of The Association For Dental Education In Europe, 16(1), e111-e116.

Beckman H., Markakis K., Suchman A., Frankel R. (1994). The doctor-patient relationship and malpractice: Lessons from plaintiff depositions. Archives of Internal Medicine, 154(12), 1365-1370.

Begley, C. M. (2009). Developing inter-professional learning: Tactics, teamwork and talk. Nurse Education Today, 29(3), 276-283.

Berg K., Majdan J., Berg D., Veloski J., Hojat M. (2011). Medical Students' Self-Reported Empathy and Simulated Patients' Assessments of Student Empathy: An Analysis by Gender and Ethnicity. Academic Medicine, 86(8), 984-988.

Bertakis, K. D., Putnam, S. M., & Roter, D. (1991). The relationship of physician medical interview style to patient satisfaction. Journal of Family Practice, 32, 175-181.

Boet, S., Sharma, S., Goldman, J., & Reeves, S. (2012). Medical education research: an overview of methods. Canadian Journal of Anesthesia, 59, 159-170.

Boyle, M. J., Williams, B., Brown, T., Molloy, A., McKenna, L., Molloy, L., & Lewis, B. (2010).

Levels of empathy in undergraduate health science students. Internet Journal of Medical Education, 1(1), 5-5.

Brown, T., Williams, B., Boyle, M., Molloy, A., McKenna, L., Molloy, L., & Lewis, B. (2010). Levels of empathy in undergraduate occupational therapy students. Occupational Therapy International, 17(3), 135-141.

Buss, D. M., & Schmitt, D. P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. Psychological Review, 100(2), 204-232.

Campbell, J. C., Coben, J. H., McLoughlin, E., Dearwater, S., Nah, G., Glass, N., Durborow, N. (2001). An Evaluation of a System‐change Training Model to Improve Emergency Department Response to Battered Women. Academic Emergency Medicine, 8(2), 131-138.

Del Canale S., Louis D., Maio V., Wang X., Rossi G., Hojat M., Gonnella J. (2012). The Relationship Between Physician Empathy and Disease Complications: An Empirical Study of Primary Care Physicians and Their Diabetic Patients in Parma, Italy. Academic Medicine, 87(9), 1243-1249.

Chaboyer, W. P., & Patterson, E. (2001). Australian hospital generalist and critical care nurses' perceptions of doctor–nurse collaboration. Nursing & Health Sciences, 3(2), 73-79.

Cheater, F. M., Hearnshaw, H., Baker, R., & Keane, M. (2005). Can a facilitated programme promote effective multidisciplinary audit in secondary care teams? An exploratory trial. International Journal of Nursing Studies, 42(7), 779-791.

Canadian Interprofessional Health Collaborative. (2010). A National Interprofessional Competency Framework.

Crandall, S. J., & Marion, G. S. (2009). Commentary: identifying attitudes towards empathy: an essential feature of professionalism. Academic Medicine, 84(9), 1174-1176.

Curley, C., McEachern, J. E., & Speroff, T. (1998). A firm trial of interdisciplinary rounds on the inpatient medical wards: an intervention designed using continuous quality improvement. Medical Care, 36(8), AS4-AS12.

Department of Health. (2007). Creating an Interprofessional Workforce: An Education and Training Framework for Health and Social Care in England. London: HMSO Retrieved from http://www.caipe.org.uk/silo/files/cipw-fw-doc.pdf.

DiMatteo, M. R., Sherbourne, C. D., Hays, R. D., Ordway, L., Kravitz, R. L., McGlynn, E. A.,

Rogers, W. H. (1993). Physicians' characteristics influence patients' adherence to medical treatment: Results from the Medical Outcomes Study. Health Psychology, 12(2), 93-102.

Dunston, R. (2011). The 'interprofessional' in Australian health professional education: current activity and future possibilities. Centre for Research in Learning and Change, University of Technology, Sydney.

Fields, S., Mahan, P., Tillman, P., Harris, J., Maxwell, K., & Hojat, M. (2011). Measuring empathy in healthcare profession students using the Jefferson Scale of Physician Empathy: health provider-student version. Journal of Interprofessional Care, 25(4), 287-293.

Fields, S. K., Hojat, M., Gonnella, J. S., Mangione, S., Kane, G., & Magee, M. (2004). Comparisons of nurses and physicians on an operational measure of empathy. Evaluation & the Health Professions, 27(1), 80-94.

Fjortoft, N., Van Winkle, L. J., & Hojat, M. (2011). Measuring Empathy in Pharmacy Students. American Journal of Pharmaceutical Education, 75(6), 1-6.

Freeth, D., Hammick, M., Koppel, I., Reeves, S., & Barr, H. (2002). A critical review of evaluations of interprofessional education. London: Learning and Support Network, Centre for Health Sciences and Practice.

Frenk, J., Chen, L., Bhutta, Z. A., Cohen, J., Crisp, N., Evans, T., Kelley, P. (2010). Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. Revista Peruana de Medicina Experimental y Salud Pública, 28(2), 337-341.

Gosselink, M. J., & Witteveen, T. (2012). Growth in empathy during clinical exchange. The Clinical Teacher, 9(3), 188-189.

Hammick, M., Freeth, D., Koppel, I., Reeves, S., & Barr, H. (2007). A best evidence systematic review of interprofessional education: BEME Guide no. 9. Medical Teacher, 29(8), 735-751.

Hanbury, A., Wallace, L., & Clark, M. (2009). Use of a time series design to test effectiveness of a theory‐based intervention targeting adherence of health professionals to a clinical guideline. British Journal of Health Psychology, 14(3), 505-518.

Hardee, J. (2003). An Overview of Empathy: A Focus on Patient-Centered Care and Office Practice Management. The Permanente Journal, 7(4).

Haux, R., Ammenwerth, E., Herzog, W., & Knaup, P. (2002). Health care in the information society. A prognosis for the year 2013. International Journal of Medical Informatics, 66(1), 3-22.

Heinemann, G. D. (2002). Teams in health care settings. New York: Kluwer.

Helitzer, D. L., LaNoue, M., Wilson, B., de Hernandez, B. U., Warner, T., & Roter, D. (2011). A randomized controlled trial of communication training with primary care providers to improve patient-centeredness and health risk communication. Patient Education and Counseling, 82(1), 21-29.

Hind, M., Norman, I., Cooper, S., Gill, E., Hilton, R., Judd, P., & Jones, S. (2003). Interprofessional perceptions of health care students. Journal of Interprofessional Care, 17(1), 21-34.

Hojat, M. (2007). Empathy in Patient Care: Antecedents, Development, Measurement and Outcomes. New York: Springer.

Hojat, M. Vergare M., Maxwell K., Brainard G., Herrine S., Isenberg G., Veloski J., Gonnella J. (2009). The Devil is in the Third Year: A Longitudinal Study of Erosion of Empathy in Medical School. Academic Medicine, 84(9), 1182-1191.

Hojat, M., Fields, S. K., & Gonnella, J. S. (2003). Empathy: an NP/MD comparison. The Nurse Practitioner, 28(4), 45-47.

Hojat M., Marvin, Z., Mike, M., Salvatore, M., Thomas, N., Michael, V., & Joseph, S. G. (2005). Empathy in medical students as related to specialty interest, personality, and perceptions of mother and father. Personality and Individual Differences, 39, 1205-1215.

Hojat M, Gonnella JS, Nasca TJ, Mangione S, Veloksi JJ, Magee M. (2002). The Jefferson Scale of Physician Empathy: Further Psychometric Data and Differences by Gender and Specialty at Item Level. Academic Medicine. 77(10):S58-S60.

Hojat, M., Gonnella, J. S., Mangione, S., Nasca, T. J., Veloski, J. Erdmann, J. B., Magee, M. (2002). Empathy in medical students as related to academic performance, clinical competence and gender. Medical Education, 36(6), 522-527.

Hojat, M., Louis, D., Markham, F., Wender, R., Rabinowitz, C., & Gonnella, J. (2011). Physicians' Empathy and Clinical Outcomes for Diabetic Patients. Academic Medicine, 86(3), 359-364.

Hojat, M., Louis, D. Z., Maio, V., & Gonnella, J. S. (2013). Empathy and health care quality.

American Journal of Medical Quality. 28(1), 6-7.

Hojat, M., Mangione, S., Nasca, T. J., Rattner, S., Erdmann, J. B., Gonnella, J. S., & Magee, M. (2004). An empirical study of decline in empathy in medical school. Medical Education, 38(9), 934-941.

Hojat, M., Spandorfer, J., Louis, D. Z., & Gonnella, J. S. (2011). Empathic and Sympathetic Orientations Toward Patient Care: Conceptualization, Measurement, and Psychometrics. Academic Medicine, 989-995.

Horsburgh, M., Lamdin, R., & Williamson, E. (2001). Multiprofessional learning: the attitudes of medical, nursing and pharmacy students to shared learning. Medical Education, 35(9), 876-883.

Kataoka. H., Koide N., Ochi K., Hojat M., Gonnella J. (2009). Measurement of Empathy Among Japanese Medical Students: Psychometrics and Score Differences by Gender and Level of Medical Education. Academic Medicine, 84(9), 1192-1197.

Kataoka, H. U., Koide, N., Hojat, M., & Gonnella, J. S. (2012). Measurement and correlates of empathy among female Japanese physicians. BMC Medical Education, 12.

Larson, E. B., & Yao, X. Clinical empathy as emotional labor in the patient-physician relationship. Journal of the American Medical Association. 293(9):1100-6.

Lauder, W., Reynolds, W., Smith, A., & Sharkey, S. (2002). A comparison of therapeutic commitment, role competency and empathy in three cohorts of nursing students. Journal of Psychiatric and Mental Health Nursing, 9, 483-491.

Leaviss, J. (2000). Exploring the perceived effect of an undergraduate multiprofessional educational intervention. Medical Education-Oxford, 34(6), 483-486.

Learning and Teaching for Interprofessional Practice Australia (2008). Interprofessional health education in Australia: A proposal for future research and development. NSW: University of Sydney Retrieved from http://www.google.com.au/url?sa=t&rct=j&q=&esrc=s&source=web&cd=5&cad=rja&ved=0CFAQFjAE&url=http%3A%2F%2Fwww.olt.gov.au%2Fsystem%2Ffiles%2Fresources%2FL-TIPP%2C%2520Aus%25202009%2520Final%2520Report%2520with%2520appendices%25201%2525262%2520(lo-res%2520images).pdf&ei=4FtiUfrBOaTYigf41oC4Cw&usg=AFQjCNFm0bUfad_I09M511NfpjDO2bw_LA&sig2=tjUvsO2xE3ascl5hP9-uMg&bvm=bv.44770516,d.aGc

Levinson W, Roter D., Mullooly J., Dull V., Frankel R. (1997). Physician-patient communication: The relationship with malpractice claims among primary care physicians and surgeons. Journal of the American Medical Association, 277(7), 553-559.

Lewin, S., Skea, Z., Entwistle, V., Zwarenstein, M., & Dick, J. (2001). Interventions for providers to promote a patient-centred approach in clinical consultations Cochrane Database of Systematic Reviews, CD003267 (4).

Linley, P. A., & Joseph, S. (2007). Therapy work and therapists' positive and negative well-being. Journal of Social & Clinical Psychology, 26(3), 385-403.

McFadyen, A., Webster, V., Maclaren, W., & O'Neill, M. (2010). Interprofessional attitudes and perceptions: Results from a longitudinal controlled trial of pre-registration health and social care students in Scotland. Journal of Interprofessional Care, 24(5), 549-564.

McKenna, L., Boyle, M., Brown, T., Williams, B., Molloy, A., Lewis, B., & Molloy, L. (2011). Levels of empathy in undergraduate midwifery students: An Australian cross-sectional study. Women & Birth, 24(2), 80-84.

McKenna, L., Boyle, M., Brown, T., Williams, B., Molloy, A., Lewis, B., & Molloy, L. (2012). Levels of empathy in undergraduate nursing students. International journal of nursing practice, 18(3), 246-251.

McPherson, K., Headrick, L., & Moss, F. (2001). Working and learning together: good quality care depends on it, but how can we achieve it? Quality in Health Care, 10(suppl 2).

Moore, P. M., Wilkinson, M., & Mercado, S. (2004). Communication skills training for health care professionals working with cancer patients, their families and/or carers. Cochrane Database of Systematic Reviews, CD003751(2).

Morey, J. C., Simon, R., Jay, G. D., Wears, R. L., Salisbury, M., Dukes, K. A., & Berns, S. D. (2002). Error reduction and performance improvement in the emergency department through formal teamwork training: evaluation results of the MedTeams project. Health Services Research, 37(6), 1553-1581.

Nunes, P., Williams, S., Sa, B., & Stevenson, K. (2011). A study of empathy decline in students from five health disciplines during their first year of training. International Journal of Medical Education, 2, 12-17.

O'Connell, A., Fuhrel-Forbisb, A., & Dangb, D. (2007). Students' intentions to work with

underserved populations and in interprofessional teams. Retrieved from: http://citation.allacademic.com/meta/p_mla_apa_research_citation/1/9/6/1/8/p196184_index.html?phpsessid=583b122477cd9edbc71ba117ab61d500

Ozcan, C. T., Oflaz, F., & Bakir, B. (2012). The effect of a structured empathy course on the students of a medical and a nursing school. International Nursing Review, 59(4), 532-538.

Williams, B., Boyle, M., Brightwell, R., Devenish, S., Hartley, P., McCall, M., McMullen, P., Munro, G., O'Meara, P., & Webb, V. (2012). Paramedic empathy levels : results from seven Australian universities. International Journal of Emergency Services 1(2), 111-121.

Price, S., Mercer, S. W., & MacPherson, H. (2006). Practitioner empathy, patient enablement and health outcomes: a prospective study of acupuncture patients. Patient Education and Counseling, 63(1), 239-245.

Reeves, S. (2001). A systematic review of the effects of interprofessional education on staff involved in the care of adults with mental health problems. Journal of Psychiatric and Mental Health Nursing, 8(6).

Reeves, S., Perrier, L., Goldman, J., Freeth, D., & Zwarenstein, M. (2013). Interprofessional education: effects on professional practice and healthcare outcomes (update). Cochrane Database of Systematic Reviews, (3).

Reeves, S., Zwarenstein, M., Goldman, J., Barr, H., Freeth, D., Hammick, M., & Koppel, I. (2008). Interprofessional education: effects on professional practice and health care outcomes. Cochrane Database of Systematic Reviews, 1.

Reid R, Bruce D, Allstaff K, McLernon D. (2006) Validating the Readiness for Interprofessional Learning Scale (RIPLS) in the postgraduate context: are health care professionals ready for IPL? Medical Education.;40(415-422).

Sands, S., Stanley, P., & Charon, R. (2008). Pediatric Narrative Oncology: Interprofessional Training to Promote Empathy, Build Teams, and Prevent Burnout. The Journal of Supportive Oncology, 6(7), 307-312.

Sarah, P., Stewart, W. M., & Hugh, M. Practitioner empathy, patient enablement and health outcomes: A prospective study of acupuncture patients. Patient Education and Counseling, 63, 239-245.

Schmidt, I., Claesson, C. B., Westerholm, B., Nilsson, L. G., & Svarstad, B. L. (1998). The

impact of regular multidisciplinary team interventions on psychotropic prescribing in Swedish nursing homes. Journal of the American Geriatrics Society, 46(1), 77.

Sherman, J. J. (2005). Measurement of changes in empathy during dental school. Journal of Dental Education, 69(3), 338.

Squier, R. W. (1990). A model of empathic understanding and adherence to treatment regimens in practitioner-patient relationships. Social Science & Medicine, 30(3), 325-339.

Stewart, W. M., Melanie, N., Markus, W., Bridie, F., & Gaby, V. General practitioner empathy, patient enablement, and patient-reported outcomes in primary care in an area of high socio-economic deprivation in Scotland—A pilot prospective study using structural equation modeling. Patient Education and Counseling, 73, 240-245.

Suh, D., Hong, J., Lee, D., Gonnella, J., & Hojat, M. (2012). The Jefferson Scale of Physician Empathy: a preliminary psychometric study and group comparisons in Korean physicians. Medical Teacher, 34(6), e464-e468.

Thannhauser, J., Russell-Mayhew, S., & Scott, C. (2010). Measures of interprofessional education and collaboration. Journal of Interprofessional Care, 24(4), 336-349.

The Interprofessional Curriculum Renewal Consortium Australia. (2013). Interprofessional Education: a National Audit. Report to Health Workforce Australia. Retrieved from http://www.hwa.gov.au/sites/uploads/IPE%20Audit%20report%20Jan%202013.pdf.

Thistlethwaite, J. (2012). Interprofessional education: a review of context, learning and the research agenda. Medical Education, 46(1), 58-70.

Thompson, R. S., Rivara, F. P., Thompson, D. C., Barlow, W. E., Sugg, N. K., Maiuro, R. D., & Rubanowice, D. M. (2000). Identification and management of domestic violence: A randomized trial. American Journal of Preventive Medicine, 19(4), 253-263.

Van Winkle, L. J., Bjork, B. C., Chandar, N., Cornell, S., Fjortoft, N., Green, J. M., Burdick, P. (2012). Interprofessional Workshop to Improve Mutual Understanding Between Pharmacy and Medical Students. American Journal of Pharmaceutical Education, 76(8), 150.

Ward, J., Cody, J., Schaal, M., & Hojat, M. (2012). The Empathy Enigma: An Empirical Study of Decline in Empathy Among Undergraduate Nursing Students. Journal of Professional Nursing, 28(1), 34-40.

Ward, J., Schaal, M., Sullivan, J., Bowen, M. E., Erdmann, J. B., & Hojat, M. (2009). Reliability

and Validity of the Jefferson Scale of Empathy in Undergraduate Nursing Students. Journal of Nursing Measurement, 17(1), 73-88.

Warmington, S. (2012). Practising engagement: Infusing communication with empathy and compassion in medical students' clinical encounters. Health, 16(3), 327-342.

Weaver, S. J., Rosen, M. A., DiazGranados, D., Lazzara, E. H., Lyons, R., Salas, E., Barker, M. (2010). Does teamwork improve performance in the operating room? A multilevel evaluation. Joint Commission Journal on Quality and Patient Safety, 36(3), 133-142.

Wild, D., Nawaz, H., Chan, W., & Katz, D. L. (2004). Effects of interdisciplinary rounds on length of stay in a telemetry unit. Journal of Public Health Management and Practice, 10(1), 63-69.

Williams, B., Boyle, M., & Earl, T. (2013). Measurement of empathy levels in undergraduate paramedic students. Prehospital and Disaster Medicine, 28(2), 145-149.

Williams, B., McCook, F., Brown, T., Palmero, C., McKenna, L., Boyle, M., McCall, L. (2012). Are Undergraduate Health Care Students 'Ready' for Interprofessional Learning? A Cross-Sectional Attitudinal Study. The Internet Journal of Allied Health Sciences and Practice, 10(3).

Wilson, S., Marks, R., Collins, N., Warner, B., & Frick, L. (2004). Benefits of multidisciplinary case conferencing using audiovisual compared with telephone communication: a randomized controlled trial. Journal of Telemedicine and Telecare, 10(6), 351-354.

Winefield, H. R., & Chur-Hansen, A. (2000). Evaluating the outcome of communication skill teaching for entry-level medical students: does knowledge of empathy increase? Medical Education, 34(2), 90-94.

World Health Organization. (1988a). Continuing Education for Physicians. WHO, Geneva, Switzerland.

World Health Organization. (1988b). Learning Together to Work Together for Health. WHO, Geneva, Switzerland.

World Health Organization. (2010). Framework for Action on Interprofessional Education and Collaborative Practice. WHO, Geneva, Switzerland.

Young, A. S., Chinman, M., Forquer, S. L., Knight, E. L., Vogel, H., Miller, A., Mintz, J. (2005). Use of a consumer-led intervention to improve provider competencies. Psychiatric Services, 56(8), 967-975.

Zachariae, R., Pedersen, C. G., Jensen, A. B., Ehrnrooth, E., Rossen, P. B., & von der Maase,

H. (2003). Association of perceived physician communication style with patient satisfaction, distress, cancer-related self-efficacy, and perceived control over the disease. British Journal of Cancer, 88(5), 658.

Zwarenstein, M., Reeves, S., & Perrier, L. (2005). Effectiveness of pre-licensure interprofessional education and post-licensure collaborative interventions. Journal of Interprofessional Care, 19(s1), 148-165.

Zwarenstein M , R. S., Barr H , Hammick M , Koppel I, Atkins J. (2000). Interprofessional education: effects on professional practice and health care outcomes. Cochrane Database of Systematic Reviews(3).

Appendices

14.1 List of participating universities and programs
14.2 Project team
14.3 Scenario/simulated patient background document: Aspergers Syndrome
14.4 Scenario/simulated patient background document: Indigenous Elderly
14.5 Scenario/simulated patient background document: Pregnant Stroke
14.6 Demographic questionnaire used
14.7 Questionnaires used
14.8 Item-level results: Empathy
14.9 Item-level results: RIPLS
14.10 Toolkit
14.11 Workshop Schedules
14.12 "What did you learn from today's workshop?" Responses from participants.
14.14 Dissemination and communication of project activities

List of participating universities and programs

University	Program
Monash University	Bachelor of Emergency Health (Paramedic) Bachelor of Emergency Health (Paramedic)/Bachelor of Nursing Bachelor of Nursing Bachelor of Midwifery Bachelor of Medicine/Bachelor of Surgery Bachelor of Physiotherapy Bachelor of Occupational Therapy Bachelor of Nutrition and Dietitics Bachelor of Medical Imaging Bachelor of Health Science Bachelor of Radiography Master of Radiation Therapy (entry level) Bachelor of Genetic Counselling
Deakin University	Bachelor of Nursing Bachelor of Nursing/Midwifery Bachelor of Social Work
University of South Australia	Bachelor of Occupational Therapy Bachelor of Podiatry Bachelor of Nursing
Edith Cowan University	Bachelor of Biomedical Science Bachelor of Nursing Bachelor of Paramedicine Bachelor of Medical Science

Project team

Associate Professor Brett Williams (Monash University) – Project Lead

Dr Brett Williams is an Associate Professor and Director of Education in the Paramedic Department at Monash University, and is one of the pioneering paramedics to enter academia. He is internationally recognised as a prolific writer in paramedicine teaching and learning with over 100 peer-reviewed publications. He has been the recipient of multiple teaching awards including an Australian Learning and Teaching Council (ALTC) award for Teaching Excellence, and Citation for outstanding contributions to student learning in 2011.

Associate Professor Ted Brown (Monash University)

Dr Ted Brown is an Associate Professor in the Monash University Department of Occupational Therapy. He is also postgraduate coordinator, undergraduate program coordinator, and first year undergraduate coordinator in the Monash Bachelor of Occupational Therapy course. Ted completed his Bachelor of Occupational Therapy with honours from Queen's University, Kingston, Ontario, Canada in 1986. He went on to complete a Master of Public Administration and a Master of Science in rehabilitation from the same university. Ted worked as an occupational therapist at the Children's Hospital of Eastern Ontario, Canada's only officially bilingual (English and French) paediatric hospital, for 14 years. After completing his PhD in Occupational Therapy from the University of Queensland, Ted migrated from Canada to Australia in 2002. Ted has had 160 peer-reviewed journal publications and 10 book chapters published to date.

Professor Lisa McKenna (Monash University)

Lisa graduated as a registered nurse in 1986 and as a midwife in 1989. She completed tertiary degrees in education, and received a PhD in 2005 for a study exploring clinical educators' roles in nursing education. She has been employed in the School of Nursing and Midwifery since 1995, where she has assumed many education roles, including leading curriculum development, convening courses, and overseeing development and delivery of undergraduate programs in the School. She has taught and coordinated units in a number of different programs, including the Bachelor of Nursing, the Bachelor of Midwifery, and the Graduate Diploma in Health Professional Education, the Master of Nursing, and the Master of Clinical Midwifery. Lisa engages in a range of education-related research, in areas including interprofessional education (IPE), clinical education, professional socialisation, midwifery and nursing education. Outcomes from her research directly inform her classroom teaching activity. She has published over 80 refereed journal articles and 5 textbooks.

Dr Malcolm Boyle (Monash University)
Dr Boyle is a senior lecturer at Monash University – Department of Community Emergency Health & Paramedic Practice. Primary teaching areas of trauma systems, prehospital trauma management, management of medical conditions in the prehospital setting, and evidence-based paramedic practice. Dr Boyle completed a PhD looking at triage and error detection in prehospital trauma management. Primary research interests include prehospital trauma triage, prehospital trauma management, the linking of ambulance datasets to other health related datasets and subsequent analysis, workplace violence and its effects, and attributes of undergraduate paramedic and allied health students. Dr Boyle has published a range of research articles on prehospital clinical practice and paramedic education in a variety of international scientific journals.

Dr Claire Palermo (Monash University)
Dr Palermo works as a lecturer with the Department of Nutrition and Dietetics at Monash University. She has a background in community and public heath nutrition and as such coordinates the undergraduate teaching and learning in this area. Her PhD evaluated a mentoring intervention for public health nutrition workforce development. Claire's research interest includes assessment of economic food access and nutrition and dietetics learning and teaching strategies. She has recently been award an Australian Learning and Teaching Council grant to develop valid and reliable competence assessment in nutrition and dietetics and a grant from the Centre for Excellence in Intervention and Prevention Science to monitor the effect on food cost for the Victorian government preventative health initiative.

Associate Professor Elizabeth Molloy (Monash University)
Associate Professor Elizabeth Molloy is Director of the HealthPEER team in the Faculty of Medicine, Nursing and Health Sciences at Monash University. Elizabeth co-ordinates the Masters in Health Professional Education. She provides curricular consultation and professional development workshops and has published research on feedback in clinical education, professional transitions and the role of practitioners and university based educators in facilitating active student learning. In 2009 she co-edited a book with Elsevier entitled "Clinical education in the health professions" targeting a multi professional audience, and is now working on a book on "Effective Feedback in Higher and Professional Education" with Routledge. She has a clinical background as a physiotherapist and worked as Team Physiotherapist for the Australian Athletics Team for seven years.

Professor Debra Nestel (Monash University)
Professor Debra Nestel is Professor of Medical Education, Gippsland Medical School, Monash University. After completing an Arts Degree at Monash, Debra spent the next twenty-five years at the University of Hong Kong and Imperial College London. In 2008, Debra returned to Monash where she is responsible for educational research and

programmatic evaluation in a medical curriculum. Her research interests include the role of simulation in the development of clinical skills. Debra has over one hundred peer reviewed publications in the field of clinical communication and simulation based education.

Associate Professor Louise McCall (Monash University)
Associate Professor McCall is Director of the Office of the Deputy Vice-Chancellor (Education) at Monash University. Educated in the fields of nursing, medical pedagogy, economics and business administration, Louise was awarded her PhD in medical education by Monash in 2002. In the Office of the Deputy Vice-Chancellor (Education), Louise has oversight of major academic projects, strategic and policy development, and management of stakeholder relationships. She provides strategic advice to senior management to ensure that Monash continues to attract high quality students and maintain its reputation for learning and teaching excellence. Louise was Deputy Dean (Education) in the Faculty of Medicine, Nursing and Health Sciences at Monash. Her research areas of interest include how clinical placement experiences affect the career choices of students across a range of health disciplines, professional behaviour and interprofessional education. Louise is the author of many journal articles and conference papers in education research and has also completed several consultancies to evaluate educational interventions. Her current research is exploring the impact of mental health on student academic performance. Louise is passionate about medical and health professions education and has particularly through her work with the Australian and New Zealand Association for Health Professional Educators.

Professor Karen Stagnitti (Deakin University)
Professor Stagnitti graduated with a Bachelor degree in Occupational Therapy from the University of Queensland. In 2003 she graduated from LaTrobe University with a Doctor of Philosophy. She has over 30 years' experience working as a paediatric OT. Since 2005 she has been at Deakin University teaching and researching in the occupational science and therapy program. She is the first editor of Oxford's Clinical Fieldwork Placement for Health Professional students. Karen has 60 national and international papers as well as 13 book chapters. She currently works as Professor, Personal Chair at the School of Health and Social Development at Deakin University, Victoria.

Ms Susan Gilbert-Hunt (University of South Australia)
Ms Gilbert Hunt is the Occupational Therapy Program Director within the School of Health Sciences, University of South Australia and joint Interprofessional Learning Lead in the Division of Health Sciences. Ms Gilbert Hunt is well recognized for her commitment and achievements in teaching and learning. She received a 2007 Carrick Citation for sustained commitment in innovative curriculum development that fosters student ability to work autonomously in addressing the needs of target community groups and, in 2008, received the prestigious Australian Learning and Teaching Council Award for teaching excellence in the area of work integrated learning. Together with the other Interprofessional Learning

Leads, Ms Gilbert Hunt is developing the curriculum for interprofessional learning across twelve discipline groups.

Associate Professor Richard Brightwell (Edith Cowan University)

Associate Professor Brightwell Richard is Coordinator of Paramedical Programs at Edith Cowan University, Perth, where he developed the undergraduate Paramedical Science Degree in consultation with the staff at St John Ambulance WA. A member of Paramedics Australasia, he has served on the PA Board since 2007. Richard is passionate about the role of paramedics in Australian healthcare. He represents PA as; The Chair of the Australasian College of Paramedicine; an executive member of NAPA; a member of the CAA National Accreditation and Ambulance Education Committees; and as a representative on various HWA and other government committees. He currently holds an ALTC grant to develop international standards for paramedics and a WA Health Department grant to research Paramedic referral to care as a possible solution to ramping.

Scenario/simulated patient background document: Aspergers Syndrome

1. **Title**
   Josh 15 year old teenager with Aspergers Syndrome.

2. **Summary/Overview**
   There are two scenes in this scenario:

Location	Participants
1. Pre-hospital	Josh Matt (older brother) 1 x Paramedic
2. At Home (Follow-up)	Josh Matt (brother) 1 x Nurse 1 x Occupational therapist 1 x Physiotherapist

Scene 1:
Josh is a 15 year old teenager who has been diagnosed with Aspergers Syndrome. Josh lives at home with his brother and both parents. He attends the local high school. He enjoys computer games, watching TV, riding his bicycle to and from school, and reading science fiction books. Josh is right hand dominant.

Earlier in the day Josh and Matt (his brother) had been to the gym to work out. When they arrive back at home around 4pm Josh starts to complain of a sore right hand/lower forearm, which he thinks he strained at the gym. The pain and discomfort continue to increase over a 30 minute period. His right hand begins to swell and some bruising starts to develop. Matt decides to ring for an ambulance as Josh becomes quite anxious and distressed with the pain. Josh and Matt's parents are still at work and aren't due home until 8pm. Josh becomes upset complaining of pain and Matt is not able to calm him.

A single responder paramedic arrives a short time later. The paramedic assesses Josh's right arm and puts on a roller bandage to support Josh's strained right wrist area. The paramedic feels Josh does not need to be transported to hospital, but a follow-up with his GP if required in the next day or two. Josh, Matt and the paramedic have a detailed discussion around this (e.g. the pros and cons of not going to hospital and any associated risks etc.). Both Matt and Josh ask a lot of questions and require some reassurance from the paramedic. Josh does not easily engage with

the paramedic, avoids eye contact, and asks the paramedic the same set of questions about four times. Josh is concerned that with his right bandaged right hand, he will not be able to play computer games, complete his homework, or ride to school on his bicycle tomorrow. He appears fixated on this and how it will affect his usual predictable routine.

Scene 2:

The next day the pain still persists in Josh's right lower arm. It appears swollen and bruised. Josh is not able to use his right arm to complete daily tasks like brushing his teeth, getting dressed, and holding a spoon to eat his breakfast. Josh is also upset that he is missing school and is not able to play computer games. Josh's mother decides to ring their local GP about the possibility of a home visit to look at Josh's arm. She isn't concerned about any serious injury, but feels Josh could do with some medical support in achieving his daily activities and schooling requirements. The GP organises for a district nurse to come that afternoon. The GP also provides Josh's mother with a community health centre phone number to organise a home visit from an occupational therapist and physiotherapist.

The nurse, occupational therapist, and physiotherapist arrive separately and each assess Josh's right lower arm along with his medical and social history. Reassurance and empathy is required from each of the clinicians.

3. **Clinician tasks**

   You are expected to gather information from Josh (and Matt) using your normal patient-centred interviewing skills. The aim of the scenario is to demonstrate empathetic, professional, caring behaviours towards Josh, and Matt. Each of the clinicians will introduce themselves and explain what their roles are to Josh and Matt.

   The occupational therapist will focus on Josh's daily routine and self-care tasks. She will ask questions about his daily activities that require the use of his dominant hand both at home and at school. She will ask him questions about being able to access his environment (opening and closing doors), and getting to and from school. The OT will also ask about how Josh uses technology for homework and leisure activities. She will also speak with Josh about his typically predictable daily routine and how this might change. She may also take to Josh and Matt about how they can problem solve any challenges that Josh might encounter and how Josh might be able to ask for assistance at school.

4. **Setting**

   At home

Specifically for the simulated patient

5. **Patient affect/behaviours**

   Josh – you are initially mildly distressed with the pain (3/10 on a pain scale). You're worried that you won't be able to attend the gym in the next few days. You are also worried about your schoolwork as you are right handed, and you think writing and typing on the computer will be difficult. You don't have any other symptoms. You are worried about not being able to complete some of your daily living tasks such as brushing your teeth, using cutlery, opening containers, opening and closing doors, key boarding, carrying books etc…that are all difficult given that your dominant hand is sore and bandaged. You are also concerned about the change to your routine and also about having to potentially ask peers at school for assistance.

   Josh and Matt: If you can think of ways to make the job of the paramedic, nurse, occupational therapist, and physiotherapist a bit more difficult that would be great. Being empathetic is essentially being able to put yourself in a patient's shoes and how the patient might be feeling. If you can make this a bit challenging for each of the clinicians that would be great ☺

6. **Patient's reason for the interaction (presenting problem) including their concerns and expectations**

   You experienced a constant dull ache in your lower arm/hand after leaving the gym. It didn't seem to hurt while you were at the gym, just when you started to cool down. You haven't done anything about the pain since getting back home from the gym (i.e. no paracetamol, no ice etc.). You are right hand dominant.

   Concerns – You are worried about not getting back to the gym in the next few days. You are concerned about your school work (you've got a major group project in the next few weeks) your capacity to write or use the computer, and your general daily routine and whether this will be affected in any way. You are also concerned about being able to complete daily tasks that require the use of two hands… brushing your teeth, using cutlery, opening containers, opening and closing doors, key boarding, carrying books etc.

   Expectations – Each of the clinicians will be interested, caring, re-assuring, and empathic allowing you to express your concerns. Again, if you make their job of interviewing (and being empathetic) that would be great ☺

7. **Patient's history of the problem**

   You have been well prior to the incident at the gym. The clinicians will ask you questions to ascertain if there have been any incidents leading up to this incident –

there hasn't been.

8. **Patient's past medical history**
   You have some mild hayfever.

9. **Patient's family history**
   Both maternal parents suffer from high blood pressure, and your father has type 2 diabetes.

10. **Patient's social information (work, lifestyle, habits)**
    You are in grade 10 at Koonung Secondary College. You enjoy school and particularly like drama and creative writing. You don't play a lot of sport but you enjoy going to the gym to work-out. You enjoy computer games, reading science fiction books and watching TV as well.

    You have a pretty good relationship with Matt. You have the "normal" brotherly arguments from time-to-time. You like to have a predictable routine and feel anxious in new situations. You also have trouble sometimes knowing how to interact socially with others, but try to respond as best you can.

    At school you have a teacher who provides support for you in issues related to having Aspergers Syndrome. You have previously seen a psychologist and an occupational therapist that have provided strategies to support you at school.

11. **Considerations in playing this role including wardrobe, makeup and challenges**
    Since we have two scenes, we'll need two sets of clothes. Clothing just needs to be comfortable, nothing special from our end.

Scenario/simulated patient background document: Indigenous Elderly

1. **Title**
   Mrs. Shelley Palmer, 60 year old suffers a fall.

2. **Summary/Overview**
   There are three scenes in this scenario:

Location	Participants
3. Pre-hospital	Shelley 2 x Paramedics
4. In-hospital	Shelley 2 x Paramedics 1 x Emergency Physician 1 x Nurse 1 x Radiologist
5. In-hospital	Shelley 1 x Physiotherapist 1 x Occupational therapist 1 x Dietitian

Scene 1:
Mrs. Shelley Palmer is a 60 year old lady who is semi-retired. She lives in a single storey villa unit by herself with two cats. She has a history of diabetes that is managed well with diet. Around 10am this morning Shelly loses her balance landing heavily on her right side with the impact of the fall being on right shoulder, hip and lower back. Shelley fortunately had her mobile phone in her pocket and was able to call for an ambulance. Shelley is quite distressed with her fall, and complains of pain in her right shoulder, hip and lower back pain. She has limited range of motion in her right shoulder and leg – any sudden movements cause an increase in pain.

Scene 2:
Shelley is transferred by ambulance to the Emergency Department (ED) where she, is managed by ED staff. Her symptoms have improved slightly; (the paramedics have given some pain relief) however, she is still quite agitated. Shelley asks a lot of questions and often asks the question several times. She demands to know whether she needs surgery, and is worried about her blood sugar levels. Reassurance and empathy is required from the ED staff. Shelley is seen by a nurse, ED physician, and radiographer. She has an X-ray taken of her shoulder and hip.

Scene 3:

Shelley is now recovering in a general medical ward. Initial investigations and scans revealed no fractures or major muscular damage. She has bruising on her right shoulder and hip. She still complains of pain and appears to be a bit confused and stressed about being away from home. Clinical staff will perform their medical examinations and social histories – for a planned discharge in a day or two.

3. **Clinician tasks**

   You are expected to gather information from Shelley using your normal patient-centred interviewing skills. The aim of the scenario is to demonstrate empathetic, professional, caring behaviours towards Shelley, other healthcare professionals. Each of the clinicians will introduce themselves and explain what their roles are to Shelley.

4. **Setting**

   At home - prehospital
   Emergency Department
   General medical ward
   At home – post hospital discharge

   Specifically for the simulated patient

5. **Patient affect/behaviours**

   You are agitated and are in quite a bit of pain in your right shoulder, hip and lower back. Eventually this will reduce after the paramedics and medical staff give you pain relief (which of course they won't actually give you). Any movements cause an increase in pain, and you're not able to stand up. We want you be hard of hearing … making the clinicians' roles difficult in getting a history from you … and hence empathetic ☺

   We have also given you a history of diabetes. When you are in the ED scene, we'll get you to feel a bit lightheaded … the clinicians will need to work out whether this is related to your sugar levels or related to the pain relief.

6. **Patient's reason for the interaction (presenting problem) including their concerns and expectations**

   You experienced a dull ache in your right shoulder, hip and lower back upon landing on the floor (hard surface). Any movements make the pain worse and sharp in nature. You manage your diabetes with tablets (not injections) and generally you look after your sugar levels pretty well. However, you are worried about your sugar levels throughout the scenario. Apart from your acute pain, hard of hearing and diabetes your health is pretty good. You are also worried about having time with

your grandchildren (who come over and have sleep over's) and the care of your pets (you have two cats). You find being in a strange hospital environment stressful and are anxious to go home.

Expectations – Each of the clinicians will be interested, caring, re-assuring, and empathic allowing you to express your concerns and possibly order some tests and investigations.

7. **Patient's history of the problem**
   You have well-managed diabetes (controlled with tablets) though you don't tend to see any local doctors that often. You are normally independent and haven't had any previous fractures or black-outs.

8. **Patient's past medical history**
   Hard of hearing, diabetes, and possibly high blood pressure (you don't take medications for this).

9. **Patient's family history**
   Nil remarkable.

10. **Patient's social information (work, lifestyle, habits)**
    You are semi-retired. You previously worked as a primary school teacher. You now help out with administration duties at the local bowls club. You work 1.5 days a week. You have a good work/life balance, and enjoy seeing your 4 grandchildren. You are quite active and have an occasional glass of wine or gin and tonic.

    You have three children. You were married for 16 years to John (John passed away 6 years ago).

    You are quite attached to your two cats. You are anxious to get home and find the noisy hospital environment stressful.

11. **Considerations in playing this role including wardrobe, makeup and challenges**
    Please wear something 'comfortable'.

Scenario/simulated patient background document: Pregnant Stroke

1. **Title**
   Mrs. Sally Scott, 35 years old pregnant woman suffering a stroke.

2. **Summary/Overview**
   There are three scenes in this scenario:

Location	Participants
6. Pre-hospital (At home)	Sally David (Husband) 2 x Paramedics
7. In-hospital (Emergency Department)	Sally David (Husband) 2 x Paramedics 1 x Emergency Physician 2 x Nurses 1 x Midwife 1 x Radiologist
8. In-hospital (Medical Ward)	Sally David (Husband) 1 x Physician 1 x Nurse 1 x Physiotherapist 1 x Occupational therapist 1 x Dietitian

Scene 1:
Mrs. Sally Scott, a 35 year old interior designer, is 28 weeks pregnant. Around 9am this morning Sally collapses unconscious at home. Her husband is in attendance and calls for an ambulance. Sally is agitated, complains of a headache, has great difficulty in speaking and swallowing, and has facial numbness. Her husband is very worried, and requires lots of reassurance and empathy from the paramedics; otherwise he becomes a little difficult to manage.

Scene 2:
Sally is transferred by ambulance to the Emergency Department where she, and David, are managed by ED staff. Her symptoms have improved slightly; however, she is still quite agitated, and has speech difficulties. David still requires careful and considered reassurance regarding the pregnancy and health of Sally. David asks a lot of questions and often will ask the question several times. He demands to know

what the prognosis is for his wife and baby. Reassurance and empathy is required from the nurses, midwife, and emergency physician.

Scene 3:
Sally is now recovering in a general medical ward that provides therapy follow-up and midwifery monitoring of the baby. She has made a full recovery.

3. **Clinician tasks**
   You are expected to gather information from Mrs. Sally Scott using your normal patient-centred interviewing skills. The aim of the scenario is to demonstrate empathetic, professional, caring behaviours towards Sally, her husband and other healthcare professionals. Each of the clinicians will introduce themselves and explain what their roles are to Sally and David.

4. **Setting**
   At home
   Emergency Department
   General medical ward that provides therapy follow-up

   Specifically for the simulated patient
5. **Patient affect/behaviours**
   You are agitated, and have great difficulty speaking swallowing and facial numbness (because of the stroke) during scene 1 and 2, although you are co-operative throughout. You nod when the clinicians ask whether you have a headache and facial numbness. You make a full recovery in scene 3 (no headache, and normal speech and swallowing).

6. **Patient's reason for the interaction (presenting problem) including their concerns and expectations**
   You experienced a sharp headache in the morning and suddenly collapse. This is your first pregnancy. You've experienced a little morning sickness, and moderate blood pressure which is being monitored by your doctor. Otherwise, you have been travelling pretty well.

   Concerns – You are very worried about the health of your baby. You are also very concerned about your speech and whether this might occur again, or be permanent if it occurs again. You are worried about the medications you've received and whether this will affect your baby. You're not sure how well David will cope with your health scare.

   Expectations – Each of the clinicians will be interested, caring, re-assuring, and

empathic allowing you to express your concerns and possibly order some tests and investigations.

7. **Patient's history of the problem**
   You have moderate blood pressure which is being monitored by your doctor. You've felt a little "off" for a few days - feeling generally unwell and tired but you thought that was just a part of the pregnancy. When questioned, it will emerge that you have had a number of small headaches over the past 2 or 3 days. You've not taken any medications as you've worried whether this might affect your baby. You have not contacted any medical help. You have not mentioned anything to David, at risk of making him too "stressed".

8. **Patient's past medical history**
   Nothing notable. Moderate blood pressure, otherwise your antenatal progress has been unremarkable.

9. **Patient's family history**
   Both maternal parents suffered from high blood pressure. Your father died of a cerebral haemorrhage 12 years ago.

10. **Patient's social information (work, lifestyle, habits)**
    You work as an interior designer. You mostly work from home, although you work from the main office when required. You have a good work/life balance, although it gets quite hectic at times. You probably do not do as much exercise as you should, and have an occasional glass of wine but have avoided this since your pregnancy was confirmed.

    You have been married to David for 5 years who works as an IT consultant.

11. **Considerations in playing this role including wardrobe, makeup and challenges**
    Please wear something 'comfortable', we'll arrange hospital gowns etc.
    We'll also arrange some pregnancy padding.

Demographic questionnaire used

1. Which course are you currently studying? (please tick one box)

1. Emergency Health (Paramedic) □
2. Midwifery □
3. Nursing □
4. Nursing/Emergency Health (Paramedic) □
5. Occupational Therapy □
6. Physiotherapy □
7. Medicine □
8. Nutrition and Dietetics □
9. Radiation Therapy □
10. Radiography □
11. Podiatry □
12. Other □

2. Year of Course? (please tick one box)

1. Year 1 □
2. Year 2 □
3. Year 3 □
4. Year 4 □
5. Year 5 □

3. What is your age group? (please tick one box)

1. 19 years or less □
2. 20 – 24 years □
3. 25 - 29 years □
4. 30 – 34 years □
5. 35 – 39 years □
6. 40 – 44 years □
7. 44 – 49 years □
8. 50 years or older □

4. What is your gender? (please tick one box)

1. Female □
2. Male □

Questionnaires used

Jefferson Scale of Empathy – Health Profession – Student version (JSE-HP-S)
Adapted from Hojat et al 2001 (with permission)

1	2	3	4	5	6	7
Strongly Disagree						Strongly Agree

A	Healthcare providers' understanding of their patients' feelings and the feelings of their patients' families does not influence treatment outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**
B	Patients feel better when their healthcare providers understand their feelings	**1**	**2**	**3**	**4**	**5**	**6**	**7**
C	It is difficult for a healthcare provider to view things from patients' perspectives	**1**	**2**	**3**	**4**	**5**	**6**	**7**
D	Understanding body language is as important as verbal communication in healthcare provider-patient relationships	**1**	**2**	**3**	**4**	**5**	**6**	**7**
E	A healthcare provider's sense of humour contributes to a better clinical outcome	**1**	**2**	**3**	**4**	**5**	**6**	**7**
F	Because people are different, it is difficult to see things from patients' perspectives	**1**	**2**	**3**	**4**	**5**	**6**	**7**
G	Attention to patients' emotions is not important in patient interview	**1**	**2**	**3**	**4**	**5**	**6**	**7**
H	Attentiveness of patients' personal experiences does not influence treatment outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**
I	Health care providers should try to stand in their patients' shoes when providing care to them	**1**	**2**	**3**	**4**	**5**	**6**	**7**
J	Patients value a healthcare provider's understanding of their feelings which is therapeutic in its own right	**1**	**2**	**3**	**4**	**5**	**6**	**7**
K	Patients' illnesses can be cured only by targeted treatment; therefore, healthcare providers' emotional ties with their patients do not have a significant influence in treatment outcomes	**1**	**2**	**3**	**4**	**5**	**6**	**7**
L	Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints	**1**	**2**	**3**	**4**	**5**	**6**	**7**
M	Healthcare providers should try to understand what is going on in their patients' minds by paying attention to their non-verbal cues and body language	**1**	**2**	**3**	**4**	**5**	**6**	**7**
N	I believe that emotion has no place in the treatment of medical illness	**1**	**2**	**3**	**4**	**5**	**6**	**7**
O	Empathy is a therapeutic skill without which a healthcare providers' success is limited	**1**	**2**	**3**	**4**	**5**	**6**	**7**
P	Healthcare providers' understanding of the emotional status of their patients, as well as that of their families is one important component of the healthcare provider – patient relationship	**1**	**2**	**3**	**4**	**5**	**6**	**7**
Q	Healthcare providers should try to think like their patients in order to render better care	**1**	**2**	**3**	**4**	**5**	**6**	**7**
R	Healthcare providers should not allow themselves to be influenced by strong personal bonds between patients and their family members	**1**	**2**	**3**	**4**	**5**	**6**	**7**
S	I do not enjoy reading non-medical literature or the arts	**1**	**2**	**3**	**4**	**5**	**6**	**7**
T	I believe that empathy is an important factor in patients' treatment	**1**	**2**	**3**	**4**	**5**	**6**	**7**

Readiness for Interprofessional Learning Scale (RIPLS)

McFadyen et al 2006 (with permission)

1	2	3	4	5
Strongly disagree	Disagree	Undecided	Agree	Strongly agree

1.	Learning with other students will make me a more effective member of a health care team	**1**	**2**	**3**	**4**	**5**
2.	Patients would ultimately benefit if health care students worked together to solve patient problems	**1**	**2**	**3**	**4**	**5**
3.	Shared learning with other health care students will increase my ability to understand clinical problems	**1**	**2**	**3**	**4**	**5**
4.	Learning between health care students before qualification would improve working relationships after qualification	**1**	**2**	**3**	**4**	**5**
5.	Communication skills should be learned with other health care students	**1**	**2**	**3**	**4**	**5**
6.	Shared learning will help me think positively about other health care professionals	**1**	**2**	**3**	**4**	**5**
7.	For small-group learning to work, students need to respect and trust each other	**1**	**2**	**3**	**4**	**5**
8.	Team-working skills are vital for all health care students to learn	**1**	**2**	**3**	**4**	**5**
9.	Shared learning will help me to understand my own professional limitations	**1**	**2**	**3**	**4**	**5**
10.	I don't want to waste time learning with other health care students (R)	**1**	**2**	**3**	**4**	**5**
11.	It is not necessary for undergraduate health care students to learn together (R)	**1**	**2**	**3**	**4**	**5**
12.	Clinical problem solving can only be learnt effectively with students from my own discipline (R)	**1**	**2**	**3**	**4**	**5**
13.	Shared learning with other health care professionals will help me to communicate better with patients and other professionals	**1**	**2**	**3**	**4**	**5**
14.	I would welcome the opportunity to work on small group projects with other health care students	**1**	**2**	**3**	**4**	**5**
15.	Shared learning will help me clarify the nature of patients' or clients' problems	**1**	**2**	**3**	**4**	**5**
16.	Shared learning before qualification will help me become a better team worker	**1**	**2**	**3**	**4**	**5**
17.	The function of nurses and allied health care workers is mainly to provide support for doctors	**1**	**2**	**3**	**4**	**5**
18.	I am not sure what my professional role will be	**1**	**2**	**3**	**4**	**5**
19.	I have to acquire much more knowledge and skill than other students	**1**	**2**	**3**	**4**	**5**

Item-level results: Empathy

Item	BEFORE Mean (SD)	AFTER Mean (SD)	SIG
Healthcare providers' understanding of their patients' feelings and the feelings of their patients' families does not influence treatment outcomes	2.22 (1.62)	1.58 (1.16)	*p*<0.0001
Patients feel better when their healthcare providers understand their feelings	6.41 (0.99)	6.63 (0.71)	*p*=0.002
It is difficult for a healthcare provider to view things from patients' perspectives	3.47 (1.28)	2.91 (1.61)	*p*<.0001
Understanding body language is as important as verbal communication in healthcare provider-patient relationships	6.32 (0.90)	6.60 (0.66)	*p*<.0001
A healthcare provider's sense of humour contributes to a better clinical outcome	4.96 (1.27)	5.42 (0.98)	*p*<0.0001
Because people are different, it is difficult to see things from patients' perspectives	3.62 (1.55)	3.16 (1.85)	*p*=0.001
Attention to patients' emotions is not important in patient interview	1.52 (0.97)	1.43 (0.93)	*p*=2.19
Attentiveness of patients' personal experiences does not influence treatment outcomes	2.24 (1.14)	1.72 (1.03)	*p*<0.0001
Health care providers should try to stand in their patients' shoes when providing care to them	5.72 (1.25)	6.24 (0.90)	*p*<0.0001
Patients value a healthcare provider's understanding of their feelings which is therapeutic in its own right	5.97 (1.04)	6.27 (0.73)	*p*<0.0001
Patients' illnesses can be cured only by targeted treatment; therefore, healthcare providers' emotional ties with their patients do not have a significant influence in treatment outcomes	2.15 (1.21)	1.71 (1.01)	*p*<0.0001
Asking patients about what is happening in their personal lives is not helpful in understanding their physical complaints	2.05 (1.18)	1.59 (1.02)	*p*<0.0001
Healthcare providers should try to understand what is going on in their patients' minds by paying attention to their non-verbal cues and body language	6.01 (1.16)	6.48 (.77)	*p*<0.0001
I believe that emotion has no place in the treatment of medical illness	1.60 (1.15)	1.35 (0.77)	*p*=0.001
Empathy is a therapeutic skill without which a healthcare providers' success is limited	5.71 (1.34)	6.06 (1.10)	*p*=0.001
Healthcare providers' understanding of the emotional status of their patients, as well as that of their families is one important component of the healthcare provider – patient relationship	6.07 (1.10)	6.54 (0.69)	*p*<0.0001
Healthcare providers should try to think like their patients in order to render better care	5.09 (1.32)	5.66 (1.31)	*p*<0.0001
Healthcare providers should not allow themselves to be influenced by strong personal bonds between patients and	4.44 (1.45)	4.72 (1.75)	*p*=2.14

their family members			
I do not enjoy reading non-medical literature or the arts	2.13 (1.46)	1.62 (1.20)	$p<0.0001$
I believe that empathy is an important factor in patients' treatment	6.28 (1.02)	6.62 (0.69)	$p<0.0001$

Item-level results: RIPLS

Item	BEFORE Mean (SD)	AFTER Mean (SD)	SIG
Learning with other students will make me a more effective member of a health care team	4.47 (.68)	4.56 (.65)	*p*=0.10
Patients would ultimately benefit if health care students worked together to solve patient problems	4.27 (0.73)	4.54 (0.68)	*p*<0.0001
Shared learning with other health care students will increase my ability to understand clinical problems	4.32 (0.77)	4.57 (0.59)	*p*<.0001
Learning between health care students before qualification would improve working relationships after qualification	4.34 (0.72)	4.64 (0.60)	*p*<0.0001
Communication skills should be learned with other health care students	4.14 (0.90)	4.52 (0.68)	*p*<0.0001
Shared learning will help me think positively about other health care professionals	4.15 (0.83)	4.43 (0.79)	*p*=0.001
For small-group learning to work, students need to respect and trust each other	4.58 (0.65)	4.75 (0.49)	*p*<0.0001
Team-working skills are vital for all health care students to learn	4.66 (0.59)	4.80 (0.47)	*p*=0.001
Shared learning will help me to understand my own professional limitations	4.21 (0.75)	4.54 (0.69)	*p*<0.0001
I don't want to waste time learning with other health care students	1.61 (0.82)	1.34 (0.60)	*p*<0.0001
It is not necessary for undergraduate health care students to learn together	1.72 (0.89)	1.48 (0.72)	*p*<0.0001
Clinical problem solving can only be learnt effectively with students from my own discipline	2.07 (0.98)	1.53 (0.68)	*p*<0.0001
Shared learning with other health care professionals will help me to communicate better with patients and other professionals	4.28 (0.77)	4.03 (1.32)	*p*=0.007
I would welcome the opportunity to work on small group projects with other health care students	4.06 (0.83)	4.50 (0.72)	*p*<0.0001
Shared learning will help me clarify the nature of patients' or clients' problems	4.03 (0.80)	4.49 (0.66)	*p*<0.0001
Shared learning before qualification will help me become a better team worker	4.35 (0.76)	4.63 (0.57)	*p*<0.0001
The function of nurses and allied health care workers is mainly to provide support for doctors	1.94 (1.01)	1.71 (1.06)	*p*=0.04
I am not sure what my professional role will be	1.89 (0.97)	1.72 (0.81)	*p*=0.10
I have to acquire much more knowledge and skill than other students	2.65 (1.02)	2.33 (1.04)	*p*<0.0001