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Peer teaching experiences of final year paramedic students: 2011-2012

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We would like to acknowledge the students who participated in this study.

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Cover Page Footnote

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Brett Williams, Holly Fellows, Kathryn Eastwood, and Jaime Wallis

ABSTRACT

Peer assisted learning (PAL) is one method of teaching which involves peers, or people from similar social groups, in reciprocal learning where one peer educates another and in return learns through the teaching experience. There have been many reported benefits of PAL programs. PAL has a long history of use in healthcare education; however, for paramedic education there is a paucity of literature. A pilot PAL project was undertaken in the Bachelor of Emergency Health (BEH) course at Monash University in Melbourne, Australia. This study had two aims: i) to evaluate the effectiveness of the pilot PAL program, and ii) to compare academic grades between peer teachers and those not involved in the PAL program over 2011-2012. Forty-one students volunteered, with 23 students in 2011 and 18 in 2012. At the completion of their peer teaching, all students were asked to complete the 14-item Peer Teaching Experience Questionnaire (PTEQ).

Of the 41 students, 63.4% were female, 73.2% were under 25, 82.9% had been taught by peers previously, 31.7% had taught peers previously, and 51.2% had undertaken previous tertiary studies. Students strongly agreed teaching and leadership were important to the paramedic role. Students also strongly agreed that their peer teaching experience was personally rewarding, increased their knowledge and skills, and would be of direct benefit to them as a graduate paramedic. Moreover, students who participated in the PAL project as peer teachers obtained higher clinical marks on their final clinical examination than their non-PAL counterparts (2011 76.5% vs. 71.0%, $p < .001$, and 2012, 75.2% vs. 72.7%, $p < .001$). This study suggests PAL programs have a great potential to provide a wide range of benefits in paramedic courses. As this was a pilot program, there were many limitations and caution should be used in making any generalisations. However, the overwhelmingly positive response from the students strongly suggests PAL programs should continue to be implemented in paramedic education.

INTRODUCTION

Throughout history, teaching and learning have been central to the progression of society (Tokuhamma-Espinosa, 2011). The concept of peer teaching can be traced back as far as the Ancient Greeks and was first described in the English Lancastrian system in 1806 before being introduced in the United States as peer tutoring programs (Iwasiw & Goldenberg, 1993; Topping, 1996). More recently, Peer Assisted Learning (PAL) programs have diversified in both use and setting (Iwasiw & Goldenberg, 1993; Secomb, 2008). Many definitions have been put forward for PAL programs (often used interchangeably with terms such as Supplemental Instruction and Peer

Assisted Study Sessions); however, all contain three important elements. First, peers are people from similar social groups who learn from and teach each other. Second, the peers providing help are not professional teachers or “experts.” Third, both parties benefit from participation, with some being assisted with their learning and some learning by teaching (Boud, 2001; Boud, Cohen, & Sampson, 1999; Henning, Weidner, & Marty, 2008; Topping & Ehly, 1998). Under such definitions, PAL is an umbrella term encompassing a variety of strategies where success and benefits are based on the theoretical idea that social interaction, collaboration, and co-operation are an essential part of learning and teaching (Henning et al., 2008; Secomb, 2008). This paper gives both a qualitative and quantitative analysis of the experience of final year paramedic students in piloting a PAL program over two years.

Much of the research regarding PAL programs investigates the validity of the claim that PAL provides benefits to all students participating. Diverse literature supports the notion of PAL promoting teaching skills (Beard, O'Sullivan, Palmer, Qiu, & Kim, 2012; Ross & Cameron, 2007; Secomb, 2008); improving professional skills, such as communication, time management, responsibility, and self-confidence (Beard et al., 2012; Loke & Chow, 2007; Nestel & Kidd, 2005; Secomb, 2008); and increasing the knowledge base of peer teachers (Best, Hajzler, Ivanov, & Limon, 2008; Henning et al., 2008; Topping, 1996). For students being taught by their peers, the reported benefits are seen through a greater openness in classes, with increased access, involvement, interest in learning, and confidence in participating (Hammond, Bithell, Jones, & Bidgood, 2010; Secomb, 2008; Topping, 1996). Despite the absence of expertise from the peer teacher, several studies have also reported improved cognitive and psychomotor abilities compared to non-peer led programs (Iwasiw & Goldenberg, 1993; Ross & Cameron, 2007; Secomb, 2008). Nonetheless, lack of expertise is the greatest cause of concern for PAL programs in terms of the quality of student learning (Henning et al., 2008; ten Cate, van de Vorst, & van den Broek, 2012; Topping, 1996). Other issues include high levels of time and resources required to implement PAL programs (Topping, 1996) and students reporting incompatibility with peer teachers (Secomb, 2008).

PAL has a long history of use in a wide variety of contexts with peer tutoring being reported in some secondary and elementary schools, including classes for children with learning disabilities or mental and physical disabilities (Iwasiw & Goldenberg, 1993; Loke & Chow, 2007). PAL programs are also increasingly popular in tertiary education with research on programs across an extensive range of subjects, including education, physics, mathematics, and healthcare (Hammond et al., 2010; Loke & Chow, 2007). There is a long history of PAL programs in healthcare degrees with authors describing its use in the 1970s and 1980s (McKenna & French, 2011). Whilst much of the research has focussed on medicine, PAL programs have also been developed for most areas of healthcare, including nursing, dentistry, physiotherapy, occupational therapy, osteopathy, psychology, and health sciences (Ross & Cameron, 2007). PAL programs are most frequently implemented in the clinical education component of healthcare courses where students are expected not only to acquire clinical skills but also develop non-clinical skills, such as problem-solving, clinical reasoning, critical thinking, professional responsibility, teamwork, and the ability to be independent but collaborative practitioners (Henning et al., 2008; Iwasiw & Goldenberg, 1993; Ross &

Cameron, 2007). Such skills are also essential for paramedics, who often work in dynamic, high-pressure settings. Despite the obvious parallels in skills, the only study on PAL programs in paramedic degrees is a small qualitative study on a pilot program run at Victoria University (VU), Melbourne, Australia in 2007 reporting improved learning and student satisfaction and increased interest and self-confidence amongst the peers (Best et al., 2008).

PAL programs are well established in healthcare degrees with a well-established history of success. For paramedics, a field of healthcare only recently transitioned to a university model of teaching, PAL offers the opportunity to implement a program incorporating key employability skills into the paramedic course, such as leadership and critical thinking skills, while also adding to the PAL body of knowledge.

The aims of this study were: i) to evaluate the effectiveness of the pilot PAL program, and ii) to compare academic grades between peer teachers and those not involved in the PAL program over a two-year period (2011-2012).

METHOD

Design

A cross-sectional study using a short paper-based self-reporting questionnaire was administered to final year peer teachers during October 2011 and 2012.

Participants

Students in their final year of the Bachelor of Emergency Health (BEH) at Monash University were asked to volunteer as peer teachers in tutorials in a cardio-respiratory emergencies unit. The BEH program is a three year pre-employment (pre-registration) degree offered to students seeking employment with an emergency ambulance service in Australia. The program does not formally teach or assess students' ability to develop teaching plans, nor does it educate students about how to teach or facilitate. A short one-hour session was provided to all peer teachers before the project outlining the aim of PAL, lesson planning, learning outcomes, and considerations for using different teaching aids. Peer teachers were also given access to all lecture notes and readings throughout the semester. PAL sessions did not require the peer teachers to assess the peer learners.

Peer teachers who volunteered were asked to link weekly lecture learning outcomes with accompanying tutorials. Peer teachers were expected to develop lesson plans and teach both theory and practical skills. For example, they would be expected to draw diagrams on a whiteboard, use models, as well as teach clinical skills and run practical scenarios. No students were excluded from participating. Teaching timetables were posted in the student lounge where peer teachers could allocate themselves to a group. These timetables included the weekly content and learning objectives. Peer teachers took part in between 4 and 11 sessions during available blocks in their timetable (Fridays). Each tutorial class consisted of two peer teachers and one paid sessional staff member. The peer teachers ran the sessions while the staff members served an assistant role, answering any questions the peer teachers were unsure of and providing clarification when needed. Tutorial classes ranged in size between eight and 14 peer learners, therefore ensuring

excellent peer teacher to peer learner ratios. To maximise exposure and experience for peer teachers they were asked to rotate between groups each week allowing opportunities to teach new peer learners.

Instrumentation

The Clinical Teaching Preference Questionnaire originally developed and tested as a tool for evaluating the peer learning experience of first year nursing students (Iwasiw & Goldenberg, 1993), was adapted to evaluate the peer teaching experience of third year nursing students, producing the Peer Teaching Experience Questionnaire (PTEQ) (McKenna & French, 2011). The PTEQ consists of 14 statements using a 5-point Likert response format. This study modified the PTEQ to reflect its use for paramedic rather than nursing students. This was simply changing “nursing” to “paramedics” and only involved three items. No other wording or items were modified. An open-ended question was also offered to participants to provide feedback on their attitudes and perceptions towards their PAL experiences. Comparison of clinical examination grades (final clinical unit of study) was also carried out between final year peer teachers involved in the PAL program and those final year students not involved in the PAL program. This comparison was undertaken in an attempt to examine whether participation in PAL had any effect on academic performance.

Ethics

Ethics approval was granted by the Monash University Human Research Ethics Committee. Peer teachers were invited to complete the PTEQ by a non-teaching staff member at the conclusion of a tutorial. Participants were provided with an explanatory statement detailing that their participation was voluntary.

Procedures

At the conclusion of the final tutorial, the peer teachers were invited to complete the PTEQ on a voluntary basis. The peer teachers were informed that their responses were anonymous. The questionnaires took students approximately 10 minutes to complete and consent was implied by completion and submission of the questionnaire. No follow-ups were undertaken. A review of clinical examination grades was also undertaken of peer teachers and a random selection of final year students' grades not involved in the PAL program. The comparison with a random selection of students was undertaken in an attempt to overcome the self-selection bias of the PAL program.

Data Analysis

Quantitative data was analysed using Statistical Package for the Social Sciences (SPSS, SPSS Inc., Chicago), investigating mean and standard deviations for each statement. Descriptive statistics, including means and standard deviations (SD), were used to summarise the demographic data. To examine if final examination scores would be different between peer teachers and non-peer teachers, an independent samples t-test was also performed. All tests were two tailed unless otherwise stated with the results considered statistically significant if the *p* value was less than .05.

RESULTS

Demographic data

Of the 214 eligible third year students, 41 (23 in 2011, and 28 in 2012) participated in this study (see Table 1). Of the peer teachers in this study, 82.9% had previous experience with being a student within a PAL setting, whilst 31.7% had previously acted in a peer teacher role. Eight in ten (82.9%) of respondents reported experience of being taught by peers while 31.7% reported experience of teaching peers. Around half of the respondents (51.2%) reported having undertaken previous studies at a tertiary level; however, there were differences between the 2011 and 2012 cohorts, with 39.1% reporting previous tertiary studies in 2011 compared with 66.7% in 2012. The majority of participants were under 25 years of age (73.2%).

In 2011, 65.2% of respondents were aged 17-21 years, 65.2% were female and 39.1% had undertaken previous tertiary study. In 2012, 50% of respondents were aged 22-25 years, 61.1% were female, and 66.7% had undertaken previous tertiary study.

Table 1
Participant demographics

		2011		2012		All	
		n	%	n	%	n	%
Age	<22yrs	15	65.2	3	16.7	18	43.9
	22-25yrs	3	13.0	9	50.0	12	29.3
	26-30yrs	2	8.7	5	27.8	7	17.1
	31-35yrs	2	8.7	0	0.0	2	4.9
	>36yrs	1	4.3	1	5.6	2	4.9
Gender	Female	15	65.2	11	61.1	26	63.4
	Male	8	34.8	7	38.9	15	36.6
Previous studies at tertiary level?	Yes	9	39.1	12	66.7	21	51.2
	No	14	60.9	6	33.3	20	48.8
Experience of being taught by peers?	Yes	20	87.0	14	77.8	34	82.9
	No	3	13.0	4	22.2	7	17.1
Experience of teaching peers?	Yes	7	30.4	6	33.3	13	31.7
	No	16	69.6	12	66.7	28	68.3

Peer teaching experience

The peer teacher responses were overwhelmingly positive, as indicated in Table 2. Students strongly agreed with the importance of teaching in the role of paramedics ($M = 4.71$, $SD = 0.46$) and their responsibility to teach ($M = 4.41$, $SD = 0.89$). Students also agreed that their peer teaching experience increased their knowledge and skills ($M = 4.17$, $SD = 0.77$), was personally rewarding ($M = 4.54$, $SD = 0.67$), and was of direct benefit to their graduate

paramedic role ($M = 4.51$, $SD = 0.60$). In carrying out the task, responses from students were mixed. Students reported varying levels of initial apprehension about the unit's peer teaching requirement ($M = 2.95$, $SD = 1.24$) and varying levels of comfort with assessing the performance of junior students ($M = 2.76$, $SD = 1.33$). However, students strongly agreed they felt comfortable teaching the junior students ($M = 4.10$, $SD = 0.83$). Overall, students strongly agreed that they enjoyed the experience and would like more opportunities for peer teaching in the curriculum ($M = 4.59$, $SD = 0.59$).

Table 2
Peer Teaching Experience Questionnaire (PTEQ) (n = 41)

	Mean	SD
Teaching is an important role for paramedics	4.71	0.46
What I have learnt in this unit will help with my graduate paramedic role	4.51	0.60
The peer teaching experience was time and effort well spent	4.61	0.59
The peer teaching experience was personally rewarding	4.54	0.67
I now understand the principles underpinning teaching and learning	3.95	0.77
I was initially apprehensive about the peer teaching requirement in the unit	2.95	1.24
I felt comfortable teaching the junior students	4.10	0.83
I have developed basic skills for teaching basic clinical skills	4.17	0.77
The peer teaching experience allowed me to reflect on my own previous learning	4.68	0.47
I enjoyed working with the junior students	4.71	0.46
I felt uncomfortable assessing the junior students' skills	2.76	1.33
I would be more confident teaching a clinical skill after this experience	4.34	0.88
There should be more opportunities for peer teaching in the curriculum	4.59	0.59
Paramedics have a professional responsibility to teach students and their peers	4.41	0.89

Comparison of clinical exam scores

The mean final year clinical examination results of peer teachers ($n = 41$) were compared to that of a random selection of students not involved in the PAL pilot study ($n = 41$). In both 2011 and 2012, students who participated in the PAL project as peer teachers obtained higher clinical marks on their final clinical examination than their non-PAL counterparts (2011 76.5% vs. 71.0%, $p < .001$, and 2012, 75.2% vs. 72.7%, $p < .001$).

Qualitative results

Qualitative data collected were grouped in themes and compared between two coders (authors BW and HF) for consistency. Feedback from the students supports the statistical findings with overall themes of a positive experience, improved knowledge, and interest in future PAL sessions.

Students commented on their experience:

Really great experience and I'm so glad I participated! (Student 1)

Students made special note of how the teaching experience has helped them to consolidate their own skills and knowledge:

What a good opportunity to revise our own skills which had become a little rusty! (Student 3)

Helped clarify our own knowledge, especially where there have been changes in clinical procedure since we were in first year (Student 2)

The students commented on peer teaching, both during this trial and in the future:

Would have loved more time for each session. Feedback from students also suggests they would have liked more time too (Student 7)

Would be great to have more opportunities for peer teaching (Student 10)

Students' mixed levels of apprehension and mixed feelings on assessment were reflected in suggestions for more education on teaching prior to the peer teaching experience and more clarity on what was being taught in the sessions:

Some teaching education prior to sessions would be beneficial (Student 6)

More communication from lecturers... sessionals and students often knew what specific things we were to cover... info hadn't filtered through to us... (Student 9)

DISCUSSION

Results closely match those found in a study by McKenna and French (2011) and a qualitative study on paramedic students by Best et al. (2008). Whilst Best et al. focussed primarily on outcomes for students receiving mentorship, they also reported benefits of revitalised interest in work and an increase in self-confidence for peer mentors, matching the results from this study. These combined studies provide the paramedic discipline with early but positive findings for other researchers to explore and replicate.

Third year paramedic students strongly agreed that teaching was an important part of the paramedic role. The interpersonal and professional skills essential to healthcare professions have been noted as more complex to integrate into the curriculum (Ross, 2012; Willis, 2009). With the importance of non-clinical skills further highlighted by students in this study, PAL programs represent one option to assist students to develop competence in these areas (Beard et al., 2012; Ross & Cameron, 2007). These are promising results given the importance being placed on teaching and education in the ambulance industry. As highlighted previously, the function and role of paramedics continues to change in an attempt to adapt to the changing health care system. One of these changes is the prominence now being placed on paramedics being teachers/educators. We would argue that the earlier this change starts the better it can be achieved.

Students reported many benefits from their experience of peer teaching, from personal enjoyment and growth through to increased skills and knowledge, all of which they saw as benefiting them as graduates. Many specific comments were made by students about how peer teaching had enhanced their own clinical skills. Theory supports such outcomes as PAL is seen as mutually beneficial since the ability to teach a skill inherently requires a deeper knowledge (Beard et al., 2012; Henning et al., 2008; Topping, 1996; Topping & Ehly, 2001). This is perhaps best described by the saying “to teach is to learn twice” (Ross & Cameron, 2007). Indeed, peer teachers involved in the PAL project obtained better scores on their clinical theoretical examination compared with their counterparts who were not involved. Better randomisation sample selection methodology for future research will help clarify this result. Additional work in educational psychology and some grounding in cognitive theory will also be very important for PAL and understanding why it can possibly lead to better academic performance.

While somewhat apprehensive prior to the commencement of teaching, students were comfortable teaching if not wholly comfortable in assessing junior students' performance. Open-ended statements suggested that the less positive responses were due, at least in part, to inadequate education on teaching prior to the peer teaching sessions and a lack of clarity on concepts being taught during sessions. These findings likely reflect that not enough time was given preparing peer teachers for their roles within tutorials. Attempts have now been put in place to increase the time, content, and clarity of these sessions. For example, we are currently using elements from the Peer Assisted Study Sessions (PASS) model as the basis for preparing peer teachers in a randomised interventional study. The PASS model has a strong focus on training for peer tutors (as they are termed in this model), with research suggesting it is this training which is responsible for the success and growth of PASS in universities (Outhred & Chester, 2010; Skalicky & Caney, 2010).

Inadequate training of peer teachers also has the potential to impact on PAL student experiences as a previous study indicated first year paramedic students' greatest concern regarding the program was feeling they were more likely to learn from instructors than peers (McLelland, McKenna, & French, 2013). Similar results were also seen in a study on PAL in athletic training where students preferred feedback from clinical instructors (Henning, Weidner, & Jones, 2006). PAL programs will only add benefit to both peer teachers and students if both the student and peer teacher feel comfortable that the quality of clinical teaching is maintained.

Results from this two-year study suggest that PAL has been a positive experience for final year peer teachers and has statistically shown to improve clinical scores compared with final year students not involved in the PAL project. These results provide the paramedic profession with important pedagogical and empirical data in exploring the benefits of PAL while also adding to its emerging body of knowledge in tertiary education. There is overwhelming support for peer teaching in all tertiary healthcare clinical education and this study adds paramedics to the growing list with positive quantitative evidence to support the inclusion of structured PAL programs (Burch, Guthrie, Kidd, Lewis, & Smiler, 2010; Secomb, 2008).

Limitations

This study has a small sample size with data only collected from students at one campus at one university in Australia. All data collected was self-reported from two groups of students over two years. As a result, any generalisations to paramedic students in general are limited and the long-term benefits of a PAL program are unknown. Hammond et al. (2010) also cautioned against what they termed the “positivist” approach that peer learning research has taken recently where student performance is the focus and PAL the independent variable. If, as is the case in this study, students self-selected into the PAL program, they were potentially more likely to already have a positive view of PAL and be higher achieving students, thus the positive outcomes of this study cannot necessarily be wholly attributed to the success of the program (Hammond et al., 2010). Finally, while students involved in the PAL project obtained higher scores on their final clinical examinations, these findings are limited given the issues surrounding self-selection bias. Greater attention needs to be given to sample selection and research design to overcome this methodological shortcoming in further research.

CONCLUSION

This study of a pilot PAL program in one tertiary paramedic course suggests there is great potential for PAL to have wide-ranging benefits for paramedic students, such as the acquisition of non-clinical skills and improvement in academic grades. Students agreed on the importance of education and leadership as core skills for paramedics and reported many benefits from their participation. Inadequate preparation, insufficient information on curriculum, and no education prior to peer teaching sessions resulted in student apprehension; however, all are easily rectified in any further iterations of the program. However, the overwhelmingly positive response and background literature indicate that the PAL program should be implemented on a larger scale.

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