ORIGINAL RESEARCH

How is peer-teaching perceived by first year paramedic students? Results from three years

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Abstract

Background: Peer Assisted Learning (PAL) can create a cooperative learning environment, providing benefits to all students involved. While there is a large pool of research exploring PAL amongst medical students it is worth considering the use of PAL amongst students of different health disciplines. The objective of this study was to examine the perceptions of first year paramedic peer learners being taught by peer teachers over a three-year period.

Methods: A cross-sectional study using the modified Clinical Teaching Preference Questionnaire (CTPQ) was administered to first year paramedic peer learners at a large Australian university during October 2011-2013.

Results: Over a three year period, 361 peer learners participated in this study. The mean item-level result for each item was highest in the 2013 cohort compared to the earlier two years. Item 1 "Teaching is an important role for paramedics" reflected the highest mean score of the eleven items (4.46 in 2011; 4.52 in 2012; 4.60 in 2013) while item 2 "I feel freer to approach my instructor for help than I do my peers" reflected the lowest mean score (2011: 3.61; 2012: 2.99; 2013: 3.72).

Conclusions: First year paramedic students over a three year period reported item-level results on the modified CTPQ which indicate that PAL is a valuable teaching method. This is consistent with previous research on PAL using students from other health disciplines. Results suggest peer learners believe teaching is an important role for paramedics, and communication between peer learners and teachers was slightly better compared with their tutors. Further mixed methodology work is required to explore other facets of paramedic PAL.

Key words

Peer-assisted learning, Paramedics, Undergraduates

1 Introduction

Peer Assisted Learning (PAL) incorporates learning techniques which date back to the time of the ancient Greeks [1]. Topping describes PAL as: "people from similar social groupings who are not professional teachers helping each other to learn and learning themselves by teaching" [1]. An umbrella term, PAL encompasses a number of cooperative learning strategies [2]. These include: peer teaching; peer learning; peer assessment; peer mentoring; and peer leaderships [2]. Irrespective of the specific strategy, both peers are actively involved in the knowledge exchange. As Topping [1] describes, the teaching peer, by teaching, is consequently learning; a feature which has led to the technique being considered 'fluid' [1, 2].

Peer assisted learning can be formal or informal planned or unplanned [3]. Studies have explored both forms. For example, a recent study by Henning *et al.* 2012 [4] found that athletic training students engaged in more PAL activities that were unplanned, rather than planned [4]. Several other papers have recommended that planned PAL be integrated into the curriculum [5-9]. Although PAL is often used interchangeably with 'Supplemental Instruction', the latter is, arguably, a technique of integrating PAL into a curriculum. Topping [1] reports that Supplemental Instruction is often used in 'high risk' courses that contain new and difficult content, and are often based primarily on lectures and have low rates of active learning.

1.1 Benefits of PAL

Benefits for both the peer learner and peer teacher have been reported in the educational research [2, 6, 9-13]. Peer learners have been documented as feeling more comfortable approaching their peer teachers for help than faculty staff [10]. This is turn has facilitated discussions which may not necessarily have occurred in the company of faculty staff; i.e. hidden curriculum [14]. Other studies have found that peer learners felt less anxious [15], less isolated [16], more confident [15] and more able to cope with challenges [16] after participating in PAL.

Peer teachers have reported an increased understanding of the syllabus [8, 14] and improvement in both their knowledge and practical skills relating to the topic being taught [17]. An increase in confidence has also been documented [14, 16], as well as an improved ability to reflect upon the experience of teaching and learning [16] and improved communication skills [18]. Peer assisted learning motivates peer teachers to engage more with content and consequently, they are able to clarify what they know and recognise any areas that they find difficult [19].

Peer assisted learning creates a learning environment which allows students to ask questions and express uncertainty [16]. It provides them with emotional [16] and social support [20, 21] which is not necessarily present in the traditional learning environment. Peer teachers have a greater understanding of the experience of the learner, having recently been through it themselves [22] and can therefore empathise more readily with the learner [23]. Peer assisted learning advocates a collaborative and co-operative learning experience [6, 7], shifting the traditional hierarchy of teacher and student, and promoting equality, active participation [24] and openness to the ideas of others [25].

1.2 Shortcomings of PAL

Unlike more traditional teaching methods, PAL is delivered by students who have very little or no teacher training [8]. Similarly, their clinical expertise is often limited [8]. For example, a peer learner who participated in a recent study by Hill *et al.* [12] voiced a number of concerns relating to PAL: "I was worried the students might give us incorrect information; that I would not know the answers and embarrass myself in front of my peers" [12]. On reflection, the student identified that their concerns were 'misplaced' and that they found the session 'extremely useful' [12]. A peer teacher in the same study reported concerns that "being only a year ahead...I had misgivings about being on a high enough academic level to be a useful teacher" [12]. Similar concerns were identified in a study by Loke & Chow [6] whose qualitative content analysis reported concerns relating to inadequate knowledge and discrepancies between the learning and teaching styles of those involved. Similarly, Secomb [7], who conducted a systematic review reported that several included studies found that issues emerged if peers were incompatible.

The use of PAL in university-level education has been widely explored in the literature and continues to grow momentum through universities [6, 8, 10, 11, 13, 14, 23, 26-30], and therefore why this study is important, not only in terms of adding to the body of knowledge, but also for the paramedic profession. Much of this research has focused on PAL amongst medical students [8, 10-12, 14, 23, 27, 29, 30] and nursing students [6, 13], with a recent paper focusing on paramedic students [31]. The objective of this study was to examine the perceptions of first year paramedic peer learners being taught by peer teachers over a three-year period.

2 Method

2.1 Design

A cross-sectional study using a short paper-based self-reporting questionnaire was administered to first year peer learners during October 2011-2013.

2.2 Participants

Students in their second and third year of the BEH at Monash University were asked to volunteer as peer teachers in tutorials for first years (peer learners) in a clinical unit of study (cardio-respiratory emergencies). The BEH program is a three-year pre-employment (pre-registration) degree offered to students seeking employment with an emergency ambulance service or other out-of-hospital primary health care provider.

Peer teachers were provided a week 12 schedule of the academic semester with a week-by-week outline of what specific topics were being covered in each tutorial. A timetable was placed near the student lounge and peer teachers could put their name against a tutorial group; these ran on Fridays from 9-4pm. Peer teachers were expected to develop lesson plans and teach both theory, practical skills and provide feedback and debriefing on simulations. On average, tutorial class sizes ranged in size between 8-14; therefore very good teachers / peer ratios were ensured.

2.3 Instrumentation

The Clinical Teaching Preference Questionnaire (CTPQ) was originally developed and tested as a tool for evaluating the peer learning experience of first year nursing students was used as the primary measure [32]. The CTPQ consists of fourteen statements using a five-point Likert scale for responses (1 = strongly disagree, 5 = strongly agree). The higher the mean score reflects a higher regard for peer teaching and learning. The CTPQ was modified for this study to reflect its use for paramedic rather than nursing students. This involved simply changing ‘nursing’ to ‘paramedics’ in the item stem and only included three items. No other wording or items were modified. The modified CTPQ has adequate sub-scale dimensionality, while its internal consistency as measured by Cronbach alpha coefficient was an unsatisfactory in a recent study [33].

2.4 Procedures

At the conclusion of the final PAL session peer learners were invited to participate in the study by a non-teaching staff member. Students were provided with an explanatory statement and were informed that results were anonymous. The questionnaires took students approximately 10 minutes to complete and consent was implied by its completion and submission. No follow-ups were undertaken.

2.5 Data analysis

Data were analysed using Statistical Package for the Social Sciences version 20.0 (SPSS, SPSS Inc., Chicago). Descriptive statistics including frequencies (%), means, and standard deviations (SD) were used to summarise the demographic and CTPQ data.

2.6 Ethics

Ethics approval was granted by the Monash University Human Research Ethics Committee (MUHREC). Peer learners were invited to complete the brief demographic and CTPQ by an administrator not directly involved in teaching. Participants were provided with an explanatory statement that stated that participation was completely voluntary, anonymous and that data would only be report in aggregate form. No financial incentives were provided to any peer teacher or peer learner.

3 Results

Over a three year period, 361 peer learners participated in this study. In each year, the majority of participants were less than 22 years old (2011: 64.6%; 2012: 65.5%; 2013: 71.8%) and female (2011: 64.6%; 2012: 75.5%; 2013: 88.7%). The majority of participants in each year had not participated in previous studies as a peer teacher (2011: 52.0%; 2012: 67.3%; 2013: 59.7%). In the 2011 cohort, 70.9% of participants had not been taught by peers; in the 2013 cohort, 64.5% had not. In 2012, 50.9% of participants had not been taught by peers. See Table 1 for full demographic results.

Table 1. Participant demographics

Academic year	**2011**	**2012**	**2013**
N	**127**	**110**	**124**
Age (% of N)			
<22yrs	64.6	65.5	71.8
22–25yrs	20.5	21.8	10.5
26–30yrs	11.8	9.1	9.7
Gender (% of N)			
Female	64.6	75.5	88.7
Male	35.4	24.5	11.3
Participation in previous studies as peer teacher (% of N)			
Yes	48.0	32.7	40.3
No	52.0	67.3	59.7
Previously taught by peers (% of N)			
Yes	29.1	49.1	34.7
No	70.9	50.9	64.5

The mean item-level result for each item was highest in the 2013 cohort compared to the earlier two years. Item 1 (*Teaching is an important role for paramedics*) reflected the highest mean score of the eleven items (4.46 in 2011; 4.52 in 2012; 4.60 in 2013) while item 2 (*I feel freer to approach my instructor for help than I do my peers*) reflected the lowest (2011: 3.61; 2012: 2.99; 2013: 3.72). The full distribution of results can be found in Table 2.

Table 2. Item-level results

Academic Year	**2011 Mean (SD)**	**2012 Mean(SD)**	**2013 Mean (SD)**
Item 1: Teaching is an important role for paramedics	4.46 (.58)	4.52 (.53)	4.60 (.55)
Item 2: I feel freer to approach my instructor for help than I do my peers	3.61 (.58)	2.99 (.88)	3.72 (.68)
Item 3: My ability to problem solve improves more from instructor teaching than from my peers	3.72 (.57)	3.32 (.84)	3.74 (.62)
Item 4: I am less anxious when performing a paramedic skill in the presence of my peers than my instructor	4.01 (.68)	3.57 (1.04)	4.31 (.61)
Item 5: Being taught clinical skills by my peers increases my interaction and collaboration with other students more than when being taught by my instructor	3.92 (.59)	3.72 (.93)	4.19 (.76)
Item 6: Being taught clinical skills by my instructor increases my sense of responsibility more than by being taught by my peers	3.82 (.75)	3.59 (.83)	3.82 (.67)
Item 7: I learn more from my instructor than my peers	3.86 (.66)	3.49 (.87)	3.87 (.75)
Item 8: I can communicate more freely with my peers than my instructor	3.86 (.56)	3.55 (1.01)	4.19 (.67)
Item 9: The feedback I receive from my peers is from a student's viewpoint, therefore more honest, realistic and helpful than from my instructor	3.80 (.55)	3.11 (1.07)	3.91 (.71)
Item 10: My peers are more supportive to me when I am performing a paramedic skill than my instructor	3.77 (.56)	3.04 (.93)	3.93 (.74)
Item 11: I am more self-confident and able to perform independently because of being taught by my peers, more so than by my instructor	3.69 (.55)	3.13 (.88)	3.95 (.69)

4 Discussion

The objective of this study was to examine the perceptions of first year paramedic peer learners over a three-year period. While results are aggregate and not linked longitudinally; they are nonetheless significant in building a larger body of knowledge to better understand PAL in the paramedic discipline. The results from this three-year review suggest that peer learners perceived the program as constructive both academically and interpersonally. The findings also highlight some specific areas worthy of further investigation.

As mentioned previously a large body of research exists that has explored the effects of PAL on university students studying various health disciplines. A systematic review conducted by Secomb (2007) reported mostly positive outcomes of PAL as it was found to "*increase student's confidence in clinical practice and improve learning in the psychomotor and cognitive domains*" [7]. One study that was not included in the systematic review was a study conducted by Loke & Chow [6]. They found that the positive experiences of PAL outweighed the negative in a qualitative study of undergraduate nursing students. Peer learners' reported an enhancement of learning; intellectual gains and personal growth. These prevailed over concerns regarding inadequate knowledge of peer teachers and mismatched learning styles [6]. The program established a cooperative learning environment, and peer learners stated they were more confident asking questions and voicing their opinions than they were previously [6].

Burke *et al.* [26] engaged four medical students trained specifically for PAL to teach 28 second year medical student's musculoskeletal-specific clinical skills [26]. Peer learners found PAL enhanced their ability to work in small groups and deal with new situations, and it was concluded that it would be worthwhile integrating PAL into medical curricula. In our study item 5 (being taught clinical skills by my peers increases my interaction and collaboration with other students more than when being taught by my instructor) produced a mean score of 3.92 in the 2011 cohort; 3.72 in 2012; and 4.19 in 2013, reflecting similar findings from Burke et al. Another study by Glynn *et al.* [27] reported that all participants found the experience valuable but found that the learning environment created by PAL was identified by both tutors and tutees as relaxed and comfortable [27]. A reciprocal exchange of knowledge was also identified. This appears to be a unique aspect of PAL [27]. The opportunity that future PAL research present is encouraging as it may uncover specific aspects of paramedic curricula or other allied health aspects of hidden curriculum and informal curriculum.

The most convincing finding from this study was that peer learners acknowledged that '*Teaching is an important role for paramedics'* which reflected the highest mean score of the 11 items (4.46 in 2011; 4.52 in 2012; 4.60 in 2013). This finding is significant when the parallels are drawn to the Paramedic Professional Competency Standards set out by the Council of Ambulance Authorities. In particular Competency Standard 9.3 which states 'Participates in the mentoring, teaching and development of others' [34]. By imbedding the PAL program into the curricula this recognises and formalises the importance of mentoring and teaching, and more broadly curricula renewal.

Hammond *et al*. [28] reviewed the use of PAL amongst undergraduate physiotherapy students in the same year level, over a three year period [28]. Participants reported that while PAL had social benefits and provided an opportunity to explore ideas without fear of embarrassing themselves in front of their lecturer; it did not improve their study skills or assignment preparation. Our findings reflect similar social benefits for paramedic students. The mean score for item 4 (I am less anxious when performing a paramedic skill in the presence of my peers than my instructor) was 4.01 for the 2011 cohort; 3.57 in 2012; and 4.31 in 2013. McKenna & French [13] also found that peer learners reported feeling less anxious practising skills in front of a peer compared to a lecturer. On another note, Field *et al.* [10] engaged three peer teachers (fourth and fifth year medical students) to provide PAL as additional tuition to n = 86 peer learners (first or second year medical students) practising clinical skills with peer learners reporting a mean score of >7.7 on a 10cm semantic scale for confidence post PAL. It was concluded that PAL could be a useful adjunct in clinical skills training.

While there are numerous papers that involve homogenous sample student groups [6, 13, 26-28] it is worth considering for future research whether the age of students, significant life experiences or previous university studies might impact on

how students respond to and participate in PAL. With this in mind, findings such as item 2 (*I feel freer to approach my instructor for help than I do my peers*) which reflected the lowest score (2011: 3.61; 2012: 2.99; 2013: 3.72) could be influenced by this closer examination.

Numerous PAL papers have examined social congruence as an important facet of the peer teacher and learner relationship. A study by Schmidt and Moust [35] recognised the importance of social congruence by emphasising the ability to communicate with students in an informal manner combined with an empathetic attitude [35]. This is reflected in the study by the student responses to Item 8 (*I can communicate more freely with my peers than my instructor*) which produced a mean score of 3.86 in the 2011 cohort; 3.55 in 2012; and 4.19 in 2013.

Limitations

This study has a number of limitations. Similarly to most studies caution should be taken when generalising conclusions to other health care disciplines. This particular study exhibits some limitations due to the study design and implementation. The cohort is from one university, therefore it is difficult to generalise findings to all undergraduate paramedic students and courses. The CTPQ was the tool measuring the learners' perceptions. Initially it was adapted from a PAL program in an undergraduate nursing program where the primary focuses was skills training. The questionnaire was modified slightly as mentioned previously however the educational setting may need to be considered. The undergraduate paramedic setting where the PAL program was implemented is where the learners are predominately performing scenarios via simulation. The use of self-reporting questionnaires bring about inherent social and completion biases, and may not actually represent the real views of participants. Therefore, it may be important to consider the use of the CTPQ in conjunction with a qualitative method. The data collected over a three year period was un-matched, and hence the long-term effects of near-peer teaching remain unknown. However, the results over the three years provide important data for future work in this area, and also allow for other comparison and or replication studies to take place.

5 Conclusion

First year paramedic students over a three year period reported item-level results on the modified CTPQ which indicate that PAL is a valuable teaching method. This is consistent with previous research on PAL using students from other health disciplines. Results suggest peer learners believe teaching is an important role for paramedics, and communication between peer learners and teachers was slightly better compared with their tutors. Further mixed methodology work is required to explore other facets of paramedic PAL.

Competing of interests

No competing interests.

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