Differences in student and clinician perceptions of clinical competency in undergraduate physiotherapy

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ABSTRACT

The ability of healthcare students to accurately self-reflect is crucial to the attainment of clinical competency; however limited research has been conducted in the physiotherapy profession. This study sought to determine a) whether ratings of clinical performance on a nationally standardised tool differ between students and their clinical educators; and b) whether the magnitude of agreement differs between ratings of clinical performance measured at two different time-points during clinical placements. From January 2012 until June 2013 undergraduate physiotherapy students and clinicians independently assessed students' clinical competency via the Assessment of Physiotherapy Practice (APP) at midway and final assessments across all clinical placements. The mean degree of agreement was compared using the Bland-Altman method. Statistical analysis revealed a mean APP% score difference (student minus clinical educator) of -7.5% (95% limits of agreement 13.7 to -28.8%) at midway and -9.7% (95% limits of agreement 7.9 to -27.4%) at final assessment. This represents student 'underestimation' of their clinical competency. Considerable within-subject variability was evident from midway to final assessment. Further examination of student and clinical educator agreement in the evaluation of student performance during health professional clinical placements is indicated in light of recent research.

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INTRODUCTION

Effective learning in clinical healthcare practice requires an intricate partnership between the supervising clinical educator and the health professional student in order to establish the required clinical skills, graduate attributes, and professionalism required for safe and effective practice (Dean et al 2009, Wass et al 2001). The partnership between student and clinical educator carries many shared responsibilities. Effective communication and feedback between both parties is important to maintain a focus and direction of learning. These processes help to identify differences between students' current and expected levels of clinical skills and behaviours, and facilitate the development of strategies to address deficits (Boud 2000). Educators are responsible for the assessment and development of clinical performance (Molloy and Keating 2011) and if required, have a duty to prevent students' academic progression if public safety or professional standards are significantly threatened (Parker and Wilkinson 2008).

Disagreement between students and clinical educators regarding the level of clinical competency may be problematic. It may reduce the potential for learning, decrease the accuracy of critical reflection, and reduce learning outcomes (Boud et al 2013). A breakdown in the clinical educator-student relationship may result in lost clinical opportunities that could impose a burden on all stakeholders, including decreased health service provision (McMeeken 2008). Negative clinical experiences have also been shown to affect the workforce with poor morale and reduced career longevity (McAllister and McKinnon 2009). Differences in the perception of performance between educators and students may exist in clinical practice. For example, perception of performance is likely to be influenced by self-serving biases, knowledge of performance during previous clinical or campus-based experiences, and personal challenges or attributes such as anxieties and/or perception of self (Delany and Molloy 2009). Kruger and Dunning (1999) demonstrated that, in a non-clinical context, individual underperformers are more likely to overestimate their performance. If these findings translate to the clinical education setting, underperforming students may lack the ability to objectively appraise their capabilities. This could potentially adversely impact upon patient care or safety and is likely to impose greater responsibilities upon educators of such students. Poor agreement may demonstrate the need for intervention with either party and could assist with identifying students at risk of future poor performance due to a lack of insight into personal performance.

Despite the importance and limitations of existing literature regarding agreement between clinician and student perceptions of performance, such methods remain the predominant basis for evaluating the attainment of clinical skill competencies (and therefore progression through undergraduate training) in the physiotherapy profession across Australia. This occurs despite a parallel emergence of a strong reflective practice culture and yearning for proactive student support paradigms. Minimal research has been conducted in the physiotherapy profession to support this practice. One review of self-assessment (Miller 2008) yielded three articles involving physiotherapy students. Only one (Palmer et al 1985) made a direct comparison between student and clinician assessments of a simple clinical skill (manual muscle testing involving goniometry), revealing a moderate correlation. Whilst clinician assessment is used to determine clinical competency, the role of student self-assessment in physiotherapy remains relatively unknown.

The primary aim of this study was to determine whether ratings of clinical performance differ between undergraduate physiotherapy students and their clinical educators. The secondary aim was to determine whether the degree of agreement between students and clinical educators differed between midway and final measures of clinical performance.

METHOD

Procedure

This study was conducted between January 2012 and June 2013 with ethics approval from Monash University (reference CF10/1321 - 2010000703). Undergraduate physiotherapy students completing their third or fourth year of the Bachelor of Physiotherapy programme at Monash University attended clinical placements of either four or five-week duration over an 18-month period. Clinical performance was measured using the Assessment of Physiotherapy Practice (APP). This instrument was validated to assess physiotherapy competence across both New Zealand and Australia (Dalton et al 2011, Dalton et al 2012). The APP rates clinical performance relative to entry-level physiotherapists against 20 items (where applicable) using standardised 5-point Likert scales (score range 0-4, with 2 indicating competence of an entry level standard). A total score (maximum 80) is derived and converted into a percentage score, to account for items unable to be assessed.

The APP was electronically transposed to a web-based platform (the 'eAPP'), designed and developed specifically for the Monash University physiotherapy programme. To enable the study data to be collected, a parallel system was created to allow students to complete self-evaluations of their performance using the same eAPP. Student entries were independent of ratings from clinical educators. The eAPP was accessed via a secure online portal that allowed both parties to independently enter data blindly. The eAPP was completed at the end of the middle and final week of each clinical placement. For this study, the clinical educators were the individuals responsible for the student's supervision whilst on clinical placement. In Australia, these clinicians are typically employees of the healthcare providers.

Analysis

Midway and final student and clinician eAPP data were extracted from all clinical placements during the data collection period and pooled across the two enrolment cohorts. Raw eAPP scores were converted into percentages. Instances of data that were not available for both student and clinician at any given time-point were deleted. Individual placement percentages were then averaged across the total number of placements to derive overall mean ratings of midway and final student and clinical educator assessments of clinical performance. The degree of agreement was analysed using the Bland-Altman (BA) method (Martin Bland and Altman 1986). This involves visual inspection of a scatter plot where the mean difference of the observation (student eAPP % minus clinical educator eAPP %; Y axis) is plotted against the mean observed score (student eAPP % plus clinical educator eAPP % divided by two; X axis). The overall mean difference and upper and lower 95% limits of agreement are indicated by central, upper and lower horizontal lines corresponding to their respective Y-axis value. Ideal agreement without systemic bias is represented by a mean difference approximating zero with narrow 95% limits and an even distribution of data across the range of possible instrument scores (X-axis). This method allows for visual comparison of data over the full dependent variable scale at both the individual and group level. This offers advantages over alternative methods such as correlation coefficients or t-tests, as it reduces the risk of erroneous interpretation that may occur when group data are summarised down to single statistical significance values. This analysis was considered representative of the extent of student and clinical educator agreement of clinical performance across the undergraduate physiotherapy programme, and constituted the principal endpoint of analysis for the primary study aim. The secondary aim was addressed via exploratory comparison of BA plots from both the midway and final assessments and inspection of box and whisker and paired co-ordinate scatter plots. All data were analysed using Stata® Data Analysis and Statistical Software version 12.

RESULTS

Corresponding data from student and clinical educator ratings of eAPP were available from 101 and 102 students who completed a mean (standard deviation) of 3.3 (1.2) midway and 3.8 (1.0) final placement assessments, respectively.

Inspection of the BA plot corresponding to midway assessments (Figure 1) revealed a mean difference (student minus clinical educator) in eAPP % score of -7.5% and 95% limits of agreement 13.7 to -28.8%. This represents 'underestimation' of clinical competency on students' behalf. Mean eAPP % scores ranged from 31.9 to 78.4, with most being less than 65%.

Inspection of the BA plot relating to final assessments (Figure 2) revealed a mean difference (student minus clinical educator) in eAPP % score of -9.7% and 95% limits of agreement 7.9 to -27.4%. This, again, represents student 'underestimation' of clinical competency, to a slightly greater extent than at midway assessment. The limits of agreement were slightly narrower than at midway assessment. Mean eAPP % scores ranged from 45.7 to 89.2, with most being greater than 55%.

The difference in the mean degree of agreement between midway and final assessments was small (2.2%; Figure 3). Closer inspection of the magnitude of change from midway to final assessment showed that, despite a small mean increase in the magnitude of student 'underestimation' of clinical competency from midway to final assessment (from -7.5% to -9.7%), there was significant variability in the direction and magnitude of within-subject change (Figure 4).

Figure 1: Bland-Altman plot of agreement at midway assessments. S = student; C = clinical educator; eAPP = electronic version of the Assessment of Physiotherapy Practice.

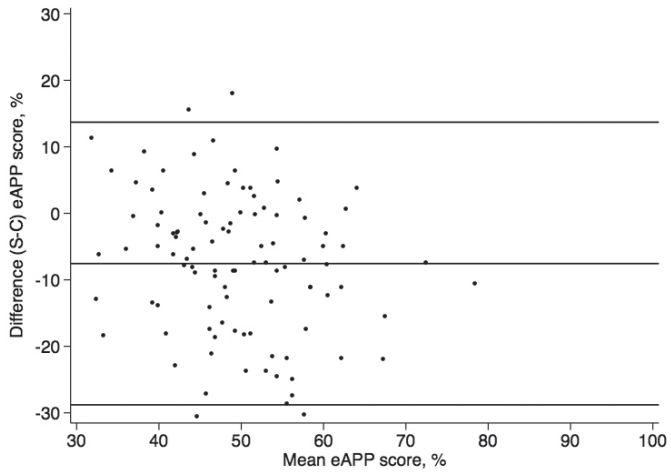
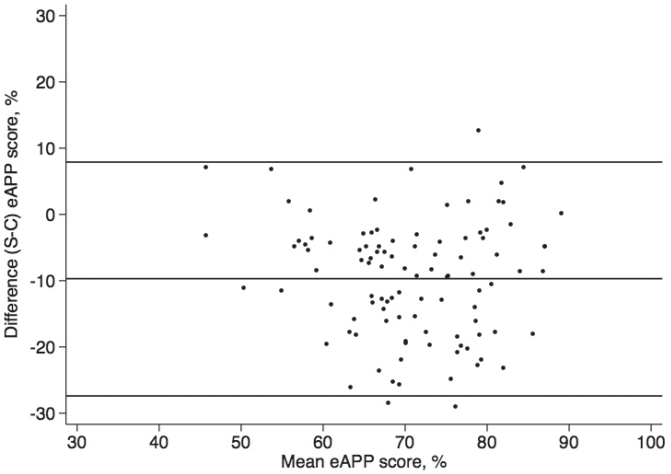


Figure 2: Bland-Altman plot of agreement at final assessments. S = student; C = clinical educator; eAPP = electronic version of the Assessment of Physiotherapy Practice.



DISCUSSION

To our knowledge, this is the first investigation to quantify the degree of agreement in ratings of skill competencies between students and clinical educators measured on a nationally standardised tool during physiotherapy clinical placements. Examination of student - clinician collaboration to ensure competency is crucial, given the heavy reliance placed upon clinical educators to assess competency in the medical, nursing and health science professions.

Our data demonstrates that, on average, physiotherapy students rate their performance 7.5% lower than their clinical educators at the midway clinical assessment. This difference increases slightly to 9.7% by the end of the placement. These mean estimates were associated with a moderate, but consistent degree of variability in the order of +/-20%. Kruger and Dunning (1999) propose that individual underperformers are more likely to overestimate their performance while high performers are more likely to underestimate. We found minimal

Figure 3: Comparison of midway and final agreement. S = student; C = clinical educator; eAPP = electronic version of the Assessment of Physiotherapy Practice.

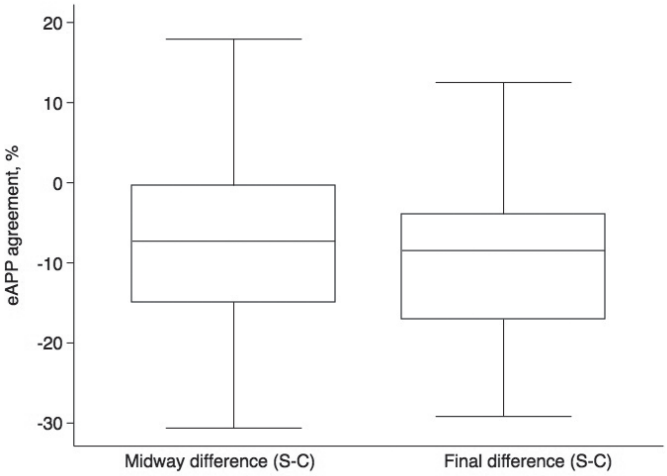
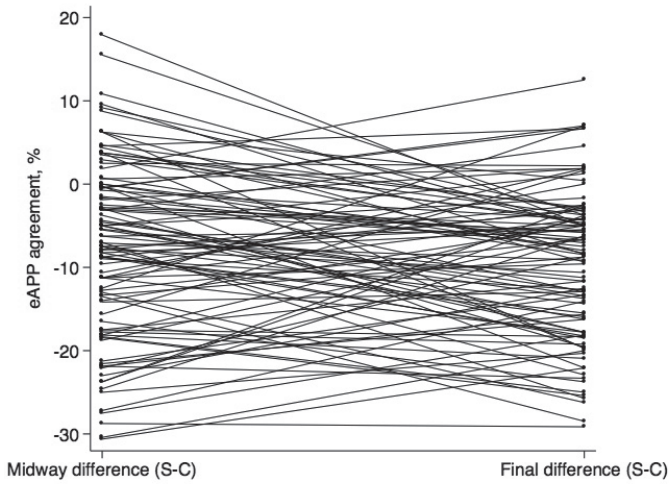


Figure 4: Within subject agreement change from midway to final assessment. S = student; C = clinical educator; eAPP = electronic version of the Assessment of Physiotherapy Practice.



evidence of student overestimation (indicated by aggregation of data well above the zero Y-axis value) at any measure of mean eAPP scores (X-axis) at either time-point (Figures 3 and 4). By contrast, these data suggest that, on average, students tend to mildly underestimate their clinical performance, particularly those who obtain higher final placement scores. This is consistent with findings from Boud et al (1989). These findings have clinical significance, highlighting a potential area for student support given the consequences of burnout and perfectionism in tertiary students in the literature (Dyrbye et al 2010, Gibbons 2010, Schweitzer and Hamilton 2002).

The precise reason(s) for the observed discrepancy in ratings of clinical performance between students and clinical educators was not clear, and beyond the scope of the present study. Hypothesised factors, attributable to either the students or clinical educators (or both), may include:

- Student underestimation. This could relate to a lack of clinical experience or understanding of new graduate competency levels

(upon which the APP is based). It may also reflect students' intrinsic ideals of the clinical supervisory relationship – one where their performance *should* be lower than that perceived by their clinical educators. Recent literature suggests that student underestimation may be associated with personality traits common to the health profession such as perfectionism (Schweitzer and Hamilton 2002).

- Clinician overestimation. Evidence suggests students may have greater awareness of their tacit knowledge than educators (Boud and Falchikov 1989), yet are non-homogeneous in their response to self-reflection (Harrington et al 1997). The reliability of clinical assessment scores is also known to vary according to clinician experience, assessment criteria clarity, task complexity, and assessment setting and duration (Blanch-Hartigan 2011, Harrington et al 1997). Alternatively, this overestimation may represent the 'failure to fail' phenomenon reported by Dudek and colleagues (2005).

The potential implications of student and clinician agreement regarding clinical performance are inexplicit. Two significant questions arise. First, does agreement relate to the attainment of clinical competencies? This may be contextually dependent but is of high importance to investigate. Second, what constitutes optimal agreement and a clinically important change in agreement? We expected the APP to demonstrate a high degree of agreement due to its robust design incorporating a five point Likert scale to rate key competency-based skill descriptor items (Boud and Falchikov 1989).

The importance of the observed difference in agreement reported in this study is yet to be determined. In the absence of an accepted definition regarding a 'significant difference', it is possibly the consistency of agreement across one or multiple clinical placements that could prove useful to monitor. Research using the earlier (midway) time-point may prove beneficial due to the opportunities that may be afforded for early detection and early intervention to address concerning behaviours. As discussed by Mattheos, clinicians may use these discrepancies as a point of discussion as it is "important to clarify that the deviation itself does not constitute a judgement of any kind" (Mattheos et al 2004).

A limitation of the approach used to measure insight in this study was the need for 'representative' data for individual students. As each student undertakes a number of clinical placements across a diverse range of clinical settings, we used the average of all available data across the number of clinical placements undertaken during the third and fourth undergraduate year of the physiotherapy programme. This enabled each dot to be representative of each student. We acknowledge this approach may omit important trends that could emerge over time. For example, students and clinicians may agree closely for the first four placements, yet strongly disagree on the fifth.

Clinician-based assessments were used as the reference standard, despite their known limitations (Ward et al 2002). Strategies to improve data reliability, such as multiple expert raters or student peer review, and consideration of inevitable differences between students' ability to accurately self-reflect, as recommended by Ward (2002), were not implemented as these were not practical within the constraints of the current clinical environment. It is crucial to note such 'uncontrolled' methods of evaluation accurately replicate the evaluation methods routinely used in undergraduate physiotherapy clinical practice across Australia.

Despite these limitations, the nature of enquiry reported in this study is important. The APP is the benchmark, validated instrument for assessing physiotherapy clinical competency in New Zealand and Australia. It has a statistically rigorous foundation and incorporates explicit marking criteria to enhance its accuracy. Furthermore, peer standard setting and familiarisation with the tool are embedded throughout the Monash University undergraduate curriculum to ensure consistency in its application.

There remains a dearth of literature regarding development of self-assessment skills within the physiotherapy profession. Current methods of evaluating student clinical competencies are unlikely to significantly change in the present fiscal academic and healthcare climate. Significant scope therefore remains to address some of these limitations and further explore these important concepts for the physiotherapy profession. For example, analysis of individual student data over time may determine the impact of clinical placement experience on student/clinician agreement and attainment of clinical competency. In particular, we support the findings of Eva and Regehr (2005) that self-assessment is "a complicated, multifaceted, multipurpose phenomenon that involves a number of cognitive processes". It is a skill which changes over time depending on content, context and expertise and we must consider this larger perspective. Further enquiries into the methods of student self-assessment used in physiotherapy appear indicated.

CONCLUSIONS

This study highlights the potential importance of examining student and clinical educator agreement in the evaluation of student performance during health professional clinical placements. On average, the degree of agreement and variability between midway and final assessments is consistent, however the precise reasons explaining student 'underestimation' are not clear. The considerable degree of within-subject variability from midway to final potentially limits the applicability of these data at an individual level. The relationship between agreement discrepancies and important clinical outcomes has not yet been established. A significant relationship may highlight significant opportunity to intervene early and optimise outcomes for students, educational institutions and healthcare providers alike. This study sets a foundation upon which such future research can be based.

KEY POINTS

- Progression through Australasian undergraduate physiotherapy clinical placements is almost exclusively determined via clinical educator ratings of student performance, despite known limitations of this 'expert vs novice' model.
- In our cohort, undergraduate physiotherapy students demonstrated reasonable insight (mild under-estimation) of their clinical performance in comparison to their clinical educators.

- The degree of agreement between student and clinical educator ratings of clinical performance conducted at midway or end of placements appears consistent.
- Identification of differences between student and clinical educator ratings of clinical performance at a midway assessment may offer a timely opportunity to implement early student support strategies to improve final placement outcomes. Its potential significance warrants further investigation.

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PERMISSIONS

This study was approved by Monash University Human Research Ethics Committee (reference CF10/1321 - 2010000703). Informed consent was gained as per the above ethics approval.

DISCLOSURES

No funding was obtained for this study.

The authors declare there are no competing interests (financial, professional or personal) which may be perceived to interfere or bias any stage of the writing or publication process.

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