Self-assessment or self deception? A lack of association between nursing students’ self-assessment and performance

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Abstract

Aim. The aim of this study was to examine senior year nursing students’ ability to self-assess their performance when responding to simulated emergency situations.

Background. Self-assessment is viewed as a critical skill in nursing and other health professional programmes. However, while students may spend considerable time completing self-assessments, there is little evidence that they actually acquire the skills to do so effectively. By contrast, a number of studies in medicine and elsewhere have cast doubt on the validity of self-assessment.

Method. In 2007, a one-group pre-test, post-test design was used to answer the question, ‘How accurate are senior year nursing students’ in assessing their ability to respond to emergency situations in a simulated medical/surgical environment compared to observer assessment of their performance?’ A total of 27 fourth year nursing students from a university in Ontario were asked to complete a questionnaire before and after an objective structured clinical examination which assessed their ability to respond to emergency situations. Self-assessments were compared with observed performance.

Findings. The experience of dealing with the simulated crisis situations significantly increased perceived confidence and perceived competence in dealing with emergency situations, although it did not affect self-perceived ability to communicate or collaborate. All but 1 of the 16 correlations between self-assessment and the objective structured clinical examination total scores were negative. Their self-assessment was also unrelated to several indices of experience in critical care settings.

Conclusion. Self-assessment in nursing education to evaluate clinical competence and confidence requires serious reconsideration as our well-intentioned emphasis on this commonly used practice may be less than effective.

Keywords: emergency, nursing education, objective structured clinical exam, self-assessment, simulation
Introduction

Self-assessment is used extensively in educational programmes especially in health science schools that have adopted a problem-based, self-directed approach. There is good reason to encourage self-assessment in health science education. Professionals such as nurses and physicians require self-regulation to maintain their professional competence. The topic of self-assessment to determine nursing competencies has been explored in Taiwan (Tzeng & Ketefian 2003; Tzeng 2004) but less attention has been paid to this area in other parts of the world including Canada and the United States. As students prepare for a career in health care, they need to develop self-assessment skills to determine their level of knowledge and identify knowledge gaps, to remain current and safe in practice. Unfortunately, the literature related to the effectiveness of self-assessment in nursing is sparse and no studies have examined its usefulness in preparing a nurse for clinical practice.

Background

Several reviews of the literature have recognized weaknesses of self-assessment (Gordon 1991, Ward et al. 2003, Eva & Regehr 2005, Colthart et al. 2008). A consistent finding is that the correlation between self-assessment and observed performance is zero or negative. This finding has been demonstrated in a wide variety of settings that include practicing physicians (Davis et al. 2006), medical students (Gordon 1991) and experimental settings with general populations (Kruger & Dunning 1999). The results from studies outside of nursing are uniform — virtually every study has shown a negative correlation between self-assessment and performance, because participants who were weaker believed their abilities to be greater than they actually were, whereas, participants who were strong and able to engage in tasks typically viewed themselves as slightly less capable than their actual performance. One specific example is a study by Hodges et al. (2001) in which 24 first-year family medicine residents interviewed a standardized patient and gave them ‘bad news’. The purpose of the activity was to determine the residents’ ability to self assess their video-taped performance before and after viewing four videos designed to represent a spectrum of performances from incompetent to advanced competence. These authors discovered that those with the least amount of skill were more likely to overestimate their abilities. This is consistent with the study of Kruger and Dunning (1999) who found that individuals who scored in the 12th percentile estimated themselves to be in the 62nd percentile. They concluded that ‘those who know less also know less about what they know’ and suggested that these individuals might have lacked metacognitive skills, or lacked the ability to distinguish accuracy from error. Martin et al. (1998) discovered that even when exposed to professionals and shown a ‘gold standard’ performance of clinical tasks, self-assessments by weaker individuals remained poor. More relevant to this study, Morgan and Cleave-Hogg (2002) had a class of medical students complete a self-assessment questionnaire about their confidence in managing clinical situations in anaesthesia. While there was a strong correlation between confidence and self-reported experience, with correlations ranging from 0·49 to 0·73, there was no statistically significant correlation between either self-reported confidence or experience and performance on actual simulations. These consistent findings, that those whose knowledge or skill is lowest are most likely to overestimate their abilities, are succinctly summarized by Keil (2001), ‘How can I know what I don’t know, if I don’t know what I don’t know?’.

Despite this body of literature, nursing schools worldwide continue to emphasize the importance of self-assessment. Perhaps one reason is simply that none of the studies has examined self-assessment in nursing; however, there is no reason to suppose that the results from other professions do not generalize to nursing. Nevertheless, direct evidence from nursing may be instrumental in encouraging nurse educators to critically examine the issue.

This paper presents findings from a sub-study conducted in a randomized control trial (RCT) that sought to determine the effectiveness of video vs. hands-on instruction in teaching senior year nursing students to respond to emergency situations (Baxter et al. in press). The effectiveness of the aforementioned interventions was measured using self-assessment and an objective structured clinical examination (OSCE). In this paper, we examine the association between student self-assessment and actual performance in ‘real-life’ emergency clinical situations using high-fidelity simulations situated in a three-station OSCE.

The study

Aim

The aim of this study was to assess the validity of senior year nursing student’s response to ‘real-life’ emergency situations by determining the association between self-assessment and performance on an OSCE that incorporated high-fidelity simulations.
Design

A one-group pre-test/post-test design was used to answer the following research question, ‘How accurate are senior year nursing students in assessing their ability to respond to emergency situations in a simulated medical/surgical environment compared to observer assessment of their performance?’

Participants

The Clinical Learning and Simulation Centre at a university in Ontario was the setting for this study. This university provides students with the opportunity to engage in small group, self-directed learning. The fourth year of the nursing programme requires students to engage in 24 hours of clinical practice per semester in a variety of healthcare settings. Students engage in an OSCE following their first year of clinical instruction, but are not exposed to this form of testing in subsequent years. The convenience sample (N = 32) consisted of female senior year nursing students who were enrolled in their first undergraduate degree. Participants had no prior exposure to high fidelity simulators and were recruited through the use of electronic postings and posters located in the School of Nursing. Students who were interested in participating either telephoned or e-mailed the research coordinator who provided them with additional information. Students were then sent electronically a letter of introduction and a consent form. An honorarium was given to those who completed the study. Data were collected in March, 2007.

Data collection

All data were collected in March, 2007.

Pre-test and post-test

Upon entering the study setting, a pre-test instrument was completed by all participants. The purpose of this test was to ascertain their level of: (1) confidence; (2) competence; (3) assessment skills; (4) decision-making; (5) communication; (6) collaboration; and (7) the ability to manage a crisis. These constructs were based upon the principles of crisis management described by Gaba et al. (1994). This same test (post-test) was administered immediately following the end of the OSCE and was also used by the examiners located at each OSCE station. The test was developed by members of the research team. To ensure both face and content validity, the tool was pre-tested by eight clinical nursing faculty and two level four nursing students. Each response was based on a 7-point Likert scale where 1 = strongly disagree and 7 = strongly agree. Overall internal consistency was 0.70 for the pre-test and 0.81 for the post-test.

Objective structured clinical examination

Upon completion of the pre-test, students proceeded to the OSCE which involved three separate stations located in different areas in the clinical learning centre. A number of steps were taken to ensure the rigour of the OSCE. First, to ensure face and content validity of each scenario used in the OSCE, each was developed by a Registered Nurse with extensive experience in the emergency department. In addition, five nursing faculty with acute care experience reviewed the scenarios to ensure their accuracy based on best practice guidelines. Second, one week prior to testing, each OSCE examiner was oriented to the developed scenarios and the measurement tool by the principal investigator. Examiners were asked to view videos that were developed to depict the scenarios used for the OSCEs. Each video included a senior level student engaged in each of the three OSCEs. Each examiner was asked to score the student viewed on the video using the scoring sheet. When comparing scores across examiners, there was 80% agreement. Third, voice actors were hired to enhance the realism of the simulations contained in the OSCE. These actors sat behind a curtain at the head of the patient’s bed out of view and provided students with subjective data and sound effects (e.g. belching, groans). All of the voice actors were brought in by the research coordinator and principal investigator one week prior to the study to review the scenarios and their scripts. Actors were given the opportunity to ask questions and to run through their scenario. Finally, to ensure consistency, each OSCE station was set up in a similar fashion and was designed to mimic a patient room in a hospital. Each of the three rooms included all the necessary equipment and resources that the participant would need to address the patient’s symptoms.

When participants entered each of the rooms, they received an audio-recorded shift report from the ‘nurses on the night shift’ that included information such as the patient’s name, past medical history, medical diagnoses, current physiological state, type of intravenous fluid and drip rate (when applicable), diagnostic tests completed and to be completed. The report also informed the participant that there were other members of the healthcare team available to them, if they needed their assistance (physician, senior nurse and respiratory technician). Each participant was given the opportunity to review a mock patient chart that was located on a table inside the simulated patient room containing additional information such as past medical tests, X-ray results,
medication list, medical history, nursing notes, doctor’s orders and laboratory results. The amount of information in the patient’s chart was kept to a minimum so that the participant did not get lost or feel overwhelmed. Participants were also provided with a pen and paper, to record pertinent information before approaching the patient.

Once participants had listened to the verbal taped report and reviewed the chart, they moved into the patient’s room and the scenario began. Participants proceeded (in no particular order) through three stations each depicting an emergency situation: (1) a pending cardiac arrest, (2) a pulmonary embolism and (3) exacerbation of chronic obstructive pulmonary disease. To ensure that each participant remained blind to each new OSCE station, and to avoid contact with other participants, a research assistant accompanied every participant from one station to the next. The participant was allowed 15 minutes to interact in the simulation with the high fidelity mannequin and with the other healthcare professionals. Every participant was provided with a call bell so a request for additional help could be made when the participant determined that they were beyond their scope of practice, did not have the skills necessary or knowledge necessary to proceed, or to seek a consultation and/or support/assistance. However, assistance was not provided to the participants until they had made an effort (at least five minutes into the scenario) to gather the appropriate data and to begin to provide basic nursing care. To determine what the participant was thinking and the hypotheses that they were generating, they were asked by the examiners to ‘think aloud’. In addition, any member of the healthcare team who was called into the room asked the question, ‘What seems to be the matter?’ The student was required to work collaboratively with any other healthcare professional that might have been called in for assistance. Together, they resolved the situation, or at least tried to minimize any immediate risk. Following each scenario, the participant engaged in a debriefing session with the multidisciplinary team for a period of 5 minutes, during which time participants were given the opportunity to ask questions and to seek clarification.

Two independent examiners were present at each of the three OSCE stations to rate the student on the same tool that students had used for self-assessment. However, examiners were also asked to provide an ‘overall impression’ of the student’s performance. Examiners where provided with the types of actions that the student should be engaging in, based on best practice guidelines for the specific condition enacted in the OSCE station. Each examiner was provided with the correct objective data that students should be collecting. At no time were the examiners permitted to discuss the participant’s performance. The examiners were kept out of direct sight from the participants. Participants were told of their presence prior to entering the ‘patient’s room’ and they were also informed that they were not allowed to ask questions of these individuals.

Ethical considerations
The study was conducted in accordance with the Tri-Council Policy Statement, ‘Ethical Conduct for Research Involving Humans’ (Tri-Council 1998). Ethics approval for the study was obtained from the University’s Research and Ethics Boards. All participants gave written informed consent for participation. All participants were assured that the information that they gave would remain confidential and that any publication of the results would in no way compromise their anonymity. In addition, students were assured that participation or non-participation would in no way compromise their academic standing at the university.

Data analysis
Descriptive statistics [mean and standard deviation (SD)] were computed for each group and a paired t-test was used to compute significance of the difference between pre- and post-test in each group. Factor analysis and reliability analysis were performed on the self-assessment data. Pearson correlations were run between self-assessment and performance data. All the statistical analyses were performed using SPSS 15.0 (SPSS, Inc., Chicago, IL, USA).

Reliability and validity
Inter-rater reliability and inter-station reliability of the observer reports was examined using generalizeability theory (Streiner & Norman 2008). The generalizability analysis yielded an inter-rater reliability of 0.67, and an average correlation across stations of 0.48. The internal consistency (reliability across items) was 0.98. The reliability of the overall test was 0.73 (Baxter et al. in press). Critical for the present paper, scores from each examiner were later compared with student self-assessment scores before and after completing the OSCE.

Results
Twenty-seven of the 32 enrolled participants completed the study. Reasons for drop-outs included failure to show up on the day of the study (n = 2) and those who were unable to complete all three OSCE stations (n = 3). Participant ages ranged from 21 to 23 years and all had successfully
completed seven clinical courses in a variety of settings over the previous three and one-half years.

Means, medians and standard deviations of the 27 completed self-assessment pre-test and post-test questionnaires are shown in Table 1. There was considerable variability in the means, with the lowest means at pre-test assigned to confidence and competence in dealing with critical situations, and the highest scores for ability to communicate and collaborate. The same general trends were true at post-test, although mean scores were significantly higher for the questions related to perceived confidence and competence in managing critical care and crisis. No change was noted in questions related to decision-making and communication/collaboration. Thus, the instruction on the simulator and the experience of dealing with the simulated crisis situations significantly increased perceived confidence and perceived competence in dealing with crisis situations, although it did not affect self-perceived ability to communicate or collaborate. This general pattern was confirmed by separate factor analyses conducted on the pre-test and post-test data. For the pre-test, factor 1, accounting for 41% of the variance, included Questions 1,2,3,and 7 related to management of critical incidents; factor 2, accounting for an additional 28% of the variance, contained questions 4,5 and 6, related to sound decision-making and communication/collaboration. Analysis of the post-test was similar; factor 1, accounting for 53% of the variance contained questions 1,2,3,4 and 7; factor 2, accounting for 25%, contained questions 5 and 6 (communication/collaboration).

The correlation (Pearson) between pre-test and post-test for the individual items ranged from 0·46 to 0·55 for the five questions related to management, but 0·10 and 0·18 for the communication/collaboration questions, mainly because of a restriction of range in the latter two questions. Thus, the self-assessment questionnaire had reasonable reliability (both test retest and internal consistency). Furthermore, it demonstrated some construct validity, in that the questions that were related directly to performance in crisis situations showed improvement as a result of the instruction and/or practice in the simulation, whereas those that were unrelated to instruction showed no change.

We next examined the relation between self-assessed competence and experience (Table 2). Competence was defined as the ability to provide safe patient care in prescribed best practice guidelines. This was compared with the amount of experience that each student had in one of the following clinical areas: emergency, intensive care unit (ICU) and cardiac care unit (CCU). Students indicated whether or not they had completed a 12-week clinical rotation in one of these areas and how many critical incidents (e.g. Cardiac arrest, hypovolemic shock etc.), they had been personally involved with. Surprisingly, seven of the eight Pearson correlations were negative, although none was statistically significant suggesting that self-assessed competence was unrelated to experience in highly acute areas. We then examined the relation between the four questions related to prior experience and self-assessed competence based on the seven responses on pre-test and post-test. Only 2 of the 56 correlations examined were statistically significant, and these were in the negative direction.

Finally, the central thesis of self-assessment is that there is a strong relationship between self-assessed competence/confidence and actual performance. The Pearson correlations between self-assessment before and after the OSCE and the observed OSCE total score are shown in Table 3. The pattern is similar to that observed with work experience; all but one of the correlations were negative (−0·405 and −0·430). While the small sample size may have reduced the likelihood that the correlations would be labelled statistically significant, the critical result is that none of the correlations were positive; there was no evidence of a positive association between self-assessed and observed performance. Perhaps equally intriguing, the experience of actually working up critical patients did not improve the participant’s assessments; if anything the

Table 1 Comparison of participant pre-test and post-test questionnaires (N = 27)

<table>
<thead>
<tr>
<th>Self-assessment</th>
<th>Pre-test</th>
<th></th>
<th>Post-test</th>
<th></th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
<td>Median</td>
<td>SD</td>
<td>Mean</td>
<td>Median</td>
</tr>
<tr>
<td>Level of confidence in dealing with acute care situations</td>
<td>3·32</td>
<td>3·5</td>
<td>1·08</td>
<td>4·91</td>
<td>5·0</td>
</tr>
<tr>
<td>Level of competence in dealing with an acute care situation</td>
<td>3·84</td>
<td>4·0</td>
<td>1·14</td>
<td>5·13</td>
<td>5·5</td>
</tr>
<tr>
<td>Ability to assess a critical incident</td>
<td>4·04</td>
<td>4·0</td>
<td>0·84</td>
<td>5·14</td>
<td>5·0</td>
</tr>
<tr>
<td>Ability to make sound decisions</td>
<td>4·95</td>
<td>5·0</td>
<td>1·14</td>
<td>5·09</td>
<td>5·0</td>
</tr>
<tr>
<td>Ability to communicate with health professions</td>
<td>5·88</td>
<td>6·0</td>
<td>0·75</td>
<td>5·96</td>
<td>6·0</td>
</tr>
<tr>
<td>Ability to collaborate with other health professionals</td>
<td>5·87</td>
<td>6·0</td>
<td>0·87</td>
<td>6·07</td>
<td>6·0</td>
</tr>
<tr>
<td>Ability to manage a crisis situation</td>
<td>4·68</td>
<td>5·0</td>
<td>0·96</td>
<td>5·29</td>
<td>5·0</td>
</tr>
</tbody>
</table>
correlations between perceived and actual competence were more negative after the experience.

Discussion

Some limitations can be identified in the aforementioned study. The sample size is small, so only one of the correlations between self-assessed and actual performance was statistically significant. However, all were negative. This study only examined one skill area and additional testing is required to explore other nursing skills. Participants in this study were educated in a small-group, self-directed nursing programme. Those educated in a more traditional programme may have responded differently to the OSCE and self-assessment.

Despite these limitations, the results of this study suggest that nurse educators stop and seriously consider ‘how’, ‘when’, and for which purposes self-assessment is used. While nursing students in this study did engage in self-assessment, and completed this in a relatively consistent and reliable fashion, their self-assessments were, if anything, inversely related to their actual performance. Although the experience of participating in the intervention increased the student’s confidence and perceived competence, the lack of association with observed performance remained.

One of the strengths of the current study was that the self-assessment was performed in context and not in isolation of the required activity. Indeed, the post-test self-assessment was completed directly after the experience of working up critical care patients, and receiving feedback, so it is clearly not an issue of memory. However, there was still no relation. Furthermore, it is unlikely that the poor performance is a result of a lack of training. The study was conducted with participants who were graduating nurses, and had completed a 4-year university nursing degree with a strong emphasis, year by year, on self-assessment.

Are there better ways? It seems not. Viewing self-assessment as a general skill is likely incorrect, similar to how we, as educators, healthcare providers and researchers viewed problem-solving as a general skill in previous years. We now know that both are likely heavily context-bound. Successful problem-solving in one domain is no guarantee of successful problem-solving in another domain (Elstein et al. 1978, Eva et al. 1998, Jonassen 2000). The same is likely true of self-assessment. That is, one can only self-assess successfully if one has no knowledge gaps (Eva & Regehr 2005, 2006, 2007, 2008, Kruger & Dunning 1999). However, if there are no knowledge gaps, then it is not necessary to self-assess.

Conclusion

The emphasis on self-assessment in nursing may require serious reconsideration. This study adds to a consistent, growing body of literature, suggesting that self-assessment is not an effective method to determine an individual’s own strengths and weaknesses in the clinical setting. As nurse educators, we frequently rely on the student to engage in self-assessment. We often use the results of such assessments to determine learning needs, particularly in the clinical setting. Results from this study suggest that caution must be exercised when using this teaching strategy. It is also suggested that additional evaluation measures such as OSCEs be used to determine areas of strength and weakness, particularly when it comes to clinical learning. Upon graduation, it is imperative that new graduates are confident in their abilities. However, overconfidence based on inaccurate assessments may prove destructive to the new graduate and may also pose a threat to
What is already known about this topic

- Self-assessment is often used in nursing and nursing education as an evaluation measure. However, the accuracy of this form of evaluation has not been assessed.
- Research in other health professions suggests that self-assessment is uncorrelated with actual performance.

What this paper adds

- There was a negative correlation between the nursing students’ perceived confidence and their actual clinical ability as evidenced by the score achieved on their objective structured clinical examination.
- Instruction and practice increased confidence without commensurately improving performance.
- Self-assessment is not an accurate measure of clinical ability in nursing students.

Implications for practice and/or policy

- The use of self-assessment in nursing education as a measure of clinical ability/competence requires serious reconsideration.
- Additional evaluation measures such as objective structured clinical examinations should be used to determine areas of strength and weakness, particularly when it comes to clinical learning.
- Additional studies are required to explore the effectiveness of combining self-assessment with other objective measures when assessing clinical competence.

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References


Conflict of interest

No conflict of interest has been declared by the authors.

Author contributions

PB & GN were responsible for the study conception and design. PB performed the data collection. PB & GN performed the data analysis. PB & GN were responsible for the drafting of the manuscript. PB & GN made critical revisions to the paper for important intellectual content. GN provided statistical expertise. PB obtained funding. PB provided administrative, technical or material support. PB supervised the study.

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