Research

Assessing competence of undergraduate paramedic student practice: a preliminary evaluation of the Australasian Paramedic Competency Assessment Tool

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Abstract

Introduction

With the recent introduction of registration for paramedics, and an absence of assessment tools that align undergraduate paramedic student practice to competency standards, this pilot study undertook to develop and evaluate a competency assessment tool designed to provide a standardised approach to student competency assessment. This paper reports the first part of a two-part enquiry evaluating the efficacy of the Australasian Paramedic Competency Assessment Tool (APCAT) to assess the practice competency of undergraduate paramedic students.

Methods

With a focus on gathering professional opinion to evaluate the usability of the tool and inform its development, a mixed methods methodology including a survey and open-ended questions were used to gather data from paramedic educators and on-road assessors in Australia and New Zealand. Data were analysed using descriptive statistics and content analysis.

Results

The outcome of the evaluation was positive, indicating that 81% agreed or strongly agreed that the tool was user-friendly; 71% believed that expectations of student performance and the grading system was clear; 70% found year level descriptors reflected practice expectations; and 66% believed that the resource manual provided adequate guidance.

Conclusion

The APCAT is simple and aligns student practice expectations with competency standards. Results indicate the support for a consistent approach for assessment of undergraduate paramedic student competence. Further research will be undertaken to determine the efficacy of using this tool to assess students in the clinical setting.

Keywords:

paramedic; clinical; assessment; undergraduate; student; competence

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Introduction

With the transition of paramedic education from vocational technical education to the university sector, the professional profile of paramedics has changed. As the status of the profession has developed, so too have the expectations of service delivery. In keeping with professional obligations and safe practices for the public, paramedics are now registered with the Australian Health Practitioner Regulation Agency (AHPRA) (1). New Zealand paramedics are now registered under the Health Practitioners Competence Assurance (HPCA) (2). Graduate paramedic students must meet the professional competencies through assessment; to demonstrate they have the necessary professional capabilities and attributes and are safe to practise.

The assessment of competence of undergraduate paramedic students while on clinical placement has been inconsistent within universities in Australia and New Zealand and has resulted in disparity in preparation and clinical practice requirements (3). There are 12 universities in Australia and two in New Zealand that offer bachelor level paramedic programs. Ambulance services within Australia and many of the universities work independently of each other (4). Before 2018, within Australia and New Zealand, there was a variation of clinical hours required by universities ranging from 304 to 740 hours (5). To address this disparity, students are now required to attend 600 hours of clinical placement at ambulance stations and other allied healthcare facilities (6).

Although changes have been made to practice hours, the lack of a standardised assessment tool that aligns to the practice standards for paramedics to assess undergraduate paramedic student practice on clinical placement continues to be a concern. These inconsistencies and variations in practice raise questions about the integrity of student paramedic assessment and, ultimately, the competence of graduate paramedics (7).

Assessment tools that are based on professional practice competency standards are utilised consistently in professions such as nursing (8), physiotherapy (9), occupational therapy (10) and speech pathology (11). Andersen (12) identified the need for educators to understand the expectations of student performance in relation to professional competency standards and to acquire knowledge about the use of them in assessment. Utilisation of professional competency standards facilitate and promote consistent expectations for assessors and students regarding performance and promotes validity and reliability of assessment outcomes (12). A review of the literature found that publications specifically relating to the discipline of paramedicine and the use of competency standards to assess the practice competence of students is sparse. In Canada, the use of a global rating scale utilised for assessment of paramedic student clinical competence is reported (13). The scale was developed for local use and was not based on recognised competency standards. The

limitations of this work included lack of transferability and use in other programs. In the United States, a study was conducted on an effective domain assessment rubric used by paramedic educators. The rubric was used to assess students' professional behaviour. The research found that there were concerns about the validity and reliability of the tool (14). No studies reporting the use of competency standards in the assessment of paramedic students, or studies regarding the use of assessment tools by on-road paramedics within Australia or New Zealand had been undertaken.

Until March 2020 (when it merged with the Australian & New Zealand College of Paramedicine to form the Australasian College of Paramedicine), Paramedics Australasia represented paramedic practitioners throughout Australia and New Zealand. The organisation provided a respected voice in determining and directing how changes in health service provision, legislation and clinical practice were shaped and implemented to enhance the quality of patient care within paramedicine (15). The Australasian Competency Standards for Paramedics were developed by Paramedics Australasia in 2011 (15). The implementation of these standards in undergraduate curriculum assessment is yet to be adopted, with many undergraduate paramedic programs expressing a need for a standardised assessment approach by the ambulance service (who often hold responsibility for undertaking competency assessment on students in practice) (16).

The purpose of this study was to develop and evaluate a standardised assessment tool to assess paramedic student practice on clinical placement that utilised the Australasian Competency Standards for Paramedics (15) and could be used across undergraduate programs in Australia and New Zealand. The rationale for including New Zealand in this work is based on imminent paramedic registration, New Zealand are now in a consultation phase of their registration (2), similar assessment issues, and that the standards are accepted as the practice standards within both countries.

Methods

A pragmatic mixed methodology was employed using quantitative and qualitative data collection methods. The study design consisted of two phases. In the first phase, academics and on-road paramedics were asked to review and evaluate the Australasian Paramedic Competency Assessment Tool (APCAT) and associated resources (17). The second phase of the study (yet to be implemented), will evaluate the efficacy of the APCAT once it is trialled in the clinical environment. The intention of this paper is to report findings from phase one of the study only.

The APCAT

Before commencing the study, an advisory group was formed to provide professional advice and guidance relating to the proposed assessment tool. Six industry experts representing

higher education and industry within Australia and New Zealand were invited. All had extensive knowledge and experience in undergraduate paramedic education. The role of the group was to review the APCAT at various stages of development and to provide feedback on the tool and associated resources. The tool and resources were endorsed before deployment of the study.

The APCAT is a two-page document that is divided into administrative (student identification, course code, placement area), assessment criteria and feedback sections (Figure 1). The Australasian Competency Standards for Paramedics (15) were incorporated in the tool and arranged in five sections. These included professional practice, professional relationships, clinical practice, critical evaluation of paramedic practice and professional knowledge. Individual criteria from the Standards were embedded in each section. A binary grading system was incorporated to assess competence. This calls on assessors to consider students' practice in relation to the competency criteria to formulate a professional judgement, the outcome of which is recorded as 'achieved competence' or 'not achieved competence'. A section for assessor feedback makes provision for inclusion of specific evidence of practice supporting the grade. The assessment is designed to be undertaken in conjunction with the student, who is provided with a section on the form to make comment about the assessment. Provision is made for assessor and student signatures and a record of attendance. On completion, APCAT forms are submitted to the course coordinator. It is expected that the form will have been used as formative assessment point mid-way through the placement experience to provide students with feedback and direction for practice development.

A resource manual for the APCAT was developed to provide assessors with information about how to use the tool. Practice examples were incorporated that linked to competency standards to provide paramedic assessors examples of student behaviour that reflect competency standards (Figure 2). Year level descriptors (Figure 3) detailing student capability and expectations were included to provide examples of the expected scope of practice for students. These included skills, knowledge and attitudes required at the first, second and third year of the paramedic program to promote consistency and reliability in assessment outcomes.

Aims and objectives

The purpose of the project was to evaluate the suitability of the APCAT for the assessment of competence of undergraduate paramedicine student practice.

The aims of the study were to:

- determine if the content of the APCAT accurately reflected the assessment requirements of a paramedic student in the industry; and portrayed the competency standards determined by Paramedics Australasia

Australasian Paramedic Competency Assessment Tool			
Student Name:		Student Number:	
Course Name:		Year Level:	
Location:		Clinical Placement dates:	

Please tick the required grade.

Competent: The student has performed to their year level of practice

Non-competent: The student has not performed to their year level of practice

Assessment item	Competent	Non-competent
Professional practice		
Practices within legal and ethical boundaries		
Practices in a non-discriminatory manner		
Provides care professionally and in accordance with service standards		
Demonstrates effective scene management, and identifies additional resources if required		
Maintains fitness for practice		
Works within scope of practice		
Professional relationships		
Works effectively and collaboratively in interprofessional practice		
Communicates effectively with all stakeholders, within professional boundaries		
Advocates for patients and their rights		
Clinical practice		
Demonstrates assessments in accordance with service standards		
Uses knowledge, reasoning and problem-solving skills to determine appropriate judgements and actions to provide safe, effective and appropriate care		
Works effectively within the multidisciplinary team		
Critical evaluation of paramedic practice		
Monitors, reflects on actions and evaluates practice		
Professional knowledge		
Demonstrates underpinning concepts and knowledge to maintain safe paramedic practice		
Demonstrates use of information and communication technology		

Australasian Paramedic Competency Assessment Tool	
Assessors Feedback:	
Professional practice	
Professional relationships	
Clinical practice	
Critical evaluation of paramedic practice	
Professional knowledge	
Assessors signature:	Date:
Student comments:	
Student signature:	Date:

Competent/Non-competent

Course Coordinator Name: _____

Course Coordinator Signature: _____

Date: _____

Figure 1. Australasian Paramedic Competency Assessment Tool

Professional practice
The student:
Practices within legal and ethical boundaries <ul style="list-style-type: none"> • Acts in the best interests of the patient and their family/carer e.g. discusses care and treatment plans with the patient and family • Demonstrates respect for patients and all stakeholders e.g. peers, mentors, nurses • Demonstrates the principles and application of consent, privacy, confidentiality and duty of care

Figure 2. Extract of practice examples

YEAR 1: Supervision and assistance is required	YEAR 2: Supervision is required	YEAR 3: Supervision may be required
<i>The student is beginning to:</i>	<i>The student is able to:</i>	<i>The student:</i>
Develop communication skills, able to express themselves clearly and engage with patients and staff. Acts with empathy and compassion. Provides culturally appropriate and responsive care.	Communicate professionally with patients, families and allied health care workers. Uses professional terminology when communicating, e.g. patient has a fractured femur. Acts with empathy and compassion. Provides culturally appropriate and responsive care.	Is confident and professional when communicating and collaborating with patients and allied services. Acts with empathy and compassion. Provides culturally appropriate and responsive care.

Figure 3. Extract of year level descriptors

- determine the usefulness and acceptability of the APCAT for both university and on-road assessors.

The following question was posed for the study: Does the APCAT provide assessors with an appropriate tool for assessing undergraduate paramedic students while on clinical placement within ambulance services in Australia and New Zealand?

Ethical approval

Ethical approval was granted by the University of the Sunshine Coast in October 2018 (approval number: A181158).

Recruitment

Recruitment was facilitated using flyers, email and social media. These provided information about the study and extended an open invitation to academics and on-road paramedics within Australia and New Zealand to participate in the evaluation of the APCAT and associated resources. Participants who were interested in taking part in the study emailed the research team and they were sent the APCAT, associated resources and a link to the online survey.

Sample

Ninety-five (95) expressions of interest to participate in the study were received. Of those, n=38 returned the completed the survey (36% response rate).

Instruments

An anonymous survey consisting of 15 questions was used to collect data. The body of the form consisted of statements about the tool's utility. Participants used a 5-point Likert scale (strongly agree, agree, unsure, disagree, strongly disagree) to

rank their opinion. Open-ended questions inviting participant comment on the clarity and ease of use was included along with a small demographic section collecting data about years of experience, qualifications and primary area of employment (education or ambulance service) and location (state/country).

Analysis

Data were analysed using descriptive statistics and qualitative thematic analysis (18).

Results

The responses are provided in three parts including demographics, survey rankings using a Likert scale and open-ended questions to gather further perspectives.

Demographics

Participants from Australia were located in Queensland (n=28), Victoria (n=1), South Australia (n=1), Western Australia (n=1), Tasmania (n=1), Australian Capital Territory (n=2) and New South Wales (n=1). Three participants were from New Zealand. Twenty-four participants (63%) indicated that their main role in assessing students was within a university and 14 were in an ambulance service (37%); 27 participants (71%) had more than 10 years' experience assessing paramedic students.

Survey rankings

When specifically asked if the APCAT was user friendly, 81.5% (n=31) of participants either agreed or strongly agreed. The clarity around expectations of the students' performance was rated with 71% (n=27) agreeing or strongly agreeing. Sixty-

eight percent (n=26) of participants agreed or strongly agreed that the instructions about the grading system were clear. Respondents appreciated the practice examples to guide student assessment with 73.69% (n=28) agreeing or strongly agreeing. When asked if they felt the year level descriptors reflected the expectations for practice at that year level, 70.27% (n=26) agreed or strongly agreed. Participants were asked to consider if the resource manual provided adequate guidance for assessors, 65.79% (n=25) agreed or strongly agreed. The inclusion of a formative assessment was met with solid approval from the participants with 70.27% (n=26) strongly agreeing and 21.62% (n=8) agreeing. Thirty-four participants 89.47% (n=34) agreed or strongly agreed that inclusion of the paramedic competency standards as criteria was important. Table 1 provides a summary of the responses in the survey that related to the APCAT, the components of the resource manual and opinions about formative assessment and the use of competency standards for assessment.

Open-ended questions

Not all participants took the opportunity to provide a response to the open-ended questions. Thirty-three participants (86.8%) responded to some or all of the questions. The survey rankings of the five participants (13.15%) who did not respond to the open-ended questions however indicated that they were in favour of the APCAT and associated resources.

Five (13.15%) respondents provided feedback after every question and they also included a general comment at the end. Four primary themes emerged from the thematic analysis of open-ended responses: assessment tools, grading,

competency standards for assessment and suitability, and utility. The following is a summary of comments made:

Assessment tools

Participants felt the tool and associated resources were simple and easy to understand with clear instructions and examples. Participants stated they found the practice examples appropriate with one participant commenting that they were:

‘...extremely helpful because they provide a standardised format and terminology.’ P33Q9

The resource manual was found to be a good length and pitched at an appropriate level. Responses to questions included:

‘I find it well laid out, and concise’. P29Q11

‘This is an appropriate resource to make it easy to have a standard for all assessors.’ P11Q11

While there was consensus that the resource manual was valuable, there were concerns raised that assessors on-road wouldn’t have time to read the resource manual.

‘This can be difficult finding time due to large workload.’ P22Q13

‘We always struggle to get busy preceptors to actually read the materials provided.’ P3Q12

Grading

Respondents recommended education for those who would use the assessment tool and they expressed concerns regarding the potential subjectivity of assessors.

Table 1. Survey results

		Strongly agree	Agree	Unsure	Disagree	Strongly disagree
1	The APCAT is user friendly	28.95%	52.63%	15.79%	2.63%	0.00%
2	The expectations of the student’s performance in the APCAT are clear	18.42%	52.63%	18.42%	7.89%	2.63%
3	The instructions about the grading system are clear	21.05%	47.37%	21.05%	2.63%	7.89%
4	The APCAT practice examples are helpful in guiding assessment of the paramedic student	26.32%	47.37%	15.79%	5.26%	5.26%
5	The year level descriptors reflect the expectations of practice for that year level	18.92%	51.35%	27.03%	2.70%	0.00%
6	The resource manual provides adequate guidance for assessors	21.05%	44.74%	18.42%	5.26%	7.89%
7	The student should have a formative assessment midway through their clinical placement	70.27%	21.62%	5.41%	2.70%	0.00%
8	It is important to use a tool that assesses paramedic students using competency standards	65.79%	23.68%	5.26%	2.63%	2.63%

'I know instructions have been provided and they are good. But I'm sure that unless there is further instruction there will be considerable divergence in how it's used.' P15Q6
'The interpretation of what standard is achieved has potential to be a little subjective.' P2Q8

One participant however, deemed that the tool would assist with objectivity:

'The tool is non-complicated. This will promote objectivity.' P16Q15

Concerns were expressed by three participants about the rating of competent/not competent and they suggested using gradings to allow for flexibility and identification of improvement in practice.

'The binary of competent/not competent does not allow for the concept of "further development". A 3-4-point Likert scale could provide more specific feedback.' P4Q6

'I am not a fan of competency standards in respect to undergraduate education. I would be more comfortable if the structure of the APCAT remained the same but a larger scale of assessments of 4 to 5 criteria, which would align more comfortably with tertiary level as opposed to vocational but remain just as user friendly.' P8Q15

The recommendation of inclusion of a formative assessment at the midway point during placement was important to most respondents. They felt it was important for the university to be able to identify and manage students who were not practising at the required level and they claimed it was beneficial not only for the university and ambulance service but also for the student.

'The formative feedback is in many ways more valuable than the summative as the student can make adjustment to their practices while still in the workplace learning environment.' P19Q13

Competency standards for assessment

An assessment tool that was based on the competency standards was deemed to be important by most respondents. A participant stated:

'We teach these competencies so we should assess them.' P3Q14

In general feedback, two comments were made about the need to use the Professional Capabilities developed by the Paramedicine Board of Australia (6):

'My biggest piece of feedback is that the tools must reflect the AHPRA Paramedicine Board Professional Capabilities for Paramedics – as that is ultimately what will guide course accreditation and graduate registration.' P7Q6

'The Paramedicine Board of Australia has an interim competency standards framework that was based of PA/CAA's competency standard.' P4Q15

Suitability and utility

Participants acknowledged that they required more

standardisation of assessment tools for both students and assessors:

'I note a different standard from all the different universities when sending students on placement and feel this a great need for a tool like this to unify the assessment process.' P6Q15

'We need more standardisation for students and assessors alike.' P17Q14

Participants stated that they appreciated the assessment tool and would utilise it if it was introduced:

'I think the tool is excellent. You have done a great job putting this together. I would be quite happy to implement this at our institution; it's certainly as good or better than anything we've managed to develop for student feedback.' P15Q15

'I will happily adopt this tool if introduced in the future.' P6Q15

They felt that the tool covered the required areas of student paramedic assessment and that students would adapt to it easily:

'I find this to be a well-developed tool with good definitions of the outcome requirements and one that also covers all aspects of the assessment of a student paramedic.' P11Q15

'Students would also quickly adopt a set standard of expectation when on-road and a tool that remains the same with working progression throughout their 3 years of study.' P6Q15

Discussion

The results demonstrated that most respondents were in favour of the APCAT and that the associated resources were helpful. They believed it was important to have a standardised assessment tool linked to the Australasian Competency Standards for Paramedics (15). With the recent introduction of paramedic registration (6), and in the absence of a tool that incorporated competency standards, this could be the impetus for this favourable evaluation. It is believed that utilising competency standards helps students and assessors to understand their professional obligations and how the standards align to clinical practice (16).

Suggestions were made to include the Professional Capabilities developed by the Paramedicine Board of Australia (6) rather than the Paramedics Australasia Standards as criteria. This was considered, but while data was collected, New Zealand had not commenced registration for paramedics, and it is unclear which standards will be used. Further, as the Professional Capabilities were based on the Paramedics Australasia Standards (15) and are currently under review and yet to be finalised (6), a decision was made to use the Paramedics Australasia Standards for the trial of the assessment tool. Should circumstances change and preference for the use of the Paramedicine Board of Australia

Professional Capabilities arise, the APCAT could be easily modified as the structure of the tool provides a sound generic template.

Concerns were raised about potential subjectivity of assessors when using the APCAT. This is a common concern in competency assessment (19). In the assessment of paramedic students, decisions about competence may be derived from an objective or subjective view. While personal experience and opinion will influence assessment outcomes, an evidence-based framework that is designed to standardise assessment benchmarks (such as competency standards) promote consistency and facilitate reliability of assessment outcomes (12,20).

A small number of participants felt that the resource manual alone did not provide adequate information and guidance about how to use the APCAT. The researchers acknowledge that educational sessions will be required to ensure that the users of the APCAT are well versed in its use. Educational sessions are necessary to reduce potential subjectivity, provide and maintain consistency, enhance understanding of the application of the practice standards and determination of competency for each year level (21).

Some respondents thought that the assessment tool should be graded rather than using 'competent' or 'not competent'. Competency standards denote minimum requirements and most clinical paramedic courses in a university program are pass/fail courses. Further, grading students in a clinical setting can lead to assessment bias (22). For these reasons, and as most participants did not raise a concern with the grading system (competent/not yet competent), this was unchanged.

The recommendation for a formative assessment was favourably received. It provides a valuable opportunity for the student to receive feedback about their progress and an opportunity to set goals for further development collaboratively with their assessor or the university. Formative assessment has been widely recognised as the basis for effective clinical teaching (23) and is essential for supporting professional, technical and cognitive development (23). Formative assessment also provides an opportunity for the university to intervene and assist if required.

With the favourable evaluation of the efficacy of the APCAT, phase two of this research will continue and include a trial of the APCAT and resources while students are on clinical placement. Education about use of the assessment tool will be conducted at participating universities in Australia and New Zealand and educational artefacts will be provided such as podcast recordings and the resource manual. The tool and a user guide are freely available (17).

Subject to the results of the second phase, the tool and associated resources may be modified if the Professional

Capabilities are approved and finalised by the Paramedicine Board of Australia (6). The APCAT (17) is available online and a website will be established to provide resources and education to prepare assessors for its use.

Limitations

Although 95 paramedics expressed an interest to take part in the study, only 38 continued to complete the survey. There were only three New Zealand participants in total. The research did not include any student feedback and it is yet to be trialled in clinical practice. The research was a pilot study and the sample size of the research was small. While participants were invited from all states and territories in Australia and New Zealand, most who enrolled were from Queensland, and responses may not be representative of the wider paramedic population in Australia and New Zealand.

Conclusion

Overall, the APCAT and associated resources were evaluated favourably, and participants welcomed a standardised assessment tool that was simple to use and linked to the competency standards. Phase two of the study will be implemented where the APCAT will be trialled in the clinical setting by five universities.

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Competing interests

The authors declare no competing interests. Each author of this paper has completed the ICMJE conflict of interest statement.

References

1. Australian Health Practitioner Regulation Agency. [Internet]. 2017. Available at: www.ahpra.gov.au/ [Accessed 5 January 2020].
2. Paramedic Council. Paramedic Registration Update. [Internet]. 2020. Available at: www.paramediccouncil.org.nz/_Web/Public/News/Paramedic-Registration-Update.aspx [Accessed 22 September 2020].

References (continued)

3. Hickson H, Williams B, O'Meara P. Paramedicine students' perception of preparedness for clinical placement in Australia and New Zealand. *BMC Med Educ* 2015;168:1-7. doi:10.1186/s12909-015-0446-7
4. O'Brien K, Moore M, Hartley P, Dawson, D. Lessons about work readiness from final year paramedic students in an Australian university. *Australasian Journal of Paramedicine* 2013;10:2-14. Available at: <https://ajp.paramedics.org/index.php/ajp/article/view/52>
5. Reid D, Street K, Beatty S, Vencatachellum S, Mills B. Preparedness of graduate paramedics for practice: a comparison of Australia and United Kingdom education pathways. *ibid.* 2019;16:1-11. Available at: <https://ajp.paramedics.org/index.php/ajp/article/view/666>
6. Paramedicine Board of Australia. Professional standards. [Internet]. 2018. Available at: www.paramedicineboard.gov.au/Professional-standards.aspx [Accessed 5 January 2020].
7. Al Shammari T, Jennings P, Williams B. Emergency medical services core competencies: a Delphi study. *Australasian Journal of Paramedicine* 2019;16:1-8. <https://doi.org/10.33151/ajp.16.688>
8. Ossenberrg C, Dalton M, Henderson A. Validation of the Australian Nursing Standards Assessment Tool (ANSAT): a pilot study. *Nurse Educ Today* 2016;36:23-30. Available at: www.ncbi.nlm.nih.gov/pubmed/26296544
9. Dalton M, Davidson M, Keating JL. The assessment of physiotherapy practice (APP) is a reliable measure of professional competency of physiotherapy students: a reliability study. *J Physiother* 2012;58:49-56. doi:10.1016/S1836-9553(12)70072-3
10. Rodger S, Clark M, Banks R, O'Brien RM, Martinez K. A comparison of international occupational therapy competencies: implication for Australian standards in the new millennium. *Aust Occup Ther J* 2009;56:372-83. Available at: www.ncbi.nlm.nih.gov/pubmed/20854548
11. McAllister S, Lincoln M, Ferguson A, McAllister L. Issues in developing valid assessments of speech pathology students' performance in the workplace. *Int J Lang Commun Disord* 2010;45:1-14. Available at: www.ncbi.nlm.nih.gov/pubmed/19424886
12. Andersen P. Determining competency for entry to nursing practice: a GT study. Unpublished doctoral dissertation 2008. Victoria University, Wellington, New Zealand.
13. Tavares W, Boet S, Theriault R, Mallette T. Global rating scale for the assessment of paramedic clinical competence. *Prehosp Emerg Care* 2013;17:57-67. doi:10.3109/10903127.2012.702194
14. Bowen M, Williams B. Assessment of US paramedic professionalism: a psychometric appraisal, advances in medical education and practice. *Adv Med Educ Pract* 2020;11:91-8.
15. Paramedics Australasia. Competency standards. [Internet]. 2017. Available at: https://nasemso.org/wp-content/uploads/PA_Australasian-Competency-Standards-for-paramedics-2011.pdf [Accessed 5 January 2020].
16. Brightwell R, Sim M, Lord B. Standards and quality indicators for best practice in paramedic and interprofessional experiential practice. 2014. Australian Government Office for Learning and Teaching. Available at: <http://hdl.voced.edu.au/10707/378533>
17. Smith A, Framp A, Andersen P. APCAT: Australasian Paramedic Competency Assessment Tool. USC Australia. 2020. Available at: <https://dx.doi.org/10.25907/5e5462e46de4c>
18. Minichiello V, Sullivan G, Greenwood K, Axford R. Handbook of research methods for nursing and health science. 3rd edn. Frenchs Forest: Pearson Education; 2004.
19. Olle C, Glenn R. The power of subjectivity in the assessment of medical trainees. *Acad Med* 2019;3:333-7. doi:10.1097/ACM.0000000000002495
20. Cant R, McKenna L, Cooper S. Assessing preregistration nursing students' clinical competence: a systematic review of objective measures. *Int J Nurs Pract* 2013;19:163-76. Available at: www.ncbi.nlm.nih.gov/pubmed/23577974
21. Hawker J, McMillan A, Palermo C. Enduring mentoring partnership: a reflective case study and recommendations for evaluating mentoring in dietetics. *Nutr Diet* 2013;70:339-44. doi: 0.1111/1747-0080.12050
22. Gonsalvez C, Calvert F. Competency-based models of supervision: principles and applications, promises and challenges. *Aust Psychol* 2014;49:200-8. doi:10.1111/ap.12055
23. Ramsden P. Learning to teach in higher education. 2nd edn. London: Routledge Falmer Taylor & Francis Group; 2003.