

Review article: Paramedic education opportunities and challenges in Australia

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Abstract

Paramedic education has been undergoing major development in Australia in the past 20 years, with many different educational programmes being developed across all Australian jurisdictions. This paper aims to review the current paramedic education programmes in Australia to identify the similarities and differences between the programmes, and the strengths and challenges in these programmes. A literature search was performed using six scientific databases to identify any systematic reviews, literature reviews or relevant articles on the topic. Additional searches included journal articles and text references from 1995 to 2011. The search was conducted during December 2010 and November 2011. Included in this review are a total of 28 articles, which are focused around five major issues in paramedic education: (i) principle on paramedic programmes and the involvement of industry partners; (ii) clinical placements; (iii) contemporary methods of education; (iv) needs for specific programmes within paramedic education; and (v) articles related to the accreditation process for paramedic programmes. Paramedic programmes across Australian universities vary with many different practices, especially relating to clinical placements in the field. The further advances of the paramedic education programmes should aim to respond to population change and industry development, which would enhance the paramedic profession across Australia.

Keywords:

- ambulance;
- Australia;
- education;
- paramedic;
- prehospital care

Introduction

Paramedic education is a relatively new field within the medical tertiary education sector. The first symposium dedicated specifically to paramedic education in Australia was held in Adelaide in 1995 and laid the basis for agreement on standards for ambulance officers and for the establishment of a national body to address education.[\[1\]](#) In 1994, the first paramedic educational programmes were established at Charles Stuart University[\[2\]](#) and Monash University.[\[3\]](#) Since then paramedic education has been undergoing significant transformation, from an in-house, post-employment training model to a university-based pre-employment programme.[\[4\]](#) Currently, these two models still exist for paramedic education; however, the former model is being progressively phased out of the system[\[5\]](#) with the

national trend in paramedic education moving towards pre-employment tertiary programmes as a model that will become the sole point of entry to the profession in the future. Entry-level paramedic qualifications are offered today in 14 higher education institutions.^[6] Also on offer at some Australian universities is a full range of courses from undergraduate bachelor degree level programmes through to postgraduate courses at both masters and PhD levels.

Educational programmes together with their range and nature responded to the developments and changes in the paramedic profession, which included the quantity of paramedic work, its scale and scope of practice. Over the years the resulting transformations in the identity of healthcare with clinical practice, education and training permeated and necessitated the concept of benchmarking in Australian undergraduate programmes around the country, as ‘without national standardised curriculum guidelines, this will cause educational duplication, uncertainty and financial inefficiencies in many sectors of the paramedic discipline’.^[7]

To better understand the current paramedic education situation in Australia, this paper aims to review available literature regarding the current paramedic education programmes in Australia to identify the similarities and differences between the programmes, and the strengths and challenges in these programmes.

Methods

Databases searched for this article include EMBASE, EBSCO, Informit Search, ProQuest, ScienceDirect and PubMed. A two-stage search process for relevant literature in the above databases was performed. In the first stage, a search for systematic reviews, literature reviews or relevant articles on the topic was conducted using combinations of the following key words in the title or abstract: ‘paramedic’ and ‘education’. Additional terms, including ‘ambulance’ and ‘education’, ‘paramedic education’ and ‘programs’, were explored to broaden the search strategy. All returned and identified abstracts were reviewed for their relevance to this study. Subsequently, selected articles were critically appraised and reviewed to extract key findings or opinions directly related to the objectives of this paper. The database searches were performed during December 2010 and November 2011.

The second stage involved searching journal articles and text reference lists from 1995 to the present time. The following journals returned the greatest number of relevant articles and were thereafter manually searched for adequate sources: *Journal of Emergency Primary Health Care*, *Prehospital Emergency Care*, *Emergency Medicine Journal*, *Prehospital Disaster Medicine and Education for Health*. Journal articles in English with full text online (available or accessible through Queensland University of Technology subscribed databases) and published between 1995 and November 2011 were included. Commentary or editorial publications and letters, non-English-language literature and material unavailable in full text were excluded from this review.

Results

Overall, 363 publications were found, of which 152 were immediately eliminated because they were either duplicates, offline resources, newspaper materials or commentaries. The remaining 211 articles were screened for relevance through their titles, abstracts and key words. Of these, 54 articles were selected for detailed examination. Then 26 articles were excluded as they did not address the topic directly, even if they had mentioned educational programmes in their discussions or in their reference lists. The remaining 28 articles

concentrated around a variety of issues, including the principles of paramedic programmes and the involvement of industry partners, issues surrounding clinical placements, contemporary methods of education, and the need for specific programmes within paramedic education. The five remaining articles addressed matters concerning the accreditation of paramedics and the lack of specialist paramedics in academia. The articles identified represent those most directly discussing the current situation of paramedic education in Australia and adding to its knowledge base. These have been accepted to augment and bolster the arguments and data of this paper.

Discussion

The field of paramedic education has evolved during recent years from vocational education and training to university-based education. The principle on which current programmes across Australia are based[2, 3, 8, 9] pervades the defining elements of all the programmes and underlines the need to equip graduates with practical skills required in the profession.

Academics in all paramedic programmes across Australian universities recognised the vital role of their industry partners in the development of educational programmes,[1, 2, 8, 9] at least partly because the clinical placements are an asset and essential component to undergraduate programmes. It has been acknowledged that such placements could provide opportunities to apply a number of competencies, such as good communication skills, the ability to work in an interdisciplinary team environment, professional etiquette, and training of psychometric skills.[2, 3, 8-10] The paramedic programme offered by the Queensland University of Technology provides students with the opportunity to work as casual student paramedics with Queensland Ambulance Services[9] during their university course.

Despite widespread agreement on the importance of clinical placements, the number of hours together with the variety of places remains unclear and inconsistent across programmes. For example, students from Charles Stuart University spent 480 h on placements with ambulance services plus an additional 160 h in other healthcare institutions (e.g. EDs).[2] Second- and third-year students from Monash University undertook 140 h per year in rural and metropolitan areas with additional hours in a hospital setting,[3] whereas students at Flinders University spent 500 h in on-road clinical placements throughout their 3 year degree programme.[8] At Queensland University of Technology, a minimum of 30 weeks clinical placement was required for paramedic students during the 3 year programme, which comprised 18 weeks work as an unpaid 'third officer' and a 12 week paid internship working as a second officer.[9] It should be noted that the internship opportunity is no longer a component of this course. Therefore, the number of practice hours differs significantly from these university programmes.

The reasons for this wide range of practice hours are many; lacking strong research evidence could be one of those. There has been no in-depth research to evaluate the effectiveness and duration of clinical placements for paramedic students.[3] However, an initial research conducted at Monash University evaluating the theory–practice gap for paramedic students[3] found that student to patient exposure during clinical placement was inadequate to meet learning objectives, and that 30% of third-year students were not engaged in patient management during their clinical placements.[3] Their findings were confirmed by another study,[11] which reported 7% of students with negative experiences with clinical placements and having additional difficulties during the placements, such as not being made to feel welcome at ambulance stations and being poorly treated by the ambulance staff and clinical

instructors. Interestingly, the lack of competency, regardless of the number of hours devoted to clinical practice, was uncovered by Willis *et al.*, which led them to the conclusion that universities at best produce an advanced novice.[10] In light of this team's conclusion, it is important to prepare the clinical instructors better, as positive or negative experience gained from practical placements has been known to be an influential factor in choosing a prospective employer.[12] In summary, the quantity and quality of the clinical placement are still in the area of urgent research to provide scientific evidence for future education programmes and teaching practice.

Current programmes in paramedic studies consist of a mixture of practical and scientific education within a complementary curriculum, similar to other allied health and medical disciplines. However, the methods of teaching are changing. Several scholars have identified the implementation of e-learning as an interesting, flexible and interactive way of presenting realistic clinical cases.[13] Online learning also offers many other advantages, such as improved opportunities to attain course learning objectives, a source for student brainstorming, and a vehicle through which students can exchange ideas with each other and lecturing staff. This new method of learning also gave rise to a great need, namely the development of flexible learning arrangements.[14] Distance learning technology appears to be an effective mechanism for extending didactic paramedic education off the university campuses, and might be particularly beneficial to students in areas that lack paramedic training programmes or adequate numbers of qualified instructors.[15] However, in the current settings, a number of scholars have raised concerns about risks associated with e-learning especially when provided by untrained educators. Further questions were raised regarding computer access, equity issues, software upgrades and bandwidth requirements, all of which require addressing before successful implementation of e-learning strategies. It has been noted that Central Queensland University offered an external model as an option for the delivery of their paramedic degree. This should provide an excellent opportunity for researching the effectiveness of such a programme in teaching clinical skills. Students also noted that online education involves and requires a high level of student motivation and self-discipline,[13, 16] which in some cases might be difficult to achieve and control.

An increasing number of curricula are now based on case-based learning (CBL) and problem-based learning (PBL) methodologies, which are generally widely appreciated by students. CBL has the potential to change passive learning into one that is self-directed where the students take responsibility for their own education; it also adds realism to the classroom environment and fosters a higher level of teaching and learning. As has been noted 'it helps make book-smart paramedics understand how to apply their knowledge in [practice]'. [17] However, teaching CBL in undergraduate paramedic education is complicated and influenced by many factors. It is important for effective CBL to use scenarios based on authentic clinical cases, allowing learners to make choices and experience the consequences of their decisions.[16] Some elements of CBL, such as methods of material delivery (e.g. case materials and brainstorming sessions), also require further research as it remains unclear which one of the two methods, face-to-face or online, is superior.[14] Communication and interaction between instructors and students has also been identified as an area for much needed improvement in CBL.[17] Despite the achievements of and progression in CBL and PBL, very little literature can be found on CBL or PBL within the context of paramedic education,[14, 18] so the effectiveness and usefulness of these methods within paramedic settings needs to be evaluated in the future.

A number of strengths have been identified in current paramedic educational programmes, such as the use of e-learning forms (usually Internet-based technologies) and also computer-assisted instruction[6] as contemporary methods of education. It has been noted that web-based examination is the students' preferred way of assessing their knowledge and thus should become an integral part of paramedic education.[19] Simulations captured on DVD in particular are reported to be interesting and informative, clinically relevant and capable of holding student attention. Such technologies have the potential to assist with clinical placements and could augment some of the practical hours especially where learning opportunities in the field are not high-quality. However, some studies suggest that if the presented cases are unrealistic, the reality of 'hands-on' experience could never be replaced.[20] Similarly, Second Life software has been embraced by students for its promotion of a collaborative environment and individual practice-based simulation that includes rich and complex scenarios with details that are much more authentic than those traditionally paper based.[16] Alternatively, on-road experience can be provided in today's education programmes through the use of classroom simulation with high-quality mannequins and outdoor road trauma centres. This would equip students with exposure to life-like trauma and medical situations, which are an essential link for healthcare educators between the virtual world of medical and trauma-based pedagogy and the visceral world of patient and clinical care.[21] However, challenges remain, as the high technical requirements (both staff and equipment) are essential and can prove to be difficult to achieve and sustain in some settings.[16]

The literature has demonstrated an urgent need in area-specific programmes within paramedic education across Australian universities. For example, teaching students generic skills ranging from question analysis to the use of referencing was only reported in the paramedic programme offered at Charles Stuart University in 2008,[22] despite the fact that these generic skills are essential for future evidence-based practitioners. Additionally, an increasingly multicultural society requires paramedics to deliver culturally appropriate healthcare, as there is evidence of adverse and deteriorating health outcomes when health professionals do not provide care according to cultural needs. There is a lack of a readily accessible compendium in the area of culturally nuanced responsiveness in paramedic education or practice.[23] Acknowledging this issue, the Queensland University of Technology has provided some of its students the opportunity to observe the paramedic practice in China for a period of time during the summer semester vocation. The feedback from these students has demonstrated the importance of the international field experience in improving their understanding of culture and health systems (Andrews R, Fordyce A, Kirby L, pers. comm., 2011).

Another emerging area of need for better education is in the area of mental health within paramedic programmes, as dealing with cases of mental illness is a significant component of paramedics' workload and increasing, but current education is limited and does not prepare paramedics adequately to address these clients' needs.[24] Similarly, the readiness to respond to emergency situations involving children with special healthcare needs has not been addressed properly within current programmes.[25] This is a growing problem, especially given the fact that medical advances are increasingly improving the quality and length of life of children with complex medical conditions together with the increasing population.

Paramedic curricula also lack units devoted to death and dying. In the USA, only 6% of programmes offer a course specifically devoted to death-related topics,[26] although even with these the educational methodologies lack effective teaching strategies. Educating

paramedics about issues concerning the dying or dead patient should provide them with an important opportunity to learn new skills and attitudes related to death and dying. This is particularly significant as paramedics deal with death regularly and are also often a bereaved person's first contact with the healthcare system.[\[26\]](#)

Finally, one of the major remaining challenges confronting paramedic education lies in the area of accreditation of the educational programmes as seen in all medical, nursing and other allied health professionals. In a 2004 Adelaide-based symposium, accreditation was defined as not simply standardisation (because variation can also be of inestimable value to the ambulance industry) because of the need for education to be responsive to the wants of industry and with respect to types of practice and workforce requirements.[\[1\]](#) However, a lack of national standards and national accreditation, together with ambiguity in role definition for paramedic practitioners and graduates, has resulted in a situation whereby the paramedic discipline remains a semi-professional job without national registration and regulation.[\[7\]](#) The Convention of Ambulance Authorities (CAA) developed and initiated a process of accreditation, which was trialled in 2007 at Charles Stuart and Edith Cowan Universities under the direction of Professor Judith Walker from the University of Tasmania. All other university programmes were thereafter able to gain provisional accreditation based on approval of a written application. This initiative confirmed institutional diversity and a variety of educational philosophies, which remains challenging for both the universities and the CAA. In 2011, these universities were provided the opportunity to apply for full accreditation for a period of 5 years. Unfortunately, the accreditation processes undertaken failed to produce standardisation that would allow paramedics to move freely across states and territories in order to find suitable employment without necessity of additional training, which remains problematic.[\[27\]](#) It needs to be noted that it was never the intention of the review process to do that. The review process was to provide a standard of education and to enable the employer to compare one tertiary degree with another, for its relative strengths and weaknesses. This issue has also been underscored by a study among paramedics on the grounds who feel that their profession is not accorded the recognition despite their strong desire to move towards a full registration. This development would also be beneficial for accredited education programmes with national curriculum standards and clinical practice consistent with industry.[\[28\]](#)

In 2006, there was reported a lack of paramedic academics, which was a challenge for offering paramedic education programmes. In order to be considered a profession in its own right, paramedics need to be the main educators of new entrants with the ability to carry out research that develops the profession's knowledge base. The first step towards achieving this should be the establishment of an environment in which practising paramedics are able to participate in research activities and publish their findings.[\[29\]](#) Opportunities should also be created for suitably qualified paramedics to spend time in an academic environment as part of their professional development, leading to less reliance on researchers and teachers from other disciplines. For example, paramedic practitioners starting to undertake research degree studies, including a PhD, would be an effective and efficient way to build a critical mass of paramedic academics across Australian universities. However, this situation is changing with six universities now employing professors from the paramedic profession (who practised or still practise as a paramedic or whose research interest is focused in paramedic field) to lead their paramedic programmes (Bange R, pers. comm., 2012).

Study limitations

This literature review has its limitations, as with any other research publication. The number of identified articles is limited because of paramedic education being an infant area in medical and health education, and they only address limited issues related to this topic. The selected literature has methodological limitations, such as pilot studies, examining a small sample of respondents or being restricted to one location.

Conclusions

Paramedic education programmes across Australia remain diverse, and there is a great need from both teaching and professional perspectives to continually develop and improve the education programmes. Current programmes and teaching methods applied in paramedic education require scientific research to provide strong evidence, which would bring great benefits for the future of paramedic education and practice in Australia.

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Author contributions

XYH and MS conceived the study. JR performed the literature search and prepared the first draft. XYH and MS critically reviewed and edited all the drafts. All authors contributed to and approved the final manuscript.

Competing interests

None declared.

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