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Volume 14 | Issue 4 | Editorial

AUSTRALASIAN JOURNAL OF
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**The challenges of paramedic education in the new
millennium: Chasing the evolution of paramedic practice**

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Editorial

The challenges of paramedic education in the new millennium: Chasing the evolution of paramedic practice

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Across university campuses nationally, the final semester of the final year of study for hundreds of aspiring paramedics is coming to a close. With lectures completed and exams just around the corner, students are already engaged in jumping through the many hoops required to ensure their best possible chance of selection as a graduate paramedic with any one of Australia's ambulance services, and indeed international employers such as London Ambulance Service.

Some two decades ago, the education of paramedics moved from a vocational model to a higher education model, with aspirations of improvement in learning and efficiency across the sector. The practice of paramedicine has advanced rapidly (and in complexity) since that time, but questions remain as to whether paramedic education has kept pace with this evolution.

Where once paramedic education was focussed on training in essential skills coupled with a basic knowledge of pathophysiology, and subsequent application to a prescriptive set of clinical practice guidelines or protocols, the level of sophistication and expectation has grown exponentially by stakeholders (governments, the health sector and the community). Where once students practised the art of tying knots and forming slings from triangular bandages, they now learn the intricacies of pre-hospital thrombolysis and 12-lead electrocardiogram interpretation. This is a significant movement from that of training to that of education, and this paradigm shift must be accompanied by specific strategies to enable both learning and understanding (1,2). These expectations also create inherent challenges for education providers, balancing the importance of incorporating new knowledge and skills into their curricula while ensuring students are capable of absorbing and understanding each aspect of learning within the same timeframe afforded them two decades ago. Thus education providers have moved beyond delivering content through traditional means (face-to-face lectures), instead utilising technologies and delivery methods designed to provide access to information, and assessment of same, outside of the traditional paradigm (3,4). This has resulted in students having unprecedented access to online resources, simulation facilities and interactive computer programs that may be accessed at convenient times outside of traditional hours of learning. Although studies have identified specific benefit in simulation learning and other types of alternate learning, significant and necessary paramedic-specific research is yet to be conducted (5).

As national registration for paramedics draws closer, discussion continues about defining the new profession and the constitution of its membership. Education forms a key component of this discussion, with not only the qualification (undergraduate degree) but also its content scrutinised for industry relevance and the ability to produce 'work-ready' paramedic graduates (6,7). Much has already been said about the competitive nature of clinical placement as a source of learning, and universities continue to work to identify novel means of providing students with essential clinical practicum experiences such as through high fidelity simulation and international study tour clinical placement opportunities (5). The measure of effectiveness of these learning tools is yet to be clearly defined through research, although efforts are being made in this area.

It is possible that as the profession redefines itself, it may be necessary to look at other health professions, such as medicine, in order to identify how best to compress an ever-changing body of knowledge into a 3-year teaching program. This in itself will require significant cooperation between service providers and universities to identify expectations and deliverables regarding graduate capabilities and specific knowledge of local service provider clinical practice guidelines content. In particular, skills maintenance will be a feature and challenge in providing future 'work-ready' graduates, with research already identifying learning decay as an issue between graduation and subsequent employment (8).

This year, the annual Paramedics Australasia International Conference will be held in Melbourne in November, and will showcase the research capacity of paramedics from Australia and New Zealand, providing an annual insight into the continuing evolution of the paramedicine field. This important conference will provide an opportunity for paramedics and students to explore and understand the factors that are influencing their role in the provision of emergency health care.

The Australasian Journal of Paramedicine will continue to support and promote the knowledge and research shaping paramedic practice in order to ensure that paramedics in our region have access to the latest in developments affecting their practice. In this issue, as in a number of recent issues, we will continue to explore the questions that universities are asking of themselves and their students through the eyes of graduate and undergraduate research papers.

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**Paramedic identification and management of victims of
intimate partner violence: A literature review**

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Review

Paramedic identification and management of victims of intimate partner violence: A literature review

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Abstract

Introduction

Intimate partner violence (IPV) occurs between adults of the same or opposite sex in a current, or past, intimate relationship. The aim of this paper is to review the literature regarding paramedic confidence, capacity and accuracy when identifying adult victims of IPV and subsequent management of the scene when IPV is suspected or identified.

Methods

A review of the literature using Ovid MEDLINE was conducted; five articles met the inclusion and exclusion criteria.

Results

Results show a consistency in findings across research areas in Australia, Canada and the United States and are clear in four separate areas: paramedics demonstrate a high degree of accuracy in identifying IPV victims; professional training effectively increases paramedic knowledge of IPV; greater than 50% of the paramedic population surveyed felt underprepared to deal with an IPV scene; and the majority of surveyed paramedics attend between one and 10 IPV scenes per year.

Conclusion

This review indicates that paramedics have the capacity to accurately identify IPV victims, and that paramedics recognise a deficit in their professional IPV training. Further research is required, using a robust sample size, to construct appropriate training packages and guide improvement to paramedic clinical practice guidelines.

Keywords:

adult; emergency medical services; emergency medical technicians; domestic violence; spouse abuse; intimate partner violence

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Introduction

Intimate partner violence, a form of domestic violence, occurs between adults of the same or opposite sex in a current, or past, intimate relationship (1-4). A well-known risk factor for both injury and death among victims, domestic violence is also used to describe child abuse and elder abuse (2). Recognised as a serious public health issue worldwide, intimate partner violence (IPV) studies in Australia, Canada and the United States (US) indicate a significant cost to the health care system in each country contributing as much as 8% of the burden of disease, higher than other well known risk factors (2,4-9).

A community-based survey conducted in the US (6) indicated that 51% of respondents knew someone who had been a victim of IPV and 36% of respondents would consider contacting paramedics as a first contact for help instead of law enforcement (2,6). This indicates that paramedics have a unique opportunity to see IPV victims in their homes, potentially observing and identifying IPV without requiring prior notification. Paramedics represent a critical support and referral resource for victims of IPV who may struggle to ask for support through fear of potential ramifications (2,4,8,9) including fear of retribution from their partner, fear of being judged by health professionals, police, friends or family and fear of not being able to survive on their own should their partner leave them. While transporting to hospital, paramedics have an opportunity to interact with the patient away from the abuser, managing the situation skilfully, confidently and confidentially, creating the opportunity for the IPV victim to feel safe enough to ask for the support they need.

Paramedics consistently report attendance of between one and 10 IPV cases per year, with some attending as many as 20 IPV cases per year (1,4-10). A number of studies have investigated paramedic knowledge of IPV, accuracy when identifying IPV and confidence in dealing with IPV (3,4,8,9,11). Overwhelmingly, these paramedics identify a deficit in their own IPV knowledge and desire more formal training in this area (1-4,7,8,10,12). Effectiveness of training, specifically for paramedics, has been shown to be effective at improving awareness and understanding among participants, (3,8) irrespective of how detailed the formal training is. Therefore, if paramedics encounter IPV frequently, feel underprepared to effectively manage the IPV scene, and desire more formal training with additional training packages designed to improve the paramedic knowledge base will also improve IPV clinical practice guidelines.

Confidence is defined as the concept of reliability or trust in a person to carry out a desired task in an appropriate way. Capacity refers to a person's ability to retain and understand information, while also reproducing it accurately and consistently. Accuracy can be described as perfection, without alteration of the facts or deviation from the absolute

truth. The aim of this paper is to review the literature regarding paramedic confidence, capacity and accuracy when identifying adult victims of IPV and subsequent management of the scene when IPV is identified or suspected.

Methods

A literature review using Ovid MEDLINE (from 1946 to October 2015) was conducted. MeSH terms and keywords used in the search were: abuse, adult, air ambulances, ambulances, domestic violence, emergency medical services, emergency medical technicians, EMT, EMS, paramedic, prehospital, pre-hospital, domestic violence, family violence, spouse abuse, partner violence, intimate partner violence, IPV, transportation of patients, violence.

Articles were included if they specifically described IPV and related to the pre-hospital setting. Articles were excluded if they solely related to children, child abuse, elder abuse, mortality resulting from domestic violence or where patients were self-presenting at hospital emergency departments. Figure 1 shows a PRISMA flow diagram of the article inclusion and exclusion process.

Results

A total of 408 documents were found. Titles were examined for relevance, records excluded (n=129) that did not relate to IPV or were in a language other than English. Of the 279 articles that remained, exclusions were made (n=274) if they related to children, youth, hospital emergency department, patient self-represented to hospital, or not specifically relating to pre-hospital (Figure 1). Overall, five studies were included which assessed paramedic knowledge of IPV, identification of IPV and frequency of paramedic attendance at IPV scenes (Table 1).

Accuracy of paramedic identification of IPV was examined in the US by Weiss et al (11) through comparison data between the treating paramedic and an independent/impartial observer. The observer followed a normal paramedic on shift and completed a 10 question Domestic Violence Scene Assessment Screen (DVSAS) while the paramedic treated a patient, which was the observer's only duty during that time. The observer then conducted a confidential conversation with the patient, which the paramedic did not witness. Subsequently the patient was asked to complete a five question Abuse Assessment Screen (AAS). Once the patient had been admitted to hospital the paramedic completed a DVSAS based on memory of the scene. Weiss et al (11) found that from 43 transports to hospital, there was an 81% (n=35) correlation between paramedic assessment and observer assessment. They also identified a 60% (n=9 of 15) correlation between patient and observer assessment.

Several studies assessed paramedic training in the US (3,8). Weiss et al (3) used a 12 question multiple-choice questionnaire completed before (pre-test), and 4–6 months after, a 3-hour workshop (post-test) that was delivered within a typical continuing professional education setting. Hall and Becker (8) used a different 12 question multiple-choice questionnaire, completed pre-test and immediately post-test a 2-hour intensive training program. Of the 46 paramedics who participated in the Weiss et al (3) study, only 41% (n=19) completed the post-test questionnaire with a reported overall improvement of 17% in accuracy of answers (54% vs. 71%, $p<0.05$). Hall and Becker (8) included 33 paramedics in their study with 100% of participants completing the post-test questionnaire and 91% (n=11) of the 12 questions showing an improvement in accuracy of answers. Hall and Becker (8) also conducted an interactive session post-training whereby the paramedics voiced concern about their ability to have a positive impact on the IPV scene.

Mason et al researched Canadian paramedic exposure to IPV via a 23 question short answer interactive web survey located on the Ontario Paramedic Association (OPA) website for 3 months (9). The OPA had a membership of 1326 at the time of the survey and recorded an average 650 visits to their website each month. Paramedics responded to the research request (n=480) and, because respondents were given the opportunity to leave some questions unanswered if they wanted to, data analysis was calculated based on the number of actual answers to each specific question irrespective of the total number of survey respondents. In the past 12 months, 65% (n=252 of 345) responded to between one and 10 IPV calls. Of all the respondents, 64.3% (n=241 of 375) transported IPV victims some of the time, 29.3% (n=110 of 375) transported IPV victims most of the time and 83.5% (n=303 of 375) said the reason for non-transport was patient refusal. Desire for additional formal IPV training was expressed by 84.5% (n=321 of 381) of participants.

Sawyer et al (4) surveyed Australian paramedics exposure to IPV using a 16 question combination binary/Likert-scale/short answer questionnaire. Of 50 respondents, 90% (n=45) had responded to at least one IPV call in the past 12 months with the average number of IPV calls being 3.66 in a 12-month period. Half of the participants (n=25) stated IPV victims are never transported to hospital and 64% (n=32) stated patient refusal is the reason for non-transport. The majority of participants felt only somewhat prepared to deal with IPV cases (60%, n=30) and believe additional training is required (50% n=12 of 24) to address this deficiency in capability. Table 2 summarises the five studies.

Discussion

This literature review indicates frequent self-reported paramedic attendance at the IPV scene (4,9,11), a perceived

deficit in paramedic IPV training (3,8) and a demonstrated capability of paramedics to identify IPV victims (11).

Attending the IPV scene is reported as a frequent occurrence by paramedics in Australia, Canada and the US with small studies showing occurrence of attendance between one and 10 times in a 12 month period (4,9,11).

The focus of this literature review was the 16 years between 1999 and 2015 and, although IPV discussion of the nature discussed in this review has been described earlier, the timeline was restricted in order to maintain relevance to current pre-hospital environments (12). Deficit in professional paramedic training on IPV is commonly cited as an area needing attention, particularly given the stated frequency of attendance at IPV cases and paramedic requests for more knowledge (2-4,7-10,12). Although previous publications have described the need for further education in this area, further research needs to be conducted to provide a foundation for development of appropriate training packages. Hall and Becker (8) showed how an individual 2-hour intensive training program increased paramedic knowledge through the application of pre- and post-test methodology. Similarly, Weiss et al (3) conducted a training program within a regular, scheduled, continuing professional education environment for paramedics. It had a more general design but was evaluated similarly using pre- and post-test methodology. Interestingly, the more robust training program did not deliver incremental benefits, as the response from paramedics in both studies (3,8) was consistently in favour of more professional IPV training, expressing an unpreparedness to deal appropriately with IPV in the community. Confirmation that this education requirement broadly applies can be obtained by conducting additional studies and gathering information from different paramedic communities. Future study design would need to include a larger sample size to gather sound statistical evidence, thereby establishing the best platform for change in paramedic IPV clinical practice guidelines. Thorough data collection from patient care records, regarding the frequency of IPV attendances, would provide a solid basis for development of future research which will ultimately guide the construction of required pre-hospital educational training packages. Paramedics need a thorough depth of knowledge and skills in order to confidently and appropriately manage the IPV victim and environment.

Sawyer et al (4) conducted the first Australian research in this area using a 16-question combination binary/Likert-scale/short answer questionnaire and identified a deficit in paramedic perception of preparation to deal with victims of IPV. The questionnaire was given to paramedics in a 2-hour IPV workshop, however it is not clear as to whether this was done at the beginning or end of the training session. The purpose of the study was to identify current understanding and awareness of IPV among Australian paramedics.

Mason et al (9) had previously conducted similar research in Canada using a similar questionnaire, however via an interactive web based survey published on a paramedic association website. Interestingly the results of both studies (4,9) are similar, while both population groups are limited in size and further research is warranted, it suggests that paramedic concern regarding deficit in professional IPV training and preparedness to deal with IPV in the community is widespread.

Weiss et al (11) conducted a study to establish the accuracy of paramedic identification and reporting of IPV. Utilising a DVSAS and an AAS it was evidenced that paramedics had a high degree of accuracy, compared to an independent observer, when identifying IPV. Again, this study deals with a relatively small population group, however it presents encouraging data regarding the capacity for paramedic identification of IPV as it indicates that paramedics have the ability to accurately identify IPV during the course of their normal duties. Historically this has been the responsibility of health care professionals in the hospital system and subsequently educational resources have been specifically focused on supporting them (8). Results from this review indicate that paramedics also have the capacity to fulfil the role of identifying IPV victims.

Paramedics are called on to provide emergency medical care in a patient's own home. Accordingly they are in a position to gain a unique insight into the living arrangement and dynamic of the home environment, something that doctors and nurses rarely have the opportunity to witness. It is crucial to equip paramedics with the training and tools they need in order to have the best opportunity to identify and treat every condition that they are likely to meet, and the research already conducted indicates that IPV is one condition in which paramedics identify the need for further training.

Intimate partner violence occurs in secret, behind closed doors and is often not discussed openly or freely. Doctors and nurses have been trained to identify potential victims of IPV and conduct screening, education and referral components of their care when the need arises. However, this management plan has the opportunity to only address those victims that are treated within the medical establishment. Paramedics do not transport 100% of patients that they see, either because the patient refuses or does not require transport. Irrespective of the reason, it means that there are IPV victims who potentially never make it to hospital. Their only interaction with the medical field is through paramedic attendance in their own home.

Intimate partner violence is a community issue. We have a societal obligation to help IPV victims, to provide as many opportunities for assistance as possible, especially in a way that can easily be accessed and utilised by them. Paramedics frequently appear in the media, on television and in the movies. Everyone knows what a paramedic is and that a call to the

emergency services will result in attendance at their home by a paramedic. Paramedics are highly respected health care professionals and are in a unique position to interact with community members in the home environment. More effort is required to ensure paramedics have the resources necessary to provide the IPV victim with the highest possible standard of care.

Limitations and future studies

The context of this literature review is a focus on the pre-hospital setting which has excluded a number of potentially relevant studies undertaken in emergency departments and other acute care settings across the world. Further to this, the use of additional electronic databases and grey literature would add further weight to the findings presented in this review. Finally, Australian research is limited so information from the US and Canada is assumed relevant to Australia.

The included studies provide data from small subsets of each community and suggest that similar statistics could be found in a broader population, however, studies conducted in larger numbers would be more robust and therefore provide conclusive findings and a strong basis for changes to clinical practice guidelines.

Future studies need to be conducted, however, given the nature of existing research being of small sample size and across different countries, it would be a good idea to combine resources nationally, or internationally, in order to substantiate recommendations and create effective change regarding paramedic clinical practice when managing the IPV scene.

Conclusion

The literature indicates that paramedics are frequently faced with IPV in the community and are often the first, or only, professional on scene. The small studies included in this review indicate that paramedics have a demonstrated ability to accurately identify the presence of IPV in addition to a desire to learn more about it and how to work with victims of IPV. Training programs at both a basic and advanced level, although on a small scale, have proven effective in increasing demonstrable paramedic IPV knowledge. At this stage in the research we do not know enough to draw conclusions and further national, or international, studies would substantiate recommendations and ultimately allow implementation of improvements in paramedic clinical practice.

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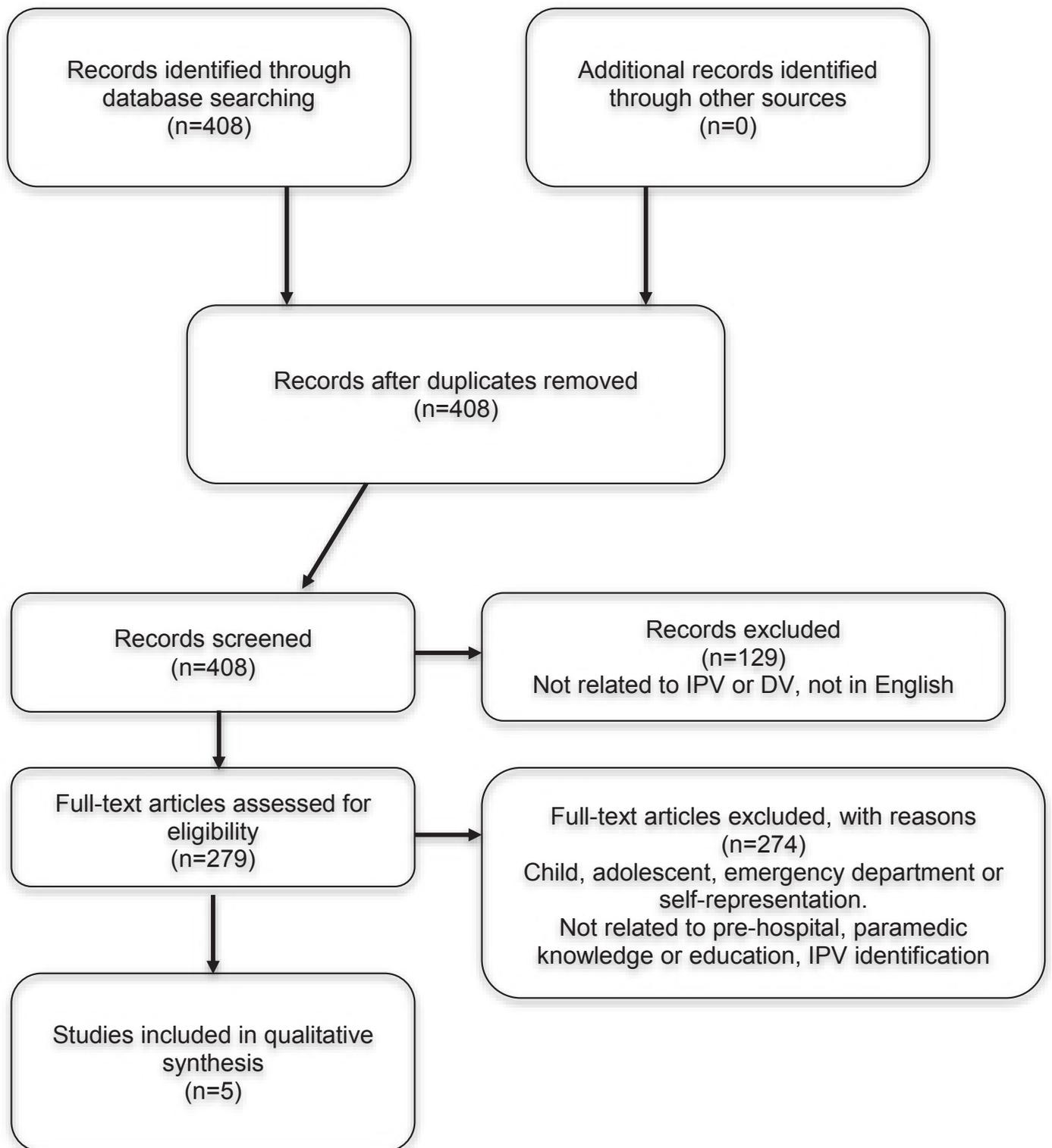


Figure 1. PRISMA flow diagram of the article inclusion and exclusion process
DV = domestic violence

Table 1. Located literature

Author, date and country	Participants	Study type	Key findings	Limitations
Weiss et al (12) 2000, US	43 transported incidents from a domestic location	Comparative study	81% (n=35) correlation between paramedic and observer of IPV identification	<ul style="list-style-type: none"> • Small sample size • DVSAS (paramedic/observer completion) assesses IPV in the present time while AAS (patient) assesses IPV over the whole lifetime • Two different observers used over 40 paramedic shifts, reliability between observers not assessed
Weiss et al (3) 2000, US	46 paramedics 100% pre-test completion, 41% (n=19) post-test completion	Prospective pre- and post-interventional study	17% overall improvement in accuracy of paramedics answers on a 12 question multiple-choice IPV questionnaire (54% vs. 71%, p<0.05)	<ul style="list-style-type: none"> • Small sample size • Only 41% completion of second questionnaire (post-training assessment)
Hall & Becker (8) 2002, US	33 paramedics, 100% pre-test and post-test completion	Training model, pre-test/post-test survey Interactive post-training session	<ul style="list-style-type: none"> • 91% (n=11) of questions on a 12 question multiple-choice IPV questionnaire showed improvement in accuracy of paramedics' answers • Paramedics expressed concern about ability to have a positive impact on the IPV scene 	<ul style="list-style-type: none"> • Small sample size • Specific data and analysis of data not published therefore cannot be verified for validity or relevance
Mason et al (9) 2010, Canada	480 paramedics, questions allowed to be left unanswered, therefore data analysis adjusted to reflect actual responses to specific questions	Interactive, web based short answer survey, 23 questions	<ul style="list-style-type: none"> • 65% (n=252 of 345) responded to 1-10 IPV calls in 12 months • 64.3% (n=241 of 375) sometimes transport IPV victims • 29.3% (n=110 of 375) mostly transport IPV victims • 83.5% (n=303 of 375) said patient refusal cause of non-transport • 84.5% (n=321 of 381) expressed need for more formal IPV training 	<ul style="list-style-type: none"> • Unanswered questions permitted • Answers reliant on paramedic recall • Questionnaire not published as part of the study design
Sawyer et al (4) 2014, Australia	50 paramedics	16 question questionnaire using combination of binary, Likert-scale and short answer questions	<ul style="list-style-type: none"> • 90% (n=45) responded to at least one IPV in 12 months, average n=3.66 • 50% (n=25) IPV victims never transported to hospital • 64% (n=32) patient refusal is reason for non-transport • 60% (n=30) somewhat prepared to deal with IPV cases • 50% (n=12 of 24) additional IPV training is required 	<ul style="list-style-type: none"> • Small sample size • Questions were limited in the information that could be gathered

Table 2. Direct result comparison

Author, date and country	Accuracy of paramedic IPV identification	Improvement in paramedic IPV knowledge	Paramedic exposure to IPV	Reason for non-transport to hospital	Additional IPV training
Weiss et al (12) 2000, US	81% compared to an independent observer	Not assessed	Not assessed	Not assessed	Not assessed
Weiss et al (3) 2000, US	Not assessed	17% overall improvement (54% vs. 71%, p<0.05)	Not assessed	Not assessed	Not assessed
Hall & Becker (8) 2002, US	Not assessed	91% of questions showed improvement	Not assessed	Not assessed	Expressed concern about ability to have a positive impact on IPV victims
Mason et al (9) 2010, Canada	Not assessed	Not assessed	65% (n=252 of 345) responded to 1-10 IPV calls in 12 months	64.3% (n=241 of 375) sometimes transport IPV victims 29.3% (n=110 of 375) mostly transport IPV victims 83.5% (n=303 of 375) said patient refusal cause of non-transport	84.5% (n=321 of 381) expressed need for more formal IPV training
Sawyer et al (4) 2014, Australia	Not assessed	Not assessed	90% (n=45) responded to at least one IPV in 12 months, average n=3.66	50% (n=25) IPV victims never transported to hospital 64% (n=32) patient refusal is reason for non-transport	60% (n=30) somewhat prepared to deal with IPV cases 50% (n=12 of 24) additional IPV training is required

Conflict of interest

The author declares she has no competing interests. The author of this paper has completed the ICMJE conflict of interest statement.

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The Bachelor of Nursing/Bachelor of Emergency Health (Paramedic) Degree: How well does it align with course objectives?

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Research

The Bachelor of Nursing/Bachelor of Emergency Health (Paramedic) Degree: How well does it align with course objectives?

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Abstract

Introduction

The Bachelor of Nursing/Bachelor of Emergency Health (Paramedic) Degree (BN/BEH-P) is a four-year on-campus double degree, combining essential units from both the accredited Bachelor of Nursing and Bachelor of Emergency Health courses. Graduates of this course are expected to be well equipped to manage the complexity of emergency care out-of-hospital, in-hospital and at the interface of these settings. The aim of this study was to explore student views of their preparation and intentions towards future practice and the alignment with course objectives.

Methods

A cross-sectional study was employed with a sample of first, second, third and fourth year undergraduate students of the BN/BEH-P. The results were mapped to course objectives by researchers.

Results

Written responses varied considerably making generalisations difficult; however, some common themes did emerge such as a need for greater flexibility in course delivery options, not enough simulation, a need for more clinical placements and better communication between the two schools. The level of satisfaction with course content and delivery was high. Timetabling problems and the allocation of clinical placements were a source of concern for many students and were found to be common to double degrees in general. There was alignment between student perspectives of course delivery with half of eight course objectives, but not in areas such as ethics, evidence based practice, professional communication and cultural values in practice.

Conclusion

The findings are important for students, universities and health services, informing a pedagogical alignment between student preparation and expectations. The findings are expected to provide valuable insight into the student view of undergraduate interprofessional education, how it shapes their intentions for future practice and how students and other stakeholders know if they will receive what is offered and funded.

Keywords:

student; nurse; paramedic; degree program; emergency care; interprofessional

Introduction

The increasing burden of chronic disease coupled with an ageing population is placing a greater reliance on community-based care. As nurses and paramedics begin to manage more acute episodes of chronic health problems in both the hospital and out-of-hospital settings, traditional and pedagogical roles that educate the health workforce in professional silos continue to be challenged (1,2).

Additionally, there will continue to be significant workforce shortages compounded by the steady attrition of specialist qualified nurses and paramedics (3) from both the hospital and pre-hospital systems. Attrition occurs for a number of reasons, including those associated with an ageing workforce and burnout. Health services and policy makers are exploring smarter ways of optimising a diminishing workforce, such as dual qualified health professionals, to meet the needs of communities under changing models of care. Therefore it is timely to invest in the development of multi-skilled health professionals equipped to deal with the increasing complexity of patient care in a range of health care environments (1,2,4-8).

Subsequently, universities have seized the opportunity to offer an increasing number of double degrees that are intended to develop skills involving two or more disciplines. Double degrees are two degrees studied concomitantly. A richer or rounder education can give double degree graduates a competitive edge over those with single degrees, providing specialisation in two fields and increasing employment options (9,10). Moreover, while double degrees increase future opportunities, they do not take double the time to complete as students are granted 'credit' either in recognition of 'double up', or the recognition of units undertaken outside their faculty or discipline area (10). Paramedic and nursing degree courses are a logical match for collaboration due to their synergies in emergency health, particularly emergency care out-of-hospital, in-hospital and at the interface of these two settings. Patients clearly benefit from the care provided by health professionals with knowledge and skills of both of these professions, at the one encounter. The career prospects for the graduate are also enhanced due to having a dual qualification.

A World Health Organization report (11), Framework for Action on Inter-professional Education and Collaborative Practice, emphasises that health and education systems must work together to facilitate the provision of sustainable health services, an effective health workforce and sound health policy (12).

The Bachelor of Nursing/Bachelor of Emergency Health (Paramedic) Degree (BN/BEH-P) aligns with the recommendations of the Productivity Commission's position paper on Australia's Health Workforce by producing graduates responsive to Australian population health needs (8,13). The

Commission proposes that innovative workforce planning is needed to service the health care needs of the community by enabling the delivery of care that crosses current professional boundaries (8).

According to Hickey et al (6) over one-third of undergraduate nursing students study by double degree which are predominantly undertaken by school leavers and those with a Higher School Certificate or equivalent (10). Women have a higher participation rate in double degrees than their male counterparts, although this may simply reflect the trend of women attaining higher tertiary entrance scores than men (6,10). Domestic students far exceed international students in double degree enrolments. This is supported by Moulton et al (9) in their study reporting only 1% of double degree students were international enrolments, compared to 16% for single degrees.

Double degrees potentially provide additional avenues for students who do not want to limit themselves to one area of study or employment. Double degrees attract high achieving students, as they generally require a higher tertiary entrance score than single degree alone. Higher tertiary entry requirements make double degrees extremely competitive, with fewer places generally offered than for single degrees. Notwithstanding, a study by Moulton et al (9) found students who graduate from a double degree are also more likely to undertake postgraduate study. The BN/BEH-P is a four-year on-campus double degree, combining essential units from both the accredited Bachelor of Nursing and Bachelor of Emergency Health courses. Graduates of this course are expected to be well equipped to manage the complexity of emergency care out-of-hospital, in-hospital and at the interface of these two settings (14). The aim of this study was explore student views of their preparation and intentions toward future practice and the alignment with course objectives.

The objectives are:

- Practice in accordance with Australian Nursing and Midwifery Council and the Australian National Training Authority competencies for registration of nurses and endorsed paramedics within Australia
- Work as either a paramedic or a nurse in an interprofessional practice context
- Act as a reflective practitioner recognising the learning needs of themselves and others
- Provide holistic, person-centred nursing and paramedic care as a beginning practitioner in a range of health care settings within local and global perspectives
- Practise in a manner that is reflective of the ethical and legal dimensions of the professions
- Interpret and apply evidence-based practice as a foundation for nursing and paramedic care
- Demonstrate the ability to communicate effectively as a member of the multidisciplinary team
- Incorporate the individual's cultural, spiritual and social values in planning, implementing and evaluating care (14).

Ethics

Ethics approval was obtained from the Monash University Human Research Ethics Committee University Human Research.

Methods

Design

A cross-sectional study was employed with a sample of first, second, third and fourth year undergraduate BN/BEH-P students. The results were mapped back to course objectives by the researchers.

Participants

Inclusion criteria for the study were current enrolment in the BN/BEH-P degree on a full-time on-campus basis. There were no exclusion criteria.

Instrumentation

Students were asked to rate their level of satisfaction with particular units and methods of delivery of course content via an online questionnaire (Survey Monkey) developed by the researchers. The questionnaire was divided into two sections. In the first section, students were asked to rate the value of each subject undertaken for 'preparing them to practise as a nurse/paramedic' via a 4-point Likert scale (1 = least valuable to 4 = most valuable). In the second section students were asked to record their responses on three items, 'methods/modes of course delivery', 'future recommendations for the course', and 'intentions towards future practice' via a combination of 3-point (yes/no/not sure) and 4-point (too many/about right/not enough/unsure) Likert scale questions. Students were also able to provide brief verbal responses to each question via open ended questions. The questionnaire took approximately 15 minutes to complete.

Procedures

Students were informed of the survey during usual teaching/lecture time, and provided with a brief explanatory statement and informed that participation was voluntary and anonymous. Students were given the URL link to complete the questionnaire online.

Results

Participant demographics

A total of 40 students completed the questionnaire. The BN/BEH-P students participated in the survey which was part of a larger study with single degree nursing and single degree midwifery students. In 2012, the total enrolment for the BN/BEH-P course was 166; this represents a response rate of 24%. The breakdown of participation by year was first year

32.5% (n=13), second year 35.0% (n=14), third year 17.5% (n=7) and fourth year 15.0% (n=6).

The majority of students were female (80%, n=32), which is the same as the entire cohort and aged between 18–21 years (70%, n=28). There were no students aged over 40 years enrolled in the course.

Perceived value of units in preparing for practice as a nurse/paramedic: first and second year students reported 'practical' units as 'most valuable'. Examples of practical units include those incorporating anatomy and physiology (first year 72.2%, n=26 and second year 67.6%, n=25), clinical concepts of paramedic practice, (only second year 81.1%, n=30), contexts of nursing (only second year 48.6%, n=17) and health assessment in clinical practice (only first year 50.0%, n=18). 'Least valuable' attitudinal scores were given predominantly to units with a more theoretical basis, such as professional communication (45.9%, n=17). Cultural responsiveness and evidence-based practice were both scored either 'least valuable' or 'not applicable'. Legal issues and concepts was the exception of the theoretical based units, scoring 58.3% (n=21) 'most valuable'. Of third and fourth year students, 68–100% reported that they had not completed their practical and clinical units at the time of the survey and responded 'not applicable'.

Method of course delivery/flexibility

For the item most relevant to lifestyle: 'Do you think your course provides sufficient flexibility?' 39.5% (n=15) recorded 'yes'. Student responses indicated general satisfaction with the number of hours dedicated to lectures and tutorials, with lectures reported as 'about right' by 73.7% (n=28) and tutorial time 'about right' by 73.0% (n=27). Face-to-face hours was also 'about right' as reported by 68.4% (n=26); although 51.4% (n=19) students reported 'not enough' time was allocated to clinical laboratories and simulations 73.7% (n=28), as well as clinical placements 55.3% (n=21) and rotations 52.6% (n=20). The students were allocated 880 nursing and 440 paramedic clinical placement hours during the four-year double degree at that time.

Students' open-ended responses were predominantly about course flexibility, rather than course content:

'The delivery of clinical material has been really good.

Links between the clinical skill and practical are highlighted and allow students to get a feel of what they are expected to do out in the workplace'.

'I think the way the course is being taught is really good, however the way the timetables have fallen have resulted in many of us having to travel to uni for just one class on several days of the week, and some of these classes only run for an hour in the middle of the day'.

Future recommendations for the course

Sixty-two percent of students (n=23) responded they would like see more flexibility in how the course was delivered in the future. Students also indicated more online teaching resources (45.9%, n=17) and summer semester options (59.5%, n=22) would be appreciated, but did not think evening classes should be added to the curriculum (67.6%, n=25). Overall students' open-ended responses and future recommendations for the course were positive and constructive.

On simulations as an approach to teaching, 73.7% of participants indicated what was offered was 'not enough' with one participant adding:

'In terms of simulation experiences we do have some with the dummies in the labs but not a lot of full scenario simulation experiences'.

Students (first year 91.7%, second year 69.5%) reported clinical placements as valuable units and they need to be better coordinated for greater student satisfaction:

'Overall excellent, although a shortage of placements can make life difficult'.

'It would be nice to have an elective (now re-introduced) and to have more choice about where to go for clinical placements'.

Coordination and communication more generally was a concern raised by several students:

'Both the nursing and paramedic faculties need to be more coordinated with each other'.

'There was a lack of organisation and communication between paramedic and nursing departments'.

And overall for the course, theory content is perceived to be well delivered:

'Overall the delivery of the theoretical learning has been pretty good. The lecturers are enthusiastic and pitch it at a good level'.

'The theory side of the course is delivered well, and in depth'.

'I'm proud to be a student and overwhelmingly have appreciation for the university, facilities and staff!'

Intention towards future practice

The majority of students (70.3%, n=26) intended to apply for a paramedic position at some time in the next 3 years (54.1%, n=20) intended to undertake a nursing position (some would apply for both) and 18.9% (n=7) were unsure. In relation to the question of graduate years and future directions, students were aware of the advantages of having completed the double degree. For nursing in the emergency department, a graduate of the double degree also has knowledge and skills associated with the pre-hospital emergency setting which is helpful for employers. Likewise, for a paramedic graduate

of the double degree there is an enhanced opportunity to gain employment with ambulance services which may seek to employ paramedics with skill sets of a registered nurse.

Students report on their intentions for future practice:

'I am studying nursing as a bonus for more flexibility in employment; I have little intention to work as a nurse'.

'As I am doing BN/BEH I am doing the nursing part to increase my experience, skill and knowledge level and to broaden my understanding in order to be a better paramedic'.

'I plan on applying to do my graduate year as a nurse after completing my four years and then after completing my nursing grad year intend to do my paramedics grad year and then work as both in some capacity (hopefully!)'.

'I think ultimately I will complete a paramedic grad year and then do my nursing year after while working casually with the ambulance service'.

Students were keen to utilise their extended skills and dual qualification, however they were uncertain as to how they could achieve this:

'I would like more info on grad year options for BN/BEH-P students'.

Alignment with course objectives

The student perspectives on value of units, method of course delivery and flexibility, future recommendations for the course, intention towards future practice and patterns of employment were summarised and backwards mapped to the course objectives by the researchers to inform course design and delivery in the future (Table 1). Objectives 1–3 are well aligned, 4–5 partially aligned and 6–8 poorly aligned; an overall outcome of approximately 50% alignment.

BN/BEH-P

While the aim is to have a 100% match between student perspectives of course delivery and course objectives, course leaders were also aligning with competencies for both professions and the requirements of the accrediting agencies (4).

Discussion

The overall response from the BN/BEH-P student cohort was promising, however, written responses varied considerably making generalisations difficult. In summary, the results of this study show that students found the practical units related to assessment and practice most valuable when compared to theoretical units. They were also mostly satisfied with the teaching hours and delivery but were dissatisfied with inadequate clinical placements, labs and simulation experiences. The majority intended to apply for a paramedic position, and about half would apply for a position in both professions in the next 3 years.

Table 1. Alignment between the course objectives and course delivery of the BN/BEH-P

	BN/BEH-P course objectives	Student perspectives
1.	Practice in accordance with ANMC and ANTA competencies for registration of nurses and endorsed paramedics within Australia	All students on placement and graduates in employment practising in accordance with ANMC and ANTA competencies
2.	Work as either a paramedic or a nurse in an interprofessional practice context	81.1% of respondents intention for future practice in interprofessional context
3.	Act as a reflective practitioner recognising the learning needs of themselves and others	Recognised their requirements for lectures, tutorials, clinical placements, clinical laboratories, simulations
4.	Provide holistic, person-centred nursing and paramedic care as a beginning practitioner in a variety of health care settings within local and global perspectives	Employed in formal interprofessional graduate programs, rural communities, defence force, nursing, paramedic holistic and person-centredness of care may be compromised. (See perspectives, Objective 8)
5.	Practice in a manner that is reflective of the ethical and legal dimensions of the professions	Legal issues and concepts scored 'most valuable' theoretical based unit
6.	Interpret and apply evidence-based practice as a foundation for nursing and paramedic care	Scored 'least valuable' or 'not applicable'
7.	Demonstrate the ability to communicate effectively as a member of the multidisciplinary team	Professional communication scored 'least valuable' scores
8.	Incorporate the individual's cultural, spiritual and social values in planning, implementing and evaluating care	Scored 'least valuable' or 'not applicable'

ANMC = Australian Nursing and Midwifery Council, ANTA = Australian National Training Authority

There was approximately 50% alignment between the course objectives and course delivery of the BN/BEH-P.

The level of satisfaction with course content and delivery was high. Timetabling problems were a source of concern for many students undertaking the BN/BEH-P, including the allocation of clinical placements. A working group was established to liaise with nursing and paramedic clinical offices. Many of the issues students experienced were found to be common to double degrees in general, not just the BN/BEH-P. For example, in a study by Russell et al (10), 72% of double degree students blamed timetabling issues for missed classes, timetable clashes, exhaustive hours and heavy workloads that compromised their performance. The mentoring of senior double degree students was introduced to meet with the students for advice and support. A lack of communication between faculties/schools was also commonly reported by double degree students, as well as multiple assessments due at the same time (10). Student, academic and administration members from each school (nursing or paramedic) joined

committees of management of the partner school (paramedic or nursing). Recommendations and actions to arise from the findings of this study were an active student and staff course management committee developed for management of student issues such as duplication of content and inter-professional assessment tasks. This was established for the BN/BEH-P in addition to the nursing and paramedic committees. The identification of unfulfilled objectives in the areas of ethics, culture professional communication and evidence based practice was surprising, acknowledging the rating scale method meant some units will necessarily be perceived as 'least valuable' by comparison to others. Some of the units were reviewed with education curriculum experts. Assessment task mapping was undertaken by an assessment committee which was formed for all degrees, prompted by the feedback of the students of BN/BEH-P when assessment tasks clashed. Students established greater influence over their timetable, recommending to the nursing and paramedic schools that some units/tutorials were 'double taught' to avoid clashes and unreasonable commencement and finishing hours.

Students were a catalyst for enhanced communication between nursing and paramedic schools and further recommendations which were taken up included regular paramedic and nursing faculty meetings, collaboration in education, publications and research, student representatives from double degree courses on each single degree course management committee and joint meetings of administrative teams. Students prompted further development of inter-professional laboratories and clinical placements to integrate their knowledge and practice and prepare for future employment.

The faculty and students of BN/BEH-P were aware of the potential for the course and for the graduate careers both in Australia and internationally. While the World Health Organization (11) recommends that health and education systems must work together to facilitate the provision of sustainable health services, without relaxation of cross-professional regulations and scopes of practice to allow double degree graduates to practise in both of the disciplines in which they have gained qualifications, some experts say they cannot maximise their contribution to a multi-skilled health workforce with cross-disciplinary expertise (12,6). Graduates of double degrees, such as BN/BEH-P, have the potential to understand the intricate nature of complex problems, and collaborate across multiple disciplinary boundaries to ensure appropriate utilisation and allocation of health services, and ultimately quality patient care and outcomes. It is important that their course leaders ensure the undergraduate experience is fully realised between the course objectives and outcomes.

Limitations

The main limitations are the low sample size and response rate. The study is potentially further limited by the use of convenience sampling. The method may be easier to recruit participants, but may not recruit a representative sample of students, ie. non-response bias. Consequently, those students who did volunteer to participate may themselves bias the results. Previous clinical experience or exposure was not addressed in the questionnaire, nor was previous education qualification. These may have affected results of those who completed the questionnaire. Finally, the use of priority level Likert scales in the questions on perceived values of the units resulted in 'least valuable' attitudinal scores being given to units with a more theoretical base, but they may have been 'perfectly acceptable' to students if a level of acceptability Likert scale was used. This may have resulted in a result of 100% alignment between student views of their preparation, intention towards future practice and course objectives. The choice of questions and scales was standard for all undergraduate courses in the school.

Conclusion

The BN/BEH-P supports the development of a multi-skilled health workforce responsive to Australian population health needs, national workforce policy direction, and reflective of trends in undergraduate health professional teaching through innovative health services programs. Assessment of student views of the alignment between course objectives and course delivery of the BN/BEH-P has provided valuable insight and encouraging evaluative data, some useful recommendations have been implemented. The findings are important for both educators and health services. Students in this small study describe high levels of satisfaction with the content, mode of delivery and preparation for their roles in both paramedic practice and nursing. Ideally the post-graduate experience is interprofessional, modelled on an integrated program of support and practice for both disciplines. Support from health policy makers and regulatory bodies is essential to prepare and incorporate these multi-skilled graduates into the health workforce.

Conflict of interest

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

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Student paramedic anticipation, confidence and fears: Do undergraduate courses prepare student paramedics for the mental health challenges of the profession?

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Research

Student paramedic anticipation, confidence and fears: Do undergraduate courses prepare student paramedics for the mental health challenges of the profession?

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Abstract

Introduction

This study explores the preparedness of undergraduate student paramedics for the mental health challenges of the paramedic profession from the perspective of course coordinators and their students.

Methods

Two surveys were developed and administered to course coordinators and students of the 16 undergraduate degree paramedicine courses across Australia and New Zealand. Sixteen course coordinators and 302 students responded.

Results

Results illustrate there was widespread recognition for the need to include preparation for the mental health challenges of the profession within undergraduate courses. Furthermore, most course coordinators and students had a preference for this topic to be taught using multiple teaching modes with particular preference for teaching the topic via discussion and activity based education. Teaching the topic as a standalone unit was supported by more than a third of course coordinators (43%) and a third of students (32%).

Conclusion

Six themes were identified as positive by participants: caring for people, high acuity work, diversity of work and patients, making a difference to patients and their families, using clinical skills and knowledge and engaging with the community. Students were most confident about communicating with patients and using clinical skills and knowledge. Students were least confident about clinical decision making and the most commonly cited fear was making a clinical mistake. A significant proportion of students (16%) feared for their personal mental wellbeing and 14% reported they were least confident about personal mental health within the profession.

Keywords:

paramedic; pre-hospital; mental health; stress; depression; anxiety

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Introduction

Mental health challenges encountered by paramedics have received much attention in recent years. This attention has particularly focussed on high rates of stress, depression and anxiety (1). Indeed, medical and behavioural science research has established a powerful relationship between stress and psychological (as well as physical) illness (2-4). Findings that high levels of stress are present within people working in a broad spectrum of emergency service professions, and are active in the pre-hospital environment, seem to indicate there are characteristics within the pre-hospital environment rather than characteristics within individuals that lead to stress (1,5). Moreover, research that reports stress is found across the paramedic profession in cultures as disparate as the Middle East (7), India (8), Japan (6) and Norway (9) as well as in western counties including Australia (10-11), the United States (12) and Canada (13) lends additional weight to the argument that stress is inherent within the pre-hospital environment rather than within individuals. Certainly there are aspects of the paramedic role that are known to contribute to the stress present in other professions. These include demanding work, poor locus of control and perceived low levels of support (14-16). Clearly the paramedic profession is a demanding profession with the need to make important decisions rapidly (ie. demanding work), while working in an unpredictable environment (ie. poor locus of control), and paramedics typically work in isolated pairs or even individually (ie. a perceived low level of support) all of which will place substantial stress on individual paramedics. This is compounded by pressures within health sectors to meet targets with a real or perceived reduction in resources together with long hours and shift work (17-18). The ultimate consequence is a stressed workforce which is costly to the individual and to the employer (1).

This heightened awareness of the high incidence of mental illness, which has at times tragically resulted in the suicide of serving and former paramedics, is stimulating the address of mental health within the paramedic profession. Indeed, there are indications the profession has one of the highest rates of work related stress, anxiety and suicide within any profession (19). Ambulance organisations have been called upon to review policy and to implement procedures to support paramedics within the workplace (20). This has commenced in a range of ways including increased wellness and peer support programs in ambulance services, as well as ongoing focussed and broad strategies such as the Ambulance Victoria Health and Safety Strategy 2016–2019 (21), Ambulance Tasmania Business Plan 2013–2016 (22), Queensland Ambulance Service Silver Linings (23), the Mental Health Reform (24) and the Wellington Free Ambulance Strategic Plan 2015 (25). There is also an opportunity to call for

paramedic preparation courses to incorporate personal mental health with a view to greater preparation of graduates before commencing their careers. Although there is yet to be a formal requirement for psychological and emotional preparedness to be included within undergraduate degree programs, it would seem worthwhile to research the extent to which undergraduate paramedic education courses include aspects of mental health preparation. Mawson (26) reflects many newly qualified paramedics are filled with the excitement and anticipation of an action packed career saving lives and are not always mindful of the toll this highly rewarding career can take both physically and mentally.

There are an estimated 7484 students enrolled in undergraduate degree programs within Australia and New Zealand (27). These student paramedics are a captive audience eager to learn as much about the paramedic profession as possible. Thus, there is potential to raise awareness of the mental health challenges of the paramedic profession within a preparatory learning environment. Furthermore, there exists the opportunity in the same learning environment to teach coping strategies to meet these mental health challenges. This proactive preparatory approach promises to be far more successful than developing ad-hoc coping strategies in response to events arising within the workplace. The purpose of this research was to (a) establish current levels of preparation within undergraduate courses for the mental health challenges of the profession, (b) elicit views on the inclusion of this subject from students and course coordinators, (c) identify what students feel most and least confident as they commence their careers as paramedics, and (d) identify student anticipatory fears.

Methods

Surveys

Two qualitative surveys were constructed. The surveys were piloted on university academic staff involved in the education and training of paramedic students, practising paramedics, course coordinators and paramedic students. One survey was designed for completion by paramedicine course coordinators and focussed on the following:

1. Information about their university and enrolments
2. Their undergraduate paramedicine program and the preparation of novice paramedics for the mental health challenges of the profession
3. Course coordinator thoughts about how novice paramedics feel commencing their careers; specifically positive anticipation, confidence and fears.

They were also asked to distribute and promote completion of a student paramedic survey.

A second survey was designed for completion by paramedicine students and focused on the following:

1. Demographic information
2. Information about their undergraduate paramedicine program and their preparation for the mental health challenges of the profession
3. Student thoughts about how they feel commencing their careers, particularly with regard to what they positively anticipate, their confidence and their fears.

Survey responses were reviewed and grouped into common themes. Themes were developed based on the responses provided by respondents. Inductive reasoning was used to develop broad themes from related specific responses. For example, when asked what students were least confident about, the responses 'making the correct diagnosis in a time-critical case' and 'taking full responsibility for the assessment, treatment and care of a patient independent from supervision of an experienced clinician' were grouped into the theme 'Clinical decision making'. Similarly, when asked what students most feared, the responses 'I am most scared of the possibility of messing up and hurting someone or killing someone' and 'making mistakes and hurting patients' were grouped into the theme 'Making a clinical mistake'.

There were strong similarities between the surveys for clinical coordinators and the survey for students. Although not identical in every respect, wherever appropriate the surveys sought to elicit responses about similar information. For example, where the course coordinator survey asked 'What do students feel most confident about when commencing their career as a paramedic?' the student survey asked 'What do you feel most confident about when commencing your career as a paramedic?' Similarly, where the course coordinator survey asked 'What do students fear the most when commencing their career as a paramedic?' the student survey asked 'What do you fear the most when commencing your career as a paramedic?' This allowed comparison between the responses of course coordinators and the responses of students.

Participants

At the time of this research in 2015 there were 16 universities offering accredited undergraduate paramedicine courses in Australia and New Zealand (27). A request for support for this research was presented to the Network of Australasian Paramedic Academics (NAPA) at the 2015 meeting. The NAPA is a 'Special Interest Group' within Paramedics Australasia which, in turn, is the peak professional association representing practitioners who provide paramedic services to the Australasian community (28-29). The NAPA agreed to support this research and surveys were sent to the undergraduate paramedicine course coordinators at each of the 16 universities. Snowball sampling (30) was used to identify undergraduate paramedicine students and included

distribution of the student survey by course coordinators, dissemination of the student survey at the 2015 Paramedics Australasia International Conference, and distribution through social media. Paramedics Australasia and The Observer promoted both surveys through social media.

Ethics

Ethics approval for this study was obtained through the Edith Cowan University Human Ethics Committee: approved ethics application number 12751.

Results

Responses were obtained from 16 paramedicine undergraduate course coordinators. This represented a 100 percent response rate from course coordinators across all states and territories of Australia and New Zealand. Responses were obtained from 302 students: 100 from first year, 108 from second year, 87 from third year, and seven from the fourth year of an extended course. Some respondents chose not to answer some questions. All respondents were included within the data analysis.

Preparation

Course coordinators and students were asked whether the mental health challenges of the paramedic profession should be part of the undergraduate curriculum, does your undergraduate course currently include the preparation of students for the mental health challenges of the paramedic profession, are the mental health challenges of the paramedic profession covered in appropriate depth, and has your course suitably prepared your students/you for the mental health challenges of the profession? Responses from course coordinators and students to each of these questions are summarised in Table 1.

All course coordinators (100%) and almost all students (97%) reported that mental health challenges of the paramedic profession should be part of the undergraduate paramedic education and training curriculum. Three-quarters of course coordinators (75%) and students (74%) agreed that mental health challenges of the paramedic profession are currently included within undergraduate paramedic courses. However, there remain a significant percentage of respondents (36% of course coordinators and 43% of students) who feel this topic is not covered in appropriate depth. Importantly, two-thirds (65%) of course coordinators and more than half (54%) of students reported students were not suitably prepared for the mental health challenges of the paramedic profession. Whereas the paramedic profession does not have uniform work readiness criteria against which the ability to meet mental health challenges can be measured, self-reporting based on individual paramedic personnel assessment is a powerful indicator.

Table 1. The proportion (%) and number of respondents who answered yes or no for questions relating to preparation

Question	Course coordinators % (N)		Students % (N)	
	Yes	No	Yes	No
Should the mental health challenges of the paramedic profession be part of the undergraduate curriculum?	100% (15)	0% (0)	97% (274)	3% (8)
Does your undergraduate course currently include the preparation of students for the mental health challenges of the paramedic profession?	75% (12)	25% (4)	74% (225)	26% (78)
Are the mental health challenges of the paramedic profession covered in appropriate depth?	64% (7)	36% (4)	57% (113)	43% (84)
Has your course suitably prepared your students/you for the mental health challenges of the profession?	35% (5)	65% (9)	46% (113)	54% (131)

Table 2. The proportion (%) and number of respondents reporting how preparation for mental health challenges is taught and how it should be taught

Mode of instruction	Course coordinators % (N)		Students % (N)	
	How is the material taught?	How should the material be taught?	How is the material taught?	How should the material be taught?
Lecture	100% (11)	86% (12)	81% (162)	69% (171)
Discussion	100% (11)	93% (13)	63% (126)	81% (202)
Activity	82% (9)	86% (12)	36% (73)	65% (162)
Independent research	9% (1)	21% (3)	34% (68)	26% (65)
Group research	36% (4)	64% (9)	9% (19)	24% (61)
A standalone unit	45% (5)	43% (6)	24% (48)	32% (79)
Placement/practicum	19% (1)	7% (1)	9% (19)	11% (27)

Course coordinators and students were asked how the topic of mental health challenges of the paramedic profession is taught and how it should be taught within the undergraduate curriculum. Responses from course coordinators and students are summarised in Table 2.

Most course coordinators and students reported mental health challenges in the paramedic profession were addressed using multiple teaching modes and most had a preference that this

topic be taught in multiple teaching modes. Whereas lectures were the most common way the topic was addressed, both course coordinators and students reported a preference for teaching the topic via discussion. Teaching the topic through activity based education was also a preference for both course coordinators (86%) and students (65%). Teaching the topic as a standalone unit was supported by more than a third of course coordinators (43%) and almost a third (32%) of students.

There was significant support by course coordinators for teaching the topic through group research (64%) and some support by students (24%). There was some support by both course coordinators (21%) and students (26%) for teaching the topic through independent research. There was little support for teaching the topic as placement/practicum by either course coordinators or students.

Positive anticipation

Course coordinators and students were asked what students most look forward to about commencing paramedicine as a career. This question elicited six themes: caring for people, high acuity work, diversity of work and patients, making a difference to patients and their families, using clinical skills and knowledge, and engaging with the community. Responses from course coordinators and students to each of these themes are summarised in Table 3.

Close to a third of students (30%) and a quarter of course coordinators (25%) reported caring for people was the greatest positive anticipation for students prior to commencing a career as a paramedic. Conversely, half of course coordinators (50%) and almost a fifth of students (18%) reported the prospect of high acuity work was most anticipated. A third (33%) of course coordinators and almost an eighth (11%) of students reported making a difference to patients and their families was most anticipated. The diversity of work and patients was considered an area of positive anticipation for 13% of students and 17% of course coordinators. Perhaps surprisingly, given the extent of the investment in undergraduate courses of teaching clinical skills and knowledge, the use of clinical skills and knowledge was not cited by any course coordinators and only 9% of

students as the most anticipated positive theme. Engagement with the community was considered the most positively anticipated response by only 17% of course coordinators and 9% of students.

Confidence (most)

Course coordinators and students were asked ‘what do students feel most confident about when commencing their/your career as a paramedic?’ This question elicited nine themes: communication with patients, using clinical skills and knowledge, working in a team, commitment to the profession, being able to keep calm, building a rapport with patients, feeling passionate about my job, having support from colleagues, and those who had not yet developed strong confidence. Responses from course coordinators and students to each of these themes are summarised in Table 4.

More than a quarter (26%) of students reported they felt most confident about communicating with patients yet no course coordinators felt students were most confident with this theme. More than half of course coordinators (64%) and a fifth of students (21%) reported being most confident about using clinical skills and knowledge. Almost a fifth (18%) of course coordinators and 11% of students felt they were most confident in working as a team and in their commitment to the profession. Slightly fewer students (8%) cited being able to keep calm, 6% cited building a rapport with patients and still fewer (5%) cited feeling passionate about their job. Seven students (3%) and one course coordinator (9%) reported students did not yet feel sufficiently confident to identify a theme. Other low volume responses included attending mentally ill patients and having the physical strength required to undertake the role.

Table 3. The themes, proportion (%) and number of respondents who identified each theme when asked what students most look forward to about commencing paramedicine as a career

Question	Themes	Course coordinators % (N)	Students % (N)
What do students/did you look forward to most about commencing their/your career as a paramedic?	Caring for people	25% (3)	30% (72)
	High acuity work/career	50% (6)	18% (42)
	Diversity of work and patients	17% (2)	13% (31)
	Making a difference to patients and their families	33% (4)	11% (26)
	Using clinical skills/knowledge	-	9% (22)
	Engaging with the community	17% (2)	9% (21)

Table 4. The themes, proportion (%) and number of respondents who identified each theme when asked what students were most confident about

Question	Themes	Course coordinators % (N)	Students % (N)
What do students/you feel most confident about when commencing their/your career as a paramedic?	Communication with patients	-	26% (59)
	Using clinical skills and knowledge	64% (7)	21% (48)
	Working in a team	18% (2)	11% (24)
	Commitment to the profession	-	1% (24)
	Being able to keep calm	-	8% (18)
	Building a rapport with patients	-	6% (14)
	Feeling passionate about my job	-	5% (12)
	Not yet confident	9% (1)	3% (7)
	Having support from colleagues	9% (1)	-

Table 5. The themes, proportion (%) and number of respondents who identified each theme when asked what students were least confident about

Question	Themes	Course coordinators % (N)	Students % (N)
What do students feel least confident about when commencing their/your career as a paramedic?	Clinical decision making	45% (5)	26% (56)
	Personal mental health well being	-	14% (32)
	Working with children	18% (2)	9% (21)
	Getting a job	-	8% (17)
	Dealing with aggressive intoxicated patients	-	7% (15)
	Understanding other cultures	-	7% (15)
	Working with mental health patients	9% (1)	5% (12)
	Communication with ESOL patients and families	-	5% (12)
	Dealing with the death of a patient	-	4% (8)
	Adapting to shift work	-	4% (8)
	Complex cases	27% (3)	-
	Driving an ambulance in bad weather	9% (1)	-
	Being in charge of a case	9% (1)	-
	Putting practice into reality	9% (1)	-
	Being able to act quickly	9% (1)	-

Confidence (least)

Course coordinators and students were asked 'what do students feel least confident about when commencing their/ your career as a paramedic?' This question elicited almost twice as many themes (15) as the question regarding what they feel most confident. These themes were: clinical decision making, personal mental health wellbeing, working with children, getting a job, dealing with aggressive intoxicated patients, understanding other cultures, working with mental health patients, communication with patients and families for whom English is not their primary language, dealing with the death of a patient, adapting to shift work, complex cases, driving an ambulance in bad weather, being in charge of a case, putting practice into reality and being able to act quickly. Responses from course coordinators and students to each of these themes are summarised in Table 5.

Clinical decision-making was identified by nearly half of course coordinators (45%) and a quarter of students (25%) as the area of least confidence upon commencing a career as a paramedic. There was some agreement between course coordinators (18%) and students (10%) that working with children was an area of least confidence. Students also noted that personal mental health wellbeing was an area of least confidence (14%). Course coordinators (27%) and no students noted complex cases as an area of least confidence. Getting a job (8%), dealing with

aggressive patients (7%) and understanding other cultures (7%) were each cited by students though no course coordinators reported these themes. Similarly, communication with English for speakers of other languages (ESOL) patients and families (5%), dealing with the death of a patient (4%) and adapting to shift work (4%) were reported by students but not by course coordinators. Conversely, a third of all themes were reported by course coordinators but not students. These were complex cases (27%), driving an ambulance in bad weather (9%), being in charge of a case (9%), putting practice into reality (9%) and being able to act quickly (9%). One course coordinator and 12 students cited working with mental health patients as an area of least confidence. Other low volume responses included: wearing the uniform, knowing when a patient can be left at home and issues relating to law and ethics.

Fears

Course coordinators and students were asked what students fear about commencing paramedicine as a career. This question elicited 10 themes: making a clinical mistake, personal mental wellbeing, not getting a job, treating children, aggressive and abusive patients, the death of a patient, multiple casualties, working with unsupportive colleagues, being accepted as an equal and motor vehicle accidents. Responses from course coordinators and students to each of these themes are summarised in Table 6.

Table 6. The themes, proportion (%) and number of respondents who identified each theme when asked what students fear the most when commencing their career as a paramedic

Question	Themes	Course coordinators % (N)	Students % (N)
What do students/you fear the most when commencing their/ your career as a paramedic?	Making a clinical mistake	36% (4)	27% (62)
	Personal mental well being	-	16% (37)
	Not getting a job	9% (1)	-
	Treating children	-	9% (21)
	Aggressive and abusive patients	-	8% (18)
	The death of a patient	-	6% (13)
	Multiple casualties	9% (1)	3% (8)
	Working with unsupportive colleagues	18% (2)	2% (4)
	Being accepted as an equal	9% (1)	0.5% (1)
	Motor vehicle accidents	9% (1)	-

Making a clinical mistake received the most responses from both course coordinators (36%) and students (27%). Although 16% of students feared for their personal mental wellbeing, no course coordinators noted this as a fear. Conversely, 18% of course coordinators reported students feared working with unsupportive colleagues yet only 2% of students agreed. Fears identified by students but not course coordinators included treating children (9%), aggressive and abusive parents (8%) and death of a patient (6%). Small numbers of course coordinators and students cited multiple casualties (9% and 3%) and being accepted as an equal (9% and 0.5%). Not getting a job and motor vehicle accidents were each identified as the most feared event for students by one course coordinator but not by students. Other fears reported by students included litigation, lack of experience, facing death on a regular basis, getting injured and not measuring up to paramedic expectations.

Discussion

The 100 percent response rate from undergraduate paramedicine course coordinators is indicative of the interest the paramedic education and training community has in mental health issues and the importance this community places on this topic.

Preparation

All course coordinators (100%) and almost all (97%) students believed mental health challenges within the paramedic profession should be part of the undergraduate paramedic education and training curriculum. This highlights the perceived importance of pro-actively addressing the mental health challenges of paramedicine. Moreover, this result supports the inclusion of this topic within the learning phase.

Reports by three-quarters of both course coordinators (75%) and students (74%) revealed agreement that the paramedic profession's mental health challenges are currently included within undergraduate paramedic courses. This shows that despite there being no formal requirement to include preparation for the mental health challenges of the profession, most courses have at least included some level of provision. Anecdotal reports reveal some courses have only recently included mental health challenges of the paramedic profession. However, this is interpreted as a growing awareness amongst paramedic educators about the value of this topic and part of the ongoing evolution of optimal education and training courses to meet the needs of their students and the profession.

Importantly, a significant percentage of both course coordinators (36%) and students (43%) reported mental health challenges within paramedicine were not covered in appropriate depth within their courses. Moreover, two-thirds (65%) of course coordinators reported students were not

suitably prepared for the mental health challenges of the paramedic profession. These are pertinent responses and demonstrate a need for additional inclusion of educational content in this area. It may also be argued that if inclusion of personal and colleague mental health and wellbeing were a formal requirement in the accreditation of courses, additional resources maybe allocated to this area by education providers as part of the accreditation process. Paramedic education and training curricula are crowded with many valuable topics. Course coordinators may have difficulty in meeting competing demands when designing courses. Further, there may be resourcing issues that limit the time and resources spent on this topic. Importantly more than half (54%) of students reported they will not be suitably prepared for mental issues in the paramedic profession.

It is noteworthy that when course coordinators were asked if students were adequately prepared for the mental health challenges of the paramedic profession, only 25% responded in the affirmative whereas 75% responded in the negative. This thinking by course coordinators as they reflect on their own paramedic experiences may explain why they have sought to include mental health preparation within undergraduate paramedicine courses.

While it is encouraging that there exists agreement between course coordinators and students about the need to teach this topic there was much variety in how the topic was taught with very little specific formal content being dedicated within course units. While the inclusion of the topic in a lecture format was a popular choice for both course coordinators and students, the opportunity for discussion and activity was also seen as advantageous. Independent research would serve to raise awareness, but further engagement in collaboration with others would encourage open conversation. It is worth considering the use of a range of learning opportunities throughout the course that would normalise this topic and encourage the consideration of personal coping strategies and how to support each other. From a pedagogical perspective it is best to teach preparation for meeting the mental health challenges of the paramedic profession using multiple teaching methods. This is because it is a recognised pedagogical principle that teaching using multiple modes ensures optimum learning for cohorts of students who will have disparate and varied learning styles (31).

Positive anticipation

That almost a third of students (30%) and a quarter (25%) of course coordinators reported caring for people was the greatest positive anticipation for students before commencing a career as a paramedic aligns with the first of the top 10 reasons to become a paramedic listed by the New South Wales Ambulance Service (32). The finding that more than a half of course coordinators (50%) and almost a fifth of students (18%) reported the prospect of high acuity work was most anticipated clearly reveals high acuity work is considered important.

This response was noted in ways such as the use of lights and sirens, the urgency of a situation and the excitement of trauma calls. The difference between the findings reported by course coordinators and students may be due to the greater knowledge and experience of course coordinators compared with novice students. Given the nature of service to the community within paramedicine it was pleasing to note that making a difference to patients and their families was most anticipated by 33% of course coordinators and 11% of students. Respondents phrased these responses in different words including: helping people on their worst day, caring for people in their darkest hour and making a bad situation better.

Confidence (most)

Of the nine identified themes in which students had most confidence, there was agreement between course coordinators on two: using clinical skills and knowledge, and working as a team. Whereas concurrency of reporting for these two themes reveals common views by both course coordinators and students, four themes were only reported by students. These were commitment to the profession, being able to keep calm, building a rapport with patients and feeling passionate about their job. All of these are beneficial and valuable characteristics of paramedics. Perhaps understandably, small numbers of course coordinators and students, primarily the most novice, did not yet feel sufficiently confident to identify a theme. The agreement between course coordinators and students regarding student ability to use clinical skills and knowledge and to work as a team is particularly pleasing given these are key aspects for successful paramedics. Being confident about working as a team also suggests interpersonal support and mentorship are highly valued. It is also possible this suggests students see value in their communication skills which have been honed within their courses, placements, volunteer work, employment and domestic lives.

Confidence (least)

Clinical decision making was the most identified area of least confidence for students by both course coordinators and students. It may be students are comfortable with what they have learned yet need support and validation from others to make final decisions. Students noted that personal mental health wellbeing was an area of least confidence for 14% of responses. This may be a result of the national (33) and international (34) media attention focussing on mental health within paramedicine as well as heightened awareness due to the survey used in this study. Interestingly, course coordinators reported five areas of least student confidence that were not reported by students. These were complex cases, driving an ambulance in bad weather, being in charge of a case, putting practice into reality and being able to act quickly. This is likely to be a consequence of course coordinators having significantly greater paramedic

experience than students, and therefore course coordinators having a broader understanding of specific challenges that await graduating students. Getting a job was also mentioned by students (8%), which shows awareness that there are limited positions in Australia. That more students did not focus on employment issues as an area of least confidence may be explained by students being confident in their ability to find employment or by their being least confident in other areas. Other low volume responses included wearing the uniform, knowing when a patient can be left at home, and law and ethics.

Fears

A sixth (16%) of students most feared for their personal mental wellbeing. As noted above, this may be a consequence of current media attention focussing on mental health within paramedicine as well as heightened awareness caused by this study. Alternatively, this finding may indeed reflect increasing self-awareness within students about the demands of paramedicine and human psychological frailty. Making a clinical mistake received the most responses from both course coordinators (36%) and students (27%). Given the clinical nature of paramedicine work, plus the potential negative consequences of making a clinical error, this fear is likely understandable in novice paramedics. It is even possible that fear of making a clinical error may serve as a motivating factor among many novice paramedics to be clinically vigilant. That almost a fifth (18%) of course coordinators reported students feared working with unsupportive colleagues (with only 2% of students agreeing) may be reflective of the course coordinators' own experiences as novice paramedics or an awareness of the importance of supportive colleagues for novice paramedics. Not getting a job, multiple casualties, being accepted as an equal and motor vehicle accidents were each reported as most feared by a clinical coordinator, but not by students. This is likely to be a consequence of the greater experience of course coordinators within the profession of paramedicine that provides clinical coordinators with a different perspective to students.

Conclusion

The mental health challenges of the paramedic profession have received considerable attention in recent years. Whereas there has been anecdotal evidence that this topic is valued by those involved in the education and training of novice paramedics, as well as the novice paramedics themselves and paramedic employers, this study is the first to research this topic among undergraduate course coordinators and students. The 100% response rate to the course coordinator survey and the completion of student surveys from all undergraduate degree programs across Australia and New Zealand during the study period is strongly indicative of the importance with which stress within paramedicine is viewed.

The negative effects of stress, anxiety and depression are well known. Stress has been documented in a number of emergency service professions and has been found to occur within paramedicine across a range of nationalities and cultures. Thus it seems likely that characteristics within the pre-hospital environment, rather than characteristics within individuals, lead to stress. Therefore educational programs that are directed to all paramedics will be most successful in supporting paramedics to meet the mental health challenges of paramedicine. In particular, the undergraduate education programs that provide the qualifications of choice to Australian and New Zealand employers. These programs are rich and fertile environments in which to begin to prepare novice paramedics to meet the mental health challenges of paramedicine. Whereas undergraduate teaching cannot, and must not, replace ongoing programs and initiatives by paramedic organisations intended to support mental health, inclusion of teaching designed to foster the ability of novice paramedics to successfully meet the challenges of the paramedic profession does offer a valuable opportunity to proactively address the challenges that arise in the pre-hospital environment.

There is value in promoting undergraduate degree programs to include comprehensive preparation for the mental health challenges of the profession, to raise awareness of mental health in paramedicine, and to educate student paramedics before commencing their careers. Student paramedics are a captive audience and there is potential to raise awareness of the mental health challenges of the paramedic profession within their preparatory learning environments. Furthermore, there exists the opportunity in the same learning environments to teach coping strategies to meet the mental health challenges.

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Conflict of interest

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

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Teaching students to think like a paramedic: Improving professional judgement through assessment conversations

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Education

Teaching students to think like a paramedic: Improving professional judgement through assessment conversations

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Abstract

Introduction

The ability to self-assess is essential to the practitioner who often works independently, and reflective practice is entrenched within the paramedic process of care. In order to develop these practices a paramedic student must be able to self-identify mistakes and learn from their errors. However, student assessment has traditionally focused heavily on outcomes, with errors being penalised. Justification for traditional approaches to assessment of paramedic students acknowledges the potentially catastrophic consequences associated with mistakes being repeated in the real world out-of-hospital setting. Responding to the challenge of balancing the reflective practice skills set with 'real world' implications of a paramedic's mistakes, an assessment process was re-designed. The 'Student-Tutor Consensus Assessment' (STCA) was created to rebalance assessment weighting from being exclusively outcomes focussed, and encourage students to apply similar critical lens to events as the paramedics who are assessing them. Parallel tutor and student self-assessments are applied to simulated scenarios, with scores awarded to criteria where consensus has been reached between student and tutor judgements.

Methods

Final year undergraduate Bachelor of Paramedic Science students enrolled in a capstone topic were invited to complete a paper-based questionnaire at the end of their studies. Questions sought student perceptions about the STCA features and effectiveness.

Results

There was a 95% response rate (n=90). Responses to the six different questions showed a range of 85.6–95.6% broad agreement regarding the value, effectiveness and suitability of the method.

Conclusion

The pilot STCA approach proved highly successful, with student endorsement for the continued and expanded application of this teaching approach.

Keywords:

student consensus; paramedic education; self-regulated learning; sustainable assessment; learning partnerships; formative assessment

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Introduction

Learning to become a paramedic involves more than simply being able to demonstrate practical task competence, it also requires development of judgement and the capacity to self-reflect. Mistakes when attempting tasks often provide some of the most valuable learning experiences. Despite this, most established assessment focuses on the assessment of learning to certify achievement, with less emphasis placed on assessment for learning to feed forward into future practice. This balance of attention can have significant unintended consequences. Accidental performance may be rewarded over understanding and the learning gained from mistakes is excluded from the assessment process. The 'Student-Tutor Consensus Assessment' was created to rebalance assessment weighting from being exclusively outcomes focussed, and to encourage students to apply a similar critical lens to events as the paramedics assessing them.

Illustrating the dilemma: Student case studies

Jeff and June are both paramedic students attempting practical assessments. A tutor is assessing them in accordance with a prescriptive rubric, which sees marks deducted for errors or omissions.

Case 1

Jeff attempts a chest pain scenario. His history-taking and patient examination are both limited and consequently several patient findings are not discovered. He manages to execute a suitable path of treatment, which results in an improvement to the patient's condition. During a debrief discussion with his assessor, it is apparent that Jeff was unaware of his practice omissions, and demonstrates a poor understanding of the underlying disease features. Jeff satisfies a majority of the assessment criteria which have an emphasis on critical outcomes and passes his exam.

Case 2

June responds to a case of patient breathlessness. She arrives at the decision that several of the patient's features (including an extensive history of asthma) suggest that asthma was a probable diagnosis. June commits to asthma management pathway. With no patient improvement following her initial actions, she methodically critiqued the case asking herself 'what was she missing?' Realising that she had forgotten to record a blood glucose level, she immediately reviews her approach. Sharing her understanding of the sequela of increased respiratory rates associated with ketoacidosis, she suggests that her initial diagnosis was probably incorrect, and modifies her management appropriately. June fails the assessment due to her initial incorrect reasoning and critical errors.

It can be argued that Jeff's actions were risk adverse, which would surely be a virtue to future paramedic practice. However, with key patient data overlooked, determination of whether his actions were based on sound reasoning or chance is unclear.

Jeff is dependent on the tutor to indicate his performance and knowledge errors. For Jeff, a large amount of the learning took place during the debriefing with the tutor, yet as much of their debrief discussion occurred after the grade had been determined using the rigid grading design, little of the paramedic tutor's critique was represented on the report.

During June's debrief, she confidently led the discussion with her tutor. She identified all key case features, highlighting her errors and suggesting how she will adapt her future practice. The assessor had very little additional guidance to offer. June has clearly demonstrated her learning from the assessment. Once again, the report fails to capture this.

The focus on clinical skills performance and outcome has resulted in the prime focus of the assessments being 'of learning' as opposed to being 'for learning'. The essence of this narrow marking approach is the deduction of points for each student fault, as opposed to rewarding student learning.

These cases illustrate one of the concerns faced in our capstone subject that approaches to the assessment of paramedics in training focus exclusively on outcomes. This emphasis was potentially sending the wrong signals to students about what constituted 'good' performance in learning and the attributes considered important to a practising paramedic. Concerns about students' approaches to study and grade seeking behaviours were another prompt for the subject redesign. It was considered a requirement to modify aspects of the existing teaching in an attempt to refocus student attention on learning rather than just performing to achieve good grades (1).

Over the past decade some literature has focussed on reframing assessment to integrate students' judgements about their own learning as a normal part of assessment activities. Boud argued 'the key to learning in complex settings is to be able to "look again", to monitor one's own performance, to see one's own learning in the context in which it is deployed' (2). Themes within this thread emphasise the importance of practice to enable students to calibrate their judgements over time (3), and the aligning of assessment with long term learning through 'sustainable assessment' (4,5). Assessment that helps students to develop the capability to make judgements about their own performance and learning needs can be used to develop reflective practitioners and self-regulated learners (6). Existing challenges are noted when it comes to the 'readiness' of graduates to undertake the role of a beginning paramedic (7), yet it is commonplace for educators to exclude students from the assessment process (2). There is an abundance of literature focused on reflective practice and reflection on practice within disciplinary groups (8-10). Reflection has also been associated with the development of 'professional thinking'(11). In teaching, however, it is still common for student tasks involving reflection to require tutor evaluations of the subjective knowledge being presented (8).

The practice of placing all of the responsibility for assessment in the hands of an assessor maintains a student dependence on others for judgement. This is considered at odds with the goals of training professionals who work mostly unsupervised (12). These ideas heavily influenced our assessment redesign.

Evaluating assessment redesign: Action research methodology

This paper presents the paramedic-specific context of the research findings obtained from a student-tutor consensus assessment component of a broader paramedic action research project (13). This broader study focussed on the evaluation of the effectiveness of a capstone paramedic practice subject in preparing students for the transition to the paramedic role. Carr and Kemmis (14) explain action research as enquiry undertaken by participants to improve their own practices and their understanding of these practices and their context. Action research involves a cycle of identifying a local 'real life' problem situation, taking action to improve that situation and evaluating the effect of the actions to contribute to future improvement and learning. It contributes to the body of knowledge through sharing learning from the process and outcomes with the wider community. In our case, the problem situation was the capstone topic and its connection to real life paramedic practice, which had been subject to some criticism. The action taken was to redesign the subject with particular attention to assessment components and their influence on developing students as critical reflective out-of-hospital practitioners (13). One part of the change, analysed in this paper, was the redesign of the practical clinical simulation assessment to incorporate and value students' clinical reasoning and their judgement about their practical performance.

Borrowing directly from on-road customs, the assessment redesign was deliberately based around the paramedic process of care (15), with criteria acknowledging recognised practice features of the paramedic role. Grading of clinical outcomes was retained, but now reduced to only represent 50% of the overall score. The total grade now also reflects student-tutor calibrated judgement of performance (50% of the score).

Implementing the student-tutor consensus approach

The application of the new approach follows a chronological series of steps. First, students attempt the practical scenarios while being observed by their paramedic assessors. Step 1 remains unchanged from traditional assessment practices with the tutor applying their judgement to the student performance and the outcomes of the case. Step 1, which is weighted at 50% of the assessment grade, retains consequences to student marks if mistakes are made which may foreseeably be linked to poor practice or potential patient harm. While the tutor completes this step during the student observation stage

of the scenario, they deliberately withhold their assessment decisions until the subsequent steps are complete. Step 2 is student driven. They are required to determine whether they had been able to satisfy a predetermined set of criteria linked to the holistic paramedic practices, voicing justification for their decision to their paramedic assessor. Once the student appraisal has been noted, step 3 requires the tutor to apply their judgement to the same criteria. Where there is disagreement between the student and tutor judgements, further discussions target this learning opportunity. Consensus provides the student with affirmation of their effectiveness. The two-way assessment conversation promotes a calibration of student judgement with their paramedic tutor's judgement. This approach appropriately rewards the student for correctly self-identifying errors, while identifying non-deliberate or excessively self-critical practice. The consensus score, which is also valued at 50% of the assessment score, is added to original paramedic tutor's score (step 1) to provide a balanced grade, reflecting both case outcomes and effective student awareness of their own performance (see Figure 1).

Data collection methods

Participants were recruited from the 2015 student cohort in the capstone undergraduate paramedic topic (this was the first cohort to experience the assessment methodology).

Ethics

Ethics approval was obtained from Flinders University Human Research Ethics Committee. Information about the study was advertised to participants via a university web platform associated with the subject. Participants were advised through the announcement that their participation was entirely voluntary and that the act of completing the paper-based questionnaire would be indicating consent. This message was repeated to participants during the administration of the questionnaire, which was performed by a university staff member who had no conflict of interest either in matters of student progress or research outcomes. All questionnaires were fully de-identified, with no ability for any of the surveys to be traced back to individual students. The questions relevant to this component of the study asked participants to rate their agreement with statements as: strongly disagree (SD), disagree (D), neither agree or disagree (N), agree (A) or strongly agree (SA).

The statements included:

1. The scenarios effectively combined my knowledge, reasoning and practical skills
2. Self-assessment is an important skill for paramedics
3. I found the student-tutor consensus marking format:
 - a. Fair
 - b. Effective for my learning
 - c. Improved my ability to critically analyse my practice
 - d. Helped me to develop skills I can use in my future profession.

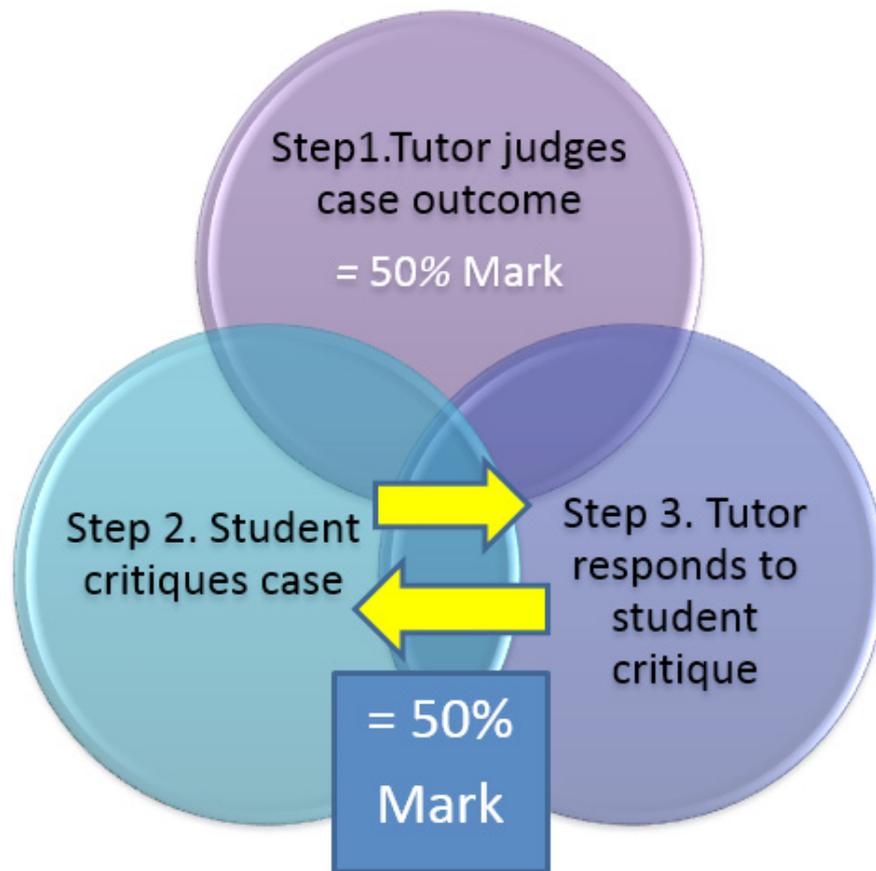


Figure 1. Student-tutor consensus grading model

Results

Ninety of the 94 eligible participants responded to the survey. In summary, 96.6% of students agreed or strongly agreed that scenarios effectively combined knowledge, reasoning and practical skills and 96.6% either agreed or strongly agreed that self-assessment is an important skill for paramedics. A total of 87.8% found the student-tutor consensus marking format fair (strongly agreed or agreed with this statement), 91.1% found it effective for their learning, 94.4% found it improved their ability to critically analyse their practice and 85.6% found it helped them to develop skills for their future profession.

Discussion

As the project set out to evaluate student perceptions of the value and effectiveness of the innovative assessment approach, these results were pleasing. All the findings demonstrate overwhelming broad student agreement across all domains of the questionnaire. Borrowing heavily from recognised industry practices is considered to be central to the successful introduction to both paramedic tutors and student cohorts. Both groups readily embraced the new

approach, with both groups independently acknowledging that it was more akin to on-road conventions than traditional classroom based assessments. Incorporating a practice into teaching and assessment design which replicates industry approaches aligns well with effective work integrated learning recommendations (16). The level of voluntary participation in the study was also noteworthy, with only four students electing not to take part. The data reflects the views of nearly 85% of the student cohort. This provides a powerful indication of the student voice when considered alongside the much lower typical response rates encountered with routine student evaluations of teaching.

The assessment redesign witnesses a dramatic shift, moving from long traditions of penalising student mistakes. Tutor judgements have been extended to acknowledge learning occurring as a result of an assessment practice, instead of being solely performance driven. At an early stage in introducing the approach, a small group of students did express dissatisfaction with no longer being able to achieve 'chance' outcome scores. This validated the academic intent of eliminating 'false positives' from student results and ensuring grades were a true reflection of student capability.

Sustainability in assessment practices is indicated through broad student agreement about the value for the approach to their practice beyond graduation (17).

Conclusion

The role of a paramedic requires critical thinking and self-reflective practices. However, traditionally university education has placed greater emphasis on assessing students' content knowledge and less on assessing their ability to self-reflect.

We have introduced an innovation that develops student judgement and critical thinking. It actively positions the student voice in the assessment process, a domain usually reserved for the tutor. Students are often very aware when they have made errors, but are typically denied an opportunity to express this. This approach is not only well embraced by students, but offers a capacity to improve student judgement that has been industry calibrated through conversations with practising paramedics.

The real out-of-hospital world is often unpredictable, requiring a paramedic to constantly re-evaluate and question their practices. The student-tutor consensus model offers an approach to assess how well a student can 'think like a paramedic'.

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Conflict of interest

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

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