

Basic life support knowledge of undergraduate nursing and chiropractic students

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Conflict of interest

The authors state that there is no conflict of interest to declare, all steps were taken to ensure that no potential or actual conflict of interest could occur.

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KEY WORDS

Basic Life Support (BLS), Automated External Defibrillators (AED), Cardiopulmonary Resuscitation (CPR), knowledge, education, training

ABSTRACT

Objective

The aim of this study was to examine retention of CPR/BLS knowledge of third year nursing and fourth year chiropractic students following instruction and assessment of CPR/BLS skills and knowledge as part of their undergraduate degree program.

Design

Non-experimental exploratory survey to determine perceived ability and knowledge of CPR/BLS following completion of CPR/BLS instruction.

Setting

University Health Sciences School.

Subjects

87 third year undergraduate nursing and 43 fourth year undergraduate chiropractic students at Royal Melbourne Institute of Technology (RMIT).

Main outcome measure

The level of knowledge of CPR/BLS was assessed via the number of correct responses to questions regarding CPR/BLS. A visual analogue scale was used for the students to score their self rated perceived knowledge and skill.

Results

The majority of students (78%) felt they were well prepared to perform CPR/BLS, however there were deficiencies in both groups with regards to knowledge of current guidelines. Chiropractic students were less likely to identify the correct compression rate compared to the nursing group (Spearman's rho 0.669, $p < .001$) with 95% of the chiropractic students not able to identify the correct rate. Thirty four percent of the students were unable to identify the correct ventilation compression ratio with nursing students again more likely to respond correctly (Spearman's rho 0.508, $p < .001$). Nursing students scored themselves highly for self rated knowledge and ability to perform CPR. Chiropractic students tended to score themselves at a lower rating in these areas than the nursing students; however the differences were not statistically significant.

Conclusions

Although students from both disciplines had significant gaps in knowledge of CPR/BLS nursing students outperformed chiropractic students in all aspects of CPR/BLS knowledge. Despite the knowledge gap students from both disciplines were confident in their self assessed ability to perform and assess the need for CPL/BLS.

INTRODUCTION

In the wider community it is an expectation that competence in cardiopulmonary resuscitation (CPR) and Basic Life Support (BLS) is at a high standard in all hospital medical and nursing staff (Buck-Barrett and Squire 2004; Perkins et al 1999). It is reasonable to conclude that community expectation regarding competency of CPR and BLS would be extended to other health care professionals such as Chiropractors (Dwyer et al 2005; Monsieurs et al 2005; Buck-Barrett and Squire 2004; Chamberlain and Hazinski 2001).

In most health care professions, CPR/BLS competence is an expectation of the regulating authorities and thus is usually a component of the curriculum. It is therefore not uncommon for this subject matter to be imbedded in the curricula. Indeed, BLS and CPR are a competency required in many undergraduate health care courses. However, this is not always the case as the Australian chiropractic regulatory authorities do not require current CPR competence for Chiropractors. Despite this most chiropractic programs have a requirement for CPR training which is additional to the curricula and is typically met through an external provider such as St Johns Ambulance.

BACKGROUND

While CPR/BLS competency is considered a fundamental skill for health care workers, the evidence suggests that retention of CPR/BLS knowledge and skills is generally poor (Brown et al 2006; Buck-Barret and Squire 2004). Studies have also identified differences in the quality of BLS / CPR performed by various healthcare providers (Wik et al 2005; Nyman and Sihvonen 2000). Often chest compression is performed inadequately with slow rates of compression and inadequate depth of compression (Abella et al 2005). De Regge et al (2008) found that after a relatively short time following training, nurse's BLS/CPR skills were poor.

Previous studies of CPR/BLS knowledge and skills have focused on nurses and other mainstream health professionals (Dwyer, Mossel-Williams and Mummery

2005; Monsieurs et al 2005; Buck-Barret and Squire 2004; Chamberlain and Hazinski 2001; Jordan and Bradley 2000; Perkins et al 1999). A review of the literature was unable to identify any previous studies that have examined the CPR/BLS knowledge and skills of chiropractic students.

The introduction of Automatic Defibrillators (AED) in community settings and the need for health professionals to be able to determine when and how to use AED, it has never been more important to determine the retention of knowledge, self perception of knowledge level and the ability to competently perform CPR/BLS in health professionals (Fleishhackl et al 2008).

At RMIT as part of the nursing and chiropractic programs, CPR/BLS is deemed an essential competency that all students must satisfactorily achieve. In the nursing course students are given a theoretical basis for CPR/BLS followed by a practical demonstration and participation in resuscitation scenarios in each year of the program. The complexity of the knowledge increasing in each year of the three year undergraduate program and in year 3 includes the use of AEDs. Chiropractic students at RMIT have no formal CPR/BLS education as part of the curriculum but are required to obtain a level II First Aid certificate by the fourth year of the program. The certificate is designed to provide competencies, skills and knowledge necessary to respond effectively and safely in first aid situations.

AIM OF THE STUDY

The aim of the study was to examine nursing and chiropractic undergraduate students' knowledge retention and self rated ability to perform CPR/BLS including use of Automated External Defibrillators (AED).

METHODS AND DATA COLLECTION

A non-experimental survey design using a 35 item questionnaire to collect information on the knowledge and self rated perception of ability to perform CPR/BLS was used. The participants consisted of a convenience sample of all third (final) year nursing

students enrolled in the undergraduate Bachelor of Nursing and all students enrolled in the fourth year of the Chiropractic program (Bachelor/Masters) at RMIT. The groups had received prior instruction and assessment of CPR/BLS skills as required by the respective programs. Students were approached during a normal timetabled lecture and asked to complete and return the questionnaire. The questionnaire was composed of categorical and likert response, questions. Visual analogue scale response questions were also utilised for the respondents to rate their self perceived ability and knowledge of CPR/BLS. The questionnaire was piloted before it was used to ensure content and face validity.

ETHICAL CONSIDERATIONS

Ethics approval was sought and obtained from the RMIT ethics committee. Completion of the questionnaire was voluntary and anonymous. Consent to participate in the study was determined by the completion and return of the questionnaire.

DATA ANALYSIS

The data was analysed using Statistical Package for Social Sciences version 15.0 (SPSS Inc). Descriptive and frequency analysis of the data from the survey questionnaire were examined to provide an overall picture of the responses. Initial analyses included frequencies and were reported as counts, percentages and means as appropriate. Further analysis of the data to assess normality indicated the data was not normally distributed therefore correlations were examined using Spearman's Rho.

RESULTS

A total of 220 questionnaires were distributed to year 3 nursing and year 4 chiropractic students. One hundred and thirty completed questionnaires were returned representing a response rate of 59%.

The questionnaire was returned by 87 nurses (53% of the year 3 nursing cohort) and 43 chiropractic students (67% of the year 4 chiropractic cohort). Of those who indicated their gender twenty-four

were male and 104 (81%) were female with a larger proportion of males in the chiropractic cohort (18 of 43 or 42%) while males represented less than 7% in the nursing group. The age of the population ranged from 19 to 47 with a mean of 25. The age range and distribution of males in the nursing group is consistent with the labour force data characteristics obtained from eleventh biennial health report of the Australian Institute of Health and Welfare (2008).

KNOWLEDGE OF CURRENT RECOMMENDATIONS FOR BLS/CPR

Students were asked to identify the current recommended rate for performing chest compression, 48% of the students could not correctly identify compression rate. There was a strong correlation between identifying the correct rate and the student's discipline (Spearman's rho 0.669, p-.001). When each discipline was examined individually 95% of the chiropractic students could not identify the correct rate. While in the nursing group 25% of the respondents were unable to identify the correct rate (as per the current Australian Resuscitation Council (ARC) guidelines).

A similar picture emerged with the ventilation compression ratio with 34% of students unable to identify the correct ratio; again there was a correlation between incorrect response to this question and the student's discipline (Spearman's rho 0.508, p-.001). Most (69%) of the chiropractic students and 17% of the nursing students were unable to identify the correct ratio.

When asked about the recommended number of initial rescue breaths once more nursing students out performed chiropractic students, with 90% of nursing students responding correctly and 53% of chiropractic students able to correctly identify the initial rescue breaths (Spearman's rho 0.422, p-.001).

Identification of the depth of compression required for effective CPR was poorly answered by both groups, with 57% of the group not able to identify adequacy of compression. When each group was examined individually 54% of nurses and 65% of chiropractic students answered this question incorrectly.

Last time practiced CPR

When students were asked regarding last time they practiced 76.9% (n=100) indicated they had practiced within the last three months while 2.3% (n=3) indicated they had never practiced CPR outside of scheduled practice/revision sessions. When students were asked how often they read ARC BLS guideline updates 41.1% had never read them and even fewer 17.2% (n=22) had read any research reports related to BLS.

In terms of actual real life experience with performing CPR the majority of respondents had not been required to do this with only 13.2% (n=17) indicating they had. Of these most (14) were nursing students who indicated that they had been required to perform CPR in an emergency situation.

Self rating of knowledge and skill

A visual analogue scale was used for the students to rate their perceived knowledge, need and ability to perform CPR/BLS. Zero on the scale indicating the lowest possible rating and ten on the scale representing the highest possible rating. Nursing students scored themselves highly for self rated knowledge of CPR, ability to assess the need for CPR highly and ability to perform CPR. Chiropractic students tended to score themselves at a lower rating in these areas than the nursing students; however the differences were not statistically significant.

Table 1: Self rating scores on visual analogue scale

	Self rated level of knowledge of BLS	Self rated ability to assess need for CPR	Self rated ability to perform CPR
Nursing students			
Mean	7.913	8.223	7.903
SD	1.3293	1.3077	1.5071
Chiropractic students			
Mean	6.542	6.900	6.588
SD	1.8808	1.9955	1.7906

There was a correlation between students who scored themselves highly on the self rated knowledge on BLS and their self rated ability to assess and perform CPR. Again nurses rated themselves higher in these areas than the chiropractic students.

Self Rated Preparedness

The majority (78.3%) of respondents agreed they were prepared to perform CPR if required, yet only 62.3% felt their First Aid training or CPR/BLS instruction they received adequately prepared them to perform CPR. Regarding preparedness to use AED, 58.1% agreed their training adequately prepared them and a similar number (62%) agreed they would use an AED if required. There was no correlation between student discipline and perceived preparedness to perform CPR or use an AED.

The majority of students (69%) indicated they agreed with the statement that chest compression performed well will result in spontaneous circulation. Many students were unsure regarding the need for chest compressions prior to defibrillation with 41% indicating that prior to defibrillation you should perform chest compression for at least five minutes. Many also appeared unsure of who is able to use AED's in an emergency situation with 42% indicating they should only be used by people who have been trained in using the devices. A similar number (57%) also indicated defibrillation is only performed if chest compression has been unsuccessful at restoring the circulation. There was no correlation between the response to this question and the students discipline.

The two questions best answered by both groups were; 'Absence of a carotid pulse is the only way to determine cardiac arrest' and 'During CPR interruptions to chest compression should be minimised' with 86.2% and 86.8% respectively.

A quarter of respondents (25.6%) indicated they were unsure whether health professionals such as chiropractors were able to initiate or perform defibrillation. Many students (21%) were also unsure whether CPR could be performed on a pregnant woman.

DISCUSSION/RECOMMENDATIONS

If the initial premise is that all health professionals should have sound CPR/BLS skills and knowledge then this study has demonstrated there are significant differences between students from two

different groups of health professionals. Do these findings indicate there is a need for all health care professionals to have the same standard of CPR/BLS instruction/training and assessment? Should CPR/BLS be a core competency across all health care professional programs? Should regulatory bodies require demonstrated competency?

If having the same standard of instruction/training and assessment is indeed a recommendation from this study then is it wise for educational institutions to consider providing the same educational preparation and assessment for CPR/BLS to all health professional programs within the institution? Are the teaching methods in the current nursing/chiropractic education system adequate to rectify the large number of incorrect responses? Before educational institutions can adopt this recommendation further examination and comparison of other health care professionals including students, needs to take place.

Added to the above recommendation should be the exploration of teaching/training and assessment methods of CPR/BLS across other health care professional education providers.

It would appear the results of this study indicate the most poorly answered or lowest knowledge areas were the objective questions such as, compression rates; ventilation to compression ratios; when to use automated external defibrillators and depth of chest compressions. If this is the case then CPR/BLS training/education should be revisited to ensure changes are addressed in these objective content areas which include how, frequency and by whom, these are delivered and assessed to ensure accuracy and retention.

Another key area this study identified was the self rated confidence and the perceived ability to perform CPR. Participants indicated they did not read ARC Guidelines or research reports; however they still felt confident in their ability to perform CPR correctly. The student's relatively high level of self-perceived knowledge and ability is at odds with the number of students not able to correctly identify the current

recommended compression rate or the depth of compression required. This suggests a further study could be implemented to compare CPR/BLS knowledge and self rated confidence of participants who read ARC Guidelines.

Nursing students outranked chiropractic students in most areas of the questionnaire. The only section where there was no distinction between the correlations in each discipline was the self rated preparedness to perform BLS/CPR. Both disciplines felt equally prepared to perform BLS/CPR yet both disciplines (although more chiropractors than nurses) answered the objective knowledge questions incorrectly. This finding is alarming as both nurses and chiropractors believe they are ready to perform BLS/CPR if they were called upon to do so. Consistent with De Regge et al (2008) findings regarding nurses BLS/CPR knowledge and skills. While BLS/CPR skill of chiropractors as a professional group have not been previously studied, the results for chiropractic students do reflect the findings from other studies that the retention of CPR/BLS knowledge and skills is generally poor (Brown et al 2006; Buck-Barret and Squire 2004). The only positive perspective is the correct responses were made by more nurses than chiropractors. This finding does not provide enough convincing evidence that nurses are either more knowledgeable on CPR/BLS or they have greater CPR/BLS knowledge retention especially as nurses are required to have annual instruction and assessment in BLS/CPR competencies.

LIMITATIONS

Within the study there were two distinctly different educational/training methods and thus also of assessment. Perhaps deeper analysis of the content of the education/training and assessment (which was not undertaken) could have provided a greater insight into why this study achieved the reported results. The student groups used in this study provided an opportunity to compare CPR/BLS knowledge retention associated with differing approaches to CPR/BLS education. By comparing only these two groups the findings may be limited in transferability to other healthcare student groups.

In addition the study did not investigate in any detail whether there was poor initial teaching and links to retention uptake (Parnell and Larsen 2007). Nor did this study explore what the CPR/BLS assessment results these two groups of undergraduate health care professional students had achieved or when they had been assessed. The formal CPR/BLS assessment results and timing of assessment (within the last six months) could have played a significant role in explaining the data obtained from these groups.

CONCLUSIONS

The study provided insight into knowledge retention of CPR/BLS of chiropractic and nursing students at RMIT in two recent cohorts. The findings indicate that for these participants, student nurses seemed to be better equipped and had a greater retention of CPR/BLS knowledge six months after they had CPR/BLS instruction. Student nurses in this group also had CPR/BLS instruction every year of their undergraduate nursing program. It is important to note this study echoes strongly that of Dwyer et al (2004, p11) in the reluctance and lack of confidence that HCP have to use AED.

Results of this study also looked at the implications of two HCP roles in CPR/BLS education and practice. Thus the study is limited in transferability of findings to other HCP. It does though provide a beginning understanding of CPR/BLS skills and knowledge across at least two HCP (Verplancke et al 2008; Jordan and Bradley 2000).

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