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- 'docendo ac discendo' - 'by teaching and learning'

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We would like to take this opportunity to show appreciation to all those involved with the production of the International Journal of Clinical Skills (IJOCS). Many thanks to all members of the Editorial and Executive Boards.

The International Journal of Clinical Skills looks forward to contributing positively towards the training of all members of the healthcare profession.

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Foreword

Head of Clinical Communication King's College London

Since its inception, the International Journal of Clinical Skills (IJOCS) has provided a unique platform for the teaching and learning of clinical skills in a variety of healthcare disciplines. It has become a well established peer reviewed Journal publishing a diverse range of clinical skills articles.

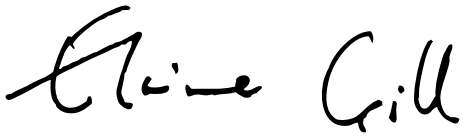
The Editorial Board consists of people active in the field of clinical skills teaching and this is reflected in the journals philosophy to encourage sharing of ideas and practice. Pertinent contributions aim to meet the current needs of researchers and practitioners.

Clinical skills teaching is going through a definite 'growth spurt' at present with increasingly responsive models, manikins and e-learning programmes - not dismissing financial investment that comes along with this. High quality clinical simulation is becoming more sophisticated as a teaching and learning methodology. The need to equip health professionals with the skills and competencies to improve patient-safety is one of the drivers behind this growth. However, alongside the purchase of the 'Sim'-men/women/babies and linked e-learning, let's not forget the importance of personal interactions through faculty support, i.e. experienced clinical teachers. In addition, simulated patients and the delivery of interprofessional sessions, bring clinical simulation closer to the realms of reality and validity, for both undergraduate and postgraduate health professionals.

The use of simulated patients, relatives and carers is well established in clinical communication education. More recently, additional interesting and innovative approaches to clinical communication teaching are in various stages of substantive core curricula and special study activity across medical schools in the UK.

The IJOCS is now established in the world of clinical skills publications by providing a niche specific arena that welcomes quality research, thereby promoting excellence in healthcare internationally. The wide range of papers covering research, discourse and reflection in clinical education and practice, plus the inclusivity of interprofessional approaches in one publication, raises the validity of this journal. There remains room for research based evidence to support teaching and practice of patient-centred clinical learning. The IJOCS welcomes additions to the literature that encourage critical debate.

Without doubt, the International Journal of Clinical Skills has continued to exceed its original ambitions and I wish it growing success.



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Blood pressure measurement and clinical preparation: BSc nursing students' perspectives

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Abstract

Traditionally blood pressure has been measured manually using a sphygmomanometer and stethoscope, but in recent years electronic or automated blood pressure machines have become popular. However, many question the accuracy and reliability of these machines when used in the clinical setting. This study presents the findings of BSc nursing students perspectives on their preparation to perform the skill of blood pressure measurement both manually (MBP) and electronically (EBP) during their first clinical placement. Results demonstrated that the majority of students felt adequately prepared for practice and the use of simulation in the clinical skills laboratories in preparation for practice was positively perceived. Opportunities to practice both skills in placement sites varied considerably. Findings suggest that in order to prepare students for the real world of clinical practice it is important to teach both manual and electronic blood pressure measurement skills.

Introduction

This paper presents the findings of the second part of a two part study conducted at the University of Limerick. Part one explored nursing students' perceptions of learning the skill of blood pressure measurement in a clinical skills laboratory using an intermediate fidelity simulator [1]. The survey was conducted prior to the students' first clinical placement. On completion of their first clinical placement a second survey (Part 2) was conducted. Part 2 explores student's perceptions of their preparation for performing the skill of blood pressure measurement during their first clinical placement. The study also explores the opportunities for practice that arose whilst on clinical placement and the perceived impact practicing the skill had on confidence and ability whilst on placement.

Background

High blood pressure is recognized as a significant cause of stroke and heart disease, and lowering blood pressure can substantially lower the risk of these conditions including coronary heart disease, cerebrovascular disease and heart failure [2, 3]. In Ireland cardiovascular disease is a leading cause of death [4] with approximately 10,000 people each year dying from the disease, including coronary heart disease, stroke and other circulatory diseases. Approximately 2,500 people in Ireland die from stroke each year with up to 10,000 people suffering stroke annually [4]. Research reports at a recent European Heart Conference highlight that heart disease is the leading cause of death in Europe [5]. Estimates in the United States suggest that about 80 million people have one or more forms of cardiovascular disease and that about 73.6 million, or 1 in 3 people, age 20 years and older have high blood pressure [6].

The accurate and early detection of high blood pressure is important in improving the cardiovascular health of society as a whole. Consequently healthcare professionals including doctors and nurses must be equipped with the knowledge

and skills necessary to accurately measure and record blood pressure. Errors in blood pressure measurement may have significant impact on the investigation and treatment of patients [7]. Armstrong explored nurses' knowledge of error in blood pressure measurement technique and found that the knowledge of participants was inadequate to perform blood pressure measurement in a standardised manner and prevent introduced error. Measuring blood pressure accurately requires a high level of skill and compliance with the recommended steps of the procedure [8].

The Nursing and Midwifery Council (NMC) in the UK through the recent publication of its *"Essential Skills Clusters for Pre-registration Nursing Programmes"* introduced mandatory skills for students [9]. It recognises the importance of students under supervision being able to accurately undertake and record a baseline assessment of a patient, including the skill of blood pressure measurement. An Bord Altranais, the regulatory body for the nursing and midwifery professions in Ireland, provides guidelines to higher education institutes for the development of flexible, innovative, practice-oriented programmes for undergraduate nurse education programmes [10]. The purpose of the programme is to ensure that at the point of registration the student is equipped with the knowledge and skills necessary to practice as a competent and professional nurse. An expected learning outcome is that the student is expected to demonstrate knowledge and competence in clinical practice skills essential for safe practice [10]. It is reasonable to suggest that one such skill essential for safe practice is blood pressure measurement and recording.

There is evidence to suggest that students are experiencing varying opportunities to learn and develop skills in clinical practice [11, 12]. While students in Ireland spend 2,300 hours (or half of their undergraduate programme) in clinical practice, shorter exposure times to clinical practice are also documented [11]. This can pose a challenge in relation to opportunities for practice, yet, it is imperative that students learn the skill of blood pressure measurement and become confident in accurate measurement and recording. Proficiency in this skill is sometimes assumed on completion of that area of the curriculum [7]. Yet studies find that nurses' knowledge and skill of blood pressure measurement may not be standardised [7, 8, 13]. It is particularly important that a standardised approach to teaching the skill to students is adopted and that following initial instruction in the clinical skills laboratory, learning is reinforced and consolidated in clinical practice.

Traditionally blood pressure measurement was undertaken manually using a stethoscope and sphygmomanometer, however, increasingly the use of an electronic or automated device is reported. By using an automated device on a regular basis learners may fail to be confident, or improve in ability, to accurately perform the skill manually. Additionally, experienced clinicians may become deskilled. The reality is that in clinical practice students' learning opportunities vary [14], with some placement sites predominately supporting manual blood pressure measurement, some supporting electronic and some supporting both. It is important therefore that students learn both skills accurately. Students surveyed in this study were taught both skills and the teaching was underpinned by international standards [15, 16]. However, greater time was devoted to teaching the skill of manual blood pressure (MBP) measurement as the technique is more complex and involves greater use of psychomotor skills and attention to auditory and visual aspects.

Some problems associated with electronic blood pressure (EBP) measurement are reported in the literature. Reports from Obrey [17] claim that automated devices can be temperamental and fail to work, or simply may not be available. It was found that 6.5% of day cases were inappropriately diagnosed as hypertensive when their blood pressure was recorded with an automatic device. However, a study by Heinemann et al [18] evaluating the automated versus manual blood pressure machine against international criteria, concluded that one specific automated / electronic dinomap can be used with some degree of confidence to assess systolic blood pressure in a general population of adult hospital inpatients, but with caution when taking diastolic readings. These studies support the argument in favour of teaching the knowledge and skills associated with both manual and electronic blood pressure measurement. In so doing educators are part fulfilling their responsibilities in ensuring that students are equipped with skills essential for safe and effective practice as outlined by the relevant regulatory bodies such as the NMC [19] and An Bord Altranais [20].

Teaching in the clinical skills laboratories using simulation is a flexible, innovative and practice oriented teaching strategy [11] that can enable students to demonstrate a knowledge base and a level of competence in clinical skills including blood pressure measurement. The benefits of teaching students in the clinical skills laboratories have been well documented in the literature and include the linking of theory to practice [21, 22, 23], increased student confidence and ability in preparation for clinical practice [24, 25, 26] and improved patient safety [22, 27].

Theory taught in the classroom provides a knowledge base for students; the knowledge can be reinforced in the clinical skills laboratories and subsequently in the clinical area where further learning and consolidation occurs. However, many authors acknowledge the challenges inherent in the transference of theoretical knowledge into clinical practice [28, 29, 30]. Students interviewed by Morgan [21] identify that the teaching of skills in the clinical skills laboratory helped with the integration of theory to practice during students' first practice placement [21].

Similarly, Freeth and Fry [22] in a mixed method study of nursing students' and tutors' perceptions of learning in a clinical skills centre, found that the clinical skills centre was an environment that supported the linking of theory to practice. Andrew et al [23] examined how prepared students are with particular reference to their first clinical placement and reported that the end of the first placement represented a major benchmark in practice learning. The clinical skills labs are vital for teaching a variety of essential psychomotor skills including blood pressure [21], and teaching using simulation is one technique that may be used to partially address the theory-practice gap as it enables the transfer of skills to the clinical environment [31].

Aims & Methods

The aims of the study were to explore:

1. Student's level of preparation for performing the skill of blood pressure measurement during clinical placement and the perceived contribution simulation makes to preparing students for performing the skill on placement
2. Student's opportunities to practice manual and electronic blood pressure measurement while on clinical placement and the perceived impact practicing the skill while on placement has on confidence and ability

As the study involved examining students' experiences in clinical placement sites, ethical approval was sought and received from the local Health Service Executive Ethics Research Committee. Students were invited to participate in the study via email and received an information sheet covering ethical issues. A fifteen part questionnaire was distributed electronically to sixty first year nursing students who had completed their first clinical placement of four weeks duration and had returned to the university to prepare for exams. Prior to clinical placement two 2 hour practical sessions in the clinical skills laboratories on blood pressure measurement and recording had been delivered to students.

The first part of the questionnaire consisted of three demographics questions and two questions to ascertain if students completing the questionnaire had attended the teachings sessions provided earlier in the semester. This was followed by a number of four and five part Likert scale questions and rating scale questions. Item generation was developed from the literature and the professional experience of the authors.

The sample was a convenience sample of sixty nursing students to whom the researchers had taught the skill. This represents just under fifty percent of the 123 student cohort. All those who received the questionnaire opened it and completed the demographic questions. However, only 20 students went on to complete the questionnaire in full. Why students opted out of the questionnaire at this point is unclear. According to Peterson [32] study participants may refuse to answer a question for two general reasons; they perceive that answering the question will take too much time and effort or secondly the participant may not have a precise memory of their behaviour or the event.

Results

Examination of sample characteristics showed a proportion of approximately 30% male and 70% female participants. 56% of participants were under 23 years of age and 44% were mature students over 23 years of age. Approximately 60% of students were undertaking a Bachelor of Science Nursing (General) programme; 30% were students of a Bachelor of Science Nursing (Mental Health) programme and 10% of participants were undertaking a Bachelor of Science Nursing (Intellectual Disability) programme. Placement sites were relevant to the discipline of nursing of the participants.

Data suggests that the majority of students felt that they had been adequately prepared for performing the skill of manual blood pressure measurement as a result of attending clinical skills lab (CSL) teaching sessions, both in terms of knowledge of the procedure and the skills to perform the procedure. Over 70% of students agreed or strongly agreed that they had adequate knowledge of the procedure and over 65% considered that they had acquired the necessary skills involved. Similarly in relation to electronic blood pressure measurement the majority felt adequately prepared in terms of knowledge of the procedure and the necessary skills required. Results of this section are displayed in Table 1.

Table 1: Preparation for practice (n = 21)

Question	Strongly Disagree (%)	Disagree (%)	Undecided (%)	Agree (%)	Strongly Agree (%)
Q1	0 (0)	4 (19.05)	2 (9.52)	11 (52.38)	4 (19.05)
Q2	0 (0)	6 (28.57)	1 (4.76)	11 (52.38)	3 (14.29)
Q3	0 (0)	2 (9.52)	3 (14.29)	11 (52.38)	5 (23.81)
Q4	0 (0)	4 (19.05)	2 (9.52)	10 (47.62)	5 (23.81)

Q1: Do you consider you had adequate knowledge of the procedure following the CSL sessions to perform MBP measurement whilst on clinical placement?
Q2: Do you consider you had the skills to perform MBP measurement whilst on clinical placement?
Q3: Do you consider you had adequate knowledge of the procedure following the CSL sessions to perform EBP measurement whilst on clinical placement?
Q4: Do you consider you had the skills to perform EBP measurement whilst on clinical placement?

In the earlier study with the same student sample exploring perceptions of learning the skill of blood pressure measurement in a clinical skills laboratory using an intermediate fidelity simulator, findings were very positive [1]. However, when completing the survey, students had no experience of performing the skill in the clinical environment. In this study a question was included that explored students' views on learning in the clinical skills laboratories on completion of their first placement experience. The majority of students considered that learning the skill of blood pressure measurement in the clinical skills laboratories using an intermediate fidelity simulator helped them in performing the skill of blood pressure measurement whilst on clinical placement as can be seen in Table 2. A number of students (n = 5) were undecided as to whether this use of simulation was helpful.

Table 2: Simulation

Did learning BP measurement in the CSL using Nursing Anne® help you to perform the skill of BP measurement whilst on clinical placement?		
	Number of students	Percentage (%)
Strongly Disagree	0	0
Disagree	0	0
Undecided	5	23.81
Agree	10	47.62
Strongly Agree	6	28.57

The opportunities for practice on clinical placement were explored. 50% of the students occasionally practiced MBP and 15% had frequent opportunities for practice during clinical placement, while just 5% (n = 1) practiced very frequently. In relation to EBP results show more frequent opportunities to practice arose in the clinical area as compared to MBP. For example, 55% of students (n = 11) reported frequent or very frequent opportunities to practice EBP. For 30% of students the opportunity to practice MBP did not arise at all during their first clinical placement and for 20% the opportunity to practice EBP did not arise. Results are displayed in Table 3.

Table 3: Opportunity for practice (n = 20)

Frequency	Manual BP (MBP)	Electronic BP (EBP)
	How often did you have an opportunity to practice MBP while on clinical placement? (%)	How often did you have an opportunity to practice EBP while on clinical placement? (%)
Never	30	20
Occasionally (not on every shift)	50	25
Frequently (at least once during most shifts)	15	5
Very frequently (many times during most shifts)	5	50

All but one of the students considered that their confidence in carrying out the skill increased following practice in the clinical environment (Table 4). Over 95% of students reported increased confidence. While results are positive the question does not differentiate between manual and electronic blood pressure measurement. Also given that some students, as reported in Table 3, did not have an opportunity to practice MBP measurement and some did not have an opportunity to practice EBP measurement, the results of this question seem somewhat incongruent with these findings.

Table 4: Confidence in blood pressure measurement (n = 20)

Did your confidence in BP measurement increase following completion of your clinical placement?		
	Number of students	Percentage (%)
Strongly Disagree	0	0
Disagree	0	0
Undecided	1	4.76
Agree	11	52.38
Strongly Agree	9	42.86

Students were also asked to rate their ability to undertake accurate blood pressure measurement before and after clinical placement on a scale of 1 to 10, where 1 represented poor ability and 10 represented excellent ability. The median score of perceived ability before clinical placement was 6.5 while on completion of clinical placement this had risen to 8.5.

Discussion

Error in blood pressure measurement has consequences for patient outcomes and can lead to inaccurate diagnosis and treatment, or failure to treat hypertension. The education of nursing and medical students and the continuing professional education of registered practitioners, in the skill of blood pressure measurement, is important. A standardised approach to teaching the skill may contribute to proficiency in performance of the skill [30]. The clinical skills lab provides a non-threatening safe environment where correct procedures can be reinforced and mistakes corrected [11, 25, 33]. The use of simulation allows the student to practice the skill of blood pressure measurement in a realistic manner, without practicing on patients [1]. It provides an opportunity to learn from mistakes, thereby increasing confidence in preparation for clinical placement. The NMC recognises the important contribution that simulation in the clinical skills laboratories makes to student learning with the introduction of arrangements for using simulated practice learning in support of providing direct care in the practice setting, up to a maximum of 300 hours [34].

Baillie and Curzio [24] report on students and facilitators perceptions of simulation in practice learning and conclude that simulation increases students' ability and confidence in their clinical placements [24]. Similarly, in a quantitative study evaluating student learning in the clinical skills laboratory [25] it is reported that students went to the clinical area better prepared (as reported by mentors) and the safe environment of the labs contributed to building up the confidence of the students (as reported by the students). In a mixed method study focusing on management skills of nurses acquired through simulation, students identified simulation as a realistic way of learning, which enhanced confidence and helped to prepare them for their clinical role [26].

In a large UK study (n = 447) nursing students were surveyed on their experiences of learning blood pressure measurement [14]. 26% percent (n = 114) suggested that more practice time in the skills laboratories was needed, particularly prior to first clinical placement, indicating that students perceive the clinical skills laboratories to be beneficial in preparing them for clinical placement. Similar to findings reported in this study, opportunity to practice in clinical placement varied considerably [14].

Learning in the clinical skills laboratories, does not replace practice based learning, rather it compliments it, and its inclusion as a teaching strategy in an undergraduate curriculum enables students to safely practice skills in preparation for clinical practice. The opportunity to practice while on clinical placement reinforces the newly acquired knowledge and skill and contributes to the consolidation of learning.

Conclusion

The majority of students surveyed felt that they had been adequately prepared in the clinical skills laboratories for performing the skill of blood pressure measurement and recording in clinical practice. The use of simulation was perceived to have contributed to preparation for clinical practice by the majority of participants. Varying opportunities for practice are reported, with infrequent opportunities to practice manual blood pressure measurement and very frequent opportunities to practice electronic blood pressure measurement reported.

Ensuring that patients receive appropriate care and treatment is a primary responsibility of healthcare professionals. Learning the skill of manual blood pressure measurement is therefore vital to the education of healthcare professionals. However, given the proliferation of electronic or automated devices in the clinical areas, it is important that students acquire the knowledge and skills associated with electronic blood pressure measurement also, to enable them to become effective and safe practitioners.

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