# INTERNATIONAL JOURNAL OF CLINICAL SKILLS

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JOCS VOLUME OS ISSUE

## Contents

## Foreword

Welcome to the latest edition of the International Journal of Clinical Skills (IJOCS), Volume 8, Issue 5, Sep 2014.

The arterial pulse is the most easily accessible and widely used marker of disease. Its importance cannot be overemphasised as it is often the first point of assessment of any mode of presentation and a reliable pointer to diagnosis. However, increasingly palpation is being replaced by automated machines providing a rate in beats per minute, which on its own is meaningless. Dr Anwar Chahal and colleagues present a paper which discusses the historical origins of the pulse, how to assess it and make a diagnosis.

In a very informative study, researchers at Plymouth University (UK) explore the impact of classroom based teaching and clinical skills rehearsal on student nurses' perception of confidence, knowledge and competence in measuring radial pulse. It is apparent that the delicate interplay between theory, simulation of clinical skills and practice placement has a crucial role to play in the development of knowledge, confidence and ultimately competence.

'The Unofficial Guide to Passing OSCEs' and 'The Unofficial Guide to Passing OSCEs (Candidate Briefings, Patient Briefings and Mark Schemes)' are two books which provide a wealth of information for students and teachers alike. Mr Waseem Ahmed and Dr Saleem Jeewa present their respective reviews of these two valuable resources. There is no doubt that the Chief Editor of these books, Dr Zeshan Qureshi, has clearly embarked on bringing together crucial knowledge, thereby allowing students to concentrate on the 'learning' rather than the 'finding' of information.

As always, your feedback is invaluable for the continued development of the International Journal of Clinical Skills – the only peer reviewed international journal devoted to clinical skills. E-mail: feedback@ijocs.org

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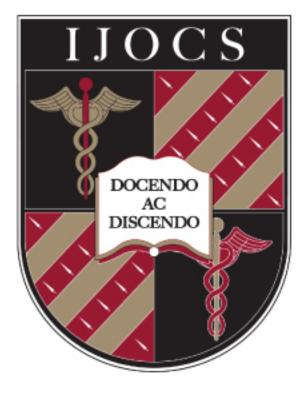
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# Nursing students' knowledge, self-efficacy and skill in measuring radial pulse in the clinical skills simulation environment: a pilot study

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## Keywords

Simulation Knowledge Confidence Nursing students Self-efficacy

#### **Abstract**

#### Aim:

This paper reports the findings of a pilot study exploring the impact of classroom based teaching and clinical skills rehearsal on pre-registration student nurses' confidence, knowledge and competence in measuring radial pulse.

#### Background:

Simulation in the clinical skills laboratory has been common experience for nursing students for many years, yet how it affects students' knowledge, confidence and acquired competence in measuring vital signs, remains undetermined.

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#### Methods:

A mixed methods design was used. Thirty-four nursing students completed questionnaires designed to measure knowledge and confidence at three time points: before theory teaching, after theory teaching and after completing a clinical skills session to measure competence. A sample of these students (n = 9) participated in focus groups, to ascertain their experiences of the different learning methods.

#### Results:

Participants showed a significant change in their knowledge  $x^2$  (d.f. 2) = 17.27, p < 0.01, and confidence  $x^2$  (d.f. 2) = 42.65, p < 0.01, over the progressive testing sessions. Confidence post skills session, was shown to be positively correlated with competence in the OSCE ( $r_s$  = 0.38, p < 0.05) and previous experience ( $r_s$  = 0.36, p < 0.05). Thematic analysis of focus group data identified the importance of reinforcement and rehearsal of skills in practice placement as crucial to learning.

#### **Conclusions:**

Reinforcement and rehearsal of skills within the clinical skills laboratory are invaluable in raising students' perception of confidence. The integration of theory and practice components both in the skills laboratory and during practice placement will improve future learning experiences for all nursing students.

#### Introduction

Establishing effective teaching and learning methods for student nurses in their future role as front-line healthcare professionals, has obvious implications for the global provision of safe and effective health care. The use of simulation within the clinical skills laboratory environment, utilising rehearsal and reinforcement as a teaching method, is not new to the nursing profession. Indeed simulation in the clinical skills laboratory has been common experience for nursing students for many years [1]. Clinical skills simulation activities were surveyed in 72 Higher Education institutions delivering pre-registration nursing and midwifery programmes in the United Kingdom [2]. They found that practising skills on fellow students increased the students' confidence and reduced their anxiety. There is no doubt that simulation in the clinical environment can have a positive impact on healthcare and inform nursing practice worldwide; it also provides a safe learning environment that can raise the confidence of student nurses. However, the effectiveness of this aspect of teaching and learning with specific regard to the interplay between the student's perception

of their levels of confidence, knowledge and competence, remains largely unknown.

### Background

Historically, many nursing students have expressed a lack of confidence at the end of their nurse education programme [3] with students in the Common Foundation Programme reporting that they felt unconfident and incompetent with their clinical skills [4]. Hence, the introduction of the Competency Curriculum and the Essential Skills Clusters in order to tackle this alleged skills deficit [5].

Studies evaluating simulation based upon students perceptions appear to be 'overwhelmingly positive' [6, 7]. Aspects which were deemed to be positive in the Nursing and Midwifery Council review of clinical skills laboratories included: increased levels of confidence, enjoyment and the combination of theory and practice [8].

A survey of second year nursing students, found that simulation offered them an opportunity to practice clinical skills safely, without exposing the client to risks [9]. The results of the study demonstrated that simulation was resource intensive, but found that student confidence increased in the simulation setting as well as the clinical environment. Qualitative findings from this study indicated that although students were initially frightened by 'being watched by peers', they felt there should be more simulation sessions.

Self-efficacy is a judgement of one's abilities to successfully perform a specific task [10] and has become one of the most widely studied variables in education, psychology and organisational sciences [11]. It has been proposed [12] that knowledge and skill alone are not sufficient to accomplish a task and people do not always behave optimally even when they are capable of doing so. This is because self-reflexivity of ability mediates between knowledge and action; therefore self-efficacy is an important factor to consider when investigating behaviour during a clinical task.

The literature contains some studies relating to aspects of vital sign measurement and recording, within the student nurse population. A survey of first year student nurses' experiences [13] of learning blood pressure measurement found that pre-course experience in blood pressure measurement was likely to have an impact on confidence. Another study [14] found that confidence of conducting basic clinical skills may improve through

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simulation. This finding is supported by other research [15] which found that simulation led to an increase in self-efficacy and confidence in assessing vital signs.

As discussed, there are few published studies which have investigated nursing students' self-efficacy, knowledge and skills in certain aspects of clinical care. Given the importance of nursing education and ultimately healthcare provision, the present study sought to investigate self-efficacy and knowledge regarding the measurement and recording of vital signs, namely the patient's radial pulse. It is hoped to obtain unique data into this aspect of nurse education and care delivery and examine the contribution of clinical skills rehearsal to effective measurement of vital signs with undergraduate nursing students.

#### The study

#### **Aims**

The primary aim of this pilot study was to explore the impact of classroom based teaching and clinical skills rehearsal on student nurses' perception of confidence, knowledge and competence in measuring a radial pulse. In addition, a secondary aim was to examine the effectiveness of the research design and data collection methods.

#### Design

A mixed methods design, utilising questionnaires, Objective Structured Clinical Examination (OSCE) performance data and focus groups was used to address the research aims. An embedded design was used, with two types of data (qualitative and quantitative) collected to explore different aspects of the same phenomenon. For this study, qualitative data was embedded in, or used to explain, the quantitative data; however, the embedded design does not integrate (or mix) the qualitative and quantitative data until the discussion phase of the study [16]. Questionnaires captured quantitative data on perceptions of confidence and knowledge at three discrete points:

- 1. Pre theory session
- 2. Post theory session, but pre clinical skills session
- 3. Post clinical skills simulation and OSCE session

Results from the students' participation in the OSCE constituted the performance data and was another

quantitative element of the study. Qualitative data was collected using two focus groups, which were conducted in order to explore the students' experience of the different learning methods.

#### **Participants**

Convenience sampling was utilised on a first year cohort and 34 Adult and Mental Health field nurses volunteered for the quantitative component of the study. These were all first-year students enrolled on a BSc degree at a University in the South of England and were recruited by the researcher prior to a classroom-based theory session taking place. This sampling strategy allowed for suitable participants to be recruited from nursing students who had no experience of clinical nursing placements and were therefore eligible for inclusion. Some students had prior experience of the skill.

A sample of 9 student nurses volunteered from the initial convenience sample for the qualitative component of the study. These students took part in one of two focus groups, designed to illicit the students' experiences of the different learning methods.

The sampling method was evaluated during the study to gauge its effectiveness in gaining an appropriate sample for the purposes of a larger study. The sample size in the pilot study will be used to determine and calculate the appropriate sample size of a proposed larger study.

#### Data collection

Data collection using questionnaires, an OSCE and focus groups, took place between February and July 2010.

#### Questionnaires

Students were taught the theory and skill of assessing a radial pulse as part of a session on vital signs. Data were collected using short structured questionnaires which were administered at three discrete points prior to students commencing their first placement:

- 1. Pre classroom based theory session on vital signs
- Post classroom based theory session on vital signspre rehearsal of vital signs in the simulated clinical environment
- Post rehearsal of vital signs in the simulated clinical environment

The questionnaire contained 10 questions: five multiple choice questions designed to measure knowledge related to the measurement of a radial pulse and five statements against which participants rated their confidence. To measure confidence, a visual scale (0-100) was used. Demographic data items related to age, gender and previous experience were also collected. To measure self-efficacy, the use of a visual scale from 0-100, anchored with low, moderate and high descriptors, to increase the sensitivity of the response scale is recommended [17]. This has the advantage of producing a higher level of measure for statistical analysis. Bandura recommends that the items in the scale must ask what the participant 'can do' rather than 'will do' to clearly judge capability rather than intention. This often involves the use of the term 'confidence' which is a catchword rather than a construct embedded in the theory of self-efficacy [18].

#### Objective Structured Clinical Examination (OSCE)

Data were also collected using an Objective Structured Clinical Examination (OSCE) assessment tool, containing eleven points / procedures that evaluated students' performance. After completing the skills rehearsal session in the simulation environment, the students' clinical competence in recording a radial pulse was assessed using this tool. The pilot study was also used to evaluate the validity and reliability of the OSCE assessment tool in gauging student competence.

#### Focus groups

Two focus groups were conducted 12-16 weeks after the skills rehearsal session had taken place, where study participants had been invited to attend a focus group, to discuss their learning experiences with regard to radial pulse measurement. At the time the focus groups were conducted, the students had been in clinical practice for approximately 16 weeks. Both focus groups were audio recorded, transcribed verbatim, and were attended by a mix of Adult and Mental Health branch nursing students.

#### Ethical considerations

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Full ethical approval was given by the university Human Ethics Committee and was consistent with the principles for Research Involving Human Participants. Students were invited to take part in the study by the authors, prior to a classroom-based theory session taking place. Written informed consent was obtained from all participants, who were also informed of their right to withdraw from the study at any time. Participants were

reassured that their data would be confidential and anonymous and that they themselves would have anonymity in any future publications. All participants were debriefed at the end of the study. These ethical considerations were followed in order to safeguard the rights of the individual and to maintain high principles of integrity [19].

#### Data analysis

Quantitative data analysis was conducted using SPSS version 17. Non-parametric tests (Wilcoxon Signed Rank Test, Friedman's ANOVA and Spearman's Rho) were used. Analysis of variance was used to identify differences between the related groups over time and correlational analysis was used to examine relationships between knowledge, confidence and competence. All statistical tests used the level of significance of  $p \le 0.05$ .

Qualitative data from the two focus groups was transcribed verbatim. Thematic content analysis was then used to analyse the content of the narrative data in order to identify important themes and patterns in relation to the student's experience. Three of the authors used open coding in the analysis of the transcribed text and compared the themes that emerged.

#### Validity and reliability

For the quantitative data collection and analysis, 'content validity' was established by ensuring that within the questionnaire there were enough questions utilised to investigate the topic and that the questionnaire was reviewed by the clinical skills team to ensure the contents were pertinent. Validity was established within the OSCE by discussing the marking criteria with clinical skills lecturers to assess the content and by basing the marking criteria on previously reliable OSCE marking grids based upon evidence based practice. Reliability was established by having two assessors examining the participant and by exposing the participant to identical situations and environments during the OSCE process. This links in with the views of other authors [20].

For the qualitative data collection and analysis, credibility was achieved by building trust and rapport with the participants and also through 'investigator triangulation' as two researchers were involved with the data collection processes (OSCE and the focus groups). Qualitative analysis was also carried out by three of the authors, initially independently and then as a group, until a consensus on themes had been reached. 'Dependability' was attained through 'inquiry audit' as an external mentor

scrutinised the processes. 'Confirmability' was achieved through an 'audit trail' and a 'decision trial' in order to be transparent regarding how the research was conducted.

#### Results

#### Participant demographics

The sample (n = 34) consisted of male and female, first year Adult (n = 22) and Mental Health (n = 12) branch nursing students. The majority of the sample (91%) was female with 55.9% of all study participants being in the 18-29 age range. A further 20.6% were in the 30-39 age range and 23.5% in the 40-49 age range. In total, 55.9% of the sample had no previous experience of working in a health setting. In this study, previous experience was defined as having worked as a Health Care Assistant (HCA) or in any formal capacity where you would be expected to perform the taking and reading of a patient's pulse e.g. Nursing Assistant, First Aider. Pulse experience was defined as having 'been taught or had experience of taking a person's pulse outside of the skills lab'.

#### Quantitative results

In line with the embedded mixed methods approach, the quantitative and qualitative data were analysed separately. For the purposes of the statistical analysis, the score on the OSCE tasks that directly related to the measurement of a radial pulse (questions 5 to 11) was used. This is because the aim of the study is to explore students' competence in specifically measuring a radial pulse.

#### Descriptive statistics

Table 1: Means and standard deviations (SD) of participants' (n = 34) knowledge and confidence scores

|            |   | Mean  | SD    |
|------------|---|-------|-------|
| Knowledge  | 1 | 59.41 | 19.38 |
|            | 2 | 78.82 | 20.86 |
|            | 3 | 75.29 | 23.12 |
| Confidence | 1 | 51.32 | 24.10 |
|            | 2 | 66.66 | 21.81 |
|            | 3 | 85.35 | 15.35 |

#### Effect on students' knowledge and confidence

Statistical analysis on the knowledge and confidence data from the questionnaires was performed using a Friedman's ANOVA. This indicated that both their knowledge  $x^2$  (d.f. 2) = 17.27, p < 0.01, and their confidence  $x^2$  (d.f. 2) = 42.65, p < 0.01, significantly changed over the period of time that the three tests took place.

Further investigation of these differences using a Wilcoxon Signed Rank Test revealed that for nursing students, there was a significant increase in knowledge and confidence over each of the progressive testing sessions, p < 0.01. There was however one exception to this, specifically between the post theory and post clinical skills knowledge scores, where no significant differences were observed, p > 0.05.

#### Relationship between confidence and competence

Analysis using Spearman's correlation coefficient, indicated that there was also a significant correlation between confidence at the post skills session, with competence in the OSCE task ( $r_s = 0.38$ , p < 0.05) and also with previous experience ( $r_s = 0.36$ , p < 0.05).

Further analysis identified significant relationships between the OSCE task score and the post skills confidence ratings of individual statements (and not the overall confidence rating) as follows:

- 1. **Statement a:** 'place the patients arm in the correct position to take a radial pulse'  $r_s = 0.34$ , p < 0.05
- 2. **Statement b:** 'locate the radial pulse by touch'  $r_s = 0.44$ , p < 0.01 (p = 0.01)
- 3. **Statement c:** 'accurately count the number of pulsations per minute of a radial pulse'  $r_s = 0.38$ , p < 0.05

**Statement d** (accurately record the number of pulsations per minute on an observation chart) and **Statement e** (give a full description of my observations of the radial pulse), were both non-significantly related to the radial pulse measurement element of the OSCE task,  $r_s = 0.32$ , p > 0.05 and  $r_s = 0.32$ , p > 0.05 respectively.

#### Relationship between confidence and knowledge

There was also a significant correlation between nurses' knowledge and confidence at the pre-theory test session,

 $r_s = 0.36$ , p < 0.05.

# Relationships between confidence, previous experience and pulse experience

Confidence at the pre-theory test session was, not surprisingly, significantly correlated with any previous experience ( $r_s$  = 0.68, p < 0.001) and also any prior pulse experience ( $r_s$  = 0.62, p < 0.001). However, the effects of any previous experience or prior pulse experience on confidence diminished somewhat, once the theory and clinical skills aspect of students' teaching and learning had commenced. A less statistically significant relationship still exists between confidence at the post skills test session and previous experience,  $r_s$  = 0.36, p < 0.05 and also any prior pulse experience,  $r_s$  = 0.48, p < 0.01.

#### Qualitative findings

Thematic content analysis of the two focus groups identified seven key themes: 'The benefits of the classroom theory session', 'Experiences in the clinical skills laboratory', 'Experiences in Placement', 'Issues with Confidence', 'The influence of previous experience', 'Teaching styles and methods' and 'Being in the pilot study'. These themes are presented below; data excerpts are identified by focus group (1 or 2), type of nurse (adult or mental health) and participant identifying letter e.g. FG1 / MH / F refers to participant F, a mental health student in focus group 1.

#### The benefits of the classroom theory session

The students spoke at length regarding how the theory session on the taking of a radial pulse was beneficial to them, describing it as 'very informative'...'very useful'...'helpful'...and 'really interesting'.

Students had been introduced to the theory behind the skill in this session and so felt able to report back to their mentors more confidently, if irregularities with radial pulse were identified.

FG1 / AN / E: 'I went to my mentor and said "I'm a bit worried about this lady, she's got a very low pulse...it's very erratic" and that was good because I could go to my mentor with a little bit of evidence to help her with this lady...That was good for me because...with the knowledge that I'd learnt here, you know with the theory and in the skills lab...I knew although she didn't look well, I could go with something a little bit more to say about her pulse'.

Students with previous experience in healthcare commented that the theory session 'consolidated' and 'reinforced' what they already knew and what they had read in books.

FG2 / AN / B: 'With myself I think that it just reinforced some of my previous knowledge and I had read books about it as well'

FG1 / MH / F: 'I found that the theory consolidated what I already knew and built on things... like knowing the differences of what I should be looking for on a pulse'

#### Experiences in the clinical skills laboratory

Inexperienced students found it difficult practicing the skill if they had been grouped with other inexperienced students, and felt the session became lengthy as a consequence.

FG1 / MH / A: 'I found that what we did in the lab was great unless you were linked with a partner who was as inexperienced as you'.

As a result, these students felt very unconfident after the session. Having inexperienced students linked to students with some prior experience, would help to solve this issue. Students observed the dichotomy between learning in the clinical placement and the clinical skills laboratory. In the clinical skills laboratory the staff and fellow students were compliant, the environment was quiet and conducive for student learning. Thus students found taking a radial pulse much harder in practice, than during simulation.

Students commented upon the many benefits of practicing the skills in the laboratory. Mistakes could occur in the safe environment of the skills laboratory away from the patient, which ultimately help the student acquire confidence in the skill, in a risk-free environment.

FG1 / MH / A: '...you can practice without being made to look a fool, if you're in front of a real live patient and you're taking their pulse and you lose it and you have to take it again, you go red, they're wondering what the heck's wrong with them and it's awkward... if you can practice that kind of thing more in here, then you can get over that and you can start to feel confident'

Additionally, students mentioned how invaluable it was to simulate the practice of being in close proximity with the 'patient' for a period of time. This helped to alleviate the

awkwardness of being inexperienced and spending time taking a radial pulse in practice. Overall, students would have liked more time to practice the skill in the skills laboratory. After the skills session, students felt the need for further hands-on practice and indeed one student found practising on their family to be rewarding.

#### Experiences in placement

Frequently, students had little or no opportunity to practise taking a pulse when on clinical placement. Students spoke of having no clinical practice and thus having 'horrendous' experiences and feelings of not becoming competent at the skill.

Some students discussed an abundance of experience in practice taking a radial pulse. In some placement settings the student was taking the radial pulse every half an hour or two to three times per day, which increased the student's confidence level.

Students discussed the benefits of having a good mentor in practice placement and how this can enhance their experience of taking a radial pulse in practice.

FG1 / MH / A: 'When I had the Sister... um, she was very knowledgeable, she knew exactly what I needed to know and she actually spoon fed me the information which was great'

Conversely, students spoke of their experiences with poor mentors. In these episodes, students found the experience unhelpful and were occasionally used as an additional 'pair of hands' instead of being supernumerary.

FG1 / MH / A: 'I found on the placement that if you had someone whose knowledge was as sketchy as your own you didn't learn anything'

FG1 / MH / A: '... when you're just shadowing a health care assistant, they don't know why they're doing it anymore than you do'

Students spoke about the perceived dichotomy of what is learnt within the University and observed in practice placement relating to taking a radial pulse.

FG1 / MH / B: 'I think there is a conflict sometimes of knowledge'

One example given was of a student who was advised to electronically measure the radial pulse, with a patient whose pulse was very high and erratic.

Hence, there was an issue with inequality within the students nurse placement regarding supervision by their mentor and experience with the skill.

#### Issues with confidence

Students discussed how practising the skills can have a direct effect upon confidence and how repeating the skill helped to develop their confidence. Despite whether they were unconfident or reasonably confident in the skills lab performing the skill, students gained in confidence when they were doing the skill regularly every day in their practice placement.

FG2 / AN / B: '...I was really lucky because my first placement was at a hospital which is care of the elderly...so every morning I was getting to do the obs so that was a lot of practice for me...it was ideal getting that one as a first placement because now I feel confident'.

However, some students commented that they lost confidence or their confidence was low when they were doing the skill in the practice setting. One student remarked that they felt confident when they had practised the skill in the simulation lab, but had 'nearly forgotten everything that you learnt' by the time they had gone out to placement. Some students commented that they did not feel confident when they had practised in the skills lab.

#### The influence of previous experience

Students spoke of any previous experience which they felt had affected their ability to perform the skill. One student had previously been a fireman and explained how even though he had taken a pulse before in emergency situations, still felt it was a daunting experience to perform the skill in the laboratory.

FG2 / MH / C: '...in a clinical setting yeah it was... it just felt completely different yeah, but like I say you put me outside in a fire kit, no, no problem. In a clinical setting, yeah, I was a bit doubtful...strangely'

Having previous experience in this situation actually made it more difficult to learn the skill.

#### Teaching styles and methods

Although some students felt that teaching in the skill was

sufficient, some made comments on how it could be improved. Students discussed the benefits of using a range of teaching methods relating to the skill as they appreciated that students learnt in different ways. For example, in the theory session the students took off their socks to locate a pulse and found practising with friends to be beneficial and less intimidating.

FG2 / MH / A: '...sometimes it's great seeing all the words and the power-points, but I think using different ways of learning...that is quite useful as well'

As students were concerned about creating anxiety in their patients as a result of poor explanations of the procedure, one aspect of improvement could be teaching the students how to explain to patients exactly what they were planning to do, as part of the taught skill.

#### Being in the pilot study

Students discussed how the pilot study may have been improved, with particular regard to recruitment. This took place with all the students (n = 240) in one big room, prior to the initial theory session. It was felt that recruitment would have increased, had the students been approached in small group settings.

Students commented at length about the OSCE which they experienced as part of the pilot study in order to attempt to gauge 'competency' at measuring a radial pulse. Some students found the OSCE daunting because they had had no experience of taking a pulse in practice. A major issue for students was the difficulty they experienced being observed, making them feel 'scared' which may have affected their performance.

FG1 / MH / C: 'As soon as I'm being observed doing anything it just all goes downhill'

FG2 / AN / B: '...coming out of theory... I'd say about 70% confident. Doing it next door actually, in practice, I was absolutely terrified. I was shaking, I was sweating and I was like "everyone's watching me" and I really don't like that'

Some students made recommendations regarding how the researchers could improve the mini-OSCE in the future studies, including a better explanation of the process and what would be required of the students. This poor explanation was felt to be a contributing factor for perceived poor performance in hand washing, consent and documentation.

100

FG2 / AN / B: 'To be honest with the OSCE I didn't know a 100% what you wanted from me'

Finally, it was felt that the focus group may have been more useful if the session had taken place sooner, when the information was still fresh in the students' minds.

#### Discussion

The pilot study showed an increase in knowledge following simulation of the skill. This is supported by research [21] which found that simulation had a statistically significant effect on knowledge. Historically, the lack of knowledge of student nurses has been commented upon [22] and claimed that students had 'practical skill illiteracy' due to the high amounts of academic theory in previous nursing curricula.

The pilot study showed an increase in confidence over the timeframe of the study. This confirms the findings of previous research. Research [23] suggests that if students participate in simulated experience, their self-confidence increases, whilst a survey [24] found that students believed skills laboratory learning reduced anxiety, increased confidence and enhanced patient safety. Other studies [8, 13, 25, 26, 27] came to similar conclusions. Looking inter-professionally, a study [28] found an increase in confidence in Occupational Therapy students who simulated clinical skills.

A theme of the pilot study was positive experiences in the skills laboratory. This is supported by similar findings [29] that students perceived that they were adequately prepared in the clinical skills laboratories to carry out clinical skills efficiently during their first placement, which helped them to link theory to practice. Additionally, a study [8] reported that students felt scared to make mistakes in practice, but feel able to do this in simulation. This is echoed by other studies [13, 30].

The pilot study highlighted the potential issue of inequality of placement experience, meaning that students have variable experiences practicing clinical skills. This issue has previously been commented upon by the NMC [31] who stated that the competency level of student nurses has been partially credited to the inconsistent environment of practice placements, resulting in different student experiences. Due to this issue, researchers [32] argue that practitioners and educators need to continually enhance the quality of teaching in practice as well as the quality of the placements themselves.

Confidence at the pre-theory test session in the study was significantly correlated with any previous experience, and this is confirmed by previous studies [33] which found that having some experience in medicine made learning basic skills easier and less intimidating. A phenomenological study [34] found that confidence was higher in 1st year nursing students with previous work experience in healthcare. A reason for this may be that they felt more independent and were more confident at trying out nursing skills [35].

The pilot study was only small scale and thus the purpose was not to generalise but to trial the methods and to produce rich descriptions of experiences which add insight and stimulates further thinking.

#### Limitations

This study had several limitations recognised by the researchers, with regard to data collection.

In total, 44.1% of the sample had previous experience of working in a health setting. This suggests that the group may not have been homogenous.

The first focus group that was conducted consisted of six students, five of which were Adult branch students, with only one Mental Health branch student present. This particular focus group lasted for 66 minutes. The second focus group contained three students, and consisted of two Mental Health students and one Adult branch student. This focus group lasted for 22½ minutes. The size and consistency of the focus groups could therefore be criticised, as this could potentially have affected the rigour.

Furthermore, a number of the students (n = 8) chose to reply electronically to the post clinical skills questionnaire, thus potentially challenging the reliability and validity of the findings.

#### Conclusion

It was evident that nursing students in the pilot study benefited from the integration of theory and practice components, within their education. Not only did the clinical skills environment provide students with a safe environment in which to practice measurement of vital skills, thereby increasing their confidence, it also provided an improved learning experience. Students in the pilot study also felt that the opportunity of reinforcement and

rehearsal of skills in practice placement is crucial to the learning experience, but that a greater equality in exposure to skills in practice placement is required.

It is apparent that the delicate interplay between theory, simulation of clinical skills and practice placement has a crucial role to play in the development of knowledge, building of confidence and ultimately competence of student nurses in the measurement of vital signs within the healthcare environment. A greater focus on these factors in future nurse education programmes, would ensure that nurses have the opportunity to develop their knowledge, confidence and skills within supportive learning environments, in readiness for the role as frontline healthcare providers.

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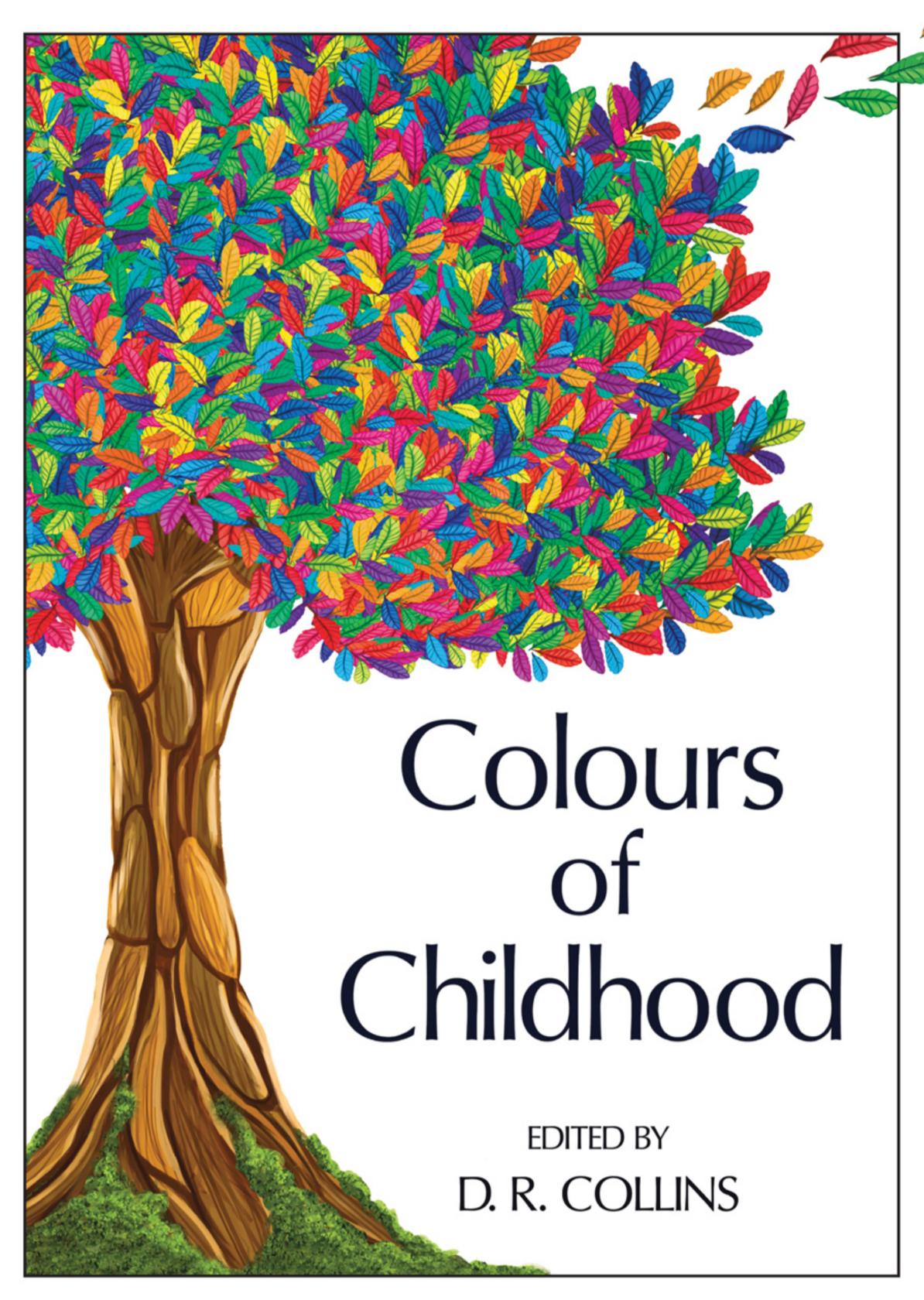
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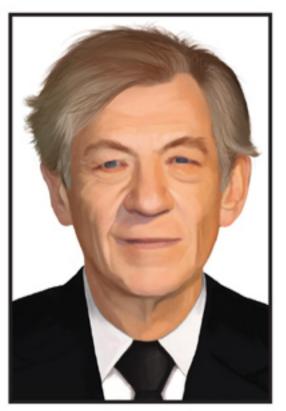


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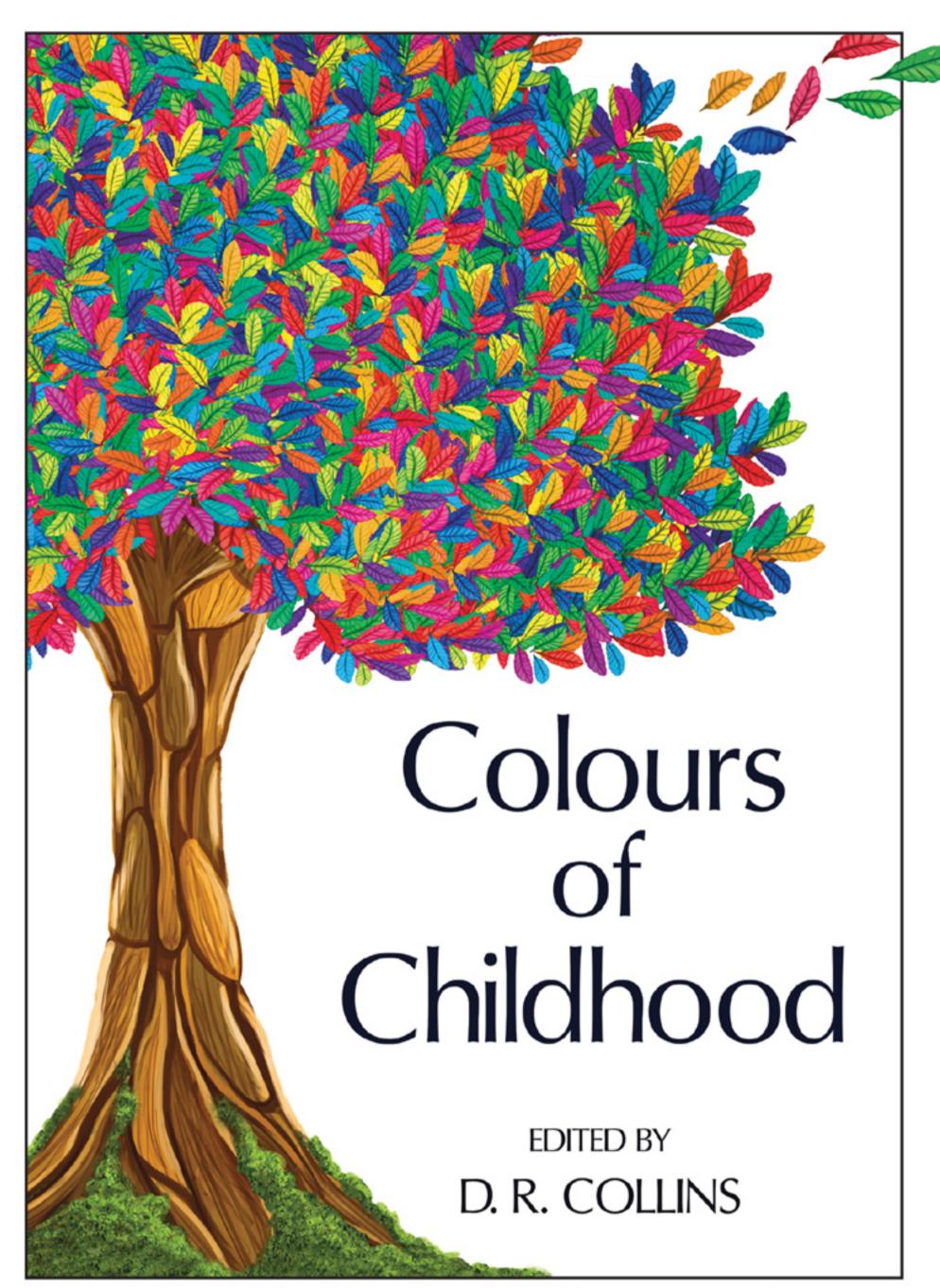
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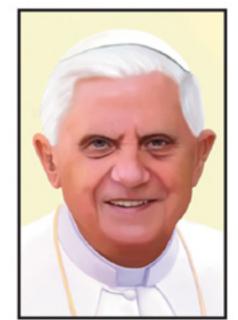
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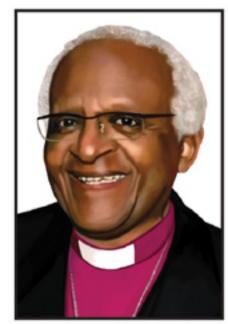
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