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**Mental health and learning disability nursing students' perceptions of the usefulness of OSCE to assess their competence in medicine administration**

**ABSTRACT:** The aim of this study was to evaluate mental health and learning disability nursing students' perceptions of the usefulness of the Observed Structured Clinical Examination (OSCE) in assessing their administration of medicines competence. Learning Disability (n=24) and Mental Health (n=46) students from a single cohort were invited to evaluate their experience of the OSCE. A 10-item survey questionnaire was used, comprising open- and closed-response questions. 12 (50%) learning disability and 32 (69.6%) mental nursing students participated. The OSCE was rated highly compared to other theoretical assessments; it was also reported as clinically real and as a motivational learning strategy. However, it did not rate as well as clinical practice. Content analysis of written responses identified four themes: Benefits of OSCE; Suggestions to improve OSCE; Concern about lack of clinical reality of OSCE; and OSCE induced stress. The themes, although repeating some of the positive statistical findings, showed participants were critical of the university setting as a place to conduct clinical assessment, highlighted OSCE related stress, and questioned the validity of OSCE as a real-world assessment. The OSCE has an important role in the development of student nurses' administration of medicines skills. However, it may hinder their performance as a result of the stress of being assessed in a simulated environment.

**KEY WORDS:** *competence, content analysis, medicines administration, nursing students, OSCE.*

## INTRODUCTION

Medicine administration errors are preventable and have a negative impact on patient outcomes and experience, and create an economic burden to health services worldwide (Mutstata 2011; Nichols *et al.* 2008). In the United Kingdom (UK), for example, the National Patient Safety Agency (NPSA 2007) estimates that preventable harm from medicines costs in excess of £750 million each year in England alone. The *Safety in Doses: medication safety in the NHS* report states that medicines administration has a 5% error rate (Department of Health (DH), 2004), and in the mental health context it can harm 1-2% of admitted patients (Maidment *et al.* 2006). Some authors claim medicines-related activities are perhaps the highest risk management activity that most nurses undertake (Duxbury *et al.* 2010). Dealing with medication is a core nursing activity, with some estimates that 40% of nurses' in-patient time is spent on medicines management-related activities (Armitage & Knapman 2003). Therefore, this core activity highlights the need for nurses to be competent in such interventions (Sulosaari *et al.* 2012).

Deficits in mental health and learning disability nurses' medicine administration competence may culminate in administration errors. It is noteworthy that pre-registration nursing curricula in the UK and Ireland have a field focus (adult, child, learning disability and mental health nursing). This contrasts with comprehensive curricula operating in countries, such as Australia, New Zealand, Canada and the USA, where specialization takes place in the chosen field after qualification. Nevertheless, deficits in preparing nursing students to administer medicines in the UK has relevance for pre-registration curricula in other countries and contexts. One potential reason for the gap between clinical practice and required standards could be that nurses have a poor pharmacology knowledge base. Without the requisite knowledge, nurses may undertake medicines management activities without the ability to understand the potential effects and side effects of the substances they administer (Hemingway *et al.* 2011; Jenkins 2000; Ndosu & Newell, 2009). Substandard delivery of applied pharmacology knowledge and drug calculation skills in undergraduate nursing programmes could be one explanation for this

gap (Dilles *et al.* 2011; Sulosaari *et al.* 2012). Another explanation is over-reliance on continuous assessment of medicines management competencies of student nurses by busy, under pressure clinical mentors across all nursing specialties (Bradshaw & Merriman 2008; Hunt 2011). It is unsurprising, therefore, that studies examining UK registered nurses administering medication have identified a failure to apply biological and pharmacological theory to learning disability (Dickens *et al.* 2006), medical-surgical (Nods & Newell 2009) and mental health settings (Turner *et al.* 2007); however, due to the small sample size of these studies their findings need to be treated with caution. It is also important to note that there are other explanations for nurses' shortcomings in administering medication such as environmental distractions and inadequate medication documentation (Hemingway *et al.* 2011; Armitage & Knapman 2003). Moreover, it can be surmised that nursing students need adequate preparation for the role of administering medication.

In the UK, a four-step pathway to gaining competence in medicine management was developed by a university and a mental health trust for mental health and learning disability nursing students (Hemingway *et al.* 2010) (Figure 1). In Step 1, students are given a thorough grounding in psychopharmacology. In Step 2, their administration of medicine competence is assessed in a simulated assessment using an Observed Structured Clinical Examination (OSCE), in the university's nursing skills laboratories, while their oral and intramuscular administration competence is assessed in clinical practice. If the now registered nurse is to proceed to build competence and confidence in all aspects of medicine management then an appropriate postgraduate course that furthers knowledge and expertise is the next step (Stage 3). Finally, if the mental health nurse is to make the transition to prescribing medicines (Stage 4), then the suggested stepped approach in Figure 1 can support development along a career-defined pathway.

The OSCE was first introduced in an attempt to bring an objective strategy to the assessment of undergraduate medical students' clinical skills performance (Harden 1975) and was then adapted successfully for the assessment of nursing students (Rushforth

2006). It has been claimed to be the 'Gold Standard' of clinical assessment (Bartflay *et al.* 2004; Wass *et al.* 2001), and can be used to simulate real-world clinical interventions and assess students safely in a controlled environment (Major 2007; Meecham *et al.* 2011; Selim *et al.* 2012; Watson *et al.* 2002). The OSCE has also been recognized as a major contributor to the improvement of clinical skill performance of graduate (Rushforth 2006; Mitchell *et al.* 2008) and undergraduate student nurses (Meecham *et al.* 2011; Godson *et al.* 2007;). It can be used formatively, when linked to preparation for clinical placements (Anderson & Stickley 2002; Godson *et al.* 2007), or summatively, as a stand-alone assessment of undergraduate or postgraduate nursing programmes (Selim *et al.* 2012; Walsh *et al.* 2011). Simulation stations are utilised to assess students' practical skills and knowledge. Compared to the potential bias of assessment of actual clinical practice, the OSCE has demonstrated reliability and validity (McNaughton *et al.* 2008; Selim *et al.* 2012; Walsh *et al.* 2011), motivates students to learn (Godson *et al.* 2007; Rushforth 2006), and gives prominence to acquiring mastery of practical skills as a major contributor to becoming a competent nurse (Mitchell *et al.* 2008; Watson *et al.* 2002). Criticisms of the OSCE include it being resource-intensive to operate (McNaughton *et al.* 2008; Walsh *et al.* 2011), the examination stress it produces may negate students' performance compared to observation in practice (Furlong *et al.* 2005; Rushforth 2006), and that it does not truly reflect clinical reality (Mitchell *et al.* 2008).

Recent studies have shown how use of the OSCE can improve medical-surgical nursing students' drug administration and applied pharmacology abilities (Meechan *et al.* 2011). Simulated skills sessions have also been identified as important to teach drug administration skills in preparation for clinical placements (Godson *et al.* 2007). Additionally, computer- and practice-based assessment approaches have been compared in the assessment of nursing students' numeracy skills for medication dosage and calculations at the point of registration (Coben *et al.* 2010).

When used specifically for mental health nursing, the OSCE has been shown to have validity and reliability in the assessment of students' competency, with objectivity being the

major stated benefit (Selim *et al.* 2012). It has been used in a variety of skills-based assessments, including interpersonal (Anderson & Stickley 2002), physical health (Jones *et al.* 2010), assessing skills when working with patients who misuse drugs (Baez *et al.* 2004), and assessing advanced practice psychiatric nursing skills in interviewing, assessing and diagnosing service users with mental health problems (Robbins *et al.* 2008). For learning disability nursing students, OSCE studies are limited to studies that include students from all fields of nursing; for example, their experiences of learning blood pressure measurement (Baillie & Curzo 2009).

Overall, no evaluation of learning disability and mental health nursing students' administration of medicine competency, using an OSCE, has been published. Therefore, ascertaining students' perceptions of the usefulness of OSCE in this situation could enhance nursing knowledge by contributing to the development of a more rigorous and reliable form of assessment of competence in the administration of medicines in pre-registration nursing and learning disability students.

### **Aim**

The overall purpose of the study was to evaluate mental health and learning disability nursing students' perceptions of the usefulness of OSCE, as a form of simulated learning, to assess their competence in administration of psychotropic medicines. Specific aims were to:

- (i) Understand the contribution of OSCEs in the preparation of the students in medicines management.
- (ii) Compare OSCE with other activities the students have experienced to help them develop their medication management role.
- (iii) Ascertain the students' rating of OSCE as a credible method of clinical assessment.

**\*\*Insert Figure 1 about here\*\***

## **MATERIALS AND METHODS**

### **Settings and participants**

All third-year mental health (n=46) and learning disability (n=24) nursing students in the University of Huddersfield, UK, were emailed a Participant Information Letter and invited to

participate in the study. Data collection took place during the students' final day in the University, prior to the completion of their course. They had completed all course-related assessments and were aware of the results. In order to minimise the likelihood of research-related stress occurring around the time they completed the actual OSCE, the final day of their course was chosen for data collection in the study. Because students were recruited from the school in which some of the researchers were employed, importance was placed on voluntary participation and anonymity, consistent with the approach stipulated by Clark & McCann (2005). While the researcher was absent from the classroom, students were asked to place the questionnaire (completed or uncompleted) in a box which, which was then sealed. Consent was assumed if students completed the questionnaire.

### **Procedure**

Clinicians, who were active clinical mentors for students, collaborated with university academics to write OSCE scenarios. An answer guide was also developed, and before the OSCE took place all assessors (academics and clinicians) received a briefing to increase inter-rater reliability.

OSCE consisted of two assessment stations, which each student completed in the following order: (i) A written case scenario, which included reference to commonly prescribed medications (psychotropic and physical health) for an adult or older age patient. The student had 20 minutes to answer 6 questions related to the case scenario, and the answers to the questions could be located in the British National Formulary (2012). (ii) In the clinical skills laboratory, the student administered medication to a simulated patient as a follow-up to the written case scenario.

### **Data collection**

Students completed a 10-item self-administered questionnaire, comprising a mixture of open- and closed-response questions. Six items focused on their beliefs about the usefulness of the OSCE in assessing medicine administration competence, with a space provided for written responses to each question. Respondents were asked to give a rank out of 10 (for example, on the value of different educational strategies, and how they rated the OSCE



compared to other assessments), ranging from least (1) to most (10) effective. Four items sought socio-demographic information.

The questionnaire was developed from a review of literature, about the value of OSCE in pre-registration nursing courses, and contributions from experienced nurse academics and registered nurses. It was then piloted within the mental health and learning disability nursing division at the University to determine the validity of its content. In order to increase its discriminant validity, advice was sought from a statistician (JS) to assess the questionnaire scoring format.

### **Data analysis**

Quantitative data were analysed using SPSS (Version 18.0). Socio-demographic characteristics of participants were summarised using descriptive statistics, means and standard deviations (SD). The effectiveness of pharmacology education strategies was assessed using general linear models to determine significant differences between mean scores of individual strategies, and to identify socio-demographic factors that may significantly affect overall strategy mean scores. Cluster analysis techniques were used to determine effective groupings of these strategies. Descriptive and inferential analyses were also undertaken to determine associations between responses to questions relating to the clinical relevance and motivational value of OSCEs, and with confidence levels in the competent and safe administration of medication.

Written responses to the open-ended parts of questions were transcribed verbatim, and a content analysis of the data was undertaken. According to Newell and Burnard (2007), two approaches can be used in content analysis: (i) examine answers to pre-set questions deductively, or (ii) allow themes to be developed inductively from the data. Deductive content analysis was used in the present study because the analysis was structured on the basis of prior literature about the reliability and validity of OSCE (Elo & Kygnas 2007), and because the written responses were more focused and concise than could be obtained from conventional semi-structured, audio-recorded interviews.

## RESULTS

### Socio-demographic characteristics of participants

Thirty-two mental health and 12 learning disability nursing students consented to participate, equivalent to a response rate of 69.6% and 50% respectively. Mental health students comprised 72.3% of respondents, while learning disability students comprised 27.3% of participants. Of the total sample, 24 (71%) were female and 10 (29%) were male representing the approximate equivalent to the gender distribution on the course. Respondents were approximately equally split between those aged 18-25 years (n=16, 36.4%), those aged 26-35 years (n=13, 29.5%), and those aged 36-45 years (n=15, 34.1%). The median length of time respondents had worked previously in mental health care, as healthcare assistants, was 7-10 years (range 3 to 15 years).

### Statistical analysis

A regression analysis was undertaken to identify socio-demographic factors affecting the overall mean score of the effectiveness of educational strategies for enhancing medication administration skills. Controlling for other demographic factors, only gender was found to significantly influence the mean score ( $p=0.035$ ), with males showing a slightly less favourable view of strategies to assess medication administration competence in general than females (mean female rating 8.34; mean male rating 7.38). Female scores were also less variable than male scores. No significant differences in OSCE rating between males and females were found ( $p=0.862$ ), although males scored OSCE slightly lower than females (mean female rating 8.41; mean male rating 8.25). The mean marks and Standard Deviations (SDs) awarded to each strategy, for males and females separately and for all respondents, are given in Table 1.

**\*\*Insert Table 1 about here\*\***

A cluster analysis (Figure 2) was carried out to assess similarity of opinions about these teaching methods, and two clusters were identified. OSCE, study days and oral/intramuscular assessments scored highest to form a first cluster. Lectures and

pharmacology workbook and, to a lesser extent, UK Nursing and Midwifery Council competencies, were rated as less effective and formed a second cluster. Medicines administration was not clustered with other methods.

**\*\*Insert Figure 2 about here\*\***

A further question asked respondents to assess the effectiveness of various strategies in contributing towards safe medicines practice. The findings showed that clinically-based mentor assessment was ranked highest by students. Mean (SD) scores (out of 10) are given in Table 2.

**\*\*Insert Table 2 about here\*\***

A second regression analysis was undertaken to identify socio-demographic factors significantly affecting overall mean score. In this model, no predictors were found to be statistically associated with the outcome measure. A cluster analysis (Figure 3) indicated observation and self-taught assessment strategies formed a single cluster, with no other obvious groupings.

**Insert Figure 3 about here\*\***

Further questions elicited students' opinion about whether OSCE clinical scenarios were as real-life as possible, and to ascertain if there was agreement with the statement that OSCE motivated and facilitated student learning. As the responses to both these questions was positive, a cross-tabulation of these responses revealed a strong association between perceptions of OSCE as a clinically real tool and perceptions of OSCE as a tool that motivates student learning (Table 3).

**\*\*Insert Table 3 about here\*\***

Combining *Partially Agree* and *Disagree* categories, both of which included very low frequencies, McNemar's test provided no evidence to reject the hypothesis that, as an assessment, the OSCE was clinically real was consistent with an assessment that the OSCE

motivates student learning ( $Z=0.447$ ;  $p=0.655$ ). The level of agreement between the two facets of the OSCE appears good.

The final closed question was concerned with students' confidence levels in safe administration of medication. Of 43 responses, 29 reported themselves as "very confident" (67.4%), and 14 as "confident" (32.6%), while no respondents reported themselves as having "no confidence" in administering medication.

### **Qualitative Results**

From the content analysis, statements were analysed and then abstracted into four categories: *Benefits of OSCE*; *Suggestions to improve OSCE*; Concern about lack of clinical reality of OSCE; and *OSCE induced stress*.

#### **Benefits of OSCE**

The involvement of clinical staff, who acted as assessors, was reported favourably as it made the assessment more relevant to their field discipline: *"Particularly enjoyed OSCEs; good feedback from qualified staff, and appropriate to employment"*.

Students also stated OSCE facilitated their skills and knowledge acquisition: *"OSCEs are very useful on learning about the safe administration of medicine in the clinical area. They help student nurses to learn practice effectively"*.

OSCE had a motivating effect on student learning: *"Makes you study in more depth"*.

There was also comment that OSCE experience was used as a foundation to improve students' performance in medication administration: *"I ensured that feedback was adhered to and highlighted areas for improvement"*.

The fact that OSCE provided variety in assessment was also highlighted favourably: *"It is important to be assessed in a different way"*.

Finally, even though OSCE appeared to be stressful it helped improved students' confidence in medication administration: *"This really helped my confidence, but at the time [I was being assessed using the OSCE] I was nervous"*.

#### **Suggestions to improve OSCE**

Student respondents highlighted issues they felt would improve the usefulness of OSCE. A university setting was questioned as the ideal place to conduct clinical assessment, and a suggestion was made about conducting the assessment in clinical settings: *“Would like to see OSCEs undertaken on the ward by a qualified nurse who is unknown to you i.e. from another ward”*.

There was also comment about a preference to undertake a trial OSCE prior to the actual formal assessment using the approach: *“Would have preferred to have a practice before the official one”*.

*“I would have preferred to have practice before OSCE”*.

Another student claimed there was more value in using the OSCE as a formative rather than a summative mode of assessment: *“I think the OSCE exam is really good experience and helped boost my confidence; however, I preferred the mock OSCE and feedback before the exam as it helped me prepare for my exam better”*.

### **Concern about lack of clinical reality of OSCE**

Reliability and validity has been highlighted as a major benefit of using OSCE. One way of evaluating the external validity of the approach is to assess its transferability to practice settings. Comments indicated concern about the lack of clinical reality of OSCE and the fact that it may be better suited to being used in actual clinical settings: *“OSCEs are designed to be real; however, they always have a fake feeling. I found it easier to be assessed on placement”*.

*“OSCEs are as clinically real as possible within a university setting. However, OSCEs may be more successful within a clinical setting, i.e. placement”*.

### **OSCE induced stress**

This category emerged inductively without any prompt from a direct question. When comparing the level of stress experienced in being assessed in a simulated environment to assessment conducted in the clinical setting, students commented that OSCE was more stressful: *“I found it to be easier to be assessed in practice, as under exam conditions it was difficult”*.

“These are a good learning experiences; however, they are not real so are very nerve racking”;

Compared to administering medication in the clinical setting, where each student had one mentor assessing his/her performance, OSCE required at least two assessors: one for assessment purposes, and one to ensure the examination conditions were maintained. A participant commented that the presence of an additional person contributed to her stress: *“Too much pressure. [I] Think only one person should be in the room at one time”*.

A final comment was made about the time constraints on students of the OSCE format and the adverse effect of this on their assessment performance: *“Unrealistic timescale for [the OSCE] written exam. In [clinical] practice, I have always been told to take my time and double check everything to ensure no mistakes are made. Made an error on written part of OSCE due to time running out and misreading the question”*.

Even though there was acknowledgement of stress associated with undertaking OSCE, there was also recognition that it was a clinically realistic and beneficial form of assessment: *“Yes, OSCEs are real as possible; even though they are nerve-racking they are beneficial”*.

## **DISCUSSION**

This article reports the findings of an evaluation of mental health and learning disability nursing students' perception of the usefulness of OSCE, an approach to simulated learning, in assessing their knowledge of and ability to administer medicines. Overall, the quantitative findings of the study indicated that while students rated OSCE highly, this was less so than supervised, and observation of, medication administration on clinical placement. In general, socio-demographic factors had limited effect on students' rating of educational strategies. A cluster analysis showed that educational strategies formed two distinct groups; a “practical” group (OSCE, study days and assessment of administration practice) and a “theoretical” group (lectures and pharmacology workbook and UK Nursing and Midwifery Council competencies). There was also evidence of an association between assessments of OSCE and confidence levels in the competent and safe administration of medication. Content analysis of written responses indicated that OSCE was valued by students, provided an

alternative form of assessment, and motivated them to learn in preparation for undertaking this novel form of assessment. However, the findings also highlighted various perceived shortcomings in OSCE.

The findings of the present study mirror other research findings; that OSCE motivates students to learn (Godson *et al.* 2007; Rushforth 2006), and is valued as a practically based learning and assessment strategy to assist them to develop their clinical skills (Mitchell *et al.* 2008; Watson *et al.* 2002). In the present study, the findings show OSCE is rated highly by students, in comparison to other teaching and learning strategies for medicines management, and these findings are similar to findings reported elsewhere (Hemingway *et al.* 2012a; Walsh *et al.* 2011). If mental health and learning disability student nurses are to receive appropriate preparation to administer medicines then, seemingly, OSCE can provide a rigorous alternative to other more theoretically based assessments such as examinations or written assignments (Hemingway *et al.* 2012b). If we accept the mantra that assessment can help motivate learning, then by making this assessment mode as near as possible to reality helps students learn and assimilate the skills and knowledge needed for clinical practice (Epstein 2007; Val Wass *et al.* 2001). Similarly, if OSCE reflects approximately what happens in practice, and enables students to assimilate knowledge and develop skills in order to pass the assessment, it can make a significant contribution to the acquisition of their competence in medicines administration (Hemingway *et al.* 2010, Meecham *et al.* 2011). The findings of the current study show OSCE used with mental health and learning disability nursing students is rated as highly as that evaluating its use in other nursing specialisms (Godson *et al.* 2007; Meecham *et al.* 2011).

OSCE related examination stress reported in the current study indicated it could negate students' performance while being assessed in comparison to assessment by observation in clinical practice. This finding is also consistent with the reports of other studies (Rushforth, 2006; Watson *et al.* 2002). All types of assessment cause varying levels of stress; however, in the present study OSCE was perceived as more stressful than assessment in clinical practice, and may have an adverse effect on student performance.

This stress has been highlighted elsewhere but has not found to be more stressful than other forms of assessment (Brand & Schoonheim-Klein 2009; Furlong *et al.* 2005). Ways of helping to minimise OSCE-related stress include ensuring students receive thorough preparation in the operation of the assessment, and giving them an opportunity to undertake an initial trial OSCE and to receive feedback from assessors.

Findings from the content analysis of written responses indicated OSCE was criticised for not truly reflecting clinical reality, a shortcoming also reported by Mitchell *et al.* (2009). Even though OSCE was rated highly by students, its limited ability to reflect clinical reality, in turn, negated its external validity as a form of assessment. This perceived shortcoming might be attributable, in part; to the limited preparation some student participants claimed they received to undertake this assessment. If students value the knowledge and skills they acquire in order to successfully pass assessments and see its transferability to practice, this can increase their overall satisfaction and motivation to learn (Kurz *et al.* 2009). Therefore, adequate preparation is critical to making OSCE a valid form of assessment (Mitchell *et al.* 2009; Rushworth 2006). It is also important to ensure the OSCE is as real-life as possible. Ways of doing this include ensuring experienced clinicians and service user representatives are involved in the development of case studies; scenarios are updated regularly to ensure the content is realistic and up-to-date; and service user representatives and/or professional actors, who have been well briefed, take part in the simulated patient sessions (Meecham *et al.* 2011; Mitchell *et al.* 2009).

### **Limitations**

There are several limitations to this exploratory study. First, as some of the authors were OSCE assessors, this may have introduced a positive bias in students' responses. Second, a small proportion of respondents answered the open-ended questions, thus limiting the insight to be gained from these responses. A future study would place greater emphasis on students providing written comment about the OSCE. A final limitation is the study included students from one university's direct entry, pre-registration mental health and learning disability nursing program, in the UK. A future study could consider including similar cohorts of



students from other UK universities and from countries operating comprehensive pre-registration nursing curricula.

## **CONCLUSION**

The findings of our exploratory study make an important contribution to nursing knowledge about the usefulness of OSCE, as a form of simulated learning, in assessing mental health and learning disability students' competence in medication administration in pre-registration nursing programs. The findings show that it has a beneficial role in developing their knowledge and skill acquisition and confidence in administration of medicines in mental health and learning disability nursing settings. The findings also show that OSCE is valued by students and can motivate them to learn appropriate knowledge and skills for clinical practice; however, it may hinder their performance as a consequence of the stress of being assessed in a simulated environment. Furthermore, as a result of a perceived lack of 'real world' context, OSCE may be more suited as an approach to preparing students for clinical practice, rather than a formative assessment of clinical competence in the administration of medicines. From a research perspective, an intervention study is warranted, with an intervention and control group, to evaluate the usefulness of OSCE in assessing and enhancing mental health and learning disability nursing students' competence in administration of medicines.

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