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Abstract

Aim: The aim of this study was to explore how student Operating Department Practitioners prepared for an Objective Structured Clinical Examination (OSCE).

Methods: A mixed methods design was used; questionnaires were used to gather data from a group of student Operating Department Practitioners on their OSCE experience.

Results: The study found coping with anxiety and the level of information students receive are important issues in preparing for OSCEs.

Discussion: Whilst preparation with the manikin is important, it may not be enough to fully prepare students for an OSCE. Students also need to be given sufficient information so they fully understand the competencies they will be assessed against, and receive support to cope with anxiety during the OSCE.

Conclusion: Further research is needed to identify mechanisms for coping with anxiety and stress in OSCEs.

Introduction

This article will discuss a small-scale study into how a group of student Operating Department Practitioners (ODPs) prepared for OSCE assessment using a simulation technique. In his report on the state of public health in 2008, Liam Donaldson, then Chief Medical Officer stated that simulation was an important route to safer patient care (Donaldson 2009). This is because simulation allows healthcare professionals and students to acquire clinical skills in safe controlled environments (CODP 2011, DH 2011). Today, simulation is widely used in the teaching and assessment of clinical skills within pre-registration healthcare education, with OSCEs frequently

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used to test students' practical skills; for example, the assessment of their ability to take patients' vital signs (Liddle 2014).

Literature Review

A review of the literature on OSCE found that this method of assessment was first used in the 1970s in the assessment of medical students' clinical skills, and consisted of a number of stations at which students were assessed while performing a range of tasks (Harden & Gleeson 1979). Harden, (1988 pg 19) defined OSCE as 'an approach to the assessment of clinical competence in which the components of competence are assessed in a well-planned or structured way with attention being paid to the objectivity of the examination'. One of the reasons for introducing OSCE into the assessment of medical students was that it was considered to be more reliable and valid than other more traditional forms of clinical assessment, with the larger number of short (five minutes) stations being key to this (Harden and Gleeson 1979). OSCEs are now increasingly being used in the assessment of students in nursing and the allied health professions to assess a broad range of skills (Harden, Lilley & Patricio 2015). However, as the use of OSCE has expanded to other healthcare professions so the nature of the assessment has changed, with nursing OSCEs now consisting of fewer stations but with more time per station. This has led to questions as to the reliability and validity of modern OSCEs (Aronowitz et.al. 2017). These concerns have led to numerous studies into this issue, and a systematic review of nineteen such studies concluded that OSCEs are a reliable and valid method of assessing students' abilities (Navas-Ferrer et.al. 2017).

The OSCE assessment strategy is based upon Bloom's Taxonomy of Learning Domains that consists of the cognitive domain (knowledge/thinking), the affective domain (attitudes/feeling) and the psychomotor domain (skills/doing). In an OSCE

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students must demonstrate their competence when performing a skill, show their knowledge in relation to the skill being assessed and demonstrate the appropriate attitudes and professional approach (Cabellero 2012). This is a view supported by Rooney et al (2015) who consider simulation based learning to be widely regarded as a multifaceted, learner centred, and experiential approach integrating the cognitive, affective and psychomotor domains.

Literature on the use of simulation in the teaching of clinical skills coupled with OSCE has tended to focus the impact of simulation on students' confidence and competence. This research has repeatedly demonstrated that using simulation can improve students' competence and confidence in performing clinical skills (Hope et al 2011, Ricketts 2011, Meechan et al 2011, McClimens et al 2012, Oitake et al 2013, Dickinson et al 2016, Lucas 2014, Cumming & Connelly 2016, Lubbers & Rossman 2017, Zieber & Sedgewick 2018).

One area where the literature review revealed there has been a lack of research, is into how students prepare for OSCE. What literature there is highlights that adequate preparation for OSCE assessment is essential, and that students will struggle if they are not prepared or have unrealistic expectations of the assessment process (Bloomfield et al 2010). Structured preparation is also seen as a key coping strategy for dealing with anxiety. Students have identified OSCEs as a stress and anxiety provoking form of assessment, with some attributing this to not being sufficiently prepared for the assessment (Brosnan et al 2006, Marshall & Jones 2003, Fidment 2012, Johnston et al 2017, Brighton et al 2017).

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Following on from this, the aim of this study was to explore how students prepared for OSCE and which preparation strategies led to improvements in students' confidence and competence in the performance of clinical skills. The purpose of this was to inform preparation for OSCE in the future.

Methodology

The overarching framework for this study was realist evaluation with a mixed methods research methodology, employing a questionnaire to collect quantitative and qualitative data. Realist evaluation is a form of theory driven inquiry, but with its basis in scientific realism. The principles of realist evaluation set it apart from other theory driven approaches, with the aim being not to seek answers to yes or no questions, but rather to determine what works, for whom, and in what circumstances. To accomplish this, it is necessary to identify and examine the mechanisms (M) associated with the programme, consider the conditions or contexts (C) under which those mechanisms operate, and discover the pattern of outcomes (O) that result from them (Pawson and Tilley 1997).

This is usually referred to as the CMO configuration, where $C+M=O$. Realist evaluation was developed as an approach to explore underlying causal processes in social programmes and how those programmes achieved their outcomes (Pawson & Tilly 1997). This approach was chosen for this study because it considers that discoverable mechanisms are responsible for phenomena, and it suggests that better knowledge of these mechanisms can give greater control to practitioners, whether teachers or learners (Johnson et al 2009). This study focused upon a module in which simulation was used to teach clinical skills (context) to discover

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which preparation strategies for OSCE (mechanism) resulted in improvements in confidence and competence (outcome).

A pragmatic mixed methods approach is normally advocated for realist evaluation, with quantitative data focusing on context and outcomes and qualitative data focusing on the generative mechanisms (Pawson & Tilley 1997). Within this study quantitative questions were used to assess outcomes, in terms of students' perceptions of their competence and confidence, with qualitative questions used to explore the mechanisms involved in OSCE preparation.

Ethical Issues

Ethical issues were taken into consideration prior to beginning the study and ethical approval for it was obtained from the University's Research Ethics Committee. Once ethical approval was obtained a purposive sample of those students who passed the OSCE were approached to participate in the study (n=25). Information on the study was provided on an information sheet and consent obtained. Autonomy was an important issue; the rights of those participating in the study were respected at all times with the participants having the right to withdraw from the study at any point. Privacy and confidentiality was carefully managed in this study, participants were assured of anonymity at all times during the research process, and University guidelines on data protection were followed. The data collection instrument was a questionnaire, which is generally considered less intrusive than other methods of gathering data, for example observation and interviews. However questionnaires do have some disadvantages, for example low response rates, as was the case in this study with only a small number of students responding to the questionnaire (n=7).

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The principal researcher was also a module tutor to the students in the study, to avoid any bias against any of the participants all data was collected anonymously using an online survey tool, with numbers allocated to the participants so individual participants could not be identified.

Data Collection

The setting for this study was the health faculty of a large UK university, which has students from a range of pre-registration healthcare programmes. A purposive sample was drawn from a cohort of student Operating Department Practitioners who had successfully completed an OSCE as part of the summative assessment for one of their modules. Seven students agreed to take part in the study and their consent was obtained. In the OSCE the students had to demonstrate they could correctly take the vital signs of a patient on admission to a Post-Anaesthetic Care Unit, with a Laerdal ALS SimMan used to simulate the patient.

Pawson and Tilley (1997) advocate that a pragmatic mixed methods approach be used in the collection of data for realist research, and this principle was applied in the design of this study. The questionnaire consisted primarily of open semi-structured questions to obtain qualitative data to explore the mechanisms involved in student preparation for the OSCE. Likert type scales were used to gather quantitative data to assess levels of competence and confidence to corroborate the qualitative data, these consisted of statements with the following options: strongly agree, agree, not sure, disagree and strongly disagree. Whilst both data sets were collected concurrently, they were analysed separately, SPSS software was used to analyse the quantitative data and the qualitative data was examined for themes and how those themes interrelate (Creswell & Plano Clark 2007).

Data Analysis

The principles of realism drive realist data analysis, in which realist evaluation is used to explain changes produced by interventions. Within this study the context-mechanism-outcome (CMO) configuration was used as the main structure for realist analysis of the collected data. The responses to the Likert type questions were processed as ordinal data on an ascending scale from one to five, as the data had no fixed intervals between the numbers, and the SSPS software was used to produce a measure of central tendency and frequency data (Parahoo 2006). The patterns of outcomes were analysed to identify those where there was a perceived improvement in confidence and competence, and the qualitative data was then analysed to identify the mechanisms responsible for generating those outcomes. The qualitative data analysis was based on a phenomenological approach using an interpretative (hermeneutic) paradigm, taking an emic point of view using Colaizzi's seven stage model of qualitative data analysis (Colaizzi 1978). The data analysis began with a reading of the participants' responses; following this significant statements pertinent to the phenomenon were extracted, meaning was then formulated from the statements and organised into themes in terms of, 'context conditions' (C), 'underlying mechanisms' (M)' and observed outcomes' (O).

Results

The participants completed a quantitative and qualitative questionnaire to determine if they felt that their confidence and competence had improved using simulation to learn clinical skills. A simple Likert scale was employed, with participants asked to

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rate how strongly they agreed or disagreed with the statements on confidence (table 1) and competence (table 2).

Statistics

Confidence

N	Valid	7
	Missing	0

Confidence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely Agree	4	57.1	57.1	57.1
	Agree	2	28.6	28.6	85.7
	Mostly Disagree	1	14.3	14.3	100.0
	Total	7	100.0	100.0	

Table 1. Improvement in confidence

Statistics

Competence

N	Valid	7
	Missing	0

Competence

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Definitely Agree	2	28.6	28.6	28.6
	Agree	4	57.1	57.1	85.7
	Mostly Disagree	1	14.3	14.3	100.0
	Total	7	100.0	100.0	

Table 2. Improvement in competence

The results show that six participants agreed that improvements had occurred, however, four definitely agreed that their confidence had improved, but only two felt this strongly about their competence, this was despite the study sample being drawn from students who passed the OSCE.

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The qualitative answers from participants who had improvements in confidence and competence were analysed to discover how they prepared for the OSCE and also what they would do differently in future to prepare, based upon their experience with this OSCE. Two themes emerged from this, the need for sufficient information, and dealing with anxiety during an OSCE.

As discussed by Aliner et al (2006) preparation for OSCE is important, especially with regard to using the manikin. For their OSCE the students were shown in class how to use the manikin to take vital observations and the assessment strategy was explained. In the weeks prior to the OSCE students were able to access the manikins in the Clinical Skills Centre to practise, and the students' responses reflected this:

Practising using the rooms available with fellow students (S7)

In addition to this students also discussed the importance of revising the theory underpinning their skills:

Rehearsed the hands on observations at the university. Read relevant books (S3)

I use a lot of books to make sure that my underlining knowledge is there. I also go back through existing lecture and seminar notes. (S2)

This is an important point as OSCEs are not only for assessing skills, but also underpinning knowledge (Merriam & Westcott 2010).

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As highlighted in the literature review, unless students are prepared for their OSCE they will struggle and have unreasonable expectations of the assessment process (Bloomfield et al2010). This was an issue that was discussed by the students in the study. Whilst teaching staff had believed they had provided the students with sufficient information with regard to the OSCE, this was not the view of the students who felt that more information would have been helpful. In response to a question on how prepared they were for the OSCE students responded:

did not feel like there was enough information to go off to prep.(S1)

As well as i could be given the amount of information given to us before hand.
(S2)

As prepared as I felt I could be on my own but felt seeing an example OSCE in class would have helped. (S5)

The last response is interesting as the student felt that in addition to being provided with information about the OSCE, actually seeing an example of one demonstrated in class would be helpful.

In response to a question about what the students would do differently to prepare for another OSCE, the need for more information was raised again.

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ask to be given all information possible in what exactly we need to prepare for and be given an extra lecture in uni to go over everything and give the students ample time for preparation and practice. (S1)

The issue of anxiety and nerves was also raised in response to the question of what students would do differently in future.

Nothing personally as I found the approach right for me but I would try and find a different way to control my nerves (S5)

I would look further into the theory side of things. maybe looking into techniques to calm nerves and anxiety. (S2)

As highlighted in the literature review, students consider OSCEs stressful, with anxiety being identified as a major concern (Marshall & Jones 2003, Fidment 2012, Johnston et al 2017, Brighton et al 2017).

Discussion

A limitation of this study is that it was undertaken in one university with a small sample of Operating Department Practice students and the results may not be generalised to other student groups in other disciplines. Further research is needed to explore this topic more fully and to compare the mechanism of student preparation against actual outcomes in the OSCE to determine if there is a correlation between particular mechanisms and higher level outcomes. The CMO configuration of realistic evaluation (Pawson and Tilley 1997) was used to explore how students

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prepare for OSCEs. The results of this study support the current literature in that students felt they needed adequate preparation with the manikins, in addition to this two other themes emerged from this study, (1) the need for students to be fully informed about the assessment strategy and (2) the need to use appropriate coping mechanisms to deal with anxiety.

The results show that in order to be fully prepared for their OSCE, students felt that they needed as much information as possible about their assessment. This may to a degree reflect students nervousness with OSCEs, and a desire to be as prepared as possible, but this need to be informed about how they will be assessed is also highlighted in the literature which suggests that students should make sure they fully understand the competencies they will be assessed against (Ahuj, 2008). One student made an interesting contribution, suggesting that observing a demonstration OSCE in class might help them to prepare for their assessment. This idea has merit, but would only provide a single opportunity to view an OSCE, another option might be to video record an OSCE as an exemplar students could watch online as part of a blended approach to learning, allowing students to view the OSCE as many times as they need (Massey et al 2017).

As discussed in the literature review, previous research has found OSCEs to be a stress and anxiety provoking form of assessment (Marshall & Jones 2003). Some authors attributed students' stress and anxiety to not being sufficiently prepared for the assessment and suggest that structured preparation is a key coping strategy for dealing with anxiety (Johnston et al 2017, Brighton et al 2017, Fidment 2012). The results of this study seem to show that despite having practised with the manikins

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and feeling as prepared as they could be for the OSCE, nerves and anxiety appear to have been issues during the assessment. When asked if they would prepare differently for future OSCEs students talked of being nervous during the OSCE and of trying to find ways of dealing with nerves and anxiety in the future. This could be attributed to the fact that the students needed more preparation for the practical aspects of the OSCE, or it could be an indication that despite the contention of previous research that preparation is the key to reducing anxiety, there is also a need for students to develop mechanisms for coping with psychological aspects of the examination.

Conclusion

This study not only identified how students prepared for their OSCE, but having learned from that experience how they would prepare in future. Students clearly felt that in addition to revising for the OSCE and practising their clinical skills they also needed to be as well informed as possible about the assessment procedure, including a demonstration of the OSCE to be undertaken. The other conclusion from this study is that stress and anxiety are major factors in OSCE assessment, and whilst previous research has recommended preparation as important in reducing these factors this study suggests that students need additional support in dealing with the emotional stress of OSCE. This is an issue that academics may need to give consideration to when planning OSCEs. Given the small scale of this study, further research into this topic is needed to identify mechanisms students can use to cope with stress and anxiety in OSCEs.

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