

Title: Enhancing OSCE preparedness with video exemplars in undergraduate nursing students. A mixed method study

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Research Highlights

- Clinical Skills developed in a simulated environment are important for preparing undergraduate nurses students for real world experiences.
- OSCEs are stressful and create significant anxiety that may impact on learning
- Video exemplars of OSCE may help to prepare students and reduce anxiety and promote learning.

Abstract:

Background: Objective structured clinical examinations (OSCEs) are examinations designed to assess clinical skill performance and competency of students in preparation for 'real world' clinical responsibilities. Although OSCEs are commonly used in health professional education, they are typically associated with high levels of student anxiety, which may present a significant barrier to performance. Students, including nursing students, have identified that flexible access to exemplar OSCEs might reduce their anxiety and better prepare them for such assessment.

Aim: To implement and evaluate an innovative approach to preparing students for OSCEs in an undergraduate acute care nursing course.

Method: A set of digitized OSCE exemplars were prepared and embedded in the University-based course website and as part of course learning activities. Use of the exemplars was monitored, pre and post OSCE surveys conducted, and qualitative data were collected to evaluate the approach. OSCE performance and overall course grade was also investigated.

Findings: The online OSCE exemplars were seen to increase self-rated student confidence, knowledge, help with preparation and provide clarity around assessment expectations. OSCE exemplars were accessed frequently and positively received; however, didn't impact on academic performance.

Conclusion: Video exemplars may aid student preparation for OSCEs as they provide a flexible, innovative and clear example of the actual assessment. Video exemplars improved student confidence and understanding of performance expectations, leading to increased engagement and reduced anxiety when preparing for the OSCE. These OSCE exemplars could be used to increase staff capacity and improve the quality of the student learning experience.

Keywords: flexible clinical learning tools, OSCA, OSCE, student anxiety, examination preparation, video exemplars.

Introduction

Development of clinical skills are crucial for preparing healthcare professionals, including nursing students, for real world experiences, to ensure they cultivate safe clinical practices (Eldarir & Abd el Hamid, 2013). Demonstrating skill acquisition and competency is often facilitated in a simulated clinical environment (Bourbonnais, Langford, & Giannantonio, 2008). Objective structured clinical examinations (OSCEs) are commonly included in health education curricula as they can be used to assess practical skill level and competency through simulation of a real world scenario, but in a mock clinical and examinable setting. Accordingly, OSCEs have been integrated into the curriculum for Bachelor of Nursing programs with other relevant forms of assessment, both internationally and within Australia (Alizadeh et al., 2014; Chiou-Rong & Ue-Lin, 2015; Jo & An, 2014; Mitchell, Henderson, Groves, Dalton, & Nulty, 2009; Setyonugroho, Kropmans, Kennedy, Stewart, & van Dalen, 2016).

The reliability and validity of the OSCE as a clinical skill assessment tool are well researched (Al-Osail, Al-Sheikh, Al-Osail, Al-Ghamdi, Al-Hawas, 2015; Setyonugroho, Kennedy, & Kropmans, 2015; Setyonugroho et al., 2016). Interestingly, students' perceptions of the OSCE, the OSCE process itself, and the impact that it has on their clinical skill learning and clinical practice has received less attention (Johnston, Massey, 2016; Nulty, Mitchell, Jeffrey, Henderson, & Groves, 2011). It has been suggested that the OSCE process is highly stressful, and that an OSCE is significantly more stressful than a written assignment (Brand, Schoonheim-Klein, 2009). High levels of stress may hinder students' ability to effectively demonstrate their clinical capability (Brosnan, Evans, Brosnan, & Brown, 2006; Muldoon, Biesty, & Smith, 2014). One study suggested pre-registration nursing students' felt so stressed by the OSCE and this had a negative impact on their performance (Byrne & Smyth, 2007). While it is recognized that a small amount of stress can enhance performance; adoption of a highly stressful assessment strategy may be counter-productive (Alizadeh et al., 2014; Salehi, Cordero, & Sandi, 2010). Exam-related stress may in part be attributed to a lack of student understanding of, or unfamiliarity with the examination processes and exam requirements (Muldoon, Biesty, Smith, 2014). Therefore, one way to reduce the stress associated with the OSCE may be to provide clarity and transparency across performance expectations and the examination itself. It has been suggested that preparation, familiarization and 'exposure' to the OSCE may help students cope better (Brand,

Schoonheim-Klein, 2009; Fidment, 2012). By clarifying examination requirements, expectations and processes, and a greater familiarity with the OSCE setting, this may help to decrease students' anxiety and stress, which may subsequently improve student performance and their ability to succeed (Alizadeh et al., 2014; Eldarir & Abd el Hamid, 2013; Johnston et al., 2016; Stunden, Halcomb, & Jefferies, 2015). This may also enhance student's engagement with the OSCE task, and correspondingly, clinical skill development, making it more meaningful and achievable.

Online resources (or e-learning) may be one avenue through which OSCE expectations and performance requirements can be presented to students. This may assist with preparation and familiarization of the OSCE process. With large student enrolments, online learning resources are being increasingly used to create and promote flexible and equitable learning opportunities (Karoglu, Kiraz, & Özden, 2014; Kelly, Lyng, McGrath, & Cannon, 2009). Video instruction has been shown to effectively engage students in a process of reflection and an extension of learning outside the classroom (Chan, 2010). Videos can be used to provide exemplars or models, which promote active learning. Through observing realistic clinical exemplars, students are encouraged to further develop and reflect on their knowledge and understanding of clinical skills and how they can be applied in a 'real-world' clinical setting (Bartfay, Rombough, Howse, & Leblanc, 2004; Kelly, McGrath, Cannon, 2009).

E-learning that incorporates video exemplars may be an accessible and effective way to teach clinical skills and prepare students for their practical examinations (Barratt, 2010; Rushforth, 2007). Kelly and colleagues (2009) developed a range of blended learning activities, including 12 clinical videos, which were available to students online (Kelly et al., 2009). These clinical videos were positively received by students, in particular, their high accessibility meant students could watch the videos again in their own time, and it was proposed this was beneficial for preparation and revision purposes. Cannon and colleagues (2009) did however suggest that these videos did not effect overall student outcomes, and thus videos were best used to complement live clinical demonstrations. Alternatively, other researchers have reported that clinical videos have not only been positively received, but have also had a positive impact on performance (Lashley, 2005; Weeks & Horan, 2013). One randomized controlled trial comparing an instructional video to traditional face-to-face learning, indicated that people who had used the video were in fact more successful at completing the desired clinical skill, which in this case was pediatric intraosseous needle insertion (Lee, Boyd, Stuart, 2007). In a mixed methods study, Weeks and Horan (2013)

investigated a video-based learning activity in physiotherapy students and results indicated that the video exemplar enhanced physiotherapy student performance in practical examinations. Weeks and Horan used surveys and focus groups to further explore the use of the video, and students felt the video improved confidence, reduced anxiety, and gave them a better understanding of the examination process. Preliminary findings support the use of video exemplars in clinical skills teaching and this research endeavors to further explore this under-researched topic.

In this study, we aimed to describe and evaluate the effects of online video OSCE exemplars on nursing students' perceptions and performance in an acute care OSCE. We hypothesized that students would be supportive of OSCE video exemplars and that these would influence their confidence, preparation, and understanding of performance expectations, following engagement with this learning resource.

Methods

An evaluation of the resources was undertaken using a mixed methods approach, meaning both qualitative and quantitative methodologies were adopted to draw on the strengths of both paradigms.

Ethics

Ethical approval was obtained from Griffith University [GU Ref No: NRS/24/14/HREC].

Sample and Setting

Students enrolled in 'Nursing clients with medical-surgical conditions' (2801NRS) were chosen for this study. This course is designed to help students develop theoretical knowledge and practical skills relevant to the care of individuals who may have a range of medical-surgical health needs. It incorporates a wide range of pathophysiological, pharmacological and nursing care components in a client-focused, evidence-based manner, designed to enable students to deliver safe high-quality patient care. Within this course, students must complete OSCEs as one part of the overall assessment strategy. The course

is held across three geographically-distinct campuses of the same University in South-East Queensland, Australia. This study was undertaken in 2014, and there were 730 students enrolled in this second year course. No additional course credit or incentive to participate was offered for participation in this research and respondents remained anonymous. Recruitment was voluntary with consent implied by the return of the survey. Explicit signed consent was obtained for the students who participated in the qualitative arm of the study.

Intervention

A set of three digitized OSCE exemplars were developed on-site and embedded online in the University-based course website and learning materials. These video resources and associated tutorial support were provided to all students enrolled in the course. Each digitized OSCE exemplar was approximately ten minutes in duration and featuring previously successful students and current staff modelling various types of nurse-patient interactions and clinical skills that are commonly assessed during this course's OSCE. All three OSCE exemplars were moderated by examiners to be 'average to high' standard. The resources were available for students to access online throughout the semester. Videos were also watched by students during tutorials, allowing tutor supported discussion about the OSCE exemplars and the depicted clinical scenarios.

Quantitative analysis

Website tracking data monitored student engagement with the video resources, including the timing, frequency, and duration of access. Mean OSCE performance across the entire cohort was collected, to be compared to the overall OSCE performance from the previous year. Overall course grade was also extracted across the two years, to investigate any changes in academic performance.

A paper-based pre and post survey was completed by students, prior to viewing the OSCE exemplars and again five weeks after completion of their OSCE examination. Participants indicated the extent to which they endorsed each statement on a 5-point Likert scale. Survey questions (see Table 1.) asked about student level of confidence, knowledge, understanding and awareness of expectations regarding the OSCE, as well as their perceived skill level. Survey questions asked about students' beliefs regarding the OSCE examination itself, in

accordance with research aims, as the digitized OSCE exemplars were designed to assist with student preparation for the real OSCE. This survey was adapted from the Weeks and Horan survey, which was used to evaluate the introduction of video exemplars in physiotherapy education (Weeks & Horan, 2013). Students were also invited to rate the digitized video exemplar in the final Student Experience of Course (SEC) evaluation, which is a university-administered standard evaluation form completed by students at the end of each course.

De-identification of data ensured that student privacy was maintained throughout the analysis. Survey data was collated and analysed in Excel and SPSS. Pre and post means and standard deviations were compared, and a chi-squared analysis performed.

Qualitative analysis

Students from all three campuses were sent information and invited via email to participate in the focus groups. Focus groups and interviews were conducted by an experienced external researcher and were guided by a series of ten key questions exploring the use and perception of the digitized OSCE exemplars and their actual OSCE. Focus group and interview questions included:

Did you watch the digitized OSCE exemplars? If Yes, when? And how?
Do you think having the digitized OSCE exemplars change your preparation for the actual OSCE?
Do you think the digitized OSCE exemplars affected your understanding of what you needed to do in the OSCE?
Do you think the digitized OSCE exemplars increased or decreased your anxiety levels for the real OSCE?
What were the best and worst aspects of the digitized OSCE exemplar?
Any further comments, suggestions or recommendations regarding OSCEs or the digitized OSCE exemplar?

Focus groups and the interview were audio-tape recorded and professionally transcribed verbatim, by a different researcher again, to minimise confounding and enhance rigour and transparency. In the post-survey, students were given the option of leaving a written comment regarding the OSCE and/or digitized OSCE exemplars. This was analysed in conjunction with the qualitative data.

Interview transcripts were analysed using a general inductive approach and thematic analysis to explore key concepts that emerged from the data (Braun & Clarke, 2006). The first stage involved reading and re-reading the transcripts and then highlighting key phrases to develop an understanding and sense of meaning, which was emerging from the focus groups and interview. Phrases were then grouped into themes and a table was constructed to match quotes to the emerging themes, and explore links between the themes. For methodological rigour, the research team had several discussions around theme development and the final themes. This approach, through discussion and group consensus, enhances the reliability and credibility of the identified themes; further ensuring rigour and quality (Polit & Beck, 2006). An audit trail was created to document the process and reasoning behind theme decisions, to further ensure a high-quality analytical approach. Additionally, a secondary computer-assisted analysis was completed using the concept-mapping software Leximancer (University of Queensland, 2014). This transparency helps ensure credible and dependable identification of themes; a parallel perspective approach to help ensure rigour and quality (Holloway & Wheeler, 2010).

Results

Sample and Setting

All 730 students, enrolled in 2801NRS, had access to the digitized online video exemplars. Students enrolled in this course were predominantly female (85%), and came from a variety of socioeconomic backgrounds and ages.

Intervention

Student online video 'hits'

Students frequently accessed the digitized OSCE exemplars, with data tracking software recording 8,482 views over the semester. On average, students viewed the videos 10.9 times (range: 1-44 views from 730 active students). The majority of views occurred on the first two days of the week (i.e., Monday and Tuesday). Peak viewing was at the beginning of the week in which tutorials first introduced the OSCEs (1,226 views), and again on the first day of the formal examination week, immediately preceding their OSCE (721 views).

Student surveys

Students completed two surveys with a response rate of 191/730 [RR 26%] for the first survey and 176/ 730 [RR 24%] for the second survey. The mean response for all five questions on the pre-survey was 3.31, with a mode of 3, indicating an overall survey response of 'sound' (see Table 1. & Figure 1a). The mean response on the post-survey was 2.31, with a mode of 2, indicating an overall survey response of 'high' for all five questions (see Table 1 & Figure 1b). In the post-survey, there was a statistically significant and visible shift towards students responding more positively, with answers of 'high' and sometimes 'very high' (Figure 1b). This change was evident across all five questions.

Chi-squared analysis of the differences in self-reported scores from the pre and post surveys, demonstrated significant changes with generally large effects sizes in each measure. Students rated their level of confidence ($\chi^2_{4, n=366} = 87.34, p<0.001, \phi=0.49$), awareness ($\chi^2_{4, n=366} = 76.87, p<0.001, \phi=0.46$), knowledge of examination content ($\chi^2_{4, n=366} = 136.22, p<0.001, \phi=0.61$), understanding of OSCE processes ($\chi^2_{4, n=366} = 124.91, p<0.001, \phi=0.59$) and skill level ($\chi^2_{4, n=366} = 101.79, p<0.001, \phi=0.53$) higher in the post-survey, compared to the initial survey (see Table 1).

Table 1. Responses to the survey enquiry before and after the OSCE

Before OSCE	Q1: My level of confidence to successfully complete my 2801 OSCA is:		Q2: My awareness of the expectations of 2801 OSCA examiners is:		Q3: My knowledge of the content examined in the 2801 OSCA is:		Q4: My understanding of the OSCA examination process from the course material presented so far is:		Q5: My level of skill developed through the use of peer-review and feedback to others in 2801 is:	
	PRE	POST	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Mean	3.29	2.43*	3.27	2.28*	3.33	2.22*	3.39	2.24*	3.28	2.40*
Standard Deviation	0.83	0.84	1.03	0.91	0.82	0.73	0.85	0.81	0.72	0.76

Note: '1' = very high, '2' = high, '3' = sound, '4' = poor, and '5'=very poor.

*Results were significantly different in the post-survey, compared to the pre-survey, for all questions. Chi-squared analysis results are listed above.

Figures 1a & b display the distribution of responses to each question investigating confidence, awareness of expectations, content knowledge, and understanding of exam and skill level. The initial responses by students in the first survey were often ‘sound’ to ‘very poor’ on all areas of interest; whereas in the post-survey students rarely responded with ‘very poor, but were more likely to respond with ‘high’ and sometimes ‘very high’ on all outcomes measures.

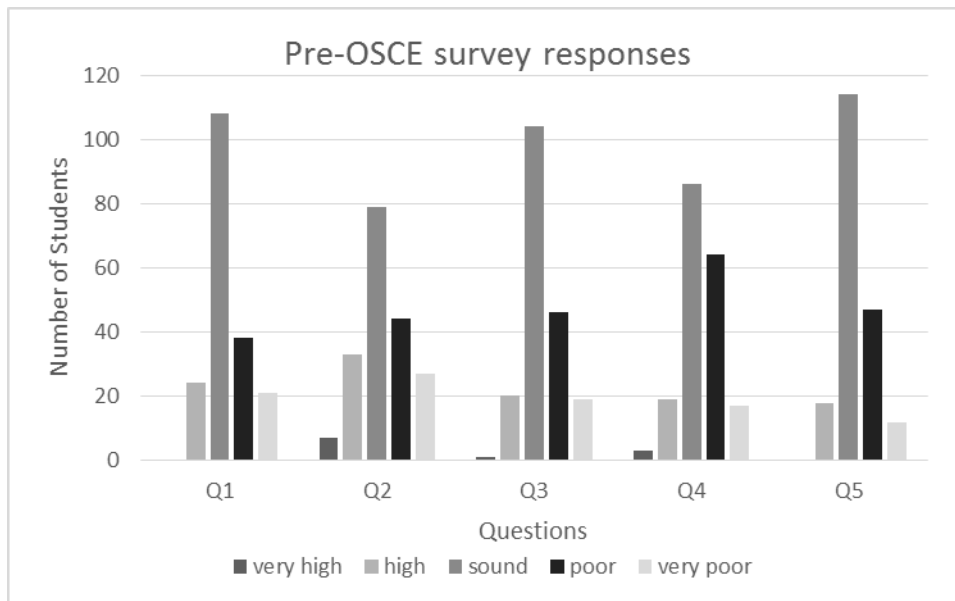


Figure 1a. Responses to the questionnaire prior to the OSCE (n=191)

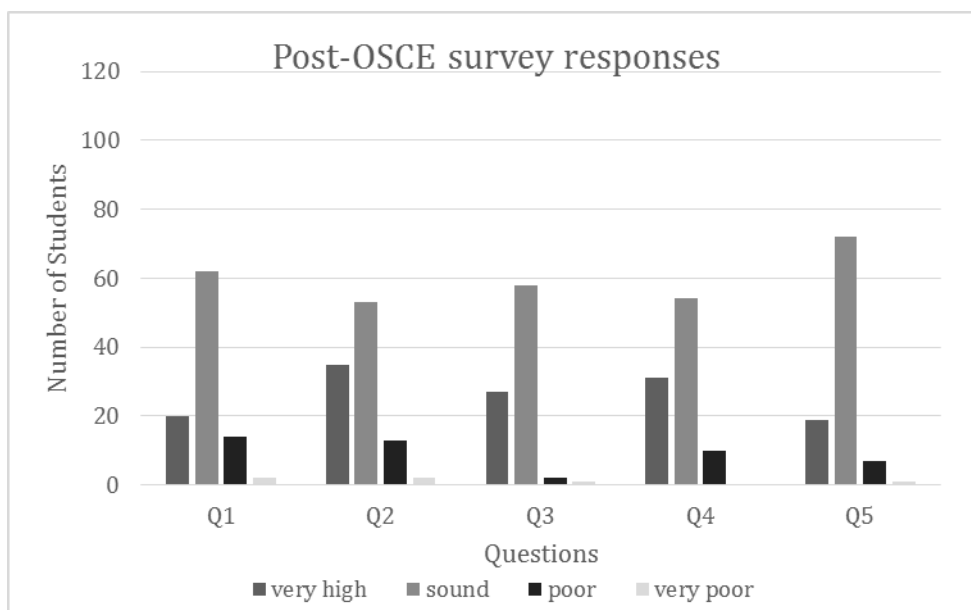


Figure 1b. Responses to the same questionnaire after the OSCE (n=175)

Student response's in the overall course evaluation

Students were invited to respond about the digitized video exemplars directly as part of the overall course evaluation (SEC). Eighty-three percent of student respondents rated the videos positively, suggesting the video exemplars assisted in learning. Overall SEC course evaluation by students improved marginally from 2013 to 2014, from 3.8/5.0 to 3.9/5.0 (n = 242).

Summative academic performance in the OSCE

A Mann-Whitney U-test was used to compare the OCSE results across the entire cohort, between 2013 and 2014. A Mann-Whitney U-test was chosen as the OSCE results were not normally distributed. Results indicate no significant difference in overall students' performance between the two years (mean OSCE score in 2013 = 41.5, compared to in 2014 = 42.5, *ns*, $P > 0.05$).

Student focus groups and interview

Two focus groups and one interview were completed with a total of nine students from all three University campuses, following the OSCE examination in 2014. Qualitative data were also extracted when students chose to leave a written comment in the post-OSCE final survey (total survey response rate was 176/730 [RR 24%]). The two focus groups were approximately 30 minutes in duration and were attended by three and five participants, at two different university campuses. A separate interview was conducted with one additional student from the third campus. Although only a small number of students attended the qualitative arm of this research, they made a useful contribution to the broader study on their experience with the digitized OSCE exemplars. This qualitative data adds depth and contextualizes the survey data by providing richer insights into the quantitative results. Four interconnected themes emerged from the qualitative data. These were 'the ability of the OSCE videos to clarify expectations,' 'the perceived value of the digitized exemplars for OSCE preparation,' and 'the usefulness of the accessibility of the digitized OSCE exemplars' and 'the stress-reducing benefit of the OSCE exemplars'. A theme regarding the exemplars as a 'pragmatic representation of real students' arose, and evolving on from this, 'recommendations for future digitized OSCE exemplars' was also discussed.

Watching the digitized OSCE exemplars was noted to provide clarity on expectations. Students were able to see what would happen in an OSCE and what type of performance was expected of them. These online OSCE exemplars were available to all enrolled students across all three campuses, meaning that exactly the same information was presented to all students in a consistent and transparent way. Offering three different digitized OSCE exemplars meant students could view different OSCE styles to fit their individual learning preferences, but all students could still understand the examination process and the key skills they were expected to demonstrate. This was positively received by students and noted to reduce stress.

'It {the OSCE exemplar} showed you – in a roundabout way- showed you what to do, so you sort of had an idea of what was expected. So it brought out what – your knowledge of what you needed to do when you're dealing with a patient doing that sort of stuff. For me, it actually sat my mind at ease, reduced the nerves and such.'

'Like, one thing I know about university is the fact that a lot of the assessments are very ambiguous. You have to – we all interpret them very differently. And so that's why when I saw them {OSCE exemplars} I was like, okay, yep. '

'It {the OSCE exemplars} really decreased stress for me. I was like, no, this is just what I have to do. It kind of just put it in plainer terms for me.'

Similarly, students identified that the digitized OSCE exemplars were a useful resource for exam preparation. Students described watching and re-watching the digitized OSCE exemplars, often creating their own OSCE scripts based on what was seen in the exemplar. After preparing a script and practicing, students were able to re-watch the OSCE exemplars to ensure they were on the right track. Having the OSCE exemplars to assist with preparation was further noted to reduce anxiety.

'I watched {it} the first time at uni, when it was announced that it's on our website, and again I watched all three of them just before the OSCE just to refresh my memory of what is what and it was good. I think, 'cause the second time I watched, it was just to reconfirm that I was just sort of there.'

'...I watched it after I was able to make my own script, as such, and go back and look at it and see what I've missed, I wasn't as stressed because it refocuses as to what isn't as important compared to what we need to cover.'

'I was still stressed {this year} but I wasn't as stressed going, yeah, I've got more preparation than last year...yeah, it's great because you've had that preparation by these OSCE exemplars.'

Students appreciated the accessibility of the OSCE exemplar and that they were available to them anywhere and at any time. The highly accessible nature of the resources was considered to assist with preparation and provide comfort to the students.

'I could watch it after the kids had gone to bed – made it easier to prepare'

'I liked just the fact that the videos were there. That took a lot of panic away'.

The digitized OSCE exemplars were a pragmatic representation of real students. The OSCE exemplars depicted normal students, who were obviously nervous, but who had completed and passed their OSCE. This was seen to reassure current students of the achievability of the OSCE.

'It did show that they were very nervous as well, and yet they still got through.'

'They were just normal students who had passed, so it did show you that – you can get through, even if you – if your nerves are really overtaken... '

Many students took this further, and wanted a 'high-distinction' (HD) or 'gold standard' OSCE example, however, this feeling was also not unanimous.

'So I think we've learnt maybe what not to do from it, which takes me back to I think we could have a poor, medium and..... I definitely would like to see a HD.'

'Let's get the course convenor to do a HD one.'

Alternatively,

'I think if a tutor or a lecturer did one of the OSCEs {exemplars}, we'd look at it going, no, they know way too much. They are nothing like me.'

To conclude, the focus groups and interview indicated that the OSCE videos were positively received and were an asset due to their accessibility, that they depicted real students, and

they were useful to clarify expectations, assist with preparation, and reduce anxiety.

'I just sat and watched {the OSCE exemplar} again, and got together with my study buddy here and we timed each other and performed, yeah, a couple of times different patients. Of course, a lot of it was hilarious, yeah. But it's – the best that worked for me was on the OSCE exemplar. I knew what it expected from me. I thought the people. I thought that all right, they're the same people like me, so I will get through.'

Discussion

Second year nursing students valued the online OSCE exemplars as indicated through their personal statements, and through high use of the OSCE exemplars throughout the semester, most notably directly before their OSCE examination. Students suggested that video exemplars helped with preparation, decreased stress and enabled them to have a better understanding of OSCE expectations. At the end of the semester, students rated they had experienced a higher level of confidence, knowledge, skills, and awareness of expectations, and understanding of OSCE exams, compared to their self-reported outcomes at the beginning of the semester. The video exemplars were also rated highly in overall SEC course evaluations.

OSCEs are designed to assist students develop and meet clinical skill benchmarks, in preparation for patient-based task-focused interactions. OSCEs represent real-world clinical scenarios, which are completed in a safe learning environment, thus representing an important first-step from knowledge acquisition to real world application and practice. Overall, data indicates OSCEs are a valid and reliable way to assess clinical skill development amongst students (Framp, Downer, & Layh, 2015; Napankangas et al., 2016). Research does highlight that OSCEs induce a considerable amount of stress, which may impact on performance (Bagheri, Forotgheh, & Fallah, 2012; Mårtensson, Löfmark, Akademin, Avdelningen & Högskolan, 2013). There is a developing body of research exploring the use of video exemplars to assist in teaching, examination and then application to 'real-world' clinical practice. This is all the more important due to the need for 'practice ready' students, coupled with pressures on contemporary education processes. Current research indicates that online video exemplars and resources may assist in the development of clinical skills, both within an examinable scope (Weeks & Horan, 2013), and to real-world application (Forbes, Oprescu, Downer, Phillips, 2016; McCutcheon, Lohan, Traynor, & Martin, 2015).

The OSCE itself is suggested to induce a considerable amount of stress on students undertaking the examination (Muldoon et al., 2014). Improved understanding of assessment expectations and better preparation has been suggested to reduce stress and increase student success (Fidment, 2012; Stunden, Halcomb, Jefferies, 2015). Ordinarily, students cannot view a real OSCE whilst others are being assessed. Video-based exemplars provide an opportunity for students to observe a 'real' OSCE, and gain insight into the clinical skills and the assessment environment. A video that is accompanied by a critique and rationale for marking, which can be further discussed amongst peers and within tutorials, highlights salient components of the OSCE approach that are not often accessible to students. This demonstrates the type of skill/s of particular interest to the examiner/s, and the manner in which they can be successfully demonstrated. Completing 'practice' quizzes or paper-based exams can assist students understand written exam response requirements, whereas, OSCE videos provide students with a means to understand simulation style exam expectations (Berragan, 2011; Weeks & Horan, 2013). By creating OSCE videos using past students, this allowed for a connection with the 'real' student experience, further reducing anxiety in the current students. The current OSCE videos were designed as a blended learning tool, using realistic resources to meet the diverse needs of students, and this is suggested to align with best practice guidelines (Karoglu, Kiraz, Özden, 2014; Mitchell, Henderson, Groves, Dalton, 2015).

The video exemplars were seen to act as a platform from which students could tailor their learning and preparation for their own specific OSCE experience. Students could learn about clinical skills and prepare for their OSCEs within traditional lecture and tutorial based learning sessions; however, many students responded well to the online platform and video exemplars and engaged with these resources at home and outside of 'traditional teaching hours'. The accessibility of the video exemplars meant students were able to access them wherever and whenever they liked, further allowing them to tailor their learning experience and preparation approach. Many students reported watching the video initially within the tutorial, but then also at home. Some students used the exemplars to create their own scripted scenarios, which they then rehearsed, either alone or with peers. Other students discussed the video exemplars and their ideas on OSCEs within a study group or tutorial. Students often referred back to the video exemplars, comparing their notes, scripts and/or performance to that demonstrated in the video, to ensure they were demonstrating appropriate clinical skills, and to look for opportunities to improve their performance.

Students watched the video exemplars throughout the semester, most commonly within the first OSCE tutorial week, and then immediately before their OSCE. Repeated viewing of the video exemplars, outside of university, indicates students found these to be a useful tool to supplement traditional learning approaches. The OSCE exemplars also offered a more homogenous and tangible message for the entire student group across all campuses and the full cohort, when compared to tutorials and lectures. This provides a consistent and transparent message to all students; however, one which can then be used in different ways by different students. The video exemplars allowed students to individualize their study time and prepare at their own level, rather than preparation and learning solely taking place in a formal tutorial setting, which does not allow for such individual learning flexibility (Stunden et al., 2015), and tutorials and lectures may also differ depending on the teacher. This tailored individualistic approach is particularly valuable in the increasingly resource and funding limited teaching environment (Goorah & Bahadur, 2012).

Instructional online videos have been noted to support student engagement in learning, reduce the stress associated with learning clinical skills, as well as increasing competency (Forbes et al., 2016). Whilst the students did report that the videos were useful for OSCE preparation and that they provided guidance on the clinical skills needing to be demonstrated, no measureable changes were detected academic performance (OSCE grades or overall course grade). A direct link between teaching resources and academic performance is; however, poorly understood and notoriously difficult to measure. Literature suggests it is often difficult to demonstrate due to small sample sizes and multiple confounders (Rasmussen, Belisario, Wark, Molina, 2014). Previous research has suggested that online instructional videos complement student acquisition of clinical skills, however they may have little effect on summative performance marks (Kelly et al., 2009). Alternatively, some research has indicated electronic resources can have a positive influence on student performance (Cooke et al., 2012; Johnston, Massa, & Burne, 2013; Lashley, 2005; Lee et al., 2007; Weeks & Horan, 2013). Whilst no significant change in academic performance was seen between consecutive course offerings in this study, multiple factors may have influenced this and future research is recommended.

Limitations

Despite students valuing the video exemplars, the use of these resources did not directly impact overall student performance in the final OSCE or in overall course grades. As data

were to remain de-identifiable, video exemplar access and student performance were pooled and compared as one cohort, as opposed to individual OSCE exemplar use and course outcomes were not investigated. Future research could explore academic performance outcomes (OSCE result and overall course grade) between frequent users of the video exemplars and non-users, to more accurately explore whether there is a relationship between exemplar use and academic performance.

Furthermore, due to the requirement for de-identified student results, we were not able to map responses against demographic factors i.e., student age, which have been shown in other digital media studies to strongly influence student appreciation of and engagement with such resources (Cooke et al., 2012). However, given the overall high frequency of accessing the OSCE resources and within-tutorial support surrounding these OSCE exemplars, and high levels of anxiety and motivation reported by students, lack of engagement with the resource is less likely to be a concern.

The surveys were worded to explore broad knowledge, understanding, awareness, skill level and confidence regarding OSCE assessments, and the questions did not specifically ask about the influence of the online resources or OSCE exemplars on these factors. Perhaps upon completion of the OSCE assessment, students felt more confident, knowledgeable and skilled, and that this is irrespective of whether they watched the OSCE exemplar or not. However, OSCEs are rated to be one of the most stressful types of examinations, even after the examination has been completed, and after multiple exposures to OSCEs (Brand and Schoonheim-Klein, 2009, Allen, Heard, Savidge, Bittengle, Cantrell, Huffmaster, 1998; Zyromski, Staren, Merrick, 2003). This suggests that the mere experience of having completed one or more OSCEs does not make students feel any less anxious, more knowledgeable, skilled or confident regarding OSCEs in general. Therefore, even though the questionnaires did not ask directly about the OSCE exemplar, it is not expected that students would rate their skill, knowledge and confidence level higher, simply because they had completed their OSCE. If students had been highly successful in completing their OSCE, they may have retrospectively self-rated that their knowledge and skills were higher; however, this would be balanced out across the cohort, where students who did not perform so well may be more likely to self-report that their knowledge and skills were quite low post-exam. Further research could be done to more directly ascertain whether it was the impact of the OSCE exemplars that improved knowledge, skill level, awareness and confidence over the semester, and not the mere experience of having completed an OSCE.

This study, like many involving voluntary student feedback, had a relatively low overall response rate, most notably in the qualitative arm. There may be a bias towards particularly motivated and high-achieving respondents, which may not be representative of all of the enrolled students. Nonetheless, the responses were seen to provide useful insight into the quantitative data, and by triangulating the focus groups, interviews and written comments (OSCE exemplar specific written comments) it does suggest that data is representative of the population of students as a whole.

Future research could look at different actors, not necessarily previous students and current examiners; different clinical scenarios and also a different range of academic performance (from a pass to high distinction). Finally, it must be noted that this study was undertaken at three geographically separated campuses of a single university. Using a single course in a uniform curriculum may have limited generalizability and transferability to other contexts.

Conclusion

Online OSCE exemplars were positively received amongst the cohort of 730-second year nursing students. OSCE exemplars were suggested to help students prepare for their OSCEs, to demonstrate performance expectations; the accessibility of the OSCE exemplar was appreciated, and these factors helped reduce stress. Although no overall change in academic performance was noted, this could be due to the methodology employed. Students did self-report that their skills and knowledge had improved by the end of the semester. The video exemplars were a useful learning tool for students, which comprised equitable and flexible resources within a blended learning approach to meet student needs, assist with teaching, and reduce student anxiety. Online video exemplars may be one effective way to assist students learn clinical skills and attain clinical skill competency benchmarks, thus setting them up to develop crucial skills for real-world practice.

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