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Karali HF*, Smith DR*, Farhad ES**

Institution

*Newcastle University Medicine Malaysia, 79200 Gelang Patah, Johor, Malaysia **International Medical University, 126, Jln Jalil Perkasa 19, Bukit Jalil, 57000 Kuala Lumpur, Federal Territory of Kuala Lumpur, Malaysia

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Abstract

Objectives: To investigate the effectiveness of the 5-minute preparation session in improving the passing rate and reducing the number of failed domains for Year 3 and 5 medical students during the Multiple Observed Standardised Long Examination Record for clinical encounter in Obstetrics and Gynaecology. Also, to evaluate the student's perception towards the session.

Methodology: This was a cross-sectional study that was carried out between 15th October 2017 and 1st July 2018 among Year 3 and 5 medical students who had undertaken their Obstetrics and Gynaecology clinical placement (n=170). Using a purposive sampling, the study sample was divided into two groups of Year 3 and 5, with a group of the students given the golden 5-minute preparation session pre-Formative Multiple Observed Standardised Long Examination Record for clinical encounter and another group given post -Formative Multiple Observed Standardised Long Examination Record for clinical encounter to study the effectiveness of the session. Students were asked to complete a post-Summative Multiple Observed Standardised Long Examination Record for clinical encounter questionnaire on the last day of their Obstetrics and Gynaecology clinical placement. Binary logistic regression was used to investigate whether attending the session increased the odds of passing the exam with 95% confidence intervals. The overall student's perception of the session was evaluated using a simple statistical technique.

Results: Almost all the students (90-100%) responded that they achieved the alignment of their knowledge and skills to the exam format, as well as improved self-confidence and motivation. The odds of passing compared to failing more than one domain, was significantly greater for students who had attended the session pre-FM (OR = 2.28, 95% CI = 1.02-5.13). There was an increase in Year 3 and 5 failure for students who did not attend the session; 28.6% vs 21.4% and 21.4% vs 17.1%, respectively.

Conclusion

The session improved achievement, knowledge, critical thinking, confidence, as well as the alignment of knowledge and skills to the exam format.

Key Words

Five-Minute Answer Planning; Improving Confidence; Motivation; Structured Study; Alignment of Knowledge; Skills to Exam

Corresponding Author:

Dr Karali Hassan Fadhil; E-mail: hassanfadhil@yahoo.com

Introduction

The Golden 5-minute preparation session is designed, taught and practiced to assist Year 3 and 5 medical students in planning for their Multiple Observed Standardised Long Examination Record for clinical encounter (MOSLER/c) hoping to improve their confidence, motivation and structure their study, as well as aligning their knowledge and skills to the exam format.

Inadequate planning prior to clinical examination could cause anxiety and stress for students, which leads to loss of focus and an inability to recall knowledge.¹ Students often do not feel prepared for exams, and more often than not they may focus on more than one section of the exam. However, making a timed schedule and committing to it can ensure adequate attention is given to each section of the exam. This may help to reduce the physical and mental exhaustion associated with the exam.² Most of the students did not plan to prepare for their exam and planned to just study to various extents. It is important to outline in writing a strategy for an exam since "failing to plan is planning to fail".³

Eriksson, a Swedish soccer coach, said "the greatest barrier to success is the fear of failure". This quote

shows that confidence in our own abilities can affect our performance and ultimately lead to our success.⁴ Stiggins (1999) offered to use assessment to build student confidence and emphasised on the relationship between confidence and success.⁵ Reviewing class notes, clarifying areas that were not understood and organizing information in an easy way to recall (e.g. outlines, note cards, flow charts, diagrams, etc.) were effective to improve students' exam confidence.²

Understanding the exam concepts and format also increased the confidence in answering in the exam. Collaborative testing improved performance, motivation, and decreased exam anxiety. They were less stressful than a traditional exam format.⁶

Information about the course, its expectations, and the exam can help students to get a better idea of what to anticipate in their exam and allow them to tailor their way of studying accordingly.² Knowing the exam format influenced a student's engagement with the course material, which can achieve deeper learning and focus on the main ideas and core concepts.⁷ Moving students from superficial to deep conceptual understanding is linked to the higher Bloom's-level exams.⁸

Students need to align their knowledge and skills to the exam format. Alignment can be defined as "how much of student's learning objectives agree and serve in conjunction with exam expectations". By this, students have the opportunity to learn and meet the expectations of the programme.⁹ Alignment should be conducted based on the cognitive demand, learning objectives and outcomes content that are applicable to the exam format.¹⁰

To achieve the cognitive alignment, Anderson and Krathwohl (2001) reviewed Bloom's Taxonomy and stated that the higher-order thinking should go through the process of applying, analysing, evaluating, and creating a structured answer plan.^{11,12} Students need to acquire critical-thinking skills and subsequently the instruction and assessment must work together to promote these higher-order thinking skills.⁹

"Learning by doing" is the most effective strategy in helping students to prepare for an unfamiliar exam format. It is most effective when instructors provide timely feedback on how students are doing – so that students can adjust their approach as needed. This may be achieved by doing an exam-type sample, practice step by step and giving explanations for each step.¹³

Practicing exams, especially under time pressures, is shown to improve exam performance.¹⁴ This practice improved the retrieval of information from the long-term memory of the student and created a correlation between answers given to the questions in the real exam.¹⁵

Exams are unavoidable stressors, in which medical training may create negative consequences of stress.¹⁶ During an exam, every second counts so using a stopwatch will be helpful to prepare for exams.³ Time management is significant in improving exam performance. If a student struggled with a component, moving on to the next task can ensure that time is not wasted.

Multiple Observed Standardised Long Examination Record (MOSLER)

Introduced in 2008, MOSLER is used to address concerns over low reliability and case specificity of single long cases. It is delivered over six sites in the North-East of England to about 340 students in each assessment. Cronbach's alpha, variance components, failure rates and examiner markings were reported in the attempt to obtain a clearer picture of the reliability of this complex examination.¹⁷

The MOSLER is an assessment tool designed to assess candidates' knowledge, clinical skills, and professionalism. The MOSLER may be considered as an evolution of both the OSCE (Objective Structured Clinical Examination) and Long Case assessment formats.¹⁸

Each MOSLER involves multiple assessments made by multiple examiners, by which the interaction between candidate and patient is observed by the examiner and candidates are graded in standardised domains against standardised grading criteria. A MOSLER is comprised of several OSLERs (Observed Standardised Long Examination Record) more commonly known as clinical encounters, each of which is designed to simulate a real clinical situation as far as possible.¹⁸

OSCEs are highly reliable, although often criticised as having a low validity. Long case exams are more valid but are known to be unreliable as only a small number of assessments may be made (usually only one) by a few (usually one or two) examiners and standardizing scoring is difficult. Furthermore, the candidates' interaction with the patient is usually not observed by the examiners, so clinical skills and behaviours are difficult to be assessed. It is impossible to take into account the effect the patient's behaviour during the encounter may have on an individual candidate's performance.¹⁷

All clinical encounters have a duration of 25 minutes: 5 minutes of preparation time during which the candidate can familiarise themselves with the candidate information specific to the clinical

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encounter and prepare themselves to perform required tasks; 20 minutes of assessment time during which time those tasks are to be performed; 20 minutes of assessment time which is divided into two components - 14 minutes for a focused history and clinical examination and followed by 6 minutes of discussion with the examiner.¹⁸

Candidate information which specifies the clinical encounter will be provided to candidates just prior to the 5 minutes of the preparation time, followed by 20 minutes of the exam. Thereafter, the assessment will be graded in the following areas:

Assessed Area	Grade
Information Gathering	Competent/Not yet competent
Technical and Procedural Skills	Competent/Not yet competent
Communication Skills	Competent/Not yet competent
Clinical and Diagnostic Reasoning	Competent/Not yet competent
Management	Competent/Not yet competent
Professional Behaviour	Acceptable/ Unacceptable

Newcastle University Medicine Malaysia (NUMed) medical students require to sit for an in-course MOSLERs both Formative MOSLER (FM) and Summative MOSLER (SM) during Year 3 and 5, in addition to the end of the Year 5 final Examination MOSLER.

The session

Throughout my work as a lecturer and examiner in the medical schools, I noticed that students did not do adequate planning for their exams in the given time just before the exam starts. The feedbacks that were given mostly by students were in planning outlines of history taking and some investigation listing. High level of anxiety and stress throughout the exam causes loss of focus and inability to recall knowledge. Therefore, a well-structured session on the 5 minutes preparation prior to the start time of the exam may help students to align their knowledge and skills towards the exam format, plan their MOSLER/c, improve their critical thinking skill, self-confidence and to help them get back their focus in the event they were panicking during the exam.

A "Golden 5 minutes" planning session was designed to assist students to plan for their formative and summative MOSLER/c during the Obstetrics and Gynaecology (OG) placement. The teaching session was designed and taught to students over the years in 2016 and 2017. The aim of the session was to help students to structure their thoughts and plan their answers in that 5 minutes prior to the exam just after receiving the case scenario. The objective was to develop a positive impact on the student experience by improving their confidence and alignment of their knowledge and skills to the exam format.

Students gave positive feedback on the session, saying that "It was very effective in structuring their thoughts at those stressful moments before the exam". Some mentioned that "It helped them in their study approach, given them more confidence towards the exam, and helped to manage their performance expectation in the exam". The session was carried out over two to three hours in a small teaching group depending on the number of students in the group (ranging from 5 to 9). Each student will be given a case scenario mimicking common cases in OG and asked to do a 5-minute MOSLER/c preparation.

The preparation was repeated through four cycles on the same scenario for each student. In each cycle, 5 minutes for planning was given followed by feedback from the lecturer. In the first cycle, the student received feedback on time management and key entrance for each case. They were advised to distribute one minute for each of the following components: history, examination, investigations, differential diagnosis, and management plan. Then the second cycle was performed, and feedback was given in the form of case-based discussion to consolidate knowledge and align it to exam expectations. After the third cycle, an individualized feedback was given to each student to achieve a structured plan. After the fourth cycle, students' plans were marked, and personalized feedback was given to those who did not achieve the target plan on time. Students were asked to compare their first and last attempt in planning for MOSLER/c to check their progress. At the end of the session, students received a verbal feedback. They were encouraged to use the techniques learned and implement them in their case preparation throughout the rotation as a team prior to their SM.

This study aimed to investigate the effectiveness of the Golden 5 minutes' preparation session in improving the pass rate and reducing the number of failed domains during MOSLER/c, as well as to evaluate the student's perception towards the session.

Methodology

This was a cross-sectional study that was carried out between 15th October 2017 and 1st July 2018. Respondents were Year 3 and 5 medical students in NUMed who had undertaken their OG clinical

placement.

A pilot study was conducted between 1st Sept and 14th October 2017, where golden 5-minute preparation teaching session was given to the first two clinical placements of Year 5 students (n=47). Pre-testing of the teaching session and questionnaire (Appendix 1) were conducted using these groups of students to identify any gaps and modify the questionnaire if necessary. Two OG specialists also reviewed and finalised the study design and questionnaire after the pilot testing. The students who participated in the pilot study were not included into the main study.

All the remaining students in Year 5 (n=70) and all Year 3 students (n=100) participated in the session during OG clinical placement, which made up a total number of 170 students who participated in this study. All the students participated in the session were given equal opportunities of learning. Using a purposive sampling, the study sample was divided into two groups of Year 3 and 5 with a group of the students given the session pre-FM and another group post-FM to study the effectiveness of the session. Their performance in FM was captured to determine if they had passed FM successfully or failed FM with one or more domain. All the students were given the opportunity to evaluate and share their views towards the session.

After all the students had completed their SM, the anonymous questionnaire which contained ten questions ('YES', 'NO' or no response options) and a written informed consent form (Appendix I) were distributed at the end of their clinical placement to collect further data including students' perception towards the effects of the session on their confidence, motivation, and study, also alignment of their knowledge and skills to the exam format. However, a third option was left blank to indicate uncertainty. All the students attended the session (n=170), however, nine of the forms were completed without consent, hence were omitted from the study. Written informed consent was taken prior to participation and anonymity was maintained. The study was approved by NUMed Research Ethics Committee and Newcastle Institutional Review Board.

Binary logistic regression analyses were used to assess whether attending the session before FM increased the odds of passing the FM. Data analyses were performed using R Environment for Statistical Computing. The odds ratio (OR) was computed as an effect size metric with 95% confidence intervals. Simple statistical techniques (percentage) were used to evaluate the overall perception related to the session post-SM.

Results

The session was attended by almost half of the students pre-FM (n=83) and the rest attended post-FM (n=87). The questionnaire was answered by all the students (n=170) post-SM, whereas 9 participants were omitted due to no informed consent, hence only 161 participants were included in the study. All the students attended the golden 5-minute preparation teaching session at the end of the rotation; hence the learning was achieved at 100%.

The session showed to improve the students' critical thinking and knowledge through the casebased discussion of the common cases practiced during the session. This also improved the alignment of knowledge and clinical skills to the exam format through increased student's awareness and practice of exam format. This was reflected by the odds of passing compared to failing in more than one domain, which was significantly greater for students who had attended the session pre-FM, in addition to the remarkable responses of student's questionnaire on the session post-SM.

All the students' perception (n=161) towards the session which was based on the questionnaire results at the end of their clinical placement post-SM was evaluated and the results were shown in Figure 1. Almost all of the students understood the concept of the session (99.4%), 93.7% were able to achieve 5 minutes MOSLER planning by the end of the teaching session, 96.2% of students had applied the planning technique during their SM, and 89.9% had successfully passed their SM.

All the students believed that the session had helped them to align their knowledge (100%), 92.5% students believed that it helped to align their clinical skills to the needs of SM and 99.4% of the students said that it had structured a good planning for SM. Students also recognised that the session improved self-confidence in exam performance (93.7%) and they were motivated to use the new strategies for their exam performance (91.8%).

Model predictions (probability of passing) from the logistic regression models are shown in Figure 2. The odds of passing compared to failing a single domain did not differ significantly between students who had attended the session and those who did not (OR=1.13, 95% CI = 0.54-2.37). However, the odds of passing compared to failing more than one domain, was significantly greater for students who had attended the session pre-FM (OR = 2.28, 95% CI = 1.02-5.13).

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Figure 1: Percentage based on structured feedback for student's achievement and perception towards the session (SM=Summative MOSLER)



Figure 2: Odds of passing compared to failing in a single or more domains.



Figure 3: Comparison of the total pass to total fail.



Figure 4: Percentage of students pass or fail the Year 3 and 5 upon attending or not attending the session.

The study compared total pass to total fail (fail = \geq 1 domain), which was not significant (p-value = 0.217), refer to Figure 3. Further details based on whether the students attended the session or not and the impact on the results for Year 3 and 5 is shown in Figure 4.

Comparison between the Year 3 and 5 for pass or fail showed no significant difference in proportion passing between years (P = 0.1433), as shown in Figure 5. There was a difference in the numbers of students with an improvement in passing the FM in

Year 5 more than those in Year 3, although this did not achieve statistical significance. This may be due to the small sample size of Year 5 students, an increase in Year 3 and 5 failure for students who did not attend the session; 28.6% vs 21.4% and 21.4% vs 17.1%, respectively, as well as an increase of passing students among Year 5 upon attending compared to not attending the session (37.1% vs 24.3%) as shown in Figure 6. This difference which favoured Year 5 students can be rationalized to say that they have more mature experiences in exams, programme outcomes and implementations.



Figure 5: Comparison of Year 3 and 5 pass or fail.



Figure 6: Total percentage of students pass, fail one or fail more than one domain upon attending or not attending the session.

Discussion

Our findings are consistent with McLean's¹⁹ and Giacalone's²⁰ findings in their research which supported the impact of case-based discussion on improvement of their critical thinking and knowledge.¹⁹ The use of feedback loop concepts can improve the student performances.¹⁵

Memory failure can occur under stressful situations

such as by 'going blank' due to the exam pressure. Self-testing and retrieval or recall practice can increase the subsequent recall rates and develop more robust memory which can become resistant to the effects of stress and anxiety.²¹ Pre-class reading can also help students to achieve the course content and result in improved exam performance.²² Chua stated that "we think that exams are an objective measure of learning, but they're really not". Students might know the information very well, but if they did not have effective exam-taking skills, they might be under-evaluated. Performance in exams can be improved when students are familiar with the exam structure, different sections of the exam and answers to the questions.³

Dunlosky et al. (2013) supported the positive impact of the training session on the alignment of knowledge and clinical skills to the exam format.¹⁵ Sweiry et al. supported that improvement of performance was due to awareness on the exam format and expectations.²³ Stanley and Karbalaei believed that strengthening the student's critical thinking improved the student's academic achievement and performance. ^{24,25}

Limitation

Our study was conducted in a single site with a small number of participants. Therefore, the results of our study may not be generalized to other settings. Future studies should be carried out with a larger sample size and implementing the session in subsequent years or other medical schools may add on to the creditability of this session as a teaching tool.

Conclusion

Timely practice on the exam format and managing the exam expectations raised the students' confidence, motivation, and reduced the exam stress. Implementation of the modified educational experiences helped with the alignment of the knowledge and skills to the exam format. A wellstructured and scheduled practice on the exam format helped the students plan for their study, improve their learning, recall their knowledge and perform in their exam.

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Appendix I

Golden 5 Questionnaire – Study Information and Consent Form.

STUDY INFORMATION.

Thank-you for agreeing to take part in this study which aims to evaluate the impact of having a "Golden 5 minutes" training session on the pass rate of a MOSER examination. It also aims to assess the perceived benefits of introducing such a session.

The study asks the candidates to complete a questionnaire which should take less than five minutes.

Before starting we need you, please, to sign the consent form below. To protect your privacy the form will be stored separately to the completed questionnaire which will be completed anonymously.

CONSENT FORM.

All information you provide on the study questionnaire is strictly anonymous and will only be used for research purposes. You have the right not to take part in this study. Refusal to participate or withdraw from this study will incur no penalty or loss of rights and benefits. The study personnel retain the right to withdraw your participation at any time. Further information about the study can be obtained from Dr. Hassan Karali (hassanfadhil.hussainkarali@newcastle.edu.my)

I hereby give consent for the information provided in this questionnaire to be used for research purposes, including publications.

Please tick box if you wish to give consent.

Signature..... Date

Questionnaire on "Golden 5 teaching session"

Feedback of student's perception for the session:

Please tick YES or NO box. If unsure do not tick.

YES	NO
YES	NO
YES	NO
YES	NO
YES	NO
YES	NO
YES	NO
	YES YES YES YES YES YES YES YES YES YES

Thank you for your Feedback

The World Journal of Medical Education & Research (WJMER) is the online publication of the Doctors Academy Group of Educational Establishments. It aims to promote academia and research amongst all members of the multi-disciplinary healthcare team including doctors, dentists, scientists, and students of these specialties from all parts of the world. The journal intends to encourage the healthy transfer of knowledge, opinions and expertise between those who have the benefit of cutting-edge technology and those who need to innovate within their resource constraints. It is our hope that this interaction will help develop medical knowledge & enhance the possibility of providing optimal clinical care in different settings all over the world.



