Objective Structured Clinical Exam-related Psychological Distress and Clinical Performance among Emergency Nursing Students

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Abstract

Background: Nursing students frequently experience psychological distress during the high-stakes Objective Structured Clinical Examination (OSCE), which may affect their clinical performance. However, there is limited information on the magnitude of this association, especially in emergency nursing education. The purpose of this study is to investigate the association between emergency nursing students' clinical performance and psychological distress related to the OSCE. **Aim**: this study aimed to investigate the association between emergency nursing students' clinical performance and psychological distress related to the OSCE. **Methods**: a descriptive, correlation research design was used in this study; the sample consisted of 259 nursing students registered in an emergency nursing course. The OSCE performance checklists were used to evaluate clinical performance, while the State-Trait Anxiety Inventory (STAI-Y) and Perceived Stress Scale (PSS) were used to measure psychological discomfort. **Results:** During the OSCE, 86.9% of students experienced severe state anxiety, and 87.6% of students reported severe anxiety trait, indicating high levels of psychological distress. The majority of students (91.9%) reported feeling moderately stressed. There was a weak but significant negative connection between OSCE performance and perceived stress and anxiety ($r = -0.134$, $p = 0.031$; $r = -0.165$, $p = 0.008$). **Conclusion:** Emergency nursing students experience extensive OSCE-related psychological distress, which weakly but significantly correlate with OSCE clinical performance.

Keywords: Anxiety, clinical performance, nursing education, OSCE, stress, psychological distress

Introduction

Clinical nursing education is at the core of a nurse's career. In addition to enhancing nursing and clinical skills, which are critical for providing safe patient-centered care, it enables students to convert theoretical knowledge into practical abilities (Zhang et al., 2022). Students must use combinations of information, abilities, and professional attitudes they will require in their later careers to be assessed for clinical competency. As a result, there is a significant paradigm shift from a standard exam to a thorough, authentic, and dynamic evaluation of clinical competencies (Nurunnabi et al., 2023; Shipton et al., 2019).

A crucial element of this change in nursing education is the Objective Structured Clinical Examination (OSCE). Students move through timed stations in this structured format, which is intended to measure a variety of clinical and professional competencies objectively. These include communication skills, critical thinking, psychomotor tasks, physical examination, self-confidence, and emotional control (Mojarrab et al., 2020). OSCEs are widely utilized as reliable and

accurate assessment tools, as they can evaluate clinical preparation in real-world settings and foster skill development and educator enthusiasm. OSCEs require students to exhibit a variety of abilities in high-fidelity, time-sensitive settings, often simulating real-life interactions with standardized patients. Consequently, OSCE is recognized as a crucial tool for assessing psychomotor skills in clinical education. (Dewan et al., 2024; Taylor et al., 2019).

Despite their educational benefits, OSCEs are also known to cause students to experience severe psychological distress, including anxiety, stress, and occasionally burnout, at levels that are frequently higher than those induced by written or simulated clinical exams (Baig et al., 2014; Dewan et al., 2024; Fouad et al., 2019). OSCE-related stressors include competing environments, limited time per station, direct observation, uncertainty regarding exam content, and unfamiliarity with the assessment process. These elements have a particularly significant effect in high-stakes situations like emergency nursing, when the capacity to function well under pressure is crucial (Alaskar et al., 2022; Awad et al., 2017). Additionally, the emergency nursing curricula fundamentally require the cultivation of adaptability, rapid decision-making, and resilience, attributes that are essential for functioning in unpredictable, high-acuity environments (Awad et al., 2017).

Significance of the study

Alexandria University, Faculty of Nursing has integrated OSCE in its critical care and emergency nursing courses in both ongoing and final clinical exams. This approach is crucial in preparing nursing students for the demanding nature of clinical practice. OSCEs immerse students in realistic, high-pressure scenarios, which is crucial for developing their technical and soft skills. Therefore, several studies have addressed the connection between clinical performance and psychological suffering associated with OSCE. While some research indicates that moderate stress can occasionally improve alertness and performance, numerous studies have found a significant negative correlation between high anxiety/stress levels and decreased clinical competence, judgment, and attention in OSCE (Mojarrab et al., 2020; Vasli et al., 2021). These disparities in the literature highlight a significant gap, underscoring the need for further investigation into the extent and impact of psychological distress linked to OSCEs on actual clinical performance. This need is particularly vital for emergency nursing students, who are required to demonstrate higher levels of competence in acute care practice.

Aim of the study:

This study intended to examine the relationship between OSCE-related psychological distress and clinical performance among emergency nursing students.

Research questions:

● What was the level of anxiety experienced by emergency nursing students before the OSCE?

● What was the level of perceived stress experienced by emergency nursing students before the OSCE?

● Was there a significant relationship between anxiety/ perceived stress and clinical performance among emergency nursing students during the OSCE?

Materials and Methods

I. Materials

Research design:

This study employed a descriptive correlational approach to accomplish the aim of the present study.

Setting: This study was conducted at the Critical Care and Emergency Nursing Department, Faculty of Nursing, Alexandria University

Subjects:
The study sample consisted of a convenience sample of 293 second-year nursing students enrolled in the first semester of the Emergency Nursing Course during the 2024–2025 academic year. 259 out of the 293 nursing students in the sample agreed to take part in the current study.

Tools:
The present study utilized three tools.

Tool I: State-Trait Anxiety Inventory (STAI-Y)
Spielberger et al. created this self-report tool in 1970 to measure adult anxiety. The two components of this measure are anxiety state and anxiety traits. The forty items that make up the STAI-Y are separated into two subscales: twenty items for trait anxiety (Form Y-2) and twenty items for state anxiety (Form Y-1). A four-point Likert scale is used to rate each item: Regarding State Anxiety: Trait anxiety ranges from 1 = Almost never to 4 = Almost always, whereas 1 = Not at all to 4 = Very much so. Each subscale has a score between 20 and 80, where higher scores correspond to higher anxiety levels and lower scores to lower anxiety levels. For each section independently, Students obtaining scores in the range of 20 to 37 were classified as experiencing mild anxiety, those who obtained scores between 38 and 44 were classified as experiencing moderate anxiety, and those who obtained scores in the range of 45 and 80 were classified as experiencing severe anxiety (Spielberger et al., 1970).

Tool II: Perceived Stress Scale (PSS)

Sheldon Cohen and associates (1983) created this instrument to gauge emergency nursing students' reported stress levels in connection with their OSCE participation. In order to assess baseline stress perceptions and investigate their possible impact on clinical performance, the instrument was administered before the OSCE. Each of the ten items on the test is scored on a 5-point Likert scale, with 0 denoting "never" and 4 denoting "very often." Scores between 0 and 13 were regarded as low stress. Modest stress was defined as scores between 14 and 26. Perceived stress was high for scores between 27 and 40(Cohen, S., Kamarch, T., & Mermelstein, 1983).

Tool III: OSCE Performance Evaluation Checklist
This tool consists of three performance evaluation checklists for the following procedures namely cardiopulmonary resuscitation, oral suction, and oropharyngeal airway insertion. These checklists were developed based on AACN Procedure Manual for High Acuity, Progressive, and Critical Care to evaluate students' performance based on the relevant literature (Bell, 2017). A score of one was given to the students for correct performance, and zero for incorrect or no performance. A total of the three procedures were given a percentage score out of 100. A score < 60% indicates low performance, 60–74% was satisfactory, 75–89% was good, ≥ 90% was Excellent.
In addition to demographic data of nursing students which include age, sex and GPA.

II. Method

1. Tools Validation and Reliability
Content validity of the tools was done by five critical care nursing experts, and required adjustments were made accordingly. The reliability of the study

tools was assessed to ensure their internal consistency and stability. Cronbach's alpha coefficient was computed for each instrument, including the State-Trait Anxiety Inventory (STAI-Y), the Perceived Stress Scale (PSS), and showed acceptable levels of reliability (0.72 and 0.75, respectively). Test-retest reliability was performed for the performance checklists of cardiopulmonary resuscitation, oral suction, and oropharyngeal airway insertion and showed (0.94, 0.96, and 0.88, respectively).

2. Pilot Study

Prior to data collection, a pilot study was carried out to evaluate the feasibility, clearness, and applicability of the study tools and procedures. The pilot included 10 % of the patch of emergency nursing students who met the inclusion criteria; however, they were omitted from the final sample.

3. Data Collection

- Before the OSCE, participants completed the State-Trait Anxiety Inventory (STAI-Y) and the Perceived Stress Scale (PSS) in a quiet setting to assess baseline anxiety and stress levels.
- Students were rotated through the three OSCE stations to assess cardiopulmonary resuscitation, oral suction, and oropharyngeal airway insertion skills. Each station had a 10-minute allotment.
- Under the guidance of qualified evaluators, groups of three students entered the lab at the same time and rotated through the stations. A structured checklist and a predetermined marking scheme were used to evaluate each student's performance.
- The aggregate of the three stations' scores was used to determine the overall performance score.
- All responses and performance scores were coded, verified, and entered into a secure database for statistical analysis.

5. Ethical considerations

Ethical approval was obtained from the Research Ethics Committee (REC), Faculty of Nursing, Alexandria University, was obtained before conducting the research (IRB00013620) (Serial Number 2022-9-14). All participants provided written informed consent stating the study purpose. Confidentiality and anonymity were assured, and participation was voluntary with the option to refuse or withdraw at any stage without penalty.

6. Statistical analysis of the data

Version 20.0 of IBM SPSS software was used to analyze the data. The data was summed up using descriptive statistics (mean, standard deviation, frequencies, and percentages). To determine normalcy, the Kolmogorov-Smirnov test was used. The following were examples of inferential analysis:

- Student t-test for comparing two groups on continuous variables with a normal distribution.
- When comparing more than two groups, use the ANOVA (F-test).
- Pearson correlation coefficient to investigate the connections between OSCE performance and psychological distress. Throughout, a significant level of $p < 0.05$ was used.

Results

Table 1 shows the distribution of nursing students according to their demographic data. Regarding sex, findings revealed a slight predominance of females (57.5%) over males (42.5%), with a mean age of 20.49 ± 0.50 years. Regarding academic performance, as measured by GPA, one third of students fell within the 3.0–3.49 range (33.2%), with a mean GPA of 3.03 ± 0.55.

Table (1): Distribution of the Nursing students according to demographic data

Demographic data	No. (259)	%
Sex		42.5
Male	110	
Female	149	57.5
Age (Years)		
≤20	132	51.0
>20	127	49.0
Mean ± SD.	20.49 ± 0.50	
GPA		
2 – 2.49	57	22.0
2.5 – 2.99	55	21.2
3 – 3.49	86	33.2
≥3.5	61	23.6
Mean ± SD.	3.03 ± 0.55	

SD: **Standard deviation**

Table 2 displays the distribution of nursing students according to the state-trait anxiety inventory (STAI-Y) and perceived stress score. Anxiety levels were notably high among participants. The State-Trait Anxiety Inventory (STAI-Y) indicated that 87.6% exhibited severe anxiety traits with a mean score of 50.05 ± 4.81, while 86.9% reported severe state anxiety with a mean score of Y2: mean 50.32 ± 5.17. The total anxiety score was also predominantly severe (96.1%) with a mean score of 100.37 ± 6.99. In contrast, perceived stress was mostly moderate (91.9%), with a mean score of 19.71 ± 4.71.

Table (2):   **Distribution of the nursing students according to of State-Trait Anxiety (STAI-Y) and Perceived stress score (n = 259)**

State-Trait Anxiety	Mild	Moderate	Severe	Total Score (Mean ± SD.)
Y1 (Anxiety trait)	0 (0.0%)	32 (12.4%)	227 (87.6%)	50.05 ± 4.81
Y2 (Anxiety state)	3 (1.2%)	31 (12.0%)	225 (86.9%)	50.32 ± 5.17
Total Anxiety score	0 (0.0%)	10 (3.9%)	249 (96.1%)	100.37 ± 6.99
Perceived stress	0 (0.0%)	238 (91.9%)	21 (8.1%)	19.71 ± 4.71

Tables 3 show the distribution of nursing students according to the total level of OSCE performance. The overall OSCE performance was classified as "satisfactory" (60–74%) for 54.1% of participants, while 35.5% achieved a "good" performance (75–89%). The mean total OSCE score was 22.36 ± 2.82 with a range of 16.0–30.0.

Table (3):Distribution of the nursing students according to OSCE level of Performance Evaluation (n = 259)

OSCE Performance Evaluation	No.	%
Levels of OSCE Performance Evaluation		
Low (<60%)	7	2.7
Satisfactory (60 – 74%)	140	54.1
Good (75 – 89%)	92	35.5
Excellent (≥90%)	20	7.7

*r*: Pearson coefficient *: Statistically significant at $P \leq 0.05$

Figures 1 and 2 display the relationship between OSCE performance and STAI-Y in addition to its relationship with stress score. Pearson correlational analysis revealed significant negative associations between psychological factors and OSCE performance. A significant weak negative correlation between anxiety score and OSCE performance   ($r = -0.165$, $P = 0.008$). Similarly, A significant weak negative correlation between perceived stress score and OSCE performance ($r = -0.134$, $P = 0.031$).

Figure (1): Correlation between State-Trait Anxiety Inventory and OSCE performance scores
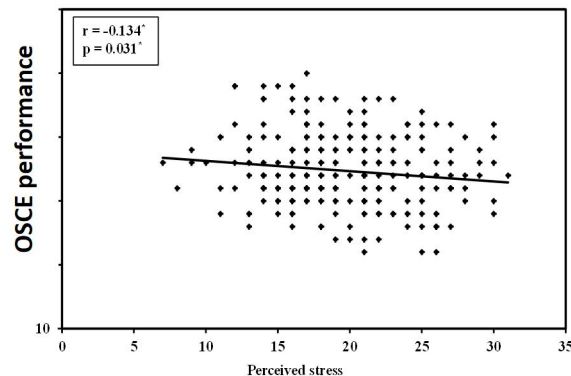
r: Pearson coefficient   *: Statistically significant at $P \leq 0.05$

Figure (2): Correlation between Perceived Stress and OSCE performance
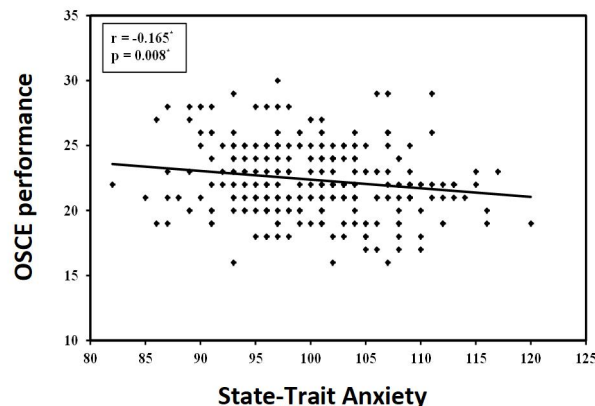
Discussion

In the current study, the State-Trait Anxiety Inventory (STAI-Y) and the Perceived Stress Scale (PSS) were used to explore how OSCE affects the psychological well-being of emergency nursing students. The findings showed that many participants experienced notable psychological strain, with high levels of both state and trait anxiety, alongside moderate levels of perceived stress.

The stressful experience of OSCE, in addition to the demanding nature of emergency nursing education, which requires students to make rapid, accurate clinical decisions—appears to contribute to elevated anxiety and stress levels. These findings align with previous research that show that anxiety is particularly common in situations demanding precision and efficiency, often resulting in heightened performance stress. In psychological terms, this phenomenon is referred to as performance anxiety, characterized by feelings of tension when carrying out tasks under evaluation based on time limits.

These findings are in line with Ahmed et al. (2023) study findings which reported that nursing students often experience higher levels of both state and trait anxiety compared to their peers in other disciplines, particularly at the start of their clinical training (Ahmed et al., 2023). Sun et al. (2020) found that students who faced challenges in clinical practice—such as difficulties with communication, time management, or fears of causing harm to patients—tended to exhibit significantly higher levels of both state and trait anxiety (Sun et al., 2016). Furthermore, Simbolon et al. (2024) reported that during OSCE, 70.9% of students experienced extreme anxiety (Simbolon & Simbolon, 2024). Furthermore, other research studies indicate OSCE's rigorous structure, evaluative atmosphere, and the pressure of being observed cause significant emotional discomfort for nursing and healthcare students (Bellido-Esteban et al., 2021; Mojarrab et al., 2020).

Nursing students often find OSCE stressful for various reasons, such as being directly observed, facing high expectations, feeling unprepared, limited time to complete tasks within the time allowed, and enduring long waits before the exam. These factors likely contribute to the moderate stress levels observed in this study. Additionally, taking the exam alongside peers and under the watch of unsupportive examiners further heightened stress. Supporting this, Emebigwine et al. (2023) reported that over half of first-year nursing students felt somewhat stressed after their first OSCE, with time pressure cited as the main stressor. The evaluation pressure and fear of judgment by instructors or classmates significantly increase students' stress (Emebigwine et al., 2023). Furthermore, Bani-Issa et al. (2019) described the experiences of assessors and undergraduate nursing students using the OSCE to evaluate physical assessment skills. The findings of this study showed that the participants reported that the exam is stressful (Bani-issa et al., 2019).

The findings of the current study also showed that emergency nursing students' OSCE performance was primarily in the "good" and "satisfactory" range. These findings highlight that only a little percentage of students achieved the highest performance level, but they also show that students' clinical performance ranged from moderate to strong. The distribution of OSCE results in the current study is consistent with other studies that emphasize the significant challenges that nursing students found during OSCE, especially in emergency scenarios where nurses must give specialized care to a variety of sick or injured patients. These patients may be

unstable, have complex needs, and be dealing with serious health or psychological problems that call for close nursing care.

Students frequently describe the OSCE as a demanding, high stress setting that evaluates not only their knowledge and psychomotor abilities but also their clinical thinking, communication, and stress resilience. Students also indicated that time constraints, the public nature of performances, and the fear of making mistakes can all prevent the best potential display of skills and knowledge (Alamri et al., 2022). Furthermore, this outcome is consistent with research by Alamri (2022), who observed that average scores generally fall between "satisfactory" and "good" performance. Although it admits that the OSCE can induce tension and anxiety, which can affect score distributions, Alamri (2022) also confirmed that the exam is a reliable and efficient method for evaluating nursing students' clinical competency (Alamri et al., 2022).

According to the study's findings, there was a weak but significant negative relationship between emergency nursing students' OSCE performance, perceived stress, and state-trait anxiety scores using Pearson correlation analysis. These results imply that students frequently suffer from anticipatory worry and stress, which are caused by time constraints, a lack of familiarity with the exam setting, and a fear of failing. Our study found a statistically significant inverse association between psychological distress (anxiety and stress levels) and OSCE performance scores, indicating that this psychological burden has an impact on performance. This correlation supports the findings of Eyüboğlu et al. (2021) (Eyüboğlu et al., 2021) and Al Mohsen (2023) that elevated anxiety can affect students' capacity to focus, remember clinical procedures, and

exhibit efficient psychomotor abilities under pressure(Al Mohsen, 2023).

These findings also align with those of Mojarrab et al. (2020), who found that nursing students who had higher levels of anxiety performed worse on OSCEs (Mojarrab et al., 2020). Our results also show that Ahmed (2023) showed a negative relationship between students' assessment of the OSCE and the educational experience and high levels of tension and anxiety, which is in line with Mojarrab's research. There is a cyclical relationship between exam anxiety and students' self-perceived preparation or confidence, as students who have a lower opinion of the experience frequently suffer higher levels of stress and anxiety (Ahmed et al., 2023).

Furthermore, exam anxiety significantly impairs nursing students' clinical competency, according to Vasli et al. (2021) (Vasli et al., 2021). Furthermore, the results of this study align with prior studies that show a significant, often negative, correlation between psychological stress and clinical exam scores in nursing education. For example, high-stress situations can lead to a reduction in clinical skill display, affecting memory, focus, and motor abilities; they can also increase procedural errors in practical tasks, lower self-confidence, and impede critical thinking.

This conclusion, on the other hand, runs counter to the findings of Alamri et al. (2022) and Raziani et al. (2022), which showed that although students experienced stress during their first OSCE, this stress had a favourable impact on their test scores (Raziani et al., 2022; Yap et al., 2012). Furthermore, additional research revealed no significant relationship between stress or anxiety and OSCE performance (Pierre et al., 2004; Yap et al., 2012).

In conclusion, the current study findings point to a persistent problem with

emergency nursing education. Although the OSCE is a useful tool for assessing clinical skills, it also produces a great deal of psychological suffering, which can have a detrimental impact on students' wellbeing and academic achievement. To maximize clinical education and performance for the upcoming generation of emergency nurses, interventions that target anxiety and stress reduction—like coping programs and simulated OSCEs—are not only advantageous but probably necessary.

Conclusion

The study concluded that emergency nursing students experience high anxiety and moderate perceived stress during OSCEs, reflecting notable psychological distress. A significant yet weak negative correlation was found between OSCE performance, perceived stress, and state-trait anxiety scores. These results underscore the need for targeted institutional and educational strategies to support students' emotional well-being and optimize their clinical performance.

Recommendations

Institutions should provide simulated training and structured pre-OSCE orientations to reduce student anxiety, along with stress management strategies such as mindfulness and cognitive-behavioral techniques to enhance well-being and performance. Faculty and assessors should be trained to recognize and respond to student distress, ensuring a supportive testing environment. Reflective practice before and after OSCEs should be encouraged, and the curriculum should be reviewed to avoid clustering assessments and overloading students during OSCE periods.

References:

Ahmed, F. A., Alrashidi, N., Mohamed, R. A., Asiri, A., Al Ali, A., Aly, K. H., Nouh, W. G., Demerdash, N. A., Marzouk, S. A., Omar, A. M., Marzouk, M. M., Alkalash, S. H., Moursy, S. M., Fadila, D. E., Eldin, S. S., & Almowafy, A. A. (2023). Satisfaction and anxiety level during clinical training among nursing students. *BMC Nursing*, *22*(1). https://doi.org/10.1186/s12912-023-01352-3

Al Mohsen, Z. (2023). The effect of academic stress on lifestyle habits among medical students. *Journal of Education Technology in Health Sciences*, *10*(2). https://doi.org/10.18231/j.jeths.2023.008

Alamri, S., Al Hashmi, I., Shruba, K., Jamaan, S., Alrahbi, Z., & Al Kaabi, T. (2022). Nursing Students' Perception and Attitude towards Objective Structured Clinical Examination in Oman. *Sultan Qaboos University Medical Journal*, *22*(3), 343–350. https://doi.org/10.18295/squmj.2.2022.012

Alaskar, A., Subbarayalu, A. V., Alfaraj, E., Ramzi, O. I., Alameri, N. S., Alhababi, A., & Vijayan, M. (2022). Health science students' perceptions about Objective Structured Clinical Examination (OSCE) as a method of clinical evaluation. *Electronic Journal of General Medicine*, *19*(6). https://doi.org/10.29333/ejgm/12466

Awad, L. A., Ahmed, S., Alshamandy, A. A., & Abolwafa, N. F. (2017). Perception of Undergraduate Nursing Students towards Objective Structured Clinical Examination (OSCE). *IOSR Journal of Nursing and Health Science*, *6*(5).

Baig, L. A., Beran, T. N., Vallevand, A., Baig, Z. A., & Monroy-Cuadros, M. (2014). Accuracy of portrayal by standardized patients: Results from four OSCE stations conducted for high stakes examinations. *BMC Medical*

Education, *14*(1).
https://doi.org/10.1186/1472-6920-14-97

Bani-issa, W., Al Tamimi, M., Fakhry, R., & Tawil, H. Al. (2019). Experiences of nursing students and examiners with the Objective Structured Clinical Examination method in physical assessment education: A mixed methods study. *Nurse Education in Practice*, *35*.
https://doi.org/10.1016/j.nepr.2019.01.006

Bell, L. (2017). AACN Procedure Manual for High Acuity, Progressive, and Critical Care, Seventh Edition. *Critical Care Nurse*, *37*(2).
https://doi.org/10.4037/ccn2017256

Bellido-Esteban, A., Beltrán-Velasco, A. I., Ruisoto-Palomera, P., Nikolaidis, P. T., Knechtle, B., & Clemente-Suárez, V. J. (2021). The Effect of Psychology Objective Structured Clinical Examination Scenarios Presentation Order on Students Autonomic Stress Response. *Frontiers in Psychology*, *12*.
https://doi.org/10.3389/fpsyg.2021.622102

Cohen, S., Kamarch, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*, 385–396.

Dewan, P., Khalil, S., & Gupta, P. (2024). Objective structured clinical examination for teaching and assessment: Evidence-based critique. In *Clinical Epidemiology and Global Health* (Vol. 25).
https://doi.org/10.1016/j.cegh.2023.101477

Emebigwine, D. L. A., Linda, N. S. B., & Martin, P. (2023). Objective structured clinical examination: Do first-year nursing students perceive it to be stressful? *Curationis*, *46*(1).
https://doi.org/10.4102/curationis.v46i1.2339

Eyüboğlu, G., Göçmen Baykara, Z., Çalışkan, N., Eyikara, E., Doğan, N., Aydoğan, S., Uçaner Çifdalöz, B., Özyıldız, A., Gündüz, C. S., Cihan Erdoğan, B., Sucu Çakmak, N. C., & Istek, N. (2021). Effect of music therapy on nursing students' first objective structured clinical exams, anxiety levels and vital signs: A randomized controlled study. *Nurse Education Today*, *97*.
https://doi.org/10.1016/j.nedt.2020.104687

Fouad, S., Gouda, E., Nasser, A. A., & Kamal, D. (2019). Perception of Students, Staff and Simulated Patients towards Objective Structured Clinical Examination (OSCE). *Education in Medicine Journal*, *11*(2).
https://doi.org/10.21315/eimj2019.11.2.4

Mojarrab, S., Bazrafkan, L., & Jaberi, A. (2020). The effect of a stress and anxiety coping program on objective structured clinical examination performance among nursing students in shiraz, Iran. *BMC Medical Education*, *20*(1).
https://doi.org/10.1186/s12909-020-02228-9

Nurunnabi, A. S. M., Rahim, R., Alo, D., Muqueet, M. A., Rahman, H. H., Jahan, N., Talukder, M. A. S., & Tapu, T. T. (2023). 'Authentic' Assessment of Clinical Competence: Where We Are and Where We Want to Go in Future. *Mugda Medical College Journal*, *6*(1).
https://doi.org/10.3329/mumcj.v6i1.68987

Pierre, R. B., Wierenga, A., Barton, M., Branday, J. M., & Christie, C. D. C. (2004). Student evaluation of an OSCE in paediatrics at the University of the West Indies, Jamaica. *BMC*

Medical Education, *4*(1), 22. https://doi.org/10.1186/1472-6920-4-22

Raziani, Y., Nazari, A., & Raziani, S. (2022). Nursing students' experiences with the objective structured clinical examination (OSCE): A qualitative study. *International Journal of Africa Nursing Sciences*, *16*. https://doi.org/10.1016/j.ijans.2022.100433

Shipton, E. E., Steketee, C., Bate, F., & Visser, E. J. (2019). Exploring assessment of medical students' competencies in pain medicine-A review. *Pain Reports*, *4*(1), e704. https://doi.org/10.1097/PR9.0000000000000704

Simbolon, P., & Simbolon, N. (2024). Students' Anxiety in Facing Objective Structured Clinical Examination. *Proceeding International Conference on Religion, Science and Education*, *3*, 433–436. https://sunankalijaga.org/prosiding/index.php/icrse/article/view/1116

Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). State-Trait Anxiety Inventory (STAI) Manual. *Counseling Psychologists Press, Inc.*

Sun, L., Gao, Y., Yang, J., Zang, X. Y., & Wang, Y. G. (2016). The impact of professional identity on role stress in nursing students: A cross-sectional study. *International Journal of Nursing Studies*, *63*. https://doi.org/10.1016/j.ijnurstu.2016.08.010

Taylor, S., Haywood, M., & Shulruf, B. (2019). Comparison of the effects of simulated patient clinical skill training and student roleplay on objective structured clinical examination performance among medical students in Australia. *Journal of Educational Evaluation for Health Professions*, *16*.

https://doi.org/10.3352/jeehp.2019.16.3

Vasli, P., Shahsavari, A., Estebsari, F., & AsadiParvar-Masouleh, H. (2021). The predictors of nursing students' clinical competency in pre-internship objective structured clinical examination: The roles of exam anxiety and academic success. *Nurse Education Today*, *107*. https://doi.org/10.1016/j.nedt.2021.105148

Yap, K., Bearman, M., Thomas, N., & Hay, M. (2012). Clinical Psychology Students' Experiences of a Pilot Objective Structured Clinical Examination. *Australian Psychologist*, *47*(3). https://doi.org/10.1111/j.1742-9544.2012.00078.x

Zhang, J., Shields, L., Ma, B., Yin, Y., Wang, J., Zhang, R., & Hui, X. (2022). The clinical learning environment, supervision and future intention to work as a nurse in nursing students: a cross-sectional and descriptive study. *BMC Medical Education*, *22*(1). https://doi.org/10.1186/s12909-022-03609-y