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CORRELATION BETWEEN LEARNING STYLES AND PERFORMANCE IN OBJECTIVE STRUCTURED CLINICAL EXAMINATIONS (OSCES) AMONG UNDERGRADUATE NURSING STUDENTS

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ABSTRACT

Background:

Learning styles play a critical role in shaping students' academic and clinical performance, particularly in nursing education where practical skills are vital. Objective Structured Clinical Examinations (OSCEs) are widely used to evaluate clinical competence. However, limited research has explored the impact of individual learning styles on OSCE performance among undergraduate nursing students.

Aim:

This study aimed to determine the correlation between learning styles and OSCE performance among undergraduate nursing students in nursing colleges located in Swat, Pakistan.

Methods:

A quantitative correlational research design was used. The study included second, third, and fourth-year undergraduate nursing students from various colleges in Swat. The sample size of 260 students was determined using the Raosoft sample size calculator from a total population of 800. Stratified random sampling ensured proportional representation across academic years. Data collection involved the VARK questionnaire (Version 7.8) to assess learning styles and institutional OSCE records to determine clinical performance. Data were analysed using SPSS version 27, employing descriptive statistics and Pearson's correlation.

Results:

The most common learning style was kinesthetic (32.3%), followed by auditory (25.8%), visual (22.3%), and reading/writing (19.6%). Students with a kinesthetic learning style achieved the highest mean OSCE scores (76.4 ± 7.3), while visual learners had the lowest (68.2 ± 7.5). A moderate positive correlation was found between learning styles and OSCE performance ($r = 0.436$, $p = 0.001$).

Conclusion:

Learning styles significantly influence OSCE performance. Adapting teaching strategies to accommodate diverse learning preferences can enhance clinical competence and academic success in nursing education.

Keywords:

Learning styles, OSCE, nursing students, clinical performance, VARK, correlation study, nursing education

INTRODUCTION

Learning styles are the preferred method of processing, retention, and picking up information. In education, these are commonly distinguished by the VARK model, Visual, Auditory, Reading/Writing, and Kinesthetic (Cabual, 2021). Objective Structured Clinical Examinations (OSCEs) are performance-based tests that focus on clinical competencies of a student, i.e., communication, decision-making, and practical intervention (Singh et al., 2023). Such assessments are essential in showing clinical competence of the undergraduate nursing students who are in a baccalaureate program. Discovering the impact of various learning styles on OSCE performance is also important in the development of educational strategies that are in conformity with student needs to increase learning and clinical competence (O'Rae et al., 2024).

OSCEs have become the most common assessment tool used in nursing teaching around the world. This notwithstanding, there has been a call into question over the variable performance of students regardless of their extensive use, and this has been seen as a reflection of a mismatch in teaching and learning styles by sectionalizing the methods (Montgomery et al., 2021). Studies have indicated a percentage of 40-70 of students who manifest high levels of stress or anxiety during OSCEs, and it might interfere with performance. Besides, a variety of learning styles in nursing cohorts is not always supported by standardized approaches to teaching. This supervision enhances a performance discrepancy that needs to be followed with more scrutiny on the manner in which learning preferences can affect the results in OSCE (Foladovandi et al., 2024).

Learning styles have an effect on the way learners meet course content and clinical practice. Learners may be visual and thus do well when exposed to images, charts, or videos, as well as kinesthetic learners, who do well in a practical environment, such as a skills laboratory (Raimi et al., 2024). Lectures and discussions favor auditory learners, and the reading/writing learners do well with textual materials. When educational strategies are not correlated with these preferences, students might not be able to develop adequate concepts and understandings to apply them, especially in high-stakes clinical activities. The identification and enabling of a variety of learning styles can increase knowledge and generate confidence in the students (Ezzeddine et al., 2023).

OSCEs are important in assessing the preparedness of a student to practice in the clinical setting. They replicate real nursing situations and require the use of theoretical as well as psychomotor skills (Montgomery, Chang, Ho, Smerdely, & Traynor, 2021). With OSCEs, there is a time limit to this, unlike written exams, which makes their complexity quite high. Since they involve more than memorization--since they involve synthesis, judgment, and interpersonal skills there is a strong possibility that different students would be well prepared and perform according to individual aptitudes on how they learn. Matching the learning style with the OSCE preparation can therefore be a doorway to success in academics and the clinical world (Ullah et al., 2025).

Nonetheless, there are some issues with the process of medical training when it comes to accommodating learning diversity in the nursing field. Most programs operate under the same teaching model which ignores the diverse needs of learners (Khelifi & Hamzaoui-elachachi, 2024). Such a one-size-fits-all can have a negative effect on students of other learning styles in areas in which skill proficiency is centered, like OSCEs. Psychological pressure that comes together with OSCEs may also contributing to the poor performance, particularly in subjects who are not able to adjust to the new formats. The direct rapport between learning styles and OSCE performance has not been a research subject and has portrayed a knowledge taboo in the literature on nursing education (Freire & Delavan, 2021).

There is enormous pedagogy in integrating the awareness of learning styles into the teaching and learning strategies. It leads to personalization of education, when adaptive approaches to the training, like simulation training, visual learning tools, peer-to-peer learning, and self-based learning modules, are promoted (Pagaduan & Natividad, 2025). Such interventions are able to suit various learning dispositions and effectively equip students to the multidimensional nature of clinical tests. The alignment of instructional strategies with the needs of learners might not only facilitate better performance on the OSCE but also help learners to be more engaged and learn skills more deeply (Muirhead et al., 2022).

This study aims to investigate the relationship between learning styles and performance with the OSCE undergraduate nursing students. Exploring such relationship may provide valuable insights on

the way educators can impact clinical teaching and evaluation. These results can sustain the implementation of an increasingly inclusive teaching model, improve student support schemes, and assure that assessment tools, such as OSCEs, would capture a student potential and clinical skills more accurately. Finally, it is also expected that this work will help crossing the chasm between the theory and practice of education, helping to achieve better and fairer nursing education.

Methodology

In this study, the researcher used a quantitative correlational research design to determine the relationship between the learning styles and performance in Objective Structured Clinical Examinations (OSCEs) among undergraduate nursing students. To make sure that the students of different academic background would be included in the research, it was carried out at different nursing colleges that are situated in Swat, Pakistan. The population served was the second, third, and fourth-year students taking undergraduate nursing programs.

Maximum population = 800 students were used as a value to estimate the sample size using raosoft sample size calculator. The minimum size of participants used was 260 people with 95% confidence and 5 percent margin of error. The stratified random sampling method was employed, where representation between all the academic years represented in the study would be proportional. Their participation was determined on the basis of enrolment in either second, third, or fourth year of the nursing program and prior experience in attending at least one OSCE.

Data Collection Procedure

Two (adopted and validated) standardized instruments were devised to measure the data. First, we administered VARK questionnaire (Version 7.8) to determine favored learning styles by students. Use of this tool would divide the learners into four key categories, namely Visual, Auditory, Reading/Writing, and Kinesthetic. Second, institutions were able to access records of OSCE performance, and both students and administration gave prior permission. The scores were an average of the last marks the students got on the OSCEs.

Data Analysis Procedure

Descriptive statistics were conducted with the Statistical Package for the Social Sciences (SPSS) version 27. Demographic traits, learning behaviors, and the performance of the OSCE were summarized into frequencies, percentages, means, and standard diversions. The relationship between learning styles and the OSCE scores was identified by the Pearson correlation coefficient. Any level of $p < 0.05$ was found to be statistically significant.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board (IRB) of Zalan College of Nursing SWAT before the study commenced. All participants were provided with detailed information regarding the purpose, procedures, potential benefits, and risks associated with the study. **Written informed consent** was obtained from each participant, ensuring voluntary participation.

Results and Analysis

Demographic Characteristics of Participants

The study included 260 nursing students, with the highest representation from the 2nd year (34.6%), followed by equal participation from 3rd and 4th years (32.7% each). A majority of participants were male (81.5%), while females comprised 18.5%. Most students were aged between 21–23 years (48.5%), followed by 18–20 years (28.5%) and 24 years and above (23.1%). This demographic distribution ensured balanced representation across academic levels and age groups [Table 1].

Table 1: Demographic Characteristics of Participants (n = 260)

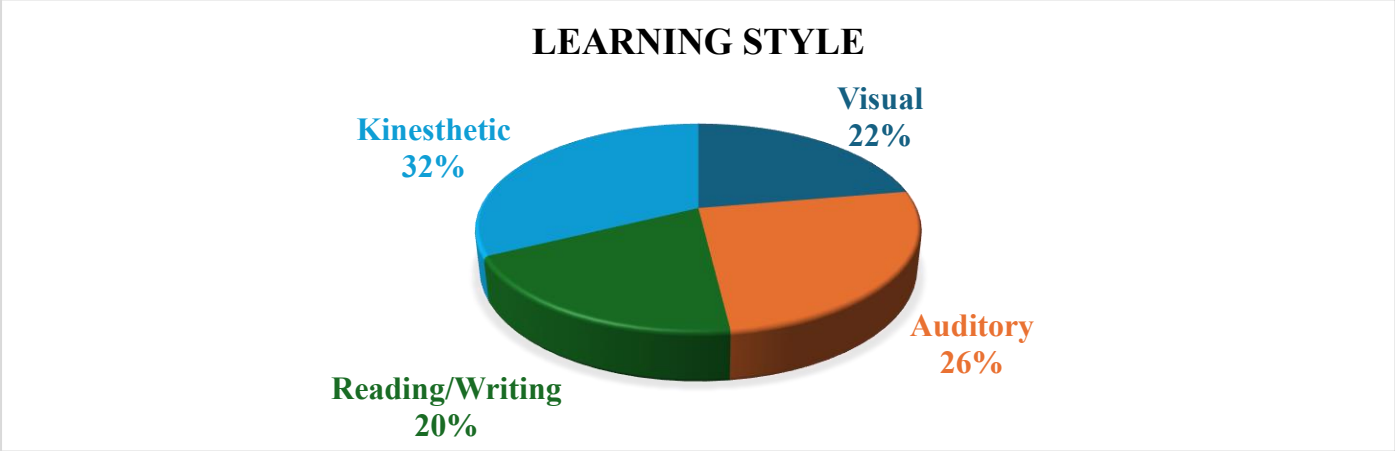
Variable	Category	Frequency (n)	Percentage (%)
Year of Study	2nd Year	90	34.6%
	3rd Year	85	32.7%
	4th Year	85	32.7%
Gender	Male	212	81.5%
	Female	48	18.5%
Age Group	18–20 years	74	28.5%
	21–23 years	126	48.5%

	24 years and above	60	23.1%

Learning Styles

The majority of students (32.3%) preferred the kinesthetic learning style, indicating a strong inclination toward hands-on, practical learning. Auditory learners made up 25.8% of the sample, while 22.3% preferred visual learning methods. The least common style was reading/writing, reported by 19.6% of participants, highlighting diverse learning preferences among the nursing students [Figure 1].

Figure 1: Distribution of Students by Learning Styles (VARK)



Mean OSCE Scores by Learning Style

Students with a kinesthetic learning style achieved the highest mean OSCE score (76.4 ± 7.3), suggesting better performance in practical, hands-on assessments. Auditory learners followed with a mean score of 72.5 ± 8.1, while reading/writing learners had a moderate average of 70.1 ± 6.9. Visual learners scored the lowest with a mean of 68.2 ± 7.5, indicating a potential mismatch between their preferred learning style and OSCE format.

Table 2: Mean OSCE Scores by Learning Style

Learning Style	Mean OSCE Score	Standard Deviation
Visual	68.2	7.5
Auditory	72.5	8.1
Reading/Writing	70.1	6.9
Kinesthetic	76.4	7.3

Correlation between Learning Style and OSCE Performance

The Pearson correlation analysis revealed a moderate positive correlation (r = 0.436) between learning styles and OSCE scores, with a statistically significant p-value of 0.001. This indicates that students' learning styles are meaningfully associated with their clinical performance. Specifically, certain learning preferences, such as kinesthetic, may contribute to higher OSCE scores. The significance of the result (**$p < 0.01$**) supports the reliability of this relationship.

Table 4: Pearson Correlation Between Learning Style and OSCE Performance

Variables	Pearson's r	p-value	Interpretation
Learning Style & OSCE Score	0.436	0.001	Moderate positive correlation

OSCE Performance by Year of Study

The results show a progressive increase in mean OSCE scores across academic years. Second-year students had the lowest mean score (69.3 ± 6.7), while third-year students scored moderately higher (73.1 ± 7.2). Fourth-year students achieved the highest mean score (75.6 ± 6.9), indicating that clinical performance improves with academic

progression and experience. Minimum and maximum scores also increased across years, reflecting greater competence in later stages.

Table 4: OSCE Performance by Year of Study

Year of Study	Mean OSCE Score	SD	Minimum	Maximum
2nd Year	69.3	6.7	55	84
3rd Year	73.1	7.2	58	87
4th Year	75.6	6.9	60	89

Discussion

Results of the study showed that the nature of the correlation between learning styles and performance in OSCE among undergraduate nursing students is moderate positive. In particular, those learners who have a kinesthetic-type of learning preference obtained the best mean OSCE scores, which implies that students who learn with their hands are better when it comes to clinical examinations that demand practical abilities. Such a result can be explained by the purpose of OSCEs as acting exams that require using psychomotor skills, critical thinking, and instantaneous decision-making. This finding will reinforce the notion that where there is a match between the learning style and the assessment format of a student, there is a high chance of turning academic achievement around.

Essa et al. (2023) also confirmed these facts in their study, as the students who participated in part-time clinical work acquired practical skills, which resulted in their better results in the OSCE. Equally, the study by Rane, Choudhary, & Rane (2023), showed that Chinese students of nursing demonstrated higher satisfaction with learning and better performance when they participated in a high amount of kinesthetic activity. The latter is proven by the current study, which shows that kinesthetic learners showed the most effective results in OSCEs since, presumably, when it comes to learning through practice and active participation in clinical activities, kinesthetic learners excel.

In opposition, the visual and the reading/writing learners demonstrated a relatively poor performance in OSCEs, and this point can also be connected with the results of Jiang et al. (2023), who stressed that the usual text-based and visual materials are less effective to learn clinical skills. Although these students perform very well in theory examinations, they might not be able to demonstrate clinical capabilities in a high-pressure environment. Such a gap proves the necessity of more comprehensive teaching methods that can narrow the divide between theoretical and practical skills.

In this study, relatively high scores in OSCE were also found in auditory learners, and this fact can be explained by the observation that auditory people memorize the information presented in lectures, discussions, and verbal instructions during clinical rotations. This is in line with Cruz et al. (2024) where he said that auditory-based interactive teaching in online learning favored effective retention of knowledge. Nevertheless, such auditory learners might not be able to gain as much out of the practical simulations; however, the instruction and verbal feedback may not be given during those sessions, so the impact of the learning styles on performance is more specific.

It has also been established that students in the fourth year perform better in OSCEs compared to second- and third-year students, meaning that more academic and clinical exposure to a student increases his or her practical skills. This aligns with the study of Zhang et al. (2024), who also highlighted the importance of the gradual clinical experience on developing confidence and the level of proficiency of the skills in students. The actual change of performance in academic years also confirms the significance of using experiential learning as one of the main elements of nursing education.

Although these findings support the application of learning styles, other studies question the predictive measures of learning styles on academic performance. As an example, Iacono et al., (2023), that, besides a fixed learning preference, adaptive expertise and applying coping to failure are more important aspects regarding student success. Their results denote that the students experiencing productive struggle and reflective practice can be more successful in comparison with peers, independently of the learning style. This is an indication that, although learning styles are a useful construct, they should not be used as the only reasoning of planning curriculum (Lewis, Popov, & Fatima, 2024).

In general, the research can also be described as a contribution to the emerging literature focusing on

the importance of the individualized learning methods in nursing education. The fact that it proves a statistically significant correlation between learning styles and OSCE performance indicates the necessity of nursing educators to use heterogeneous approaches to teaching. The combination of simulation-based learning, verbal debriefings, and visual aids may serve a broader variety of learners, which eventually leads to the advancement of clinical competence and educational results.

Conclusion and Recommendations

The results of the study indicated a moderate positive correlation amongst learning styles and Objective Structured Clinical Examination (OSCE) score of undergraduate nursing students. The results indicated that kinesthetically inclined students were much better in OSCEs, which meant that in-game, practical learning fits better when it comes to evaluating clinical performance. There was also a relatively high level of performance among auditory learners as the visual and reading/writing learners had averagely performed low. Besides, the OSCE values were elevated as a clinical academic progress demonstrating that clinical experience and exposure lead to higher practical competence.

These findings demonstrate the need to pay attention to personal learning styles in nursing education and their possible contribution to academic and clinical achievements. It will enhance better performance by aligning teaching approaches and evaluation strategies to the various learning styles and help educators to support engaged learning and confidence among students.

Drawing conclusions, it can be suggested that nursing educators should put into practice the multimodal teaching strategies, including the simulation-based learning, group discussions, visual aids, reflective writing, to appeal to the different learning styles of students. Furthermore, students are supposed to be motivated to experiment and use learning strategies that will suit their style and requirement of clinical education. Exposure to an OSCE-like environment should also be early and repeated in nursing programs to achieve a lower level of anxiety and higher performance during a real practice. Finally, it is suggested that this study should be replicated with bigger and more diverse populations to confirm these results and develop them and to find out how other forms of cognitive and emotional factors affect the performance during OSCE.

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