

Original Article

A Comparison of the Academic Performance of Students throughout the Year and the Sendup Exam with Respect to Gender

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ABSTRACT

Background: The impact of gender on academic performance has garnered considerable attention in the realm of medical and dental education, revealing significant disparities. With evolving enrollment trends and academic achievements across genders worldwide, understanding these dynamics within specialized educational environments becomes crucial.

Objective: This study aimed to assess and compare the academic performance of male and female undergraduate dental students at Sharif Medical and Dental College (SMDC), Lahore, over an academic year and specifically in their sendup examinations, to identify gender-based patterns and disparities in academic outcomes.

Methods: Conducting a cross-sectional analysis among third-year BDS students at SMDC from January 2020 to January 2021, this study, after securing ethical clearance and informed consent, engaged a sample size of 491 students. Academic performances were assessed from Oral Pathology records, categorized under four performance brackets (<50%, 50% to 69%, 70% to 79%, and >80%). SPSS version 25 facilitated the data analysis, employing the chi-square test to explore the association between gender and academic performance. Statistical significance was earmarked by a p-value of <0.05.

Results: The findings indicated a significant correlation between gender and academic performance throughout the academic year ($p \leq 0.001$), with females significantly outperforming males—22% of females versus 4% of males achieved excellence. In the context of the sendup exams, the gender disparity persisted ($p = 0.022$), with exclusively female students (2%) attaining excellent performance. Moreover, 26% of female students compared to 7% of male students achieved average performance in the sendup, while the percentage of males with poor results (7%) exceeded that of females (3%).

Conclusion: The study highlights a pronounced gender disparity in academic performance among dental students, with female students consistently outperforming their male counterparts throughout the academic year and in pivotal examinations. These findings call for targeted educational interventions to address and mitigate gender disparities, ensuring equitable academic opportunities and outcomes.

Keywords: Academic Performance, Gender Differences, Dental Education, Sendup Exams, Cross-Sectional Study, Educational Disparities, SPSS Analysis.

INTRODUCTION

Medical and dental education programs are instrumental in equipping students with the requisite skills and knowledge for effective healthcare delivery. It is universally acknowledged that professional education serves as a cornerstone for securing lucrative employment opportunities (1, 2). The academic achievements of students are subject to a myriad of influencing factors, among which gender is notably significant. Gender, defined as the societal distinctions between males and females, has been consistently highlighted in literature as a critical determinant of performance and accomplishment across various domains (3, 4). A substantial

body of research conducted globally underscores the disparities in academic outcomes along gender lines, suggesting that females often surpass their male counterparts in educational settings. This divergence is attributed to differences in cognitive abilities and adaptability to academic environments, with females demonstrating greater verbal proficiency and males exhibiting superior mathematical skills (5, 6). Despite these general trends, certain studies present contrasting findings. For instance, research conducted by Wangu et al. in Kenyan secondary schools observed a higher pass rate among male students, whereas Goni et al. found no significant correlation between gender and academic performance in a college-going cohort, even when accounting for similar intelligence quotients (7, 8).

The interplay between instructional design and gender also merits consideration, as the pedagogical approach can significantly influence student outcomes. The perpetuation of stereotypes by educators, whether through biased praise or differential expectations based on gender, can adversely affect the academic engagement and performance of students. Such biases underscore the necessity for a critical examination of teaching methodologies and their alignment with the goal of fostering an inclusive and equitable learning environment (9, 10).

This study aims to delve into the nuances of academic performance disparities between genders over the course of an academic year and specifically in the context of sendup exams. By investigating whether study efforts remain consistent or intensify in preparation for final assessments, and how these patterns might vary between male and female students, this research seeks to contribute to a deeper understanding of the dynamics at play in medical and dental education (11, 12). Through this lens, the study endeavors to shed light on the broader implications of gender on academic achievement, with a view to informing educational strategies that promote fairness and excellence for all students.

MATERIAL AND METHODS

This study employed a cross-sectional design to evaluate the academic performance of third-year Bachelor of Dental Surgery (BDS) students at Sharif Medical and Dental College (SMDC), Lahore. The research spanned from January 2020 to January 2021, following the receipt of ethical approval from the Sharif Medical Research Centre (SMRC) under the clearance number SMDC/SMRC/132-20. Prior to participation, informed consent was secured from all participants, in alignment with the ethical guidelines set forth by the Declaration of Helsinki (13).

The study population consisted of undergraduate dental students enrolled in their third year at SMDC, irrespective of their age, gender, and previous academic performance. Exclusion criteria were applied to students who had been expelled, had a continuous absence of one month due to illness, or had discontinued their studies during the academic session. A sample size of 491 was determined based on a 5% precision level, a 3.25% prevalence rate of good academic performance, and a confidence level of 95% (14).

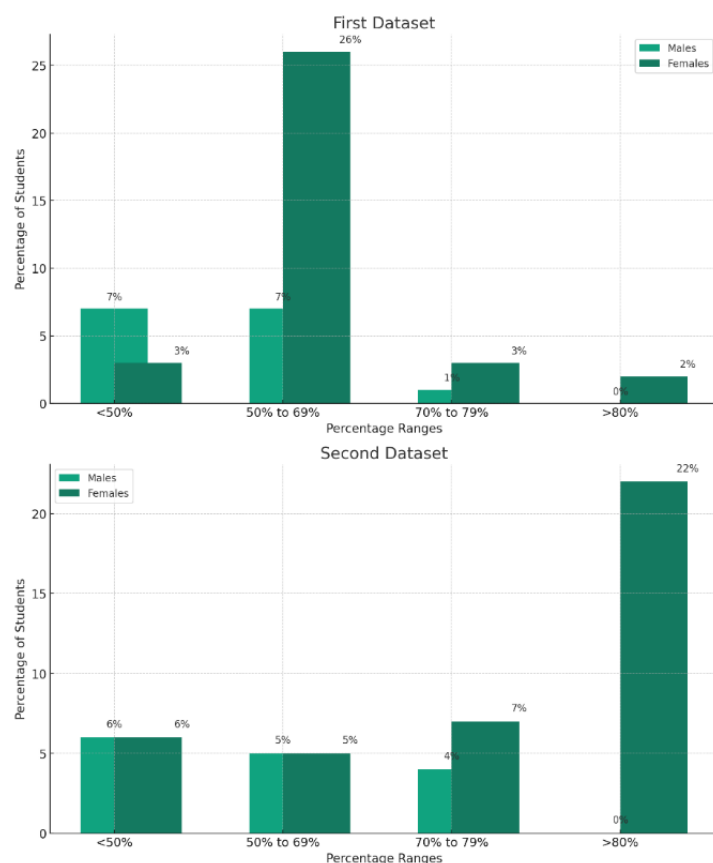
Academic achievements were gauged through the analysis of student records in the subject of Oral Pathology, focusing on two primary indicators: the cumulative percentage from monthly tests conducted throughout the year and the performance in the year-end send-up examination. For the purpose of this study, academic performance was categorized into four distinct groups: excellent (>80%), good (70-79%), average (50-69%), and poor (<50%), as delineated in the study's criteria (14).

Data collection involved a meticulous review of academic records and assessments of performance levels according to the predefined criteria. All numeric data were presented in terms of mean and standard deviation, while nominal data were summarized through frequency and percentages. The analytical process was conducted using SPSS version 25 to ensure an up-to-date approach to statistical analysis. The chi-square test was the primary statistical method employed to explore the associations between academic performance (both annual and send-up examination results) and gender, as well as the relationship between attendance records and academic outcomes. Significance was established at a p-value of less than 0.05.

RESULTS

Regarding the sendup exams, Figure 2 further highlights a gender disparity ($p=0.022$), with no males reaching the excellent performance category (>80%), whereas females showcased a substantial presence, with 22% excelling beyond the 80% mark. Conversely, male performance was notably lower, with a gradual decrease observed as performance categories ascended, culminating in a 0% representation in the highest performance bracket.

These findings succinctly demonstrate a pronounced gender gap in academic achievement both throughout the academic year and specifically in the sendup exams. Females not only outperformed males in achieving excellent grades but also displayed a broader distribution across the performance spectrum. In contrast, males showed a concentrated performance in the lower to middle ranges, with a significant absence in the highest academic achievement category.



DISCUSSION

The exploration of gender disparities in academic performance has become a focal point of global concern, reflecting broader socio-educational dynamics. Notably, variations in the enrollment and academic achievements of male and female students have been documented across diverse geographic and educational contexts (15, 16). For instance, an upward trend in the enrollment of female students in tertiary education has been observed in Saudi Arabia, paralleling similar shifts in Germany where female admissions to higher education institutions have surpassed those of their male counterparts, thereby increasing the prevalence of degree attainment among women (17, 18). Such patterns echo findings from studies on undergraduate dental students, where females have consistently demonstrated superior academic performance compared to males.

Our research aligns with these observations, revealing a significant association between gender and academic performance throughout the academic year ($p \leq 0.001$), with a notably higher percentage of females (22%) achieving excellent performance compared to males (4%). This gender-based academic disparity extends to the results of the sendup

exams, where exclusively female students were found in the excellent performance category, highlighting a profound gender divide in academic outcomes.

The study's findings are corroborated by research from the Pakistani province of Khyber Pakhtunkhwa, indicating that external factors such as security crises disproportionately affect female students' academic performance. This suggests that external socio-political challenges compound the inherent educational inequalities faced by female students, further complicating the gender dynamics within academic settings (19, 20).

Comparative analyses with other studies reinforce our results. For instance, one study highlighted a greater proportion of girls achieving scores above 70% than boys, contrasting with the higher male representation in lower performance brackets. Such discrepancies underscore the complex interplay of societal norms, gender stereotypes, and educational achievements, with girls often perceived as higher achievers due to various attributed qualities such as inspiration, capability, and presentation (16, 21).

This study, while shedding light on the gender disparities in academic performance among dental students, is not without its limitations. The cross-sectional design provides a snapshot of the academic landscape, lacking the longitudinal depth required to track changes over time or assess the impact of interventions (22). Furthermore, the focus on a single educational institution may limit the generalizability of the findings, necessitating further research across diverse settings to fully understand the gendered dimensions of academic achievement (22, 23).

CONCLUSION

In conclusion, our findings indicate that female students not only exhibit better overall academic performance but also dominate the ranks of those achieving excellence in both regular assessments and sendup exams. Conversely, male students are more likely to fall into lower performance categories, highlighting a critical need for targeted interventions to address these disparities. Recommendations for future research include exploring the underlying causes of gender-based academic differences, examining the role of educational policies and practices in mitigating or exacerbating these disparities, and developing strategies to foster a more equitable academic environment for all students.

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