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Original Article

Gender Disparities in Medical and Dental Admissions: Students' Perspectives on Barriers

Nabiha Farasat[1]*, Muhammad Ilyas[2], Raz Muhammad Kakar[1], Usama Saeed[1], Muhammad Saim[1], Muhammad Saeed[1]

[1]Bolan Medical College, Quetta, Pakistan

[2]Balochistan Institute of Psychiatry and Behavioral Sciences, Quetta, Pakistan

*Corresponding Author

Nabiha Farasat
nabihasaeed@hotmail.com

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Abstract

Objective: : To explore the gender distribution trends in the MDCAT test, MBBS, and BDS admissions at Bolan Medical College (BMC), Quetta, from 2019 to 2024, and to gather students' perceptions regarding the barriers faced by female students in medical education.

Methodology: This qualitative study was conducted in 2024 at BMC, Quetta, to examine gender inequity in MBBS and BDS admissions from 2019 to 2024. Thirty-two first-year female students from the 2024 batch were purposively selected for focus group discussions (FGDs) to explore their personal experiences regarding gender-specific challenges. The themes that emerged were safety concerns, transportation issues, cultural norms and social pressures, lack of female role models, and family support. In addition, the study examined the availability and accessibility of MDCAT preparation resources, specifically for students from rural backgrounds, who reported more challenges in accessing coaching and educational materials.

Results: : The five-year data analysis revealed persistent gender inequity, with female admissions consistently lower than male admissions. In MBBS, female admissions ranged from 39.2% (n=89/227) in 2019-2020 to 30.62% (n=105/343) in 2023-2024, while female enrollment in BDS remained relatively equal, at 61.36% (n=27/44) in 2019-2020 and 52.27% (n=23/47) in 2023-2024. Among the surveyed students, 37.5% (n=15) reported encountering barriers in pursuing health sciences. The primary obstacles identified were safety concerns and transportation issues at academic institutions (47.5%, n=19), followed by cultural norms and social pressures (20%, n=8), and a lack of female role models in college (12.5%, n=5). While most participants identified inadequate family support and limited access to MDCAT preparation as the primary obstacles, they found educational resources and coaching centers to be generally sufficient. However, a subset of students from rural areas reported restricted access.

Conclusion: There was a persistent gender inequity in MBBS and BDS admissions in BMC with female students facing considerable challenges both pre and post-admission.

Keywords: Aptitude Test, Family Support, Gender Inequality, Rural Residence, Social Support.

Introduction

Gender inequity in medical education has been a topic of increasing concern, particularly in the regions of Balochistan and Khyber Pakhtunkhawa (KP), where cultural, financial, and institutional barriers are prevalent.[1,2] In Balochistan, poverty and lack of financial resources are other contributing factors to gender inequity. Parents due to low-income sources prefer their male children for higher studies.[2] Institutional gender discrimination is also observed.[3] In remote areas, gathering males and females in one place, even for educational purposes, is against cultural norms. The representation of females in medicine has increased compared to the past, particularly after the 1960s,[4] when a female quota in public sector medical colleges was replaced with open merit in the 1990s. Since then, nearly 50% of medical college seats have been filled by female students. The last decade has been a milestone, with female enrollment surpassing 70% in most institutions.[4] However, only 34.4% of females are working in fields.[5] In Balochistan, there are 2,806 male and 1,962 female medical professionals, along with 285 female dentists and 260 male dentists.[6] Baluchistan's healthcare system is marked by the underrepresentation of female students in Bolan Medical College and three other medical colleges in the province, including Makran Medical College Turbat, Jhalawan Medical College Khuzdar, and Loralai Medical College. This disparity has significant implications for the healthcare sector, where a diverse workforce is crucial for meeting the healthcare needs of all societal segments.[7]

Females play a crucial role in creating more inclusive and effective healthcare systems, particularly in addressing the healthcare needs of women. This is especially important in regions like Balochistan, where cultural norms often prevent women from seeking medical and dental care from male physicians.[8] Consequently, addressing gender inequities in medical education is not only an issue of educational equity but also a critical factor in improving healthcare outcomes for women and underserved populations.

This study explores the barriers faced by female medical students during MDCAT preparation and throughout their professional journey. By analyzing trends in male and

female admissions, it examines the gender gap in MBBS and BDS admissions over multiple years, focusing on factors such as social and family support, perceived challenges before and during the MDCAT test, cultural norms, and institutional factors contributing to gender inequity. The study aims to fill a gap in the literature concerning the specific challenges faced by female students in medical education, particularly in the context of Pakistan's cultural and educational settings.[1,8] The findings will provide valuable insights for policymakers and educational institutions to develop targeted interventions and support systems that promote gender equity in medical education, ultimately contributing to a more diverse and inclusive healthcare workforce.

Methodology

A qualitative study was conducted from September to October 2024, after obtaining ethical approval from the Institutional Review Board of Bolan University of Medical and Health Sciences, Quetta (IRB No. 0043/BUMHS/24, Dated: 6th November 2024). Confidentiality was confirmed to the participants. Before starting qualitative data collection, a record of total admissions of males and females from the past five years (2019 to 2024) was obtained directly from the administration office of Bolan Medical College (BMC) admissions section to assess gender trends in MBBS and BDS admissions. The research staff was trained about the research topic, conveyed questions to the participants clearly, told to listen to participants' views intently and reported the findings. To check the validity (face and construct) of this questionnaire, a pilot study on 10 female students was done. Two medical educationists confirmed the face validity of the questionnaire, whereas construct validity was confirmed by applying the questionnaire to the participants of the pilot study and taking their responses to the questionnaire. Validity and reliability were satisfactory (reliability index was 0.75). Before starting data collection written consent was taken from the participants and also before the start of audio recording for the discussions, verbal consent was taken.

Data Collection Procedure: Data was collected from purposefully selected 32 female students, 20 from MBBS and 12 from BDS female professional year. Questions were asked orally and were audio-recorded (tape-recorded) by the trained staff from the participants. The semi-structured open-ended questionnaire (Annexure I) included social and family support, residence, and perceived challenges before and during the MDCAT test and after admission to MBBS and BDS impacting gender inequity in MBBS and BDS admissions.

Discussions were conducted in an isolated place within the premises of the Oral Pathology Department in a total of 4 focus groups, with 8 participants in each group. The participants were briefed about the topic of research and the discussion, and their written consent was obtained. To ensure anonymity during recording, note-taking, and analysis, each participant was assigned a unique numerical code. Twenty minutes are allotted for each participant.

The discussions were conducted in Urdu. The first author moderated all four discussions, a support staff took the notes, and the last author observed the discussions. The audio recordings were translated into English, and the transcriptions were checked with the recordings to verify accuracy. The notes and the recordings were used during various stages of data analysis. The notes provided information on the discussion setting, as well as the verbal and nonverbal expressions of the participants. The notes helped to assess the impressions, emphasis, and feelings of the participants during the discussions. The discussions used pre-formulated discussion guides with open-ended questions on gender inequalities, Social Constraints, and Perceived Barriers/challenges Pre-Post MDCAT and after admission in MBBS and BDS. Probing was done on several occasions during the discussion to gain more clarity on the issue. Cross-checking among the participants and between the groups was done to triangulate the received information. The transcript was formatted and analyzed using thematic analysis to identify recurring themes related to admission challenges in Figure 1.

Frequency and percentages were calculated through SPSS (version 26.0) to present descriptive data on gender trends in admissions from 2019 presented in Table 1 (MBBS) and Table 2 (BDS).

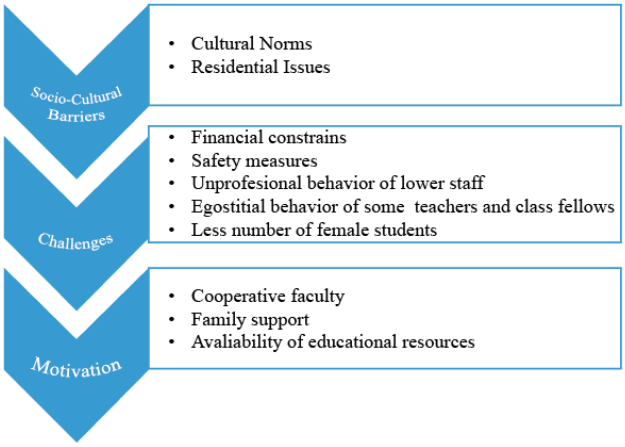

Figure 1: Themes and Subthemes extracted from the FGDs of First Year students.

Cultural Norms persenting Gender Inequity	Behavior of Discrimination	Proposed Solutions
• Domestic role for females • Worthlessness of female education • Safety concerns • Restrictions on mobility • Conservative culture • Social stigma	• Family members • Finincial constrains • Religious misinterpretations • Lack of female role model	• Community awareness programs • Provision of safety • Provision of scholorship for the poor • Transportation facility

Figure 2: Themes and sub-themes related to admission challenges and their proposed solutions.

Results:

In the study, participants reported safety and transportation, social pressure/cultural norms, lack of female role models and financial and educational resources as barriers to their academic progress. MBBS admissions at BMC from 2019 to 2024 revealed a gender gap trend showing a consistently higher male enrollment ratio than female enrollment across the five years of MBBS fluctuating slightly with the highest in 2022-2023 at 70.67% detailed in Table 1.

Table 1: Gender-wise distribution of 1st-year MBBS students during the past 5 years

Academic Year	Total Students	Male Students (n=)	Female Students (n=)
2019-2020	227	138	89
2020-2021	323	201	122
2021-2022	320	214	106
2022-2023	324	229	95
2023-2024	343	238	105

Admissions percentages in BDS are demonstrated in Table 2. The table shows a fluctuating gender distribution over the past five years, with a noticeable increase in male students in the 2022-2023 academic year, while female enrollment has varied slightly.

Table 2: Gender-wise distribution of 1st year BDS students during the past 5 years

Academic Year	Total Students	Male Students (n=)	Female Students (n=)
2019-2020	44	17	27
2020-2021	40	15	25
2021-2022	40	20	20
2022-2023	41	28	13
2023-2024	47	24	23

Pre-Admission Challenges

Residential and Family Issues: During the qualitative phase of the study participant's perceptions of the accessibility to coaching institutes varied, with those residing in urban Quetta reporting better access compared to those from surrounding areas of Balochistan. Students from the periphery complain that *"it is very difficult for us to prepare for the MDCAT test as we came from far away from Quetta and have issues in accommodation." (R.1-8)* They declare that *"we belong to poor families and don't have much money to pay hostel fee, we face problems in buying two meals a day for ourselves, as our parents cannot afford it. Many of us miss out on medical admission due to the inability to prepare for this test and afford it." (R.1-22)*

The majority of students from outside Quetta faced difficulties in coaching, household responsibilities were also identified as a substantial burden for female students preparing for the MDCAT test. Notably, Lack of family support was the least concerning factor (n=3/40) as almost all female respondents indicated strong family support during their academic pursuit, suggesting that support networks might aid in mitigating some of these barriers.

Safety Measures: During the interview, participants identified deficient safety measures that didn't match the cultural norms during the MDCAT test. One of them said *"There were too many students, all boys and girls were gathered in one place which is against our cultural norms [10] and this causes a lot of rush. We were getting nervous because of the tension of the test and secondly, we had not eaten anything and we did not sleep all night because of exam tension. (R-1)*

When asked about their perspectives on the most significant hindrances for female MDCAT test aspirants, safety concerns ranked the highest, followed by gender inequity and financial constraints.

Cultural Norms: *Another reason was that we came from distant areas and were not used to such crowded and mixed-gathering, which makes a big problem for us."* (R-22) They agreed that cultural values in areas like Quetta, and the interior of Balochistan don't change. The social life of females is limited with no communication with males, and this is the reason for our stress during the MDCAT test and after admission to the MBBS and BDS course study. Others admit "that we face a language barrier*."*

Post-Admission Challenges

These were primarily associated with gender discrimination, followed by cultural expectations and societal norms.

Safety and Financial Barriers: Participants recognize safety and financial barriers in their academics. They informed us that *"there are deficient rooms in girl's hostel and we were asked to accommodate ourselves privately till college administration provide accommodation in college hostels. We feel unsafe and financially burdened due to this issue, many of us moved back to our homes as we were unable to afford private hostel fees and our family didn't allow them to live alone in private rooms/hostel*. They further said, *"How can we live alone, we are scared and it is against our cultural norms".* (R-15)

Educational Resources: When the researcher asked about resource accessibility, most of the participants agreed that educational resources and books were equally accessible to both genders. They informed us that *"though we were not accepted the atmosphere here is very motivating, despite rude lab staff behavior of library staff and many of the faculty is very co-operative and books and net is available easily." (R-40)*

Unprofessional behavior of Lower Staff: Female students admitted the unprofessional behavior of some lower staff during their lab practical, they said; that during our practical work when we started and were in the initial stages the male staff always used to say, *'Come on, do it you're a man, take it like a man', though it was my first time in performing it … I was also told that I should man up and shouldn't be as feminine." (R-22)*

Number of Female Students: Another student said "*In our class, the low number of female students makes us feel the need to raise our voices to be heard, and sometimes it is necessary to be more aggressive with our tone." (R-30)*

The behavior of some Male Students and Faculty Members: "*Some male students as well as faculty are egotistical and feel good when girls show lack of confidence and they are always so ready to help them." (R-25)*

Discussion

This study investigates the gender distribution trends during the MDCAT test, MBBS, and BDS admissions at Bolan Medical College, Quetta, from 2019 to 2024, examine barriers to female academics and perceptions of students to

barriers, and explore possible strategies to promote gender equity in medical education. Five-year data analysis (MBBS admissions presented in Table 1 and BDS in Table 2) revealed a persistent gender inequity in MBBS admissions in BMC with female students facing considerable challenges both pre and post-admission including facing barriers to pursuing health sciences, citing safety and transportation in academic institutions as the primary barriers, cultural norms and social pressures, lack of female role models in college. On the other hand, students were satisfied regarding family support and accessibility to MDCAT preparation and educational resources and coaching, although a subset from rural areas reported limited access. Gender inequities still exist worldwide in medical education, although equality is institutionalized in many developing countries. In Pakistan, the constitution of the country guarantees equal rights to female education in all of its aspects inequality still exists.[9] Awareness programs can resolve this problem. [10] College/National organizations should match female medical students with mentors and icons who are not only a source of inspiration but also provide networking opportunities. [11] Dahal (2022) [12] from Nepal disclosed differences in educational opportunities for males and females in his community. Families usually support male children's education by enrolling them in private schools while girls are set in community schools together with early marital engagements and household work." The same inequity was observed in our study. Participants of the current study informed gender inequity during MDCAT preparation, examination, admission and in studying MBBS. To resolve issues related to MDCAT test preparation awareness programs can help change societal norms regarding gender inequity. Providing transportation and accommodation to female students during the MDCAT test, improving access to coaching centers, or providing online alternatives could bridge this gap.

The government of Pakistan has made positive efforts to curb gender inequality. During admissions, PM&DC notifies an equal distribution of seats in MBBS and BDS to both male and female students,[14] still the ratio of male students admitting to MBBS was high in the current study (Table 1). This suggests structural or social barriers impacting female education. Our findings are consistent with prior research indicating that gender biases and societal expectations can limit educational opportunities for women in traditionally male-dominated fields.[11,14,15] In a controversial finding, Rehman (2018) observed that 55% of female students were enrolled in her study conducted at Punjab Medical College, Pakistan.[16] The disparity between Punjab Medical College and Bolan Medical College can be attributed to the higher literacy rate in Punjab (61%) compared to Balochistan where 39% of males and only 16% of females are literate.[17] Whereas, in the case of the BDS profession previous studies confirm a high female percentage.[18, 19, 20] This difference in female population in MBS versus BDS is due to the low number of students in dentistry (n=40) as compared to the strength of MBBS students (n=277-374 during 2019-2024). Additionally, the short duration of professional study (4 years) in BDS as compared to 5 years MBBS is also a factor. Samuriow et al. (2019) reported that study participants observed gender inequity in their clinical settings, noting that healthcare professionals' experiences were influenced by their gender.[21] Similarly, participants in the present study identified gender disparities during their academic journey, highlighting the impact of gender on their educational experiences. The notion of a gendered culture in clinical practice has been previously reported about the impact that it had on the development of the professional identity of third-year female medical students.[21] In the current study, some female participants reported that female faculty members exhibited favoritism towards male medical students, offering them more support in their learning and practical work. However, the majority shared that nurses tended to be more supportive of female medical students, perceiving them as more vulnerable. Interestingly, two participants noted that male nurses were more supportive of female medical students than their female counterparts. Several participants also experienced unprofessional behavior from support staff during exams and admissions.

This aligns with findings from Dawood's study, where participants similarly reported unprofessional conduct from lower-level staff.[22] To address this issue, implementing staff training programs, particularly for support staff, could help promote professionalism and improve the experience for female students. Females are usually reluctant to report incidents of gender inequality because of stigmatization. Awareness-raising strategies are needed to put in place appropriate for a work environment that is more conducive and approachable for female medical student workers. [4]

Due to deficient female teaching staff students are deprived of role models/mentors and even some female students didn't pay attention to learning as they felt "exhausted, disappointed, unprotected and insecure in the pre-clinical years.[23] Female teachers act as role models motivate, provide support and learning opportunities to female students, provide them with a safe and learning environment, provoke their creativity, assist them to be competent and professional.[24, 25] Our study participants recognized the importance of female faculty.

Regarding the availability of educational resources, the finding of the current study demonstrated equally accessible educational resources to both genders suggesting progress in educational equity. However, the limited access to coaching facilities in rural areas highlights a geographical disparity that may hinder female MDCAT test aspirants from these regions, exacerbating the gender inequality or gap. Participants recognized deficient safety measures and transport issues during the MDCAT test. Males and females were gathered in one place that was against the cultural norms of our province. Similarly, a nationwide study conducted by Malik in 2023 in different cities of Pakistan found culture as a barrier to gender equity. In his study, gathering males and females in one place against cultural norms highlights how societal expectations influence gender equity, especially in KPK and Balochistan, providing an insightful discussion on cultural and societal influences related to gender inequity and the stress associated with medical admissions.1 Cultural constraints significantly affect the admission process for both genders. Controversially, cultural diversity was not a matter of discussion in the study conducted by Alyia in 2022 in some public and private sector medical colleges of Peshawar, Pakistan.3 Subjects of this study detected no cultural bias in their learning environment. However, they observed gender bias in some clinical departments.

The desire to become a doctor is at its peak in Pakistani society and most students face academic stress due to social and family pressures. [26] The strong family support, as observed in this study, lessened the pain and discomfort students experienced during the MDCAT test and admission process

among the respondents may reflect changing family dynamics, with families increasingly valuing higher education for their daughters. This support could mitigate some of the identified barriers, such as financial or societal constraints. However, the prominence of post-admission challenges, particularly gender inequity and cultural expectations, suggests the need for policies that foster gender equity within academic institutions.

Strengths and Limitations

This research work benefits from a systematic data collection methodology using BMC's MBBS and BDS admission records over five years. This is a targeted survey among female students to enhance the reliability of findings within a city/province and encourage readers to highlight the reference once working for a nationwide survey. Clear patterns of gender inequities emerged, highlighting the challenges faced by female students in accessing medical education in Balochistan. These include accommodation issues, cultural restrictions, financial constraints, and limited educational resources, particularly in rural areas. By incorporating students' perspectives, this study offers valuable insights into the systemic barriers within the region's medical education landscape, emphasizing the need for targeted interventions to promote gender equity. However, the study focuses on a very small group of participants in a single institution which may limit the generalizability of results. For more reliability in results, other medical colleges in Pakistan or regions beyond Balochistan may be included. Additionally, the reliance on self-reported data from female students introduces the possibility of response bias.

Recommendations

Future research can mitigate these limitations by incorporating data from multiple institutions and broadening the sample size to include a more diverse representation of participants. Longitudinal studies can assess whether recent interventions or policy changes impact the gender gap in MBBS admissions over time. Additionally, interdisciplinary collaborations—combining insights from sociology, psychology, and education—could offer a more nuanced view of gender disparities in medical education. Lastly, exploring additional variables, like parental education levels or rural vs. urban backgrounds, could provide a more comprehensive view of the factors influencing female MBBS admissions in Balochistan.

Conclusion

The study highlights a persistent gender gap in MBBS and BDS admissions at BMC. Notably, female students face challenges both pre- and post-admission, particularly in the areas of safety, gender discrimination, and social expectations. Despite these obstacles, strong family support was a prevalent factor in aiding female students in pursuing their education. The findings underscore the need for targeted measures, such as enhancing safety and transportation options and promoting community awareness programs, to address the structural barriers limiting female participation in medical education.

Authors' Contributions

NFK: Conceptualized and designed the study, supervised the research process, and contributed to manuscript writing and final approval; MI: Assisted in study design, contributed to qualitative data analysis, and provided critical revisions to the manuscript; USU: Conducted data collection, facilitated focus group discussions, and contributed to data interpretation; MS & MS:: Assisted in literature review, data compilation, and manuscript drafting.;; RM: Provided expert input on gender disparities in medical education, reviewed the manuscript, and approved the final draft.

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