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A Cross-Sectional Study of the Educational and Demographic Background of Medical PG Students in Central India

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ABSTRACT

Background: Medical postgraduate (PG) education in India is highly competitive and is influenced by several demographic and educational factors. This study was conducted to examine the demographic profile of medical PG students and to assess the relationship of gender, region of residence, type of undergraduate medical college, and parental occupation with the prevalence of drop years and academic performance at secondary (10th), higher secondary (12th), and undergraduate (MBBS) levels.

Methods: A cross-sectional study was carried out in 2024 among 188 medical postgraduate students from multiple specialties. Data were collected using a structured questionnaire covering demographic details, academic history, and drop years. Descriptive statistics were used for analysis, and one-way analysis of variance (ANOVA) was applied to compare age and academic performance across departments.

Results: Among the participants, 83% reported at least one drop year before postgraduate admission. The mean age of the students was 29.7 years. Male students were more commonly enrolled in surgical specialties, whereas female students predominated in non-surgical disciplines. Government medical colleges accounted for 64.9% of undergraduate training, and most students were from urban backgrounds. Academic performance in MBBS, 12th, and 10th examinations varied across departments, with Forensic Medicine and Anatomy identified as outliers with relatively lower scores. One-way ANOVA revealed statistically significant differences in age, MBBS percentage, and 10th and 12th class examination performance among different departments.

Conclusion: The study demonstrates notable demographic and academic variations among medical postgraduate students in India. These findings highlight the need for targeted educational strategies and policy-level interventions to reduce disparities and support equitable postgraduate medical training.

Key-words: Medical Postgraduate Education, Demographic Factors, Educational Background, One-Way ANOVA, Gender Disparities, Regional Diversity, Postgraduate Medical Departments

INTRODUCTION

Medical postgraduate (PG) education in India is a critical phase in developing a specialized healthcare workforce that caters to the country's diverse population.

Every year, thousands of medical graduates compete for limited PG seats across various specialties, making the process both competitive and indicative of broader demographic, socioeconomic, and educational trends.

Understanding the background of medical PG students is essential for identifying patterns, addressing disparities, and informing policies to promote equitable access to advanced medical training [1,2].

In 2024, India saw approximately 1.8 million applicants for the National Eligibility cum Entrance Test for Postgraduate (NEET-PG), competing for about 45,000 PG seats in government and private institutions. Among the applicants, 60% were male, while 40% were female,

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showing a gradual increase in female representation compared to previous years. However, gender disparities remain evident in certain fields, with men predominantly opting for surgical disciplines and women showing higher representation in pediatrics, dermatology, and non-surgical specialties [3,4].

The distribution of permanent addresses revealed that 68% of students hailed from urban areas, while 32% were from rural regions, reflecting ongoing urban–rural divides in access to quality education and resources. Additionally, data on UG college affiliations showed that 74% of successful candidates graduated from government medical colleges, while 26% were from private institutions. This highlights the continued dominance of government institutions in providing affordable and high-quality education, despite the rapid growth of private medical colleges [5,6].

Dropout rates after UG education also provided significant insights. In 2024, approximately 28% of medical graduates did not pursue PG studies, citing reasons such as financial constraints (35%), burnout and academic pressure (25%), preference for alternate careers (20%), and international migration (20%). These trends indicate the need for systemic changes to retain talent within the country's healthcare system [7,8].

Parental occupation emerged as a key socioeconomic indicator. Among PG students in 2024, 38% reported fathers working in professional roles such as doctors, engineers, or academicians, while 25% identified their fathers as business owners. In contrast, 70% of mothers were homemakers, with only 20% engaged in professional careers and 5% in business or self-employment. Furthermore, educational background data revealed that 65% of students completed higher secondary education under state boards, whereas 35% studied under national boards like CBSE and ICSE [9,10].

This study aims to analyze the educational and demographic backgrounds of medical PG students in India in 2024. By exploring trends in gender representation, regional diversity, UG college affiliation, and socioeconomic factors, this research seeks to provide actionable insights to policymakers and educators for promoting inclusivity and addressing barriers in medical postgraduate education [11].

MATERIALS AND METHODS

Study Design and Setting- A cross-sectional observational study was conducted in 2024 among medical postgraduate (PG) students at Netaji Subhash Chandra Bose Medical College, Jabalpur, Madhya Pradesh, India. The study aimed to assess the educational and demographic background of PG students and to evaluate factors associated with drop years and academic performance.

Study Population- The study population comprised all medical postgraduate students enrolled across various clinical and non-clinical departments during the study period. Students who were actively enrolled and consented to participate were included in the study. Incomplete responses were excluded from the final analysis.

Data Collection Method- Data were collected using a structured, self-administered questionnaire developed specifically for this study. The questionnaire was designed to obtain comprehensive information on demographic characteristics, undergraduate (UG) educational background, academic performance, parental occupation, and the prevalence and reasons for taking drop years after MBBS.

The questionnaire consisted of both closed-ended questions to collect quantitative data (such as gender, permanent residence, type of UG medical college, and parental occupation) and open-ended questions to capture qualitative information related to reasons for taking drop years and personal academic experiences.

The survey was administered online using Google Forms to ensure ease of access and participation among all eligible students.

Sample Size and Sampling Technique- A census sampling technique was employed, wherein the questionnaire was distributed to all eligible medical postgraduate students in the selected institution. This approach ensured that every member of the target population had an equal opportunity to participate in the study.

A total of 188 students completed and returned the questionnaire, and all responses were included in the final analysis. The sample was considered representative of the PG student population of the institution.

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Study Variables- The study variables included demographic factors (age, gender, permanent residence), educational background (type of UG college, board of higher secondary education), academic performance (percentages obtained in 10th class, 12th class, and MBBS), parental occupation, department of postgraduate study, and the presence or absence of drop years after MBBS.

Statistical Analysis- The collected data were entered into Microsoft Excel and analyzed using the Statistical Package for the Social Sciences (SPSS) software. Descriptive statistics were used to summarize the data and were expressed as frequencies, percentages, means, medians, standard deviations, and interquartile ranges where appropriate.

Inferential statistical analysis was performed using one-way ANOVA to assess differences in age and academic performance (MBBS, 12th, and 10th class percentages) across postgraduate departments. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations- The study adhered to ethical principles for human research. Participation was voluntary, with electronic informed consent obtained from all participants. Anonymity and confidentiality were maintained, and data were used solely for academic purposes.

RESULTS

The study included 188 medical postgraduate students, with a slight male predominance (53.7%). Most participants were from urban areas (75%) and had completed their undergraduate education at government medical colleges (64.9%). A large proportion of students (83%) reported taking at least one drop year after MBBS. Regarding educational background, 53.2% studied under the CBSE board, followed by state boards (43.1%) and ICSE (3.7%).

Parental occupational status showed that most fathers were employed in government services (41.5%), while most mothers were homemakers (79.3%). Overall, the table highlights the predominant urban background, government college education, and high prevalence of drop years among medical PG students (Table 1).

Table 1: Demographic and Educational Profile of Medical PG Students

Demographic Variables		Frequency	Percentage (%)
Gender	Male	101	53.7
	Female	87	46.3
Permanent Address	Urban	141	75
	Rural	47	25.
UG College	Govt	122	64.9
	Private	66	35.1
After UG Drop	Yes	156	83
	No	32	17.
Higher Secondary Board	State Board	81	43.1
	CBSE	100	53.2
	ICSE	7	3.7
Occupation of Fathers	Private Department	11	5.9
	Self	34	18.1
	Agriculture	19	10.1
	Others	30	16
	Govt Department	78	41.5
	Doctors	16	8.5
Occupation of Mothers	House wife	149	79.3
	Others	7	3.7
	Private Department	10	5.3
	Doctors	6	3.2
	Govt Department	15	8.0
	Agriculture	1	0.5

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The descriptive analysis summarizes the age and academic performance of medical postgraduate students. The mean age was 29.7 years (median: 29 years), with a standard deviation of 3.89 and an interquartile range of 4, ranging from 24 to 43 years.

The mean MBBS score was 64.9% (median: 64.1%; SD: 5.51; IQR: 8), with values ranging from 51% to 81%. The mean percentage in the 12th class examination was 80.5% (median: 81.9%; SD: 10.87; IQR: 15.1), with scores ranging from 42% to 98%. The mean 10th class percentage was 83.9% (median: 86%; SD: 11.28; IQR: 12.23), with scores ranging from 44% to 100%. Overall, the findings indicate a strong academic background with considerable variation in performance across different educational stages among medical PG students (Table 2).

Table 2: Descriptive Statistics of Age and Academic Performance of Medical PG Students

	Mean	Median	SD	IQR	Minimum	Maximum
Age	29.7	29	3.89	4	24	43
Percentage of MBBS	64.9	64.1	5.51	8	51	81
Percentage of Class 12th	80.5	81.9	10.87	15.1	42	98
Percentage of Class 10th	83.9	86	11.28	12.23	44	100

The overall dropout rate after MBBS was 83%, with significant variation across postgraduate departments. General Medicine showed a statistically significant dropout rate of 59.3% (p=0.01). Departments including Anesthesia, Psychiatry, Radiation Oncology, Pharmacology, Microbiology, Forensic Medicine, Anatomy, and Physiology reported 100% dropout rates, all of which were statistically significant (p≤0.05).

In contrast, departments such as Orthopedics, Pediatrics, General Surgery, Obstetrics and Gynecology, Ophthalmology, Radiodiagnosis, Pathology, Community Medicine, and Biochemistry demonstrated dropout rates that were not statistically significant (p>0.05), indicating relatively stable continuation patterns in these specialties. Overall, the findings indicate marked departmental differences in dropout rates following MBBS, highlighting specific specialties with significantly higher attrition (Table 3).

Table 3: Department-wise Dropout Rates After MBBS with Statistical Significance

PG Department	Drop After MBBS		Total	p value
	No	Yes		
General Medicine	11(40.7)	16(59.3)	27	0.01*
Orthopedics	2(22.2)	7(77.8)	9	0.71
Pediatrics	1(20.0)	4(80.0)	5	0.87
General surgery	2(20.0))	8(80.0)	10	0.81
Obstetrics and Gynaecology	5(35.7)	9(64.3)	14	0.14
Anesthesia	0	20(100.0)	20	0.01*
Psychiatry	0	5(100.0)	5	0.01*
Ophthalmology	1(9.1)	10(90.9)	11	0.36
Radio-diagnosis	3(50.0)	3(50.0)	6	0.11
Radiation oncology	0	2(100.0)	2	0.01*
Pathology	2(9.5)	19(90.5)	21	0.24

doi: 10.21276/SSR-IIJLS.2025.11.6.36

Pharmacology	0	5(100.0)	5	0.01*
Community Medicine	4(13.3)	26(86.7)	30	0.55
Microbiology	0	5(100.0)	5	0.01*
Biochemistry	1(14.3)	6(85.7)	7	0.84
Forensic medicine	0	4(100.0)	4	0.01*
Anatomy	0	5(100.0)	5	0.01*
Physiology	0	2(100.0)	2	0.01*
Total	32(17.0)	156(83.0)	188	

Analysis across postgraduate departments showed significant variation in age and academic performance. The mean age ranged from 26.5 years in Physiology to 35.3 years in Forensic Medicine. Mean MBBS scores varied from 58% in Physiology to 69.3% in Radiodiagnosis, while mean 12th class percentages ranged from 63.4% in Community Medicine to 88.5% in Pediatrics. The mean 10th class percentages ranged from 66% in Radiation Oncology to 91.9% in Obstetrics and Gynaecology.

One-way ANOVA demonstrated statistically significant differences across departments for age (p=0.006), MBBS percentage (p=0.02), 12th class percentage (p=0.001), and 10th class percentage (p=0.001).

Forensic Medicine and Anatomy emerged as notable outliers. Forensic Medicine had the highest mean age and comparatively lower 12th and 10th class scores, while Anatomy showed lower mean MBBS and 12th class percentages. In contrast, Pediatrics and Obstetrics and Gynaecology demonstrated higher academic performance, with the highest mean 12th and 10th class scores, respectively. Overall, the findings indicate that the postgraduate department significantly influences age distribution and academic performance (Table 4)**.**

Table 4: Relationship Between Demographic Factors (Age) and Academic Performance (MBBS, 12th, and 10th Class Percentages) Across PG Medical Departments

		Age		**Percentage of MBBS**		**Percentage of 12th Class**		**Percentage of 10th Class**	
PG Department	**N**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**	**Mean**	**SD**
General Medicine	27	28.6	3.32	66.3	4.905	84.1	9.788	87.2	8.741
Community Medicine	30	30.4	4.96	63.4	4.549	77.5	8.315	82.5	8.743
Orthopedics	9	28.9	1.965	67.9	5.126	86.3	9.407	84.7	10.225
Pediatrics	5	28.2	2.387	63.8	2.809	88.5	7.969	91.2	5.891
General surgery	10	28.4	2.319	66.9	4.218	83.3	9.055	83.9	11.077
Obstetrics and gynaecology	14	27.7	2.431	66.8	5.852	87.2	5.324	91.9	4.183
Biochemistry	7	32.3	6.317	61.7	4.766	77.1	10.024	83.3	11.485
Forensic medicine	4	35.3	5.909	63.9	9.981	67.3	6.551	66	13.565
Anesthesia	20	30.1	4.03	62.4	4.719	78.8	11.251	78.5	15.443
Microbiology	5	30.4	3.362	65.5	5.968	76.9	12.153	83.1	15.526

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Pathology	21	30.3	3.411	64	5.844	76.2	13.959	80.4	8.942
Anatomy	5	33.4	4.615	61.2	5.891	70.4	18.995	73.4	17.771
Psychiatry	5	29.2	2.588	66.2	4.563	83.7	8.124	90.3	8.167
Ophthalmology	11	27.2	1.722	67.6	6.184	82.2	8.803	91.3	5.993
Radiodiagnosis	6	29.7	3.141	69.3	6.633	88.4	5.919	88.4	6.996
Pharmacology	5	32	2.236	64.3	4.52	73.9	13.02	81.2	11.432
Physiology	2	26.5	0.707	58	9.956	74	5.657	85	14.142
Radiation oncology	2	30	1.414	61.1	1.626	82.9	4.101	70.8	22.274
p-value	188	0.006*		0.02*		0.001*		0.001*	

**Significant, One-Way ANOVA*

DISCUSSION

The findings of this study resonate with existing literature on medical education and demographic trends among postgraduate (PG) medical students. Similar gender distributions, with a slight male predominance in postgraduate medical courses, have been reported in earlier studies [12]. The predominance of students from urban areas observed in the present study is also consistent with previous reports indicating better access to educational resources, coaching facilities, and academic support among urban populations [13].

The high proportion of students graduating from government medical colleges (64.9%) aligns with earlier evidence suggesting that government institutions are preferred due to lower cost, higher patient load, and better clinical exposure [14]. The high prevalence of drop years (83%) mirrors findings from previous studies, which have documented the competitive nature of postgraduate entrance examinations as a major contributor to gap years among medical graduates [15].

Parental occupational background in the present study further supports existing literature indicating that students from families with government-employed parents often benefit from greater academic stability and financial security [16]. The predominance of homemaker mothers observed in this study reflects established sociocultural patterns reported in earlier Indian studies, in which maternal roles are largely centered on household responsibilities [17].

Academic performance indicators, including mean MBBS and higher secondary examination scores, were comparable to those reported in previous studies on medical PG students [18]. The observed inter-departmental variability in academic performance may reflect differences in competition levels, specialty preferences, and perceived career opportunities, as noted in earlier research [19].

The significantly higher dropout rates in certain specialties, such as Psychiatry, Anatomy, and Anesthesia, are consistent with previous findings that attribute attrition to factors such as high stress, limited perceived career growth, and lower specialty preference [20]. In contrast, relatively stable interest in Pediatrics and Obstetrics and Gynaecology aligns with prior reports highlighting sustained demand and favorable career prospects in these disciplines [21].

The significant differences in age and academic performance across departments observed in this study are also supported by earlier evidence suggesting that older candidates may opt for comparatively less competitive specialties, while higher academic achievers tend to prefer clinically popular disciplines [22].

Overall, these findings highlight persistent systemic challenges within postgraduate medical education. Targeted interventions, including structured career counseling, financial incentives, and stress management programs, have been recommended in earlier studies to improve retention and ensure balanced distribution of specialists across medical disciplines [12]. The present study adds to existing evidence by emphasizing the need

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for data-driven policy reforms to enhance equity and efficiency in postgraduate medical training.

Despite the insights of this study, several gaps remain. Its cross-sectional design limits understanding of longitudinal trends in academic progression and drop years. Psychosocial factors, mentorship, peer support, and extracurricular involvement were not explored, nor was the UG-to-PG transition. Regional disparities in resources and socio-economic conditions also warrant further investigation. Addressing these gaps through multi-centric longitudinal studies would provide deeper insights to guide educational reforms and support systems for medical trainees.

CONCLUSIONS

In conclusion, demographic and educational factors significantly shape postgraduate medical education in India. This study reveals a high prevalence of drop years, with 83% of students taking at least one gap year before admission, along with gender-, region-, and institution-based disparities influencing academic performance, specialty choice, and career progression. Male students were predominantly represented in surgical specialties, whereas female students more often opted for non-surgical disciplines. Academic outcomes varied across departments and were affected by prior educational background. These findings underscore the need for targeted interventions, including structured support systems, equitable access to resources, and informed career guidance, to improve the quality and balance of postgraduate training.

Future research should employ longitudinal and multi-centric designs to track medical students over time, incorporating psychosocial, demographic, and educational factors. Such studies would provide deeper insights into the determinants of drop years, specialty selection, and academic performance, ultimately guiding policy reforms and strategies to optimize postgraduate medical education in India.

CONTRIBUTION OF AUTHORS

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Critical review- Sanjay Jain
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