

A COMPARATIVE STUDY ON EMPATHY AND ALTRUISTIC ATTITUDE AMONG FIRST YEAR AND FINAL YEAR MEDICAL STUDENTS

Boyapati Chandana¹, K. Madhavalatha², PJ Srinivas³, Palak Khemka¹, Snehitha Raja¹

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Corresponding Author

Dr. palak Khemka

Email: drpalakkhemka@gmail.com

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¹Junior Resident, Department of Psychiatry, Andhra Medical College, Visakhapatnam, Andhra Pradesh, India

²Associate Professor, Department of Psychiatry, Andhra Medical College, Visakhapatnam, India

³Associate Professor, Department of Community Medicine, Andhra medical College, Visakhapatnam, Andhra Pradesh, India

Abstract

Background: Medical education plays a critical role in nurturing empathy and altruism, essential for effective patient care. This study investigates the levels of empathy and altruism among first-year and final-year MBBS students at Andhra Medical College, Visakhapatnam, Andhra Pradesh. **Materials and Methods:** Employing a cross-sectional design, data was gathered from 500 students (250 from each year) using the Altruism Personality Scale and Empathy Assessment Scale. Sociodemographic factors such as age, gender, family structure, and socioeconomic status were also examined. **Result:** First-year students demonstrated notably higher scores in altruism (Mean = 56.11 ± 7.82) and empathy (Social Interaction Mean = 12.95 ± 2.19; Cognitive Behavior Mean = 17.96 ± 4.39; Emotional Identification Mean = 13.16 ± 3.55) compared to final-year students ($p < 0.001$). Female students showed greater empathy across all dimensions. Factors such as family structure and socioeconomic status significantly influenced the scores, with nuclear families and lower socioeconomic classes scoring higher. Religious affiliations emphasizing community service correlated with higher altruism scores. **Conclusion:** The results highlight a concerning reduction in empathy and altruism among students as they advance through medical training, underscoring the need for curricular interventions. Enhancing these traits could better prepare future doctors for compassionate and effective patient care, mitigating professional detachment.

INTRODUCTION

Altruism, as described by Anna Freud in 1946, reflects a selfless act of prioritizing others' well-being over personal interests. While altruistic behavior can stem from conscious and unconscious motivations, empathy is considered its cornerstone.^[1] Empathy involves understanding and sharing another's emotions, identifying the causes of their emotional state, and adopting their perspective—critical qualities for the medical profession, enabling doctors to deliver compassionate care.^[2]

The empathy-altruism hypothesis posits that empathy-driven prosocial motivation focuses on enhancing the welfare of those in need. In medicine, altruism manifests in acts such as working extra hours without additional compensation to ensure patient welfare.^[3] Despite the rise in violence against doctors and mistrust in the profession, the presence of empathy and altruism remains pivotal.^[4] However,

medical education may erode these traits over time due to stress, burnout, and clinical pressures.^[5]

Medical students, as future healthcare providers, must cultivate empathy and altruism to deliver optimal care. The introduction of the Attitude, Ethics, and Communication (AETCOM) module in the MBBS UG curriculum by National Medical Council, India emphasizes these traits, aiming to foster patient-centered communication skills.^[6] Comparing first-year and final-year students provides insight into how empathy and altruism evolve through medical training. While first-year students may reflect diverse pre-medical influences, final-year students face the impact of extensive clinical exposure and professional development.^[7]

This study evaluates and compares empathy and altruism among first-year and final-year medical students, analyzing factors influencing these traits, including gender, family structure, and socioeconomic status. The primary aim of the study is to assess the level of empathy and altruistic

attitudes among first-year and final-year medical students. The specific objectives include evaluating empathy levels among first-year and final-year medical students, assessing altruism levels among first-year and final-year medical students, identifying factors influencing altruism and empathy, and analyzing the relationship between empathy, altruism, and parental socioeconomic status.

MATERIALS AND METHODS

This cross-sectional study was conducted at Andhra Medical College, located in Visakhapatnam, Andhra Pradesh, India, from September 2023 to February 2024. Ethical clearance for the study was obtained from the Institutional Ethics Committee prior to the commencement of the research. The study population consisted of 500 MBBS students, divided equally between first-year and final-year students. This sample size was selected to allow for robust statistical analysis and to provide a comprehensive comparison between the two groups. Participation was voluntary, and all participants provided informed consent before taking part in the study.

Three primary instruments were employed for data collection. First, sociodemographic data collection aimed to capture relevant sociodemographic characteristics of the participants, such as age, gender, family structure (nuclear or joint), parental education, parental occupation, and socioeconomic status (SES) using Modified Kuppuswamy scale.

The second instrument, the Altruism Personality Scale, was used to measure the frequency of altruistic behaviors directed toward strangers. This 20-item scale assesses participants' altruistic behaviors on a 5-point Likert scale, with responses ranging from "Never" (0) to "Very Often" (4). Various scenarios where participants may exhibit altruism, such as helping someone in need or volunteering, were included in the scale.

The third instrument, the Empathy Assessment Scale, evaluated empathy across three distinct dimensions: Social Interaction (SI), Cognitive Behavior (CB), and Emotional Identification (EI). This 13-item scale measures empathy using a 5-point Likert scale, with responses ranging from "Never" (1) to "Always" (5). The Social Interaction dimension evaluated how often participants engaged in empathetic social behaviors. Cognitive Behavior assessed participants' ability to understand and share another person's perspective, while Emotional Identification measured the extent to which participants could identify and share the emotional states of others.

Data collection was carried out in a structured manner to ensure consistency and reliability. Participants were briefed about the study's objectives, procedures, and confidentiality assurances, and informed consent forms were distributed and collected before participation. The questionnaires for sociodemographic data, Altruism Personality Scale, and Empathy Assessment Scale were then distributed to the participants. Assistance was provided to clarify

any doubts regarding the questionnaires. The collected data were entered into an electronic database, with double-entry verification to ensure accuracy. Any discrepancies identified were resolved through cross-checking with the original questionnaires.

The collected data were subjected to comprehensive statistical analysis using SPSS v 22.0 Released 2013. Armonk, NY: IBM Corp. Descriptive statistics, including means, standard deviations, medians, minimum, and maximum values, were calculated for continuous variables, while frequencies and percentages were computed for categorical variables. The Mann-Whitney U test and Kruskal-Wallis test were utilized to compare mean scores across different groups (e.g., first-year vs. final-year students, gender, family structure, SES). These non-parametric tests were chosen due to the ordinal nature of the Likert scale data. Where applicable, post hoc analyses were conducted to identify specific group differences, with Dunn's test employed following the Kruskal-Wallis test to determine significant pairwise comparisons. A p-value of less than 0.05 was considered statistically significant for all tests.

RESULTS

Sociodemographic Profile: Data were collected from first-year and final-year MBBS students at Andhra Medical College over a six-month period from September 2023 to February 2024. The sample included 500 students, with 250 from each year. The age range of the participants was 16 to 24 years, with a mean age of 19.44 ± 1.87 years. The majority of the study subjects were males (54.4%, $n=272$), and 61.2% of the subjects were under 20 years old ($n=306$). [Table 1]

The sociodemographic characteristics of the participants showed that the majority of the students were Hindu (90%, $n=450$), followed by Christian (6.2%, $n=31$), and Muslim (3.8%, $n=19$). More than half of the students (53%, $n=265$) were the first-born in their families, with the remaining being the second (42.8%, $n=214$) or third-born (4.2%, $n=21$). A significant majority of the participants came from nuclear families (78.6%, $n=393$), while 21.4% ($n=107$) were from joint families.

Regarding parental education, 26.8% of the students' mothers were graduates, followed by 25.8% with intermediary education, and 13.2% with postgraduate degrees. The majority of the mothers were unemployed (66.6%, $n=333$), while 17% ($n=85$) were professionals. The fathers' educational background showed a higher percentage of graduates (38.2%, $n=191$) and postgraduates (35.2%, $n=176$), with the majority working as professionals (47.8%, $n=239$) or skilled workers (31%, $n=155$). The socioeconomic status (SES) of the participants was predominantly upper middle class (60.4%, $n=302$), followed by lower middle class (24%, $n=120$), and upper class (12.4%, $n=62$).

Empathy and Altruism Scores: The mean Altruism Personality Scale score was 50.39 ± 9.73 , with scores ranging between 28 and 88. In the Empathy Assessment Scale, the Social Interaction domain had a mean score of 12.04 ± 2.82 , Cognitive Behavior had a mean score of 16.16 ± 4.56 , and Emotional Identification had a mean score of 12.06 ± 3.69 .

The distribution of mean scores based on age and gender showed that the mean Altruism Personality Scale scores did not demonstrate significant differences between different age groups or genders [Figure 1]. However, the Empathy Assessment Scale scores showed significant differences in all three domains. Participants under 20 years of age had higher mean scores in Social Interaction (12.29 vs. 11.64, $p=0.01$), Cognitive Behavior (16.94 vs. 14.94, $p<0.001$), and Emotional Identification (12.52 vs. 11.34, $p<0.001$) compared to those aged 20-24 years. Females had higher mean scores in Social Interaction (12.77 vs. 11.42, $p<0.001$), Cognitive Behavior (17.19 vs. 15.30, $p<0.001$), and Emotional Identification (12.97 vs. 11.30, $p<0.001$) compared to males. [Table 3]

Sociodemographic Influences on Empathy and Altruism:

The mean Altruism Personality Scale scores showed significant differences based on religion, family structure, father's education, mother's occupation, and socioeconomic status. Hindu participants had significantly higher scores (50.80 ± 9.78) compared to Christians (45.26 ± 7.95 , $p=0.006$). Students from nuclear families scored higher (51.06 ± 9.71) compared to those from joint families (47.95 ± 9.42 , $p=0.003$). Father's education also influenced scores, with those having schooling education scoring higher (54.06 ± 10.81) compared to other educational levels ($p=0.01$). Mother's occupation showed that unemployed mothers' children had higher scores (51.19 ± 9.59) compared to non-professional mothers (48.56 ± 9.07 , $p=0.02$). Socioeconomic status revealed that students from lower socioeconomic backgrounds had higher scores, with lower-class students scoring the highest (61.33 ± 2.52 , $p=0.01$). [Table 2 & Figure 4-6]

Empathy Assessment Scale Analysis: The comparison of mean scores for the Empathy Assessment Scale across various sociodemographic variables showed significant differences based on family structure, mother's education, and socioeconomic status. Students from nuclear families had higher scores in Social Interaction (12.27 vs. 11.17, $p<0.001$), Cognitive Behavior (16.53 vs. 14.80, $p<0.001$), and Emotional Identification (12.26 vs. 11.33, $p=0.02$) compared to those from joint families. Mother's education showed significant differences in Social Interaction and Emotional

Identification domains, with students whose mothers had schooling and higher education levels scoring significantly higher compared to those with illiterate mothers ($p<0.001$ for Social Interaction, $p=0.002$ for Emotional Identification). Socioeconomic status showed that lower and upper-lower class students had higher scores in all three domains compared to upper and upper-middle class students ($p=0.04$ for Social Interaction, $p=0.001$ for Cognitive Behavior, and $p=0.02$ for Emotional Identification).

Comparison of Study Years: The mean Altruism Personality Scale scores showed significantly higher mean scores in first-year students (56.11 ± 7.82) compared to final-year students (44.67 ± 7.92 , $p<0.001$) [Figure 2]. Similarly, the Empathy Assessment Scale scores were higher in first-year students across all three domains: Social Interaction (12.95 vs. 11.12, $p<0.001$), Cognitive Behavior (17.96 vs. 14.36, $p<0.001$), and Emotional Identification (13.16 vs. 10.96, $p<0.001$). [Table 4 & Figure 3].

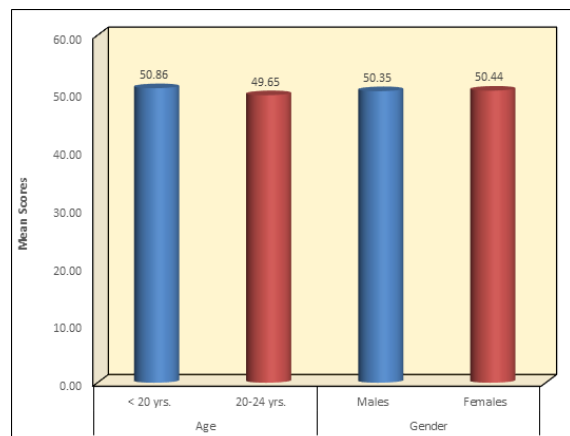


Figure 1: Mean Altruism personality Scale scores based on age and gender of the study subjects

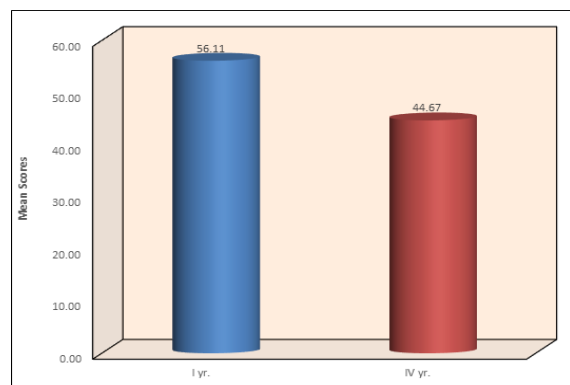


Figure 2: Mean Altruism personality Scale scores based on study year of the study subjects

Table 1: Age & Gender distribution among study subjects.

Variable	Category	N	%
Age	< 20 yrs.	306	61.2%
	20-24 yrs.	194	38.8%
	Mean		SD
	Mean	19.44	1.87

	Range	16 - 24	
Gender	Males	272	54.4%
	Females	228	45.6%

Table 2: Comparison of mean Altruism personality Scale scores based on sociodemographic characteristics of the study subjects

Variable	Category	N	Mean	SD	p-value
Religion	Hindu	450	50.80	9.78	0.006*b
	Muslim	19	49.21	9.04	
	Christian	31	45.26	7.95	
Order of Birth	First	265	50.59	10.03	0.57 b
	Second	214	49.99	9.42	
	Third	21	51.95	9.11	
Type of Family	Nuclear	393	51.06	9.71	0.003*b
	Joint	107	47.95	9.42	
Mother's Education	Illiterate	38	48.47	10.11	0.36b
	Schooling	133	51.28	10.04	
	College	129	50.28	9.04	
	Graduate & above	200	50.24	9.88	
Father's Education	Illiterate	15	50.93	9.49	0.01*b
	Schooling	52	54.06	10.81	
	College	66	50.11	9.73	
	Graduate & above	367	49.90	9.50	
Mother's Occupation	Unemployed	333	51.19	9.59	0.02*b
	Non & Semi-professional	82	48.56	9.07	
	Professional	85	49.02	10.57	
Father's Occupation	Unemployed	19	51.79	9.95	0.62b
	Non & Semi-professional	242	50.13	9.67	
	Professional	239	50.55	9.79	
SES	Upper Class	62	47.97	10.33	0.01*b
	Upper Middle Class	302	50.14	9.30	
	Lower Middle Class	120	51.45	10.12	
	Upper Lower Class	13	55.46	10.28	
	Lower Class	3	61.33	2.52	

Note: a. Mann Whitney Test & b. Kruskal Wallis Test followed by Dunn's post hoc Test. p-values for Dunn's post hoc analysis have been provided in the results explanation. * - Statistically Significant

Table 3: Comparison of Empathy Assessment scale scores based on the age and gender of the study subjects

Variable	Category	Social Interaction		Cognitive Behaviour		Emotional Identification	
		Mean	SD	Mean	SD	Mean	SD
Age	< 20 yrs.	12.29	2.67	16.94	4.69	12.52	3.78
	20-24 yrs.	11.64	3.00	14.94	4.05	11.34	3.43
	p-value a	0.01*		<0.001*		<0.001*	
Gender	Males	11.42	2.78	15.30	4.72	11.30	3.11
	Females	12.77	2.69	17.19	4.13	12.97	4.10
	p-value a	<0.001*		<0.001*		<0.001*	

Table 4: Comparison of mean scores for Altruism Personality Scale & Empathy Assessment Scale based on the study year using Mann Whitney Test

Parameters	Study year	N	Mean	SD	Mean Diff	p-value
Altruism Personality Scale scores	I yr.	250	56.11	7.82	11.44	<0.001*
	IV yr.	250	44.67	7.92		
Social Interaction	I yr.	250	12.95	2.19	1.83	<0.001*
	IV yr.	250	11.12	3.07		
Cognitive Behaviour	I yr.	250	17.96	4.39	3.60	<0.001*
	IV yr.	250	14.36	3.98		
Emotional Identification	I yr.	250	13.16	3.55	2.20	<0.001*
	IV yr.	250	10.96	3.50		

*Statistically Significant

DISCUSSION

This study provides an in-depth analysis of empathy and altruistic attitudes among first and final-year medical students, focusing on essential factors such as age, gender, family structure, socioeconomic status, and parental occupation. By comparing first-year and fourth-year students, this research offers valuable insights into how medical training impacts these traits over time.

Empathy and Altruism Across Study Years

The findings reveal that first-year students displayed significantly higher empathy and altruism scores compared to fourth-year students. This trend is consistent with existing literature by Studies by Neumann et al. and Hojat et al., suggesting that medical education and the clinical environment may lead to a decline in empathy as students advance through their training.^[8,9] Studies by Neumann et al. and Bellini LM et al. have reported similar decreases in empathy among medical students, attributing this decline to increased clinical exposure and emotional burnout.^[9,10] This phenomenon highlights the need for targeted interventions to preserve empathy and altruism during medical education.

Gender Differences: In line with previous research by Rueckert L et al, female students demonstrated higher empathy scores across all domains compared to their male counterparts. This gender difference in empathy is well-documented, with also from the study reported by Karniol R et al, indicating that women generally score higher on measures of empathy due to socialization patterns that promote nurturing behaviors.^[12] This study adds to the growing body of evidence supporting the notion that gender plays a significant role in empathetic and altruistic tendencies.

Impact of Family Structure: The influence of family structure on empathy and altruism was evident in this study, with students from nuclear families scoring higher in both traits compared to those from joint families. This finding suggests that more intimate familial interactions in nuclear families may foster stronger empathetic and altruistic behaviors. Previous research by Stewart AL et al, supports this observation, indicating that close-knit family environments are conducive to the development of empathy.^[13] The greater degree of individual attention and emotional support available in nuclear families may be instrumental in nurturing these traits.

Socioeconomic Status and Parental Occupation: Students from lower socioeconomic backgrounds and those with unemployed mothers scored higher in the cognitive behavior and emotional identification domains of the empathy scale. This finding aligns with the work of Wilkinson et al., which posits that individuals from less privileged backgrounds develop stronger empathetic skills due to their personal experiences with hardship.^[14] Additionally, Eberly MB et al, suggested that the increased emotional investment from unemployed mothers

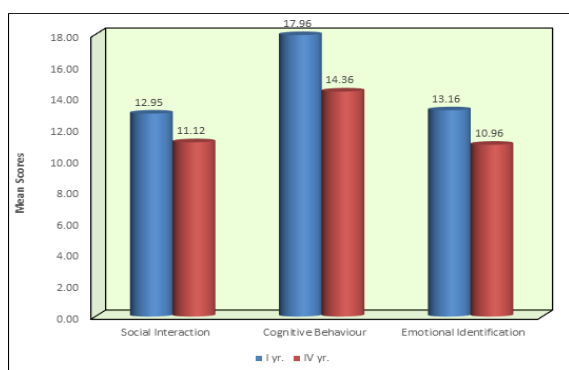


Figure 3: Mean Empathy Assessment scale scores based on the study year of the study subjects

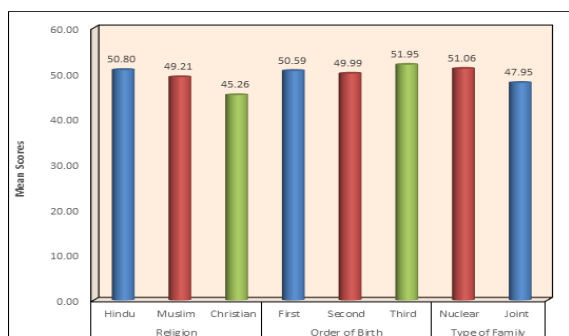


Figure 4: Mean Altruism personality Scale scores based on Sociodemographic Characteristics among the study subjects

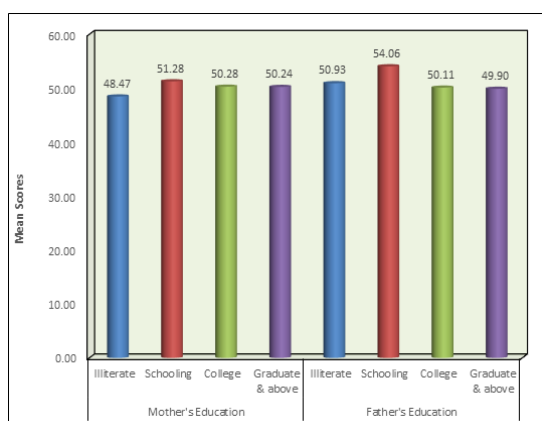


Figure 5: Mean Altruism personality Scale scores based on Parents Educational Status among the study subjects

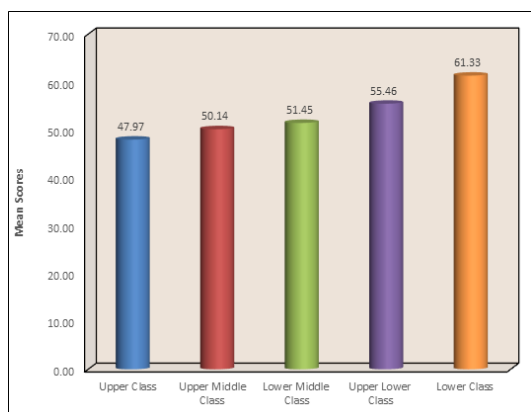


Figure 6: Mean Altruism personality Scale scores based on Socio-economic Status among the study subjects

may play a crucial role in nurturing altruistic values in their children by parental influence.^[15] These results underscore the importance of considering socioeconomic factors when developing strategies to enhance empathy and altruism in medical students.

Religious Affiliation: The study also found that religious affiliation impacts altruistic attitudes, with Hindu students exhibiting higher altruism scores compared to Christian students. This variation may reflect cultural and religious teachings that emphasize selflessness and service. Research by Saroglou et al, has highlighted the role of religious teachings in promoting prosocial behavior, further supporting the findings of this study.^[16] The emphasis on community service and the moral frameworks provided by religious teachings may contribute to the development of altruistic attitudes among students.

Other specific concerns: The significant decline in empathy and altruism scores from the first to the fourth year of medical training is concerning and warrants further exploration. The rigorous and often stressful nature of medical education may contribute to this decline, as students face increasing clinical responsibilities and emotional challenges. The findings suggest that curricular interventions aimed at maintaining and enhancing empathy and altruism throughout medical training are essential.

Gender differences in empathy scores, with females consistently scoring higher, reflect broader social and cultural influences on emotional development. These findings are consistent with the literature and emphasize the need for medical education to address and support the development of empathetic skills in all students, regardless of gender.

The impact of family structure on empathy and altruism highlights the role of the home environment in shaping these traits. Nuclear families, with their closer interpersonal relationships, may provide more opportunities for developing empathy and altruism. These findings suggest that medical schools could consider providing support and resources to students from diverse family backgrounds to foster these important qualities.

The relationship between socioeconomic status and empathy scores underscores the complex interplay between personal experiences and emotional development. Students from lower socioeconomic backgrounds may develop stronger empathetic skills due to their lived experiences of adversity. Medical educators should be aware of these dynamics and consider them when designing programs to support the development of empathy and altruism in students from all backgrounds.

Finally, the influence of religious affiliation on altruistic attitudes suggests that cultural and religious values play a significant role in shaping these traits. The emphasis on community service and moral teachings in various religious traditions may contribute to the higher altruism scores observed among Hindu students in this study. These findings highlight the importance of considering cultural and

religious contexts when developing strategies to enhance empathy and altruism in medical students.

Limitations: The study's cross-sectional design restricts the ability to infer causality between variables, as data were collected at a single point in time, making it challenging to determine relationships' directionality. Additionally, the research was conducted at a single institution, limiting the generalizability of the findings to other medical colleges with different educational systems or demographics. The reliance on self-reported measures may introduce biases like social desirability bias, affecting the accuracy of the reported levels of empathy and altruism. Lastly, focusing on students from a single cultural and socio-economic background limits the applicability of the findings to more diverse populations.

Strengths: The study employed robust data collection instruments, such as the Altruism Personality Scale and Empathy Assessment Scale, ensuring the reliability and validity of the findings. A large sample size of 500 participants enhances the statistical power of the study, allowing for more reliable comparisons and generalizations within the studied population. Comparative analysis between first-year and final-year medical students provides valuable insights into the evolution of empathy and altruism throughout medical training, while the inclusion of various sociodemographic factors enriches the understanding of influences on empathy and altruism.

Future Research Directions: Future research should adopt a longitudinal design to track changes in empathy and altruism over the entire course of medical training. Expanding the study to multiple institutions across different regions would provide a more comprehensive understanding of these traits in medical students. Additionally, studies assessing the impact of targeted interventions, such as empathy training workshops or mentorship programs, on preserving and enhancing empathy and altruism among medical students are recommended. Incorporating qualitative methods and exploring cultural differences would provide deeper insights into factors influencing empathy and altruism.

CONCLUSION

The present study elucidates notable differences in empathy and altruistic attitudes between first and fourth-year medical students, thereby emphasizing the profound impact of medical education on these psychological traits. The analysis identifies several pivotal factors, including gender, family structure, socioeconomic status, parental occupation, and religious affiliation, which significantly influence these attitudes. The observed decline in empathy among fourth-year students underscores the exigency for curricular interventions aimed at preserving and augmenting empathy throughout medical training. It is imperative to integrate empathy training into the medical curriculum, with a particular emphasis on the

advanced stages of education, to counteract this decline and ensure that future physicians maintain the essential compassionate care required for effective patient interactions.

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