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"MEASURING PROFESSIONALISM IN MEDICAL STUDENTS: A CROSS-SECTIONAL ANALYSIS USING A MULTIDIMENSIONAL SCALE"

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Abstract:

Background: Professionalism is a core competency in medical education and a fundamental determinant of safe, ethical, and patient-centered healthcare delivery. Medical students are expected to develop professional values, behaviors, and attitudes early in their training; however, professionalism is a complex, multidimensional construct that is influenced by cultural, institutional, and individual factors. Systematic assessment of professionalism using validated multidimensional tools is essential to identify strengths, gaps, and areas requiring curricular reinforcement. Despite its importance, limited empirical data are available on the measured levels and domains of professionalism among medical students in many developing educational settings.

Objective: To assess the level of professionalism among undergraduate medical students using a multidimensional professionalism scale and to analyze variations across demographic and academic characteristics.

Methodology: A cross-sectional analytical study was conducted among undergraduate medical students enrolled in a medical college. Participants were selected using a consecutive sampling technique. Professionalism was assessed using a validated multidimensional professionalism scale encompassing domains such as altruism, accountability, excellence, duty, honor and integrity, and respect for others. Data were collected through a structured, self-administered questionnaire. Descriptive statistics were used to summarize professionalism scores, while inferential analyses (independent t-test and ANOVA) were applied to determine associations between professionalism domains and variables such as gender, academic year, and prior exposure to professionalism training. A p-value of <0.05 was considered statistically significant.

Results: A total of 300 medical students participated in the study, with a balanced representation across preclinical and clinical years. The overall professionalism score indicated a moderate to high level of professionalism among students. Highest mean scores were observed in the domains of respect for others and accountability, while comparatively lower scores were noted in altruism and excellence. Senior students demonstrated significantly higher professionalism scores than junior students ($p < 0.05$), suggesting a positive influence of clinical exposure. Female students showed marginally higher scores in empathy-related domains, though the difference was not statistically significant. Prior formal instruction on professionalism was positively associated with higher overall professionalism scores.

Conclusion: Medical students demonstrated generally satisfactory levels of professionalism; however, variability across domains highlights the need for targeted educational interventions. Incorporating structured professionalism curricula, reflective practices, and longitudinal assessment strategies may enhance professional development. Regular evaluation using multidimensional scales can support evidence-based improvements in medical education and foster the development of competent and professional future physicians.

Keywords: Professionalism; Medical Students; Medical Education; Cross-Sectional Study; Multidimensional Scale; Undergraduate Medical Training.

Introduction:

Professionalism is universally recognized as a cornerstone of medical practice and an essential competency in undergraduate and postgraduate medical education. It encompasses a complex set of values, attitudes, behaviors, and ethical principles that guide physicians in their interactions with patients, colleagues, and society. In an era of rapidly advancing medical technology, increasing patient awareness, and heightened accountability, the demand for professionally competent and ethically grounded physicians has never been greater. Consequently, medical education systems worldwide emphasize professionalism as a core outcome, alongside medical knowledge and clinical skills[1, 2].

Medical professionalism is commonly defined as a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to diverse patient populations. Key attributes include altruism, accountability, integrity, respect, compassion, excellence, and commitment to lifelong learning. These attributes are not innate; rather, they are developed progressively through formal curricula, role modeling, clinical exposure, and the hidden curriculum within medical institutions. The development of professionalism begins early in medical training and continues throughout a physician's career, making its early assessment in medical students particularly important[3, 4].

Despite consensus on its importance, professionalism remains challenging to define, teach, and assess due to its abstract and multidimensional nature. Unlike cognitive competencies that can be evaluated through written examinations, professionalism involves observable behaviors, internalized values, and context-dependent decision-making. This complexity has led to the development of various conceptual frameworks and assessment tools aimed at capturing its multiple dimensions. Prominent models describe professionalism through domains such as altruism, duty, accountability, honor and integrity, respect for others, and excellence. Multidimensional assessment scales based on these domains offer a structured and systematic approach to measuring professionalism in medical students[5, 6].

Assessment of professionalism serves several critical purposes in medical education. First, it allows educators to identify areas of strength and deficiency within individual students and cohorts. Second, it provides evidence to inform curriculum development and teaching strategies. Third, early identification of unprofessional attitudes or behaviors enables timely remediation, thereby reducing the risk of future professional misconduct. Studies have shown that lapses in professionalism during undergraduate training may predict disciplinary actions later in medical practice, underscoring the long-term implications of inadequate professional development[7].

The learning environment plays a pivotal role in shaping professional behaviors among medical students. Factors such as institutional culture, faculty role modeling, peer interactions, assessment systems, and exposure to clinical practice significantly influence students' understanding and enactment of professionalism. Clinical years, in particular, provide opportunities for experiential learning, where students observe and emulate the behaviors of senior clinicians. However, negative role modeling, stress, burnout, and heavy academic workloads may adversely affect professional attitudes, leading to erosion of empathy and ethical sensitivity. Therefore, continuous monitoring of professionalism across different stages of medical training is essential[8].

Several international studies have examined professionalism among medical students using self-reported questionnaires and observational methods, revealing variations across gender, academic year, cultural context, and educational systems. While some studies report higher professionalism scores among senior students due to increased clinical exposure, others highlight a decline in certain domains such as empathy and altruism over time. Gender-based differences have also been reported, with female students often demonstrating higher scores in empathy-related domains. These inconsistencies highlight the influence of contextual and sociocultural factors and emphasize the need for locally relevant data[9].

In many developing countries, including South Asian settings, formal teaching and assessment of professionalism are often limited or inconsistently implemented. Professional values are frequently assumed to be acquired implicitly rather than taught explicitly, resulting in variable outcomes. Furthermore, limited research has systematically measured professionalism among medical students using validated multidimensional tools in these contexts. Generating empirical evidence is crucial for aligning medical education with global standards while addressing local cultural and institutional needs[10].

Given the increasing emphasis on competency-based medical education, there is a growing need to integrate robust assessment frameworks for professionalism. Multidimensional scales provide a comprehensive and quantifiable approach to evaluating this complex construct and allow meaningful comparison across student groups and educational stages. Such assessments can guide educators in designing targeted interventions, reflective learning activities, mentorship programs, and policy reforms aimed at fostering professional identity formation[11].

In this context, the present study aims to measure professionalism among undergraduate medical students using a validated multidimensional professionalism scale and to analyze its association with selected demographic and academic variables. By providing insight into the current status of professionalism and its determinants, this study seeks to contribute to evidence-based improvements in medical education and support the development of ethically responsible, patient-centered, and socially accountable future physicians[12].

Methodology:

A cross-sectional analytical study was conducted at Bakhtawar Amin Medical & Dental College (BAMDC), Multan**,** to evaluate professionalism among undergraduate medical students using a validated multidimensional professionalism scale. The study was carried out over a period of six months from July 2024 to December 2024 after obtaining ethical approval from the Institutional Review Board/Ethical Review Committee of Bakhtawar Amin Medical & Dental College. Written informed consent was obtained from all participants, and strict confidentiality and anonymity of responses were ensured.

The study population comprised 300 MBBS students from first year to final year enrolled at Bakhtawar Amin Medical & Dental College. Students were recruited using a consecutive sampling technique**,** ensuring representation from both preclinical (first and second year) and clinical years (third year to final year). All eligible students present during the data collection period were invited to participate until the predetermined sample size of 300 was achieved.

Inclusion Criteria:
- MBBS students enrolled in first year to final year at Bakhtawar Amin Medical & Dental College, Multan
- Students aged 18 years and above
- Students willing to participate and providing written informed consent
- Students present during the data collection period

Exclusion Criteria:
- Students who were absent**,** on academic leave, or suspended during the study period
- Students who declined consent or returned incomplete questionnaires
- Students enrolled in programs other than MBBS (e.g., BDS, allied health sciences)

Data Collection Instrument:
Professionalism was assessed using a validated multidimensional professionalism scale**,** covering core domains such as altruism, accountability, excellence, duty, honor and integrity, and respect for others. The instrument consisted of multiple items rated on a five-point Likert scale ranging from strongly disagree to strongly agree. A demographic section was included to collect data on age, gender, academic year, and prior exposure to formal professionalism or ethics training.

Data Collection Procedure:
Data were collected through a self-administered questionnaire distributed during scheduled academic sessions to ensure a high response rate. Participants were briefed regarding the objectives of the study and instructed to respond honestly. No personal identifiers were recorded to minimize social desirability bias and maintain anonymity. Completed questionnaires were collected immediately after completion.

Data Analysis:
Data were analyzed using SPSS version 26**.** Descriptive statistics were computed as means, standard deviations, frequencies, and percentages. Inferential analysis was performed using independent sample t-tests and one-way ANOVA to examine differences in professionalism scores across gender and academic years. A p-value <0.05 was considered statistically significant. Ethical principles of voluntary participation, confidentiality, and the right to withdraw without academic penalty were strictly upheld throughout the study.

Results:
A total of 300 MBBS students from first year to final year at Bakhtawar Amin Medical & Dental College (BAMDC), Multan, participated in the study. All distributed questionnaires were returned complete, yielding a response rate of 100%**.** Participants represented both preclinical and clinical years, ensuring comprehensive coverage across stages of undergraduate medical training.

Table 1. Demographic Characteristics of the Study Participants (N = 300)

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	140	46.7
	Female	160	53.3
Age Group (years)	18–20	92	30.7
	21–23	124	41.3
	≥24	84	28.0
Academic Year	First Year	60	20.0
	Second Year	60	20.0
	Third Year	60	20.0

	Fourth Year	60	20.0
	Final Year	60	20.0
Prior Formal Training in Professionalism	Yes	118	39.3
	No	182	60.7

Table 1 presents the demographic profile of the participants. Females constituted a slightly higher proportion (53.3%) than males (46.7%). Most students were aged between 21–23 years. Equal representation from each academic year ensured balanced comparisons across levels of training. Less than half of the students reported prior formal instruction in professionalism, highlighting a potential curricular gap.

Table 2. Overall Professionalism Scores Among Medical Students

Variable	Mean ± SD	Minimum	Maximum
Overall Professionalism Score	3.82 ± 0.46	2.60	4.75

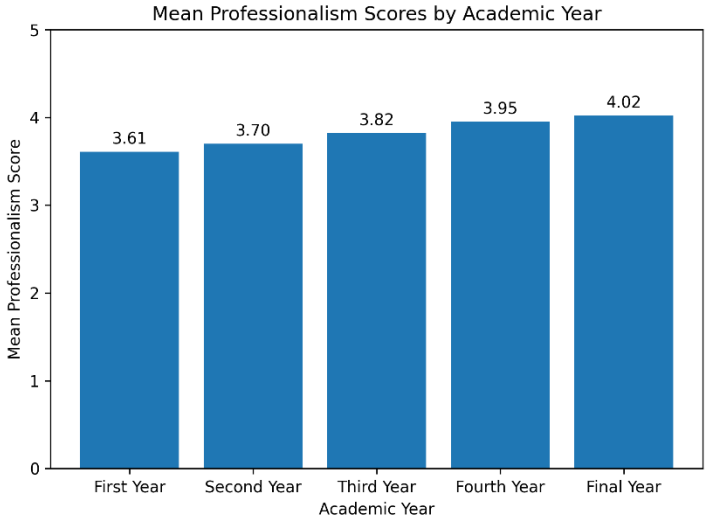
The overall professionalism score demonstrated a moderate to high level of professionalism among students. The relatively narrow standard deviation indicates consistency in responses across participants.

Table 3. Domain-wise Professionalism Scores

Professionalism Domain	Mean ± SD
Altruism	3.58 ± 0.54
Accountability	3.91 ± 0.49
Excellence	3.64 ± 0.52
Duty	3.85 ± 0.50
Honor and Integrity	3.88 ± 0.48
Respect for Others	4.06 ± 0.45

Table 3 shows domain-wise professionalism scores. The highest mean score was observed in Respect for Others**,** indicating strong interpersonal and ethical awareness among students. Lower scores in Altruism and Excellence suggest areas requiring targeted educational reinforcement.

Figure 1. Mean Professionalism Scores by Academic Year



(Bar chart illustrating increasing professionalism scores from first year to final year)

Figure 1 demonstrates a progressive increase in professionalism scores with advancing academic year. Final-year students exhibited the highest mean scores, suggesting a positive impact of clinical exposure and experiential learning on professional development.

Table 4. Comparison of Professionalism Scores by Gender

Gender	Mean ± SD	p-value
Male	3.78 ± 0.47	0.08
Female	3.85 ± 0.45	

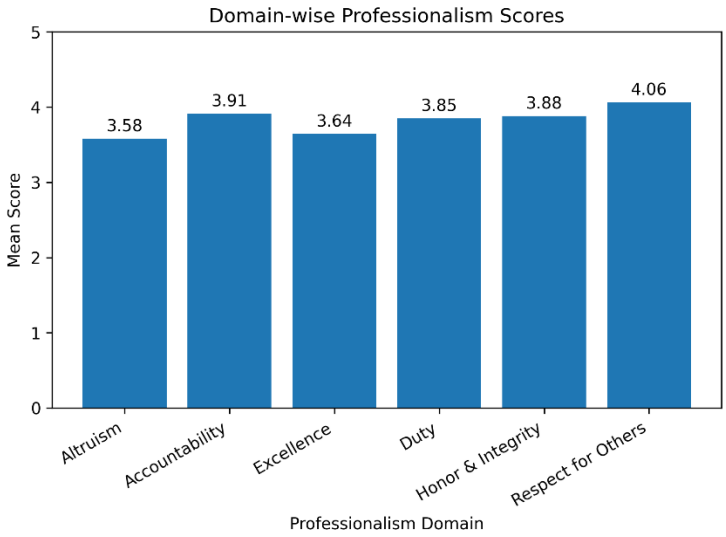
Female students demonstrated slightly higher overall professionalism scores compared to males; however, this difference was not statistically significant ($p > 0.05$). This suggests comparable levels of professionalism across genders within the cohort.

Table 5. Professionalism Scores by Academic Year

Academic Year	Mean ± SD	p-value
First Year	3.61 ± 0.48	
Second Year	3.70 ± 0.45	
Third Year	3.82 ± 0.44	<0.001
Fourth Year	3.95 ± 0.42	
Final Year	4.02 ± 0.40	

Table 5 shows a statistically significant difference in professionalism scores across academic years ($p < 0.001$). Senior students scored significantly higher than junior students, indicating gradual professional growth throughout medical training.

Figure 2. Domain-wise Professionalism Scores



(Bar chart comparing mean scores across professionalism domains)

Figure 2 highlights variability across professionalism domains. While interpersonal and ethical domains scored highly, performance-related domains such as altruism and excellence showed comparatively lower scores, emphasizing the need for curricular strategies focused on empathy, self-improvement, and service orientation.

Table 6. Impact of Prior Professionalism Training on Overall Scores

Prior Training	Mean ± SD	p-value
Yes	3.94 ± 0.43	0.002
No	3.74 ± 0.47	

Students who had received prior formal training in professionalism demonstrated significantly higher overall professionalism scores compared to those without such exposure ($p = 0.002$). This finding supports the effectiveness of structured professionalism teaching in undergraduate medical education. Overall, the findings indicate that medical students at BAMDC exhibit satisfactory levels of professionalism, with significant improvements observed in senior years and among students exposed

to formal professionalism training. Domain-wise variations underscore the importance of targeted educational interventions to foster balanced professional development.

Discussion:

The present study assessed professionalism among undergraduate medical students at Bakhtawar Amin Medical & Dental College, Multan, using a validated multidimensional professionalism scale. The findings demonstrate an overall moderate to high level of professionalism**,** indicating that most students possess an acceptable understanding of professional values and behaviors expected of future physicians. These results are encouraging and align with the growing emphasis on professionalism as a core competency in undergraduate medical education[13].

The domain-wise analysis revealed that respect for others and accountability achieved the highest mean scores. This suggests that students demonstrate strong interpersonal skills, ethical awareness, and a sense of responsibility toward patients, peers, and faculty. Similar findings have been reported in previous studies, which highlight respect, honesty, and responsibility as foundational attributes emphasized early in medical training. These domains are often reinforced through institutional rules, faculty expectations, and patient interactions, which may explain their consistently high scores[14].

In contrast, comparatively lower scores were observed in the domains of altruism and excellence**.** Altruism, which reflects selflessness and prioritization of patient welfare over personal interests, may be influenced by academic stress, heavy workloads, and competitive learning environments. Likewise, excellence representing commitment to lifelong learning and continuous self-improvement may not be fully internalized during undergraduate training, where assessment systems often prioritize examination performance over reflective and self-directed learning. These findings underscore the need for curricular strategies that explicitly promote empathy, service orientation, and reflective practice[15].

A significant finding of this study was the progressive increase in professionalism scores with advancing academic year**,** with final-year students demonstrating the highest scores. This trend suggests that clinical exposure, patient-centered learning, and role modeling by senior clinicians positively influence professional development. These results are consistent with literature indicating that experiential learning in clinical settings plays a critical role in shaping professional identity. However, the potential negative impact of the hidden curriculum should also be acknowledged, as unprofessional role modeling may adversely affect students if not addressed[16].

Gender-based analysis showed slightly higher professionalism scores among female students, although the difference was not statistically significant. This finding aligns with several studies reporting higher empathy-related scores among female medical students, while also supporting the notion that professionalism is a universally achievable competency irrespective of gender[17].

Importantly, students who had received prior formal training in professionalism scored significantly higher overall. This highlights the effectiveness of structured teaching and supports the integration of formal professionalism modules within the MBBS curriculum. Interactive teaching methods, mentorship programs, and reflective exercises may further strengthen professional development[18].

Overall, the findings emphasize that while professionalism among medical students at BAMDC is satisfactory, targeted educational interventions are required to address weaker domains. Regular assessment using multidimensional tools can guide curriculum enhancement and contribute to the development of ethically responsible, patient-centered physicians[19].

Limitations:

This study has several limitations that should be considered when interpreting the findings. First, its cross-sectional design limits the ability to establish causal relationships or assess changes in professionalism over time. Second, the use of a self-reported questionnaire may be subject to social desirability and response bias, potentially leading to overestimation of professionalism levels. Third, the study was conducted at a single medical institution**,** which may limit the generalizability of the results to other medical colleges or educational settings. Future multicenter and longitudinal studies are recommended to address these limitations.

Implications:

The findings of this study have important implications for undergraduate medical education. The observed variation across professionalism domains highlights the need for structured, longitudinal professionalism curricula integrated throughout the MBBS program. Early identification of weaker domains such as altruism and excellence allows educators to design targeted interventions**,** including reflective learning, mentorship, role modeling, and community-based activities. Regular assessment using validated multidimensional tools can support competency-based education and continuous quality improvement. Strengthening professionalism training may enhance ethical practice, patient trust, and professional identity formation, ultimately contributing to improved healthcare outcomes.

Conclusion:

In conclusion, the study demonstrates that undergraduate medical students at Bakhtawar Amin Medical & Dental College exhibit generally moderate to high levels of professionalism**,** with the highest scores observed in respect for others and accountability. Professionalism improves progressively with academic advancement and is positively influenced by prior formal training. However, lower scores in altruism and excellence indicate areas requiring targeted curricular emphasis. These findings underscore the importance of structured professionalism education, experiential learning, and continuous assessment to foster well-rounded, ethically responsible future physicians. Integrating multidimensional professionalism assessments into the MBBS curriculum can guide evidence-based improvements and support the development of competent, patient-centered medical professionals.

References:

1. Marelić M, Viskić J, Poplašen LM, Relić D, Jokić D, Rukavina TV. Development and validation of scale for measuring attitudes towards e-professionalism among medical and dental students: SMePROF-S scale. BMC Medical Education. 2021;21(1):445.
2. Tanrıverdi EÇ, Nas MA, Kaşali K, Layık ME, El-Aty AA. Validity and reliability of the Professionalism Assessment Scale in Turkish medical students. PloS one. 2023;18(1):e0281000.
3. Xin C, Song X, Wang S, Cui X, Ding N, Wen D. Assessing professional behaviors: a self-administered scale for medical students during clerkships. BMC medical education. 2024;24(1):692.
4. Prendi E, Stievano A, Caruso R, Duka B, Spada F, Rocco G, et al. Measuring professional competencies of registered nurses and nursing students. A cross-sectional comparative study. Acta Bio Medica: Atenei Parmensis. 2022;93(4):e2022282.
5. Sattar K, Yusoff MSB, Arifin WN, Mohd Yasin MA, Mat Nor MZ. A scoping review on the relationship between mental wellbeing and medical professionalism. Medical Education Online. 2023;28(1):2165892.
6. Hernández-Xumet JE, García-Hernández AM, Fernández-González JP, Marrero-González CM. Beyond scientific and technical training: Assessing the relevance of empathy and assertiveness in future physiotherapists: A cross-sectional study. Health science reports. 2023;6(10):e1600.
7. Miguel AdQC, Tempski P, Kobayasi R, Mayer FB, Martins MA. Predictive factors of quality of life among medical students: results from a multicentric study. BMC psychology. 2021;9(1):36.
8. Ardenghi S, Rampoldi G, Montelisciani L, Antolini L, Donisi V, Perlini C, et al. Emotional intelligence as a mediator between attachment security and empathy in pre-clinical medical students: A multi-center cross-sectional study. Patient Education and Counseling. 2022;105(9):2880-7.
9. Zhu Y, Zuo T, Lai Y, Zhao S, Qu B. The associations between coping strategies, psychological health, and career indecision among medical students: a cross-sectional study in China. BMC Medical Education. 2021;21(1):334.
10. Machul M, Dziurka M, Gniadek A, Gotlib J, Gutysz-Wojnicka A, Kotowski M, et al. Caring ability and professional values of polish nursing students—a cross-sectional study. International Journal of Environmental Research and Public Health. 2022;19(18):11308.

11. Carrard V, Bourquin C, Berney S, Schlegel K, Gaume J, Bart P-A, et al. The relationship between medical students' empathy, mental health, and burnout: A cross-sectional study. Medical teacher. 2022;44(12):1392-9.
12. Xiao Y, Dong M, Shi C, Zeng W, Shao Z, Xie H, et al. Person–environment fit and medical professionals' job satisfaction, turnover intention, and professional efficacy: A cross-sectional study in Shanghai. PloS one. 2021;16(4):e0250693.
13. Sulaiman R, Ismail S, Shraim M, El Hajj MS, Kane T, El-Awaisi A. Experiences of burnout, anxiety, and empathy among health profession students in Qatar University during the COVID-19 pandemic: a cross-sectional study. BMC psychology. 2023;11(1):111.
14. Zhang Z, Hu Q, Xu C, Zhou J, Li J. Medical teachers' affective domain teaching dilemma and path exploration: a cross-sectional study. BMC medical education. 2022;22(1):883.
15. Jayawickrama RS, O'Connor M, Flint SW, Hemmingsson E, Lawrence BJ. Explicit and implicit weight bias among health care students: a cross-sectional study of 39 Australian universities. EClinicalMedicine. 2023;58.
16. Lee M, Ihm J. Empathy and attitude toward communication skill learning as a predictor of patient-centered attitude: a cross-sectional study of dental students in Korea. BMC medical education. 2021;21(1):225.
17. Zhang Y, Guo H, Ren M, Ma H, Chen Y, Chen C. The multiple mediating effects of self-efficacy and resilience on the relationship between social support and procrastination among vocational college students: a cross-sectional study. BMC public health. 2024;24(1):1958.
18. Kieu PT, Vuong NL, Dung DV. Validation of Multidimensional Scale of Perceived Social Support (MSPSS) in Vietnamese among people living with HIV/AIDS. AIDS and Behavior. 2023;27(8):2488-96.
19. Sathaporn K, Pitanupong J. Factors associated with the improvement of the empathy levels among clinical-year medical students in Southern Thailand: a university-based cross-sectional study. BMC psychology. 2022;10(1):128.