ORIGINAL ARTICLE

CLINICAL TEACHERS AS ROLE MODELS: PERCEPTION OF UNDERGRADUATE MEDICAL STUDENTS IN MEDICAL COLLEGES OF PAKISTAN USING ROLE MODEL APPERCEPTION TOOL

Maria Khan[1], Brekhna Jamil[2], Fatima Muhammad[3], Nazish Bilal[4], Bilqis Hasan[3]

[1]Department of Pathology, Peshawar Institute of Cardiology, Peshawar - Pakistan

[2]Institute of Health Profession Education & Research, Khyber Medical University, Peshawar - Pakistan

[3]Department of Medical Education, North West School of Medicine, Peshawar - Pakistan

[4]Department of Medical Education, Rehman Medical College, Peshawar - Pakistan

ABSTRACT

Objective: This study aimed to determine medical students' perceptions of their clinical teachers as role models during the clinical years of a medical program.

Materials and Methods: In this cross-sectional study, a pre-validated questionnaire, Role Modeling Apperception Tool was used and completed by Final year medical students selected from affiliated medical institutions of Khyber Medical University, Peshawar i.e. four graduating cohorts, comprising about 600 students. Participants were selected following universal sampling and data was analyzed for descriptive and inferential statistics.

Results: The response rate to Role Modeling Apperception Tool was 75.1% n=451. The total number of students participating in this study from Private sector medical colleges was 157 34.8% and Public Government was 294 65.2%. The mean age of the students was 23.71 years SD=0.77, Range=22-26. Male respondents comprised 42.4% n=191 and females were n=260 57.6% of the study sample. Altogether, 92.9% of students experienced positive role models while 72% had negative role models among academic staff in their medical colleges. Mostly, medical students perceived male clinical teachers as their role models in comparison to their female counterparts. Moreover, clinical teachers were more considered positive role models than basic sciences teachers. Private-sector medical college students rated their clinical teachers higher among all domains Clinical, Personal, and Teaching in comparison to Public sector medical college students. A strong positive correlation was noted among domains tested on Role Modeling Apperception Tool.

Conclusion: Clinical instructors are inveterately considered by students as their role models in medical colleges and significance are conferred on their position. Altogether, doctors with teaching roles must be cognizant of their responsibilities and their influence on the professional growth and performance of students. Eventually, components related to Personal, Clinical, and Teaching attributes were suggested as major traits perceived in role models.

Keywords: Clinical Teacher, Role model, Medical Student, Medical College

This article may be cited as: Khan M, Jamil B, Muhammad F, Bilal N, Hasan B. Clinical teachers as role models: perception of undergraduate medical students in medical colleges of Pakistan using role model apperception tool . J Med Sci 2023 January;31(1):10-16

INTRODUCTION

A considerable proportion of imminent doctors' training is devoted to erudition and teaching in a healthcare setting. [1] To shape the values, demeanors, and ethical behavior of scholars, William Osler suggested the approach of role modeling is the fundamental element. [2] Literature indicates that the transition to an excellent doctor role model entails creativity and commitment because it promotes the desire for the acquisition of knowledge, and the perfection of skills, as well as building directions for pursuing a specific field of medicine. [3] Role modeling correlates to the framework of social learning theory, and is depicted as a course during which "faculty members model and articulate expert thought processes, demonstrate clinical skills and exhibit positive professional attributes." [4, 5] Considerable literature exists on the clinical instructor as a role model[6], as well as research, has acknowledged its impact on medical students concerning future career choices, standards of professional attitudes, and their reputation among different subjects. [7] Usually, students learn by observation and imitation therefore us-

Correspondence
Dr. Maria Khan
Assistant Professor
Department of Pathology, Peshawar Institute of Cardiology, Peshawar - Pakistan
Cell: +92-331-9111986
Email: kmaria22@hotmail.com
Date Received: 16-09-2022
Date Revised: 06-02-2023
Date Accepted: 18-02-2023

ing the most powerful teaching strategy of role modeling, clinical teachers play a crucial part in shaping, mentoring, coaching, and assisting future clinicians. [8, 9] Whether, the on-the-job and formal teaching sessions in small discussion or lecture theatres, role modeling has been held as one of the twelve roles of clinical teachers, which directly impact students' professional learning. [10] As illustrated in one study, 90 percent of students choose a role model while still in medical college. [11] However, a significant dissimilarity had been observed between males and females in ranking for key role model attributions. [12]

Customarily, medical institutions in Pakistan are ensuing traditional curricula, formal links, and existent hierarchal schemes among teachers and students resulting in the mere acquisition of technical skills and medical knowledge in clinical training programs. [13, 14] The fundamental standards of medical professionalism linked to patient care are empathy, compassion, altruism, and honesty. Therefore, the Association of American Medical Colleges AAMC in 1999, demanded medical institutions instill attributes of professionalism in the core curriculum of medical education15. Likewise, the Royal College of Physicians and Surgeons, Canada CANMEDS established the core competencies for a medical professional, with role modeling being part of professionalism and care of self. [16] Importantly recognized characteristics by students in clinician role models were an expression of enthusiasm for specialty; profound clinical reasoning skills; establishing a close doctor-patient relationship; the skill of actively engaging students; incisive communication with students; as well as having personality, clinical competence, teaching ability, on the contrary, research achievements and academic title were of minimum significance. [17]

Generally, tools assessing the attributes of clinical educators are available but unevenly comprehend items on role modeling, as result lacking specificity to categorize key features of role models. 18 Notably, clinical educators as role models have infrequently been appraised in medical colleges outside the USA and the European continent. Nonetheless, limited data regarding students' perspectives on role model identification, and its impact on medical institutions across Pakistan is available, where cultural values and social configuration are in contrast to the Occident world. [19, 20] Hence, substantial influence of role models exists in a clinical and educational environment as well as their commendable influence on students' identity formation and professional, an attempt is undertaken to fill the gap using the Role Model Apperception Tool RoMAT, established and subsequently validated by Jochemsen-van der Leeuw et al. [21, 22] It consists of two components for evaluating the positive and negative role modeling behaviors in terms of Caring attitude and Effectiveness, eventually grading items such as teaching, personal and clinical attributes.

As evident, role models help in fostering the career of young doctors, therefore, it is imperative to recognize their characteristics. [23] The results of this research can be adopted; to implement a curriculum and its needs assessment by staff members; serve as a feedback tool to clinical tutors, appoint or promote a faculty member, or during the planning of staff development programs. [10, 24] Indeed little is known regarding the attributes of a clinician role model from the medical undergraduate's perspectives in a Pakistani context, therefore, the study aimed to assess the perspectives of undergraduate students regarding role model's attributes/characteristics both in the course of formal and informal teaching settings using a reliable and validated questionnaire.

MATERIALS AND METHODS

The study was a quantitative cross-sectional descriptive conducted among four graduating cohorts, i.e. 451 Final year medical students from a total of four medical colleges of Peshawar, which included two private and two public sector medical colleges during July-August 2021. While students were not willing to participate, not consenting and migrating students from other medical colleges were excluded. Ethical approval DIR/KMU-EB/MS/00113 & 08/06/2021 and data collection permission letters were obtained from the ethical committee of Khyber Medical University, Peshawar, as well as, individual institutions. RoMAT Role Model Apperception Tool[22] comprised of scoring each domain clinical, teaching, personal, caring attitude, and effectiveness on a five-point Likert scale was used. Moreover, students were asked to provide perceptions regarding experiencing Role models RMs in individual settings i.e. during formal clinical teaching or other circumstances, along with mentioning the hierarchal level, they belong to e.g. Trainee medical officers, Medical officers, Assistant Professors, Associate professors, and professors.

RESULTS

A total of 451 Final-year medical students, 191 42.4% males and 260 57.6% females with a response rate of 75.1% 451 were noted. Overall students from Private sector medical colleges were 157 34.8% and Public Government 294 65.2% with a mean age was 23.71 years, SD=0.77, Range= 22-26. In response to a question on the number of role models encountered by each student during undergraduate years, n=93 20.6% students selected "1", 98 21.7% students chose "2", 95 21.10% chose option "3", 89 19.70% mentioned, "more than 3", while n=76 16.90% students said to have encountered "none" no role models at all. In response to the presence of positive role models in each medical college, a total of 419 92.9% of students chose "Yes", while 32 7.1% replied "No". Next, about experiencing negative role models' students in their medical colleges, a total of 320 71% chose the option of

"Yes", while 131 29% replied "No". Using the Chi-square to compare two categorical variables type of medical college and encountering positive and negative role models. In table 1, a significant association was observed between the two variables ($p < 0.05$).

There was statistically no significant difference between the genders of students while experiencing positive and negative role models at their respective medical colleges. 174 (91.1%) male students and 245 (94.2%) females have experienced a positive role model, while 136 (71.2 %) males and 184 (70.8%) females have experienced a negative role model during the undergraduate years of MBBS. The majority of medical students 187 (41.5%) chose male clinical teachers as their role models (Table 2)

In response to perceptions of medical students regarding the location/site where role modeling usually occurs, the maximum number of students selected clinical wards n=209 (46.3%, $p<0.001$) as a primary site for experiencing role modeling; next 105 (23.3%) students chose Classrooms; while n=72 (16%) selected OPD and 65 (14.4%) selected the option of 'others'. In response to the appointment or designation of role models, the majority of medical students chose full Professors, n= 202 (44.8%), Assistant Professor= 146 (32.4%) Associate Professor= 80 (17.7%) trainee medical officer= 14 (3.1%), and Medical Officer=9 (2%).

According to study participants, the majority of positive role models were affiliated with the specialty of Medicine 218 (29.9%), Surgery 97 (13.3%), and Ophthalmology 81 (11.1%), respectively. In contrast, most of the negative role models belonged to the specialty of Gynecology n=107 (20.2%). The overall mean score obtained and standard deviation of each component of the Caring and Effectiveness domain of RoMAT are shown in Figure 1.

The majority of students (66.9%) in private medical colleges rated clinical teachers higher in Clinical components, whereas 51.7% of students in public medical colleges scored the average. For the teaching domain, 56.7% and 54.4% rated their clinical teachers as average in private and public medical colleges, respectively. Regarding personal attributes, 58% of students from private medical colleges and 51.7% of Public sector medical colleges rated their clinical teachers as average.

On the whole, for the Caring attitude domain, 61.8% of private medical college students rated their teachers higher, while 52.7% were rated as average in public medical colleges. On the whole, 57.3% of students in private medical colleges rated their clinical teachers as average on the effectiveness domain, whereas 43.5% of public medical colleges' students scored them as average and 25.9% rated them as low Table 3.

Almost all domains had a positive and strong correlation with each other. Total clinical score was more strongly correlated to the caring attitude domain, r 451 = 0.87, ($p<0.001$) than to personal scorer 451 = 0.73, ($p<0.001$), and teaching scorer 451 =0.75, ($p<0.001$). The results were statistically significant for teaching score i.e. strong positive correlation was noted r= 0.90, n=451, $p < 0.001$ with effectiveness domain and caring attitude r=0.82, $p < 0.001$.

Also, a strong positive correlation was observed between the personal domain and the effectiveness component r=0.88, $p < 0.001$. To evaluate the relationship between the overall Caring attitude and Effectiveness domain among medical colleges, the results were found to be statistically significant, i.e. strong positive correlation r= 0.6, n=451, $p < 0.001$ was noted in Table 4.

Table 1: Association between Percentage of Positive PRM and Negative Role Models NRM present in Medical College

Type of Medical College	Positive role model n %		Negative Role Model n %	
	Yes	No	Yes	No
Private	70 94.6%	4 5.4%	62 83.8%	12 16.2%
	69 83.1%	14 16.9%	34 41.0%	49 59.0%
Total	139 88.5%	18 11.5%	96 61.1%	61 38.9%
Public	206 94.9%	11 5.1%	169 77.9%	48 22.1%
	74 96.1%	3 3.9%	55 71.4%	22 28.6%
Total	280 95.2%	14 4.8%	224 76.2%	70 23.8%

Table 2: Choice of Gender Role Models among Medical Students

Final Year MBBS Students	Male Role Models n %	Female Role Models n %	Both Gender Role Models n %	Total n
Male Students	98 51.3%	14 7.3%	79 41.4%	191
Female Students	89 34.2%	38 14.6%	133 51.2%	260
Total Students	187 41.5%	52 11.5%	212 47%	451

Table 3: Mean Domain score comparison between Private and Public sector medical colleges

Domain	Type of Medical College	Total Score	Mean Score	Score					
				Low n %	Average n %	High n %	p value	Standard Deviation	Standard Error of Mean
Clinical	Private	30	23.04	1 0.6%	51 32.5%	105 66.9%	<0.001	3.11	.25
	Public		20.67	18 6.1%	152 51.7%	124 42.2%		4.39	.26
Teaching	Private	55	39.57	1 0.6%	89 56.7%	67 42.7%	<0.001	4.53	.36
	Public		35.26	41 13.9%	160 54.4%	93 31.6%		8.07	.47
Personal	Private	20	14.52	7 4.5%	91 58.0%	59 37.6%	<0.001	2.47	.19
	Public		12.81	64 21.8%	152 51.7%	78 26.5%		3.41	.19
Caring Attitude	Private	50	38.10	%1.9 3	%36.3 57	%61.8 97	<0.001	4.99	.39
	Public		34.86	%6.1 18	%52.7 155	%41.2 121		6.89	.40
Effectiveness	Private	55	39.03	%1.3 2	%57.3 90	%41.4 65	<0.001	5.34	.43
	Public		33.87	%25.9 76	%43.5 128	%30.6 90		9.33	.54

Table 4: Correlation of Scores achieved among different components of RoMAT

Pearson Correlation r	Total Clinical Score r p-value	Total Teaching Score r p-value	Total Personal Score r p-value	Total Score Caring Attitude r p-value	Total Score Effectiveness r p-value
Total Clinical Score	**1**	**0.001> 0.75**	**0.001> 0.735**	0.001> 0.871	0.001> 0.75
Total Teaching Score	0.75m<0.001	1	0.001> 0.78	0.001> 0.82	0.001> 0.90
Total Personal Score	0.001> 0.73	0.001> 0.78	1	0.001> 0.69	0.001> 0.88
Total Score Caring Attitude	0.001> 0.87	0.001> 0.82	0.001> 0.69	1	0.001> 0.63
Total Score Effectiveness	0.001> 0.75	0.001> 0.90	0.001> 0.88	0.001> 0.63	1

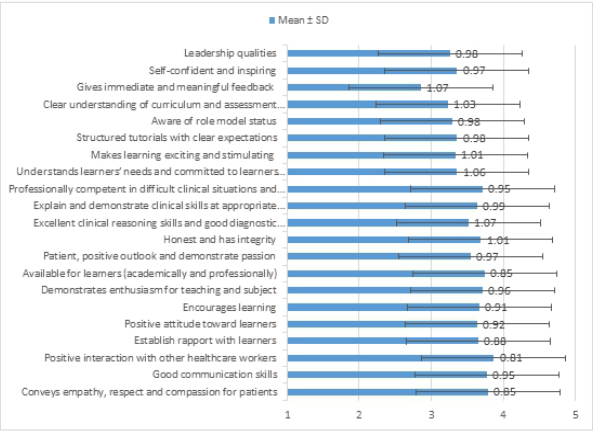

Fig 1: Mean ± SD scores for items in Effectiveness and the Caring Attitude components of RoMAT 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree

DISCUSSION

Based on the results obtained, medical students categorize the characteristics and roles of an admirable role model, which further support them in their future career lines because these role models have an impact both implicitly as well as explicitly. According to White et al., what students experienced throughout their preclinical years regarding patient-centered care was in contrast to what they truly experienced in their clinical years, as a result of this conflict, some level of compromise, transformation, and reinforcement might have changed their values. 25 Therefore, this research was conducted to observe whether undergraduate medical students, with a mean age of 23.71 years, experience PRM and NRMs during their medical education.

Provided that in one study, an average of 3.7 physicians were nominated as RMs by each medical student. [26] Contrarily, it was perceived that only 21.1% of students had three role models while 19.70% mentioned having more than three. In another study concerning the opinions of students about perceiving PRMs and NRMs, almost all students testified to having commonly witnessed both PRMSs as well as NRMs. Likewise, 92.9% of students have observed positive role models in their respective medical colleges. On the other hand, many graduating medical students did not find faculty members exhibiting skills, behaviors, and expertise that are perceived as attributes of PRMs. [27] Furthermore, earlier accounts from the 1990s in the USA, exposed the unprofessional and unethical conduct of teachers and supervisors with 90% of medical students and 92.5% of residents during training. [28] Similarly,

76.2% n=224 of students had agreed upon the presence of negative role models in their respective medical colleges. Moreover, findings from a study conducted among Japanese medical students reported a lesser proportion of medical students experiencing NRMs. Mostly due to cultural differences and social norms that made students compromise on professional values without being critical, or rarely any unprofessional teacher hired by Kagoshima University. [29]

Without a doubt, the majority of PRMs had an affiliation to major clinical specialties Medicine 29.9% and Surgery 13.3%. In contrast, the maximum number of NRMs 20.2% belonged to the specialty of Gynecology. Findings from a study on students of pharmacy and dentistry departments concerning role models indicated that respect towards colleagues, being knowledgeable, and having effective teaching abilities were considered essential traits. [30] By the same token, attributes that were scored higher by students were good communication skills and showing respect, empathy, and compassion towards patients.

Moreover, McGill University surveyed, the three most essential features for choosing a role model among residents of different specialties which included, personality, clinical expertise, and teaching aptitude [11] Likewise, the RoMAT questionnaire was used in the present study to test these three domains. Undoubtedly, two imperative traits documented by undergraduate students for clinician role models were interpersonal/communication skills, legal/ethical conduct, and ability of educational content delivery. Whereas interns ranked components of being knowledgeable and student support initiatives as the most significant qualities. [31] Presently, undergraduate students indicated teaching skills were ranking higher than the clinical and personal skills of a clinician role model. Another study by Reddy et al. reported more than 80% of students to get inadequate feedback from members of the faculty. [32] Particularly, giving meaningful and immediate feedback by the clinical teacher scored low among study participants, in the present study. Conversely, according to a majority of students, attributes concerning research abilities, professional status, and administrative services were categorized as least essential for clinician role models. [33] However, being honest, having integrity, as well positive interaction with other healthcare workers, were scored higher. Correspondingly, senior faculty members with the designation of Professor were mostly 44.8% considered as role models, while very few students chose junior doctors Medical Officers 2%.

According to students, most clinical teachers ranked lower during demonstrating clinical skills at the appropriate student level as well as most teachers were not aware of their role model status. Factually, more recent publications elaborated that empathy is to be taught and a role model at the same time. [34] Similarly, conveying empathy and compassion toward patients was considered an integral quality of a role model by study participants. Thereafter, we found that the majority of students provided higher scores to items on the 'Caring Attitude' element as opposed to the "Effectiveness" domain, these findings were comparable to a study in Amsterdam using RoMAT. [18]

Several factors may have contributed to achieving higher scores in all domains tested, as research has proved that in studies measuring questionnaire items or consisting of self-reporting methods, participants might give socially appropriate responses when inquired about sensitive topics. [35] Therefore, a tendency was shown by respondents towards selecting agree to the option, regardless of their opinion, when formulated questions have 'Agree/Disagree' options referring to the phenomenon of acquiescence bias. [36] On the other hand, comparatively homogeneous and higher scores may mirror the general satisfaction of students with the behavior of clinical teachers as role models. Probably, due to the robust emphasis on ongoing faculty development and clinical teaching skills exercises undertaken by clinical teachers currently in Peshawar, Pakistan. Our results showed significant correlations among components of personal attributes; it, therefore, raises the possibility that by strengthening and improving some traits other traits are habitually refined.

Primarily, the unanticipated outcome in most studies was the lack of provision of evidence on the gender bias among role models as perceived by students. [37] As evident and suggested from our findings, female clinician role models were rarely reported 11.5% and in addition, female students also reported male clinical teachers as their role models. Likewise, it seemed that the majority of the role models encountered by medical students were male clinical teachers, and only 7.3% of male students had a female clinical teacher as their role model. Partly, because medical faculty represents a less share of female members, as a result, females are less often perceived and pursued by students. Our outcomes as well confirmed that fewer role models were reported by female students as opposed to their male counterparts. In this sense, the dearth of female role models and professionals may prove as a significant obstacle to females' career development and accomplishments. [38]

Firstly, the likelihood that RoMAT may not have effective transferability to other institutions or educational settings due to distinctive cultures among organizations and a variable amount of contact time among teachers and students. Therefore, additional research is required to confirm the prominent elements tested in the present study that is reflected in other cultural groups, stages of medical education, and curriculum planners. Secondly, the study had a small sample size and medical colleges in one city. Therefore, research projects with large sample

sizes, involving multiple cities and countries will be essential to guarantee appropriate generalization of the study outcomes. Additionally, due to the use of a predetermined structured questionnaire in this study, it is recommended to further explore in-depth the roles, characteristics, and responsibilities of clinical teachers, Moreover, these limitations could be addressed through direct observation of role models. Further research is required to study the correlation between various aspects of role modeling to personality groups of students. Last but not least, it is suggested that research should emphasize upon identification of characteristics, and roles that clinical teachers perceive as significant for themselves.

CONCLUSION

On the whole, tools like RoMAT can be considered for reviewing the influence of training programs on clinical teachers. Even though participants had similar ethnic backgrounds and were studying the same curriculum, students in private medical colleges experience more positive role-modeling characteristics in comparison to public sector medical colleges. More male clinical teachers are perceived as role models than female clinical teachers by both male and female students. Students from private medical colleges had more positive perceptions regarding RMs compared to students from Public sector medical colleges. Although maximum students encountered both PRMs and NRMs during medical education, the results of this study revealed different numbers of both. Based on this study's findings, it is concluded that teachers ought to be more cautious of their professional and personal behavior because students expect role models who are accountable, punctual, and mindful regarding their authorized responsibilities.

REFERENCES:

1. Ash JK, Walters LK, Prideaux DJ, Wilson IGJMJoA. The context of clinical teaching and learning in Australia. 2012;1967:475-.
2. Wright SM, Kern DE, Kolodner K, Howard DM, Brancati FL. Attributes of excellent attending-physician role models. The New England journal of medicine. 1998;33927:1986-93.
3. Sternszus R, Cruess S, Cruess R, Young M, Steinert YJAM. Residents as role models: impact on undergraduate trainees. 2012;879:1282-7.
4. Horsburgh J, Ippolito K. A skill to be worked at: using social learning theory to explore the process of learning from role models in clinical settings. BMC Med Educ. 2018;181:156.
5. Irby DM. Clinical teaching and the clinical teacher. Journal of medical education. 1986;619 Pt 2:35-45.
6. Walton HJEftP. Overview of themes in medical education. 1985:49-51.
7. M. Harden JG, Graham Buckley, IR Hart, R %J Medical teacher. BEME Guide No. 1: Best evidence medical education. 1999;216:553-62.
8. McAllister L. Facilitating learning in clinical settings: Nelson Thornes; 1997.
9. Campos-Outcalt D, Senf J, Watkins AJ, Bastacky SJAmjotAoAMC. The effects of medical school curricula, faculty role models, and biomedical research support on the choice of generalist physician careers a review and quality assessment of the literature. 1995;707:611-9.
10. Harden R, Crosby JJMt. AMEE Guide No 20: The good teacher is more than a lecturerÐthe twelve roles of the teacher. 2000;224:334-47.
11. Wright SM, Carrese JAJC. Excellence in role modeling: insight and perspectives from the pros. 2002;1676:638-43.
12. Elzubeir MA, Rizk DEJME. Identifying characteristics that students, interns and residents look for in their role models. 2001;353:272-7.
13. Nasim M. Medical education needs to change in Pakistan. JPMA The Journal of the Pakistan Medical Association. 2011;618:808-11.
14. McLean M. Is culture important in the choice of role models? Experiences from a culturally diverse medical school. Medical teacher. 2004;262:142-9.
15. Med MSOWGJA. Learning objectives for medical student education-guidelines for medical schools: Report I of the Medical School Objectives Project. 1999;741:13-8.
16. Frank JRJhrmocCCep. The CanMEDS 2005 physician competency framework. 2005.
17. Ambrozy DM, Irby DM, Bowen JL, Burack JH, Carline JD, Stritter FTJAmjotAoAMC. Role models' perceptions of themselves and their influence on students' specialty choices. 1997;7212:1119-21.
18. Said M, Jochemsen-van der Leeuw RH, Spek B, Brand PL, van Dijk NJPome. Role modeling in the training of hospital-based medical specialists: a validation study of the Role Model Apperception Tool RoMAT. 2019;84:237-45.
19. Haider SI, Gill RC, Riaz QJJTJotPMA. Developing role models in clinical settings: A qualitative study of medical students, residents and clinical teachers. 2020;709:1498.
20. Wright SJAmjotAoAMC. Examining what residents look for in their role models. 1996;713:290-2.
21. Jochemsen-van der Leeuw HR, van Dijk N, van Etten-Jamaludin FS, Wieringa-de Waard MJAM. The attributes of the clinical trainer as a role model: a systematic review. 2013;881:26-34.
22. Jochemsen-van der Leeuw HR, van Dijk N, Wieringa-de Waard MJAM. Assessment of the clinical trainer as a role model: a Role Model Apperception Tool RoMAT. 2014;894:671.
23. Paice E, Heard S, Moss FJB. How important are role models in making good doctors? 2002;3257366:707-10.
24. Jochemsen-van der Leeuw HR, Wieringa-de Waard M, van Dijk NJPome. Feedback on role model behaviour: effective for clinical trainers? 2015;43:153-7.

25. White CB, Kumagai AK, Ross PT, Fantone JCJAM. A qualitative exploration of how the conflict between the formal and informal curriculum influences student values and behaviors. 2009;845:597-603.

26. Wright S, Wong A, Newill C. The impact of role models on medical students. Journal of general internal medicine. 1997;121:53-6.

27. Bijari BB, Zare M, Haghdoost AA, Bazrafshan A, Beigzadeh A, Esmaili MJIjome. Factors associated with students' perceptions of role modeling. 2016;7:333.

28. Baldwin Jr D, Daugherty SR, Rowley BDJAmjotAoAMC. Unethical and unprofessional conduct observed by residents during their first year of training. 1998;7311:1195-200.

29. Tagawa MJBme. Effects of undergraduate medical students' individual attributes on perceptions of encounters with positive and negative role models. 2016;161:1-9.

30. Frank J, Jabbour M, Tugwell P, Boyd D, Labrosse J, MacFadyen JJARCPSC. Skills for the new millennium: report of the societal needs working group, CanMEDS 2000 Project. 1996;294:206-16.

31. Bahmanbijari B, Beigzadeh A, Etminan A, Najarkolai AR, Khodaei M, Askari SMSJEp. The perspective of medical students regarding the roles and characteristics of a clinical role model. 2017;94:4124.

32. Reddy ST, Farnan JM, Yoon JD, Leo T, Upadhyay GA, Humphrey HJ, et al. Third-year medical students' participation in and perceptions of unprofessional behaviors. 2007;8210:S35-S9.

33. Yazigi A, Nasr M, Sleilaty G, Nemr E. Clinical teachers as role models: perceptions of interns and residents in a Lebanese medical school. Medical education. 2006;407:654-61.

34. Buckman R, Tulsky JA, Rodin GJC. Empathic responses in clinical practice: Intuition or tuition? 2011;1835:569-71.

35. King MF, Bruner GCJP, Marketing. Social desirability bias: A neglected aspect of validity testing. 2000;172:79-103.

36. Saris W, Revilla M, Krosnick JA, Shaeffer EMJSRM, v4i1. -Ds. Comparing questions with agree/disagree response options to questions with construct-specific response options. 2010.

37. Cheryan S, Siy JO, Vichayapai M, Drury BJ, Kim SJSP, Science P. Do female and male role models who embody STEM stereotypes hinder women's anticipated success in STEM? 2011;26:656-64.

38. Wright SM, Carrese JA. Excellence in role modeling: insight and perspectives from the pros. CMAJ : Canadian Medical Association journal = journal de l'Association medicale canadienne. 2002;1676:638-43.

CONFLICT OF INTEREST: Authors declare no conflict of interest

GRANT SUPPORT AND FINANCIAL DISCLOSURE: NIL

AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Khan M: Concept, manuscript writing, data collection

Jamil B: Concept, Acquisition of data, critical review,

Muhammad F: Analysis and interpretation of data

Bilal N: Data collection, Statistical analysis

Hasan B: Bibliography and drafting of manuscript

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.