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Effectiveness of Structured Mentor Training on Mentoring Competence in Undergraduate Medical Education: A Quasi- Experimental Study

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Abstract

Objective: To assess mentors' baseline competence prior to a mentor training workshop at Wah Medical College and to evaluate changes in overall mentoring proficiency and specific mentor skill domains following the intervention using a self-assessment tool.

Methodology: Faculties of Wah Medical College were involved in this quasi-experimental study and 35 numbers of faculty involved in mentoring were included. The intervention included two structured workshops separated over eight weeks, with the support of reflective and self – study phases. The Mentor Competency Assessment tool (MCA-21) was used pre and post the intervention.

Results: The overall mentoring competence was found to significantly increase ($p < 0.01$) from statistical analysis. The most significant improvements were made in communication, fostering independence and enhancing professional development itself among the six mentoring domains. The findings from these outcomes confirm the value of structured mentor training in faculty development.

Conclusion: Training based on experiential learning, in a structured manner, improves mentoring skill remarkably. To strengthen the quality of mentorship, and ultimately, student outcomes, institutions should be compelled to invest in such faculty development programs.

Keywords: Mentor training, Medical education, MCA-21, Experiential learning, Faculty development, Mentoring competence

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Introduction

Mentorship has been widely accepted as the cornerstone of medical education and is more than just a tool for academic instruction; it is a vehicle in which the professional identity and psychosocial support for the mentee are formed as well as a means through which his career development is provided. The definition of mentoring is a relationship between an experienced individual who shares knowledge and emotional support and teaches a less experienced individual.[1] In the realm of health professions education, mentorship plays an increased role by the virtue of complexity of clinical training in which technical skills and humanistic values are expected to be developed simultaneously.[2]

Over the past two decades, mentoring in medical education has evolved from an informal, ad hoc activity into a more organized and structured process with clearly defined objectives. This shift reflects a growing recognition of mentorship as a deliberate pedagogical strategy rather than a courtesy-based or incidental experience.[3] The existence of a well working mentorship framework influences the improved academic performance, the higher student engagement, higher retention rates and reaping a more valuable professional relationship.[4] On the other hand, it's also welcoming to mentors as it leads to personal satisfaction, strengthens collegial network, and increases the institutional credibility.

While structured mentorship training has been globally advanced, this is not true for many regions, such as South Asia. Formal mentoring is still in early days in Pakistan and is isolated in some forward-looking institutions like Vakani et al. (2024) being promising initiatives, these are rarely studied or published, and yet not implemented system wide.[5] In most institutions, there is no standard preparation or evaluation of the mentors before they enter the role. As a result, mentoring practices differ significantly in focus, in the quality and usefulness of mentoring they deliver to mentees.[6]

Hundreds of studies point out that mentorship effectiveness depends more on a constellation of competencies from which academic knowledge is only one part.[7] Include these communication skills, emotional intelligence, cultural competence to align expectations, provide feedback, and basic skills like fostering autonomy and professional development in mentees. However, they believe most faculty are ill- prepared to fulfill these expectations, especially when there is no formal training. Mentors are often provided with only anecdotal and inconsistent in quality preparations for what it takes to mentor.[2]

Structured mentor training is now recognized as an accepted need. Besides clarifying the roles and responsibilities of a mentor, such a training enables the mentor to navigate different mentoring situations. Thus, it promotes practice that is theory informed and works toward merging mentorship with the larger institutional agenda of inclusivity, professional identity formation, and academic excellence. An ELT that supports training development would be one of the most compelling models, which is Kolb's Experiential Learning Theory (1984) which emphasizes a cyclic model of learning via concrete experience, reflective observation, abstract conceptualization, and active experimentation. The model offers a framework specifically suited for both mentor education, when delivered through workshops, simulations, reflective writing and peer discussion.

For any educational intervention having measurable outcomes is needed. During mentoring, self-assessment has become a strong mechanism for mentors to determine and evaluate one's competency and locate and assess their development as well as track the progress over a period. Thus, a validated and theory derivatives study self as well as the probe of mentor proficiency in the six central competence domains maintaining effective communication, aligning expectations, promoting independence, assessing understanding, handling diversity, and supporting professional development.[8] In addition, it offers an evidence-based platform to commence reflective practice and to measure advancement of competency because of educational interventions.

In so doing, the current study included offering a structured mentor training program at Wah Medical College, Pakistan, a setting where faculty members had not received any formal mentoring instruction prior to the study. The outcomes of using the MCA 21 as an assessment tool were based on the training design which aimed to enhance mentor competence using Kolb's ELT model. The study sought especially to measure how much such training could improve mentors' self-perceived skills and which skill area would be enhanced.

The present study addresses key gaps in the mentorship literature by examining changes in mentors' self-perceived competencies following a structured training intervention. Although mentor training programs are widely recognized as beneficial, prior empirical studies are limited by the absence of standardized and validated instruments for assessing mentor competence, heavy reliance on subjective self-assessment, and methodological heterogeneity across institutions, which restricts generalizability and scalability.[8] The influence of cultural and institutional context on mentoring practices also remains underexplored, particularly in South Asian medical education settings, where mentoring structures and expectations differ significantly from Western models.[1,9] By employing a theory-informed training design and a validated assessment tool, this study contributes empirical evidence from a low- and middle-income country context and supports the role of structured mentor development in strengthening educators' professional identity at the intersection of clinical practice and medical education.[2,10]

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The objectives of this study are three fold. First, the research focuses on assessing the current mentoring abilities of the faculty of Wah Medical College using the MCA-21 self-assessment tool. Building on this baseline, the goal of the study is to assess the effectiveness of an eight-week structured mentor training program in improving these particular mentoring competencies as measured by the same measure. Finally, the research entails a comparative analysis of the outcomes of pre- and post-training self-assessment to look for significant improvements in proficiency or outstanding gaps in overall mentoring effectiveness.

The study holds multiple important reasons for investigation. The study achieves two key aspects: (1) it delivers data-based evidence on mentor training programs for low-resource settings while (2) conducting empirical research on faculty development in South Asian contexts. The study contributes to limited quantitative research about faculty development in the region of South Asia. The research works to establish mentorship training as fundamental educational practice through its presentation of a training method that can be replicated using experiential learning principles. MCA-21 functions as a beneficial assessment instrument which provides organizations with tools to develop and enhance mentor competencies.

This initiative helps faculty members reach higher mentorship capabilities leading to better conditions for undergraduate medical students to learn. Mentors who demonstrate enhanced competence establish better relationships with their students and produce better academic results which results in more satisfied students. Such programs at the organizational scale develop an outstanding mentorship culture that emphasizes teamwork together with reflective learning and ongoing professional development.

Over the past few years, mentorship has become a crucial strategy in medical education to fill the gap between acquisition of knowledge and construction of a professional identity. Mentorship in academic medicine has traditionally been informal, and personality driven, which is why the support that is provided for learners across different contexts in academic medicine is formalizing.[7] Undergraduate medical students benefit from a mentorship program that is structured well with respect to academic performance, professional development, emotional wellbeing, and career progression. [1]

Education mentorship is drawn from several theoretical models. According to Kolb's Experiential Learning Theory (ELT), Kolb, 1984), learning is an ongoing method of exercising experience. It stresses the involvement, reflection, the conceptualization and experimentation (Kolb, 1984). ELT applied in mentor training provides more in-depth involvement allowing mentors to reflect on mentoring practice and glean from peer relationships and elevate those takeaways into behavior. In accordance with Social Cognitive Theory (Bandura, 2001), mentorship frameworks are also supported because learning is viewed as taking place in a social context through the observation, imitation, and modeling of others. It is the utmost reinforcement to the significance of role models in education, because mentors are the templates for consequent behavior among mentors in professional environments.

Mentoring competency is more than a proficiency in the subject; there are communication abilities, feedback techniques, emotional intelligence, diversity management, and professional guidance. To assess these attributes, Pfund C et al. (2016) developed the Mentor Competency Assessment (MCA-21) comprised of six domains.[11] Formal training proved to greatly enhance mentor self-efficacy and skills application, and these improvements are maintained over time according to their research. According to Rubenstein J et al.(2025) in a recent analysis, early career faculty tend to be overwhelmed by mentoring responsibilities that they are poorly prepared to fulfill because the expectations are unclear.[12] Mentors who participate in these structured mentorship programs are given skills for effective sustained mentor-mentee relationships and academic success on the impact mentoring can have in both the mentees and mentor's academic success.

Mentor training has been found useful by studies in many regions. Torsson et al., (2020) revealed in one of the programs in Finland that structured workshops had high impact to nursing educators' mentoring confidence and competence. Moreover, Batchelor et al., (2025) developed an American national clinical research boot camp and found that trained mentors made the difference and improved mentees' outcomes and career clarity. Vakani FS et al.(2024) drew closer to the South Asian context and observed large mentorship gaps in Pakistani medical institutions.[5] The considerations identified by their study refer to cultural hierarchies, lack of time, and lack of institutional support that serve as barriers to effective mentoring and they point to the need for purposeful, context-sensitive training programs.

Despite the fact there is evidence, barriers to training of the mentor persist. There are faculty workload, the absence of incentives, and the lack of institutional frameworks, and inconsistent evaluation methods that may impede the scalability of mentor development programs.[9] However, these issues are more pronounced in countries with low- and middle-income level of educational resources and faculty development budgets. Furthermore, inequity in the mentor-mentee experience based on gender has been reported. In a review, Espejo G et al.(2025) have mentioned that women in academic medicine often face diminished access to mentoring opportunities, affecting their movement and confidence in advancement.[13]

The loss of institutional integration of mentoring as a

core faculty development goal is likely due to the various barriers in accomplishing it. They should make use of validated self-assessment tools like MCA-21 for ongoing monitoring. Learning in the form of peer to peer, reflective practice to embed learning. Based on contextually relevant models, they are considered sociocultural dynamics. For example, recently implemented a scalable, multi-component academic clinical educator training program that resulted in improved preparedness of the mentee as well as improved satisfaction of the students who received the training.[14]

Methodology

A quasi-experimental pretest, posttest design with no control group was used to assess the effectiveness of structured training of medical faculty supervisors on their self-perceived mentor competencies. Due to the ethical and logistical considerations of not excluding any volunteers from being provided to training, the decision was made to use a quasi-experimental approach. The measure of interest was the change in mentoring competence, and this was measured quantitatively using validated self-assessment instrument, Mentor Competency Assessment (MCA-21).

The research was carried out at Wah Medical College, Taxila, Pakistan. Purposive sampling was used to recruit the participants. Criteria for inclusion of participant was a minimum of Assistant Professor rank, one year of experience as teacher and involvement in current mentoring activities of undergraduate students. Thirty-five faculty members from various clinical and basic science departments electively participated in the study. All participants were assessed pre- and post-intervention. A universal sampling technique was adopted. The universal sampling technique was selected because the number of faculty members enrolled in the mentoring program was limited. This approach ensured the inclusion of the entire target population, thereby eliminating sampling bias and enhancing the representativeness of the findings.

Eight-weeks mentor training program was used as an intervention that was designed based on the Kolb's Experiential Learning Theory (ELT) as the instructional framework. According to ELT, the process that takes place while someone master's something involves four stages namely, concrete experience, reflective observation, abstract conceptualization and active experimentation. It was split into two main workshop sessions containing some self-directed reflection in between. The first four-hour workshop occurred at the onset of the program introduction participants to the essential mentorship competencies. This covered sessions on the role of the mentor, communication, alignment of expectations, delivering feedback and diversity in mentoring relationships. Interactive lectures, case-based discussion, role-playing simulation and sessions of peer sharing were pedagogical methods. After this, participants were in a four-week self-directed phase, where they journal about their reflection to structured reflection, learning set up strategies about mentoring that they applied in the real world and lastly, they read about best mentoring strategies in the selected readings. The purpose of this experiential learning was to further enhance the assimilation of the initial workshop participants on the subjects on which the initial workshop had focused. At the end of the program, the second workshop was conducted and lasted four hours. It covered advanced topics like encouraging independence, long term development of mentees, assistance with difficult mentoring scenarios, as well as gauging mentee understanding. Group presentations, peer feedback, and individual goal setting exercises to continue to grow as mentors ended the session.

To ascertain changes in mentoring competencies, Mentor Competency Assessment (MCA-21) tool was administered before the first session and two weeks after the completion of second workshop. The MCA 21 is composed of 21 items spread across six domains, namely, Maintain effective communication, Align expectations, Encourage independence, Foster professional development, Evaluate whether understanding has taken place, and Respond to diversity. The skill rating of each item is done on a 7-point Likert scale from 1 ('Not at all skilled') to 7 ('Very Skilled'). Despite this, Cronbach's as were reported above 0.80 in previous research, which shows that the tool is widely recognized because of its validity and internal consistency.

To preserve anonymity, reduce social desirability bias and facilitate data collection, an online data collection method was put into place. For confidentiality's sake, participants were assigned unique identifiers and demographic information was collected to analyze. The analysis of the data was made using SPSS version 24. Demographic characteristics and the mean scores of the domains were summarized with descriptive statistics. Using paired sample t-tests, inferential analysis was done for the differences in mentoring competencies pre and post the intervention. Cohen's d was used to calculate the effect size and Cronbach's alpha was used to determine the reliability of the MCA-21 in the present context. Statistically significant was determined as $p < 0.05$.

The Institutional Review Board (IRB) of Wah Medical College granted it ethical approval. Prior to participation all participants gave informed consent. The study was carried out according to the confidentiality aspect, voluntary participation and the non-maleficence aspect. Participants were told that there were no incentives provided and that participation or opting to withdraw would not impact their professional evaluations or their standing within the institution.

Results

A structured mentor training program was evaluated in the effectiveness through pre- and post-interven-

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tion data of 35 participants. A structured framework for evaluating mentoring competency in terms of six core domains was provided by The Mentor Competency Assessment (MCA-21) tool. I conducted descriptive and inferential analyses to find out what this intervention had done.

The contextualization of the findings within the study is based on demographic analysis. The 30 faculty participant's demographical information about age, gender and professional designation is detailed in Table 1. A mature, experienced respondent cohort of 30 percent in the 36–40 category and 20 percent in the 41–45 and over 50 categories was found among most respondents. Seventy percent of the participants were females, 30 percent were male. The distribution of designations shows that public votes were Assistant Professors (60%), Associate Professors (30%) and Professors (10%). This diverse demographic of student teachers represent an additional strength in terms of generalizability of the results and broad applicability of the mentor training programme across differing levels of academic seniority.

Table 2 shows the changes in skills related to mentoring within the domain before and after the workshop. On all 21 items in the MCA-21, means were significantly higher after workshops compared to pre-workshop scores. The biggest improvements were obtained in active listening (from 4.13 to 5.20), constructive feedback (3.97 to 5.20), and trust establishing and work life balance support. The improvements are straightforward consequences of experiential training and peer interaction strategies applied in the training. Decreased posttest standard deviations also imply higher uniformity in respondents' self-perceptions.

Normality tests, including Kolmogorov-Smirnov (p = 0.124) and Shapiro-Wilk (p= 0.226), confirmed no significant deviation (p > 0.05), thereby justifying the use of parametric statistics.

Paired sample t test was conducted to analyze improvements within different MCA-21 domains shown in table 4. The highest increase was in the summit of Promoting Professional Development (Mean = 5.63), then in Aligning Expectations (5.53) and finally in Fostering Independence (5.07). Maintaining Effective Communication yielded the smallest gain (4.83), but it was still highly significant.

Discussion

TThis study seems to give timely and contextually relevant evidence in support of the inclusion of structured mentor training as part of faculty development programs in medical education. Using the MCA-21 tool the results show statistically significant improvements in all six areas of mentoring competency with overall mean scores rising from 3.23 to 4.08. These results are consistent with the literature from around the world, as well as the experiential learning framework on which the training design was based. Similar improvements in mentoring efficacy have also been observed in past research who raised the importance of theory-informed mentoring programs.[11,15,16]

The Kolb Experiential Learning Theory (ELT) was used to establish a basic framework for the intervention.

Table 1. Descriptive Statistics of Demographics

Age		
Age in years	**N**	**%**
30-35 years	5	16.7%
36 -40 years	9	30.0%
41 -45 years	6	20.0%
46 -50 years	4	13.3%
Over 50 years	6	20.0%
Gender		
Female	21	70.0%
Male	9	30.0%
Designation		
Assistant Professor	18	60.0%
Associate Professor	9	30.0%
Professor	3	10.0%
Total	**30**	**100%**

Table 2. Mean scores of competencies measured with MCA-21 Before and after training

Competency	Pre-Test Mean ± SD	Post-Test Mean ± SD
Active listening	4.13 ± 1.196	5.20 ± 1.243
Providing constructive feedback	3.97 ± 1.273	5.20 ± 1.270
Establishing trust	4.20 ± 1.540	5.47 ± 1.332
Communication style accommodation	3.90 ± 1.494	5.17 ± 1.262
Aligning expectations	3.83 ± 1.367	5.67 ± 0.758
Considering personal/professional differences	4.17 ± 1.392	5.57 ± 0.935
Setting research goals	3.73 ± 1.437	5.50 ± 0.938
Career guidance	4.00 ± 1.313	5.47 ± 0.681
Helping with work-life balance	4.13 ± 1.279	5.53 ± 0.819
Stimulating creativity	3.87 ± 1.167	5.57 ± 0.898
Addressing diversity (biases, backgrounds, etc.)	3.87 ± 1.224	5.63 ± 0.964

Table 3. Tests of Normality

Test	Statistic	df	Sig. (p-value)
Kolmogorov-Smirnov	0.142	30	0.124
Shapiro-Wilk	0.955	30	0.226

Table 4. Paired Samples Test (Domain-Wise Scores)

Domain	Mean	SD	p-value
Maintaining Effective Communication	4.83	4.511	< 0.001
Aligning Expectations	5.53	3.277	< 0.001
Assessing Understanding	5.07	3.619	< 0.001
Fostering Independence	5.07	3.269	< 0.001
Addressing Diversity	4.80	3.336	< 0.001
Promoting Professional Development	5.63	4.287	< 0.001

Through role-play, simulation, journaling and feedback participants took in the concepts, and actively translated them into real-world mentoring behaviors. Such approaches are echoing principles of adult learning, and allow mentors to become involved at a depth of reflective practice.[17, 18] Study demonstrated that Kolb-informed training in healthcare and educational institutions contributes to the integration of theory into professional practice; this finding has been supported by the results of this study.

Out of the six domains, the most improvement was made in "Fostering Independence" and "Maintaining Effective Communication". These are essential in mentorship to nurture autonomy and confidence among the mentees. Our training design, which builds on the methods of reflective experience, improved the practical communication strategies of participants, which is similar to the findings of Douglas et al. (2025) about the role of interactive methods in the development of communication efficacy.[19] In addition, the "Addressing Diversity" domain that was the lowest scoring initially had meaningful post-training gains. This is especially important in the South Asian context where mentoring tends to take place in hierarchical and culturally rigid structures. As mentoring across lines of gender, ethnicity and socio-economic class becomes more critical, these gains imply that faculty are becoming more aware and responsive to mentee diversity, as is highlighted in the work of Espejo et al. (2025) and Vakani et al. (2024) who did an international work on inclusive mentorship.[5,13]

There was also a lot of improvement in the domain

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of "Promoting Professional Development." Mentors reported increased levels of proactive goal setting, planning and one-to-one support consistent with Rubenstein et al. (2025) who reported that effective mentorship is known to support the development of academic identity formation and resilience.[12] Locally but not limited to Qadid (2025) in his view that the structured mentorship in physiotherapy helps promote leadership and professional development which is further reinforced by the results from this study.[20]

Pakistani studies are realizing the acuteness of the need for structured mentoring programs.[21] Studies emphasized that the research mentorship has not been developed at its full potential and informal mentoring restricts the growth of academics. Likewise, a research illustrated that the contradictory evidence in the access and effectiveness of mentoring, particularly with underrepresented students, is gratuitous.[22] Current study results provide an established model to fill these gaps and act as a model to plan adaptation in a region.

The MCA-21 tool itself showed strong internal consistency (Cronbach's $\alpha > 0.83$ across all domains), confirming its reliability for evaluating mentoring competencies in the local context. Its continued use is not only supported by the data from this study, but also increased use internationally for formative and summative mentor evaluation.[23] Given the statistically significant results and lower variability in post-test scores, it is clear that the training was able to harmonize the level of competency, especially among the participants with different teaching experience.

Demographically, the study used a well-distributed study group in terms of gender, academic rank and years of experience. This diversity helps to support the selling point of the intervention's scalability and adaptability levels across faculty. Whether in the form of more relatively consistent skill-perceptions among athletes, narrowing post-intervention is suggestive of greater self-awareness and skill-perception convergence leading to a case for standardizing such training within growth of ongoing professional development strategies.

Finally, although the research is an addition to the existing literature in the form of new and empirical data in a South Asian context, the research is not without limitations. The lack of a control group limits causal inference and the use of self-reporting introduces the risk of bias, despite the fact that anonymity has been used and a validated tool is used. Furthermore, the study was limited to one institution, indicating that more generalizable research is needed to overcome this limitation.

Nevertheless, this work has been distinguished in a region where regional literature has been marked by anecdotal or qualitative accounts.[5,9] It offers a robust, scalable, and quantitative framework for mentorship reform in undergraduate medical education, and presents information on the results in a way that can be used to inform policy, curriculum development, and future research topics. The dramatic post-intervention improvements, cultural responsiveness and scientific rigor add up to making structured experiential mentor training a permanent fixture among faculty development in South Asia and in similar settings.

Conclusion

Training based on experiential learning, in a structured manner, improves mentoring skill remarkably. To strengthen the quality of mentorship, and ultimately, student outcomes, institutions should be compelled to invest in such faculty development programs.

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Authors' Contribution Statement

RA contributed to the conception, design, acquisition, analysis, interpretation of data, drafting of the manuscript, critical review of the manuscript, and final approval of the version to be published. NS contributed to the design, acquisition, analysis, drafting of the manuscript, and critical review of the manuscript. NB contributed to the acquisition, analysis, interpretation of data, and drafting of the manuscript. SZ contributed to the acquisition, analysis, interpretation of data, and drafting of the manuscript. OA contributed to the design, acquisition, and analysis of data. AM contributed to the interpretation of data, drafting of the manuscript, and critical review of the manuscript. All authors are accountable for their work and ensure the accuracy and integrity of the study.

Conflict of Interest

Authors declared no conflict on interest

Grant Suppport and Financial Disclosure

None

Data Sharing Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.