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The Outcome of Using the Modified Mini-Peer Assessment Tool (mini-PAT) on the Performance of Demonstrators Working at a Public Sector Medical College of Punjab

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ABSTRACT

Background: The non-standardization in the existing assessment methods of healthcare workers highlights the need to develop a modified methodology that can assess healthcare professionals working in public/private sector medical colleges based solely on their professional development. **Objective:** To assess the performance of demonstrators by using a modified mini-PAT at a public sector medical college. **Study Design:** Quasi experimental study. **Settings:** Department of Medical Education, Sahiwal Medical College, Sahiwal, Pakistan. **Duration:** July, 2024 to December, 2024. **Methods:** After obtaining approval from the institutional ethical review board and informed consent from the participants, the first round of using mini-PAT on a total of 54 demonstrators, results were collated, and feedback sessions were carried out. We then conducted the second round of assessment using mini-PAT and compared the results with those of the first round through statistical analysis using IBM SPSS version 26. **Results:** A total of fifty-four (54) demonstrators (42.6% males and 57.4% females) were evaluated through the modified mini-PAT via pre- and post-assessment questionnaires. Both pre- and post-mini-PAT forms were compared through the Related samples Wilcoxon Signed Rank Test, and a significant increase in mean values of the scores from 15.00±2.00 to 23.5±3.00 was obtained (p value=0.000). **Conclusion:** A noticeable variation between pre-feedback and post-feedback mean assessment scores was noted, which gave us the idea regarding the abilities and deficiencies of the demonstrators, their workplace relations with other coworkers, including their teaching and training practices. Educational bodies can also use this tool as a method for assessing professional behaviors.

Keywords: *Demonstrator's performance, Mini-PAT, Outcome.*

INTRODUCTION

Feedback plays a key role in various organizations and institutions across the world. Feedback encircles the personal and professional horizons and informs us about what has worked and what has not.[1] It gives an accurate picture of the attitude of employees within a particular workplace.[2] Performance appraisals are a common practice in life and have been used traditionally to boost employee performance in modern industries,[3] and timely feedback is crucial for effective appraisals.

The methods for collecting feedback should be structured and unbiased. There are many ways to assess an employee across the world. Traditional ways to assess an employee are more outdated and biased. In this regard, feedback forms are generated, which are also available online. The mini-PAT form is one of the adapted forms that is validated and has gained fame as an impressive tool for assessment in various institutions.[4] It focuses on obtaining feedback about an employee not only from one colleague but also from others working around him, which is why the term 'multisource feedback' (MSF) is given. Previously, a study conducted in India found that postgraduate trainees believed the mini-PAT is instrumental in developing an action plan for future progress in the learning process.[5] Typically, the assessment through mini-PAT is done by senior colleagues, and the employee usually chooses the assessors. The idea to use such a methodology is to eliminate the bias present in the current system.[6]

Pakistan is deficient in adopting the latest and updated methods of assessment. The Annual Confidential Report (ACR)/Performance Evaluation Report (PER) is a one-sided and biased assessment of the employees in different institutions in Pakistan. This method has become outdated as the feedback is given only by the HOD. Several employees have suffered in their line of work because of this outdated process. The objective of our study is to assess the outcome of the mini-PAT questionnaire on the performance of the teachers working at a public sector medical college. This will not only lead to improvement in the feedback system but will also provide a deeper understanding of the performance and mental attitude of demonstrators in their working environment. This information will eventually help to identify the key domains of improvement and thus will impart the professional growth of junior demonstrators. The feedback received from supervisors will help learners at all stages of continuous medical education to utilize the experiential learning opportunities in combat with their students, colleagues, and patients.[7]

There is no standardization in the assessment methods already used by healthcare workers.[8] So there is a strong urge to develop an alternate method that can evaluate the demonstrators precisely on their professional performance. Feedback is the fundamental element that leads to transformation, and this feedback is non-existent in the traditional assessment system in the public health sector.

METHODS

After being approved by the Ethical/Institutional Review Board (IRB), letter# 235/IRB/SLMC/SWL (dated:25-06-2024), this study was done at Sahiwal Medical College, Sahiwal. A non-probability convenient sampling technique was used. Demonstrators (sample size = 54) who gave consent for the study were included. Sample size calculation was done by using the following formula;

$$\frac{(Z1\text{-}\alpha/2 + Z1\text{-}\beta)^2 (SD1^2 + SD2^2)}{(\text{mean1} - \text{mean2})^2}$$ (Lawanga *et al*., 1991)

n = 54

Demonstrators with 1-3 years of working experience were included. All the demonstrators were evaluated twice. The assessors chosen by DME distributed a valid questionnaire (modified mini-PAT). Three raters then assessed all the demonstrators. The assessors were selected from department heads, associate professors, assistant professors, and other demonstrators. We adopted a single-blinding technique to ensure that the assessor was unaware of the participants ' identity. The assessment was then performed on a four-point Likert scale ranging from 1 to 4. This evaluation method was then re-performed after two months. After the first assessment, a feedback meeting was organized by the researcher between the assessor and his/her supervisor to improve their workplace-based performance. After conducting the second assessment session, the mean scores of pre- and post-feedback findings were analyzed using IBM SPSS version 25. Wilcoxon's signed-rank sum Test compared the means of findings.

RESULTS

The data obtained after the assessment were then analyzed by using IBM-SPSS version 25. We calculated the statistical distribution of frequencies of age and gender groups, along with the calculation of the means and standard deviations of pre- and post-feedback assessment mean scores of mini-PAT evaluation forms. The results of comparing the two findings using Wilcoxon's Signed Rank Sum Test gave a p-value of 0.0000. The questionnaire consisted of two general themes, named 'working with colleagues' and 'maintaining good teaching practices'. The Wilcoxon's Signed Rank Sum Test was then applied to compare the pre- and post-feedback mean scores of the individual themes, and we obtained an evident p-value of 0.000. The same test was also used for pre- and post-feedback assessment median scores of individual sub-themes (p value=0.000).

The comparison of pre-feedback assessment mean scores (15.00 ± 1.76) vs post-feedback assessment means scores (23.5 ± 2.09) was calculated by applying the Related-Samples Wilcoxon Signed Rank Test (resulting in a p-value of 0.000).

Table No. 1: Pre-feedback mean assessment and post-feedback mean assessment scores Comparison. Theme 1 (Working with Colleagues) and Theme 2 (Maintaining good teaching practice)

	Themes	
	Working with the Colleagues	Maintaining a good teaching practice
Pre-assessment Score (Mean ± St. dev)	1.40 ± 1.40	1.60 ± 1.40
Post assessment Score (Mean ± St. dev)	2.00 ± 1.80	2.40 ± 2.00
p value*	0.000	0.000

** The calculation of the p-value was done by applying the Related-Samples Wilcoxon Signed Rank Test.*

Table 2: Pre-feedback mean assessment & post-feedback mean assessment scores Comparison (subthemes of theme 1)

	Theme #1. Working with the Colleagues				
	Verbal communication with colleagues	Written communication with colleagues	The Ability to acknowledge the contributions of others	Accessibility / Reliability	Willingness and effectiveness during teaching or training colleagues
Pre assessment Score (Median ± IQR)	1.00 ± 1.00	1.00 ± 1.00	2.00 ± 1.00	1.00 ± 1.00	1.00 ± 1.00
Post assessment Score (Median ± IQR)	2.00 ± 0.01	2.00 ± 1.00	2.00 ± 1.00	2.00 ± 0.01	2.00 ± 0.01
p value*	0.000	0.000	0.000	0.000	0.000

** the calculation of p value was done by applying Wilcoxon Signed Rank Test*

Table 3: Pre-feedback mean assessment & post-feedback mean assessment scores comparison (Subthemes of theme 2)

	Theme #2; Maintaining good teaching practices				
	Ability to manage time effectively	Awareness of his/her limitations	Technical skills appropriate for the current teaching practice	Appropriate utilization of resources	Attitude in adverse circumstances
Pre-assessment Score (Median ± IQR)	1.00 ± 1.00	2.00 ± 1.00	1.00 ± 1.00	1.00 ± 0.25	1.00 ± 1.00
Post assessment Score (Median ± IQR)	2.00 ± 0.01	3.00 ± 2.00	2.00 ± 1.00	2.00 ± 1.00	2.00 ± 1.00
p value*	0.000	0.000	0.000	0.000	0.000

** The calculation of the p-value was done by applying the Wilcoxon Signed Rank Test.*

DISCUSSION

The implementation of the mini peer assessment tool (mini-PAT) among demonstrators at Sahiwal Medical College yielded statistically significant improvements across all assessed domains, with the overall mean score rising from 15.00 ± 1.76 pre-feedback to 23.50 ± 2.09 post-feedback ($p < 0.001$). These findings corroborate and extend existing literature[9] demonstrating the efficacy of structured multisource feedback in enhancing teaching performance and collegial competencies in medical education. Zhang *et al*. (2023) conducted a mixed-methods study among nursing students and found that peer video and verbal feedback significantly improved both reflective abilities and clinical competence, outperforming faculty feedback in some measures.[10] This parallels our overall increase, suggesting peer-based feedback effectively elevates both cognitive reflection and practical competence.

Mean scores rose from 1.40 ± 1.40 to 2.00 ± 1.80 ($p <0.000$), reflecting enhanced teamwork and peer interaction. A systematic review in educational settings shows that peer assessment increases team dynamics, communication skills, professionalism, and interdependence among learners.[11] Our findings resonate strongly improved working-with-colleagues scores mirror enhanced peer collaboration noted in broader literature.

Scores increased from 1.60 ± 1.40 to 2.40 ± 2.00 ($p <0.000$), indicating growth in pedagogic effectiveness. While specific mini-PAT data is limited, a BMC review concludes that well-structured peer assessment promotes self-regulation, metacognition, and reflective teaching practices in higher education.[12] The improvement in teaching practices in our study aligns with these established benefits of peer feedback.

All five subthemes (verbal communication, written communication, acknowledging contributions, accessibility/reliability, willingness & teaching effectiveness) showed median increases from 1 to 2, each with $p <0.000$. A pre-service teacher study demonstrated that structured peer feedback cultivates self-regulated learning, initiative, and stronger cognitive and interpersonal engagement.[13] Our subtheme improvements especially in communication, accessibility, and willingness to teach parallel these facets of enhanced collaborative learning and professional engagement.

Subthemes improved notably: time management (1 → 2), self-awareness of limitations (2 → 3), technical skills (1 → 2), resource use (1 → 2), attitude in adversity (1 → 2); all with $p<0.000$. These enhancements reflect improved self-regulation, recognition of strengths/limitations, adaptability in teaching contexts, reminiscent of qualities fostered through peer feedback, as noted by Liu & Carless (2006) in describing peer feedback's support in bridging actual and desired performance levels.[14] Our overarching improvements echo Zhang *et al*.'s findings that peer feedback, especially via structured tools like mini-PAT enhances both reflective and clinical capacities.[15]

Enhanced interpersonal and teamwork subthemes reflect broader evidence that peer assessment fosters responsibility, professional behavior, and collaboration. Improvements in teaching practice subthemes align with literature highlighting peer feedback's role in self-regulation, reflective practice, and teaching effectiveness.[16]

The overall improvement in the post feedback results of the theme #1 and theme #2 emphasizes the value of training programs or interventions in improving multiple facets of sustaining effective teaching methods. Similar results were there in a study conducted in UK where there was an overall significant improvement in junior pharmacist performance over the length of the programs, as determined by the differences in mini-PAT mean values between the first set of measures at 6 months and the last team-based assessment at 30 months (p,0.001).[17]

A substantial difference was recorded between the means of assessment scores of pre- and post-feedback. The strengths and flaws of demonstrators and their workplace-based relationships with other coworkers, as well as instructional approaches, are discussed. In this study, the modified mini-PAT is utilized as an instructional approach to assess demonstrators' professional competency in a team-working setting. By applying this assessment technique, more knowledgeable and ambitious future doctors will be produced. This modified assessment technique can provide trustworthy information about the performance of demonstrators.

LIMITATIONS

A single-centered study and a comparatively small sample size. Both study participants and assessors/raters lack motivation. Another limitation is Raters/assessors' bias. L52ack of regular academic staff.

SUGGESTIONS / RECOMMENDATIONS

- Upcoming research should investigate the incorporation of mini-PAT with other assessment techniques, use randomized controlled trials, and incorporate larger, more varied samples.
- For the mini-PAT process to be improved and optimized, regular input from trainers and trainees is also essential. By doing this, the results will be more broadly applicable and generalizable.

CONFLICT OF INTEREST / DISCLOSURE

None.

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