

# 360-Degree Evaluation Of Postgraduate Residents At Rawalpindi Medical University: Appraising The Achievement Of Core Competencies By Comparing The Scores Of 1<sup>st</sup> & 2<sup>nd</sup> Cycles Of Evaluation

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## Author's Contribution

<sup>1</sup> Conception of study

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## Abstract

**Objectives:** To compare 360-degree evaluation scores of postgraduate residents during 1<sup>st</sup> and 2<sup>nd</sup> cycles of evaluation to analyze the acquisition of core competencies.

**Materials & Methods:** A cross-sectional analytical study was done to compare the acquisition of core competencies as per ACGME by MS/MD residents in 3 public sector teaching hospitals of Rawalpindi. The enrolled residents have undergone 1<sup>st</sup> and 2<sup>nd</sup> cycle of 360-degree evaluation from Jan-June 2018 and July 2018 - Jan 2019 respectively. The data was gathered from supervisors, faculty, nursing staff, patients, and their attendants by structured proforma. Data were analyzed by SPSS version 25.0. Specialty-wise scores were statistically presented with 95% CI. Differences in scores of core competencies during both cycles were determined by independent sample t-test.  $P < 0.05$  was considered significant.

**Results:** About 93 and 113 trainees were evaluated during 1<sup>st</sup> and 2<sup>nd</sup> cycles of evaluation respectively. Most (41.70%) of them were 1<sup>st</sup>-year residents. 2<sup>nd</sup> cycle of evaluation revealed statistically significant improvement ( $P < 0.00001$ ) in all 6 core competencies. Feedback from the patients also illustrated a significant difference in scores of both cycles ( $P = 0.01$ ). Trainees of MS Surgery & Allied programs were determined as highly competent with a  $250.06 \pm 38.57$  score followed by those of MD Medicine & Allied ( $247.59 \pm 42.15$ ) and Gynecology & Obstetrics ( $246.71 \pm 46.26$ ) out of a total score of 331. Residents of HFH and DHQ Hospital had statistically significant enhancement of competencies ( $P < 0.0001$ ) than those of BBH ( $P = 0.003$ ).

**Conclusion:** There was a substantial enhancement of core competencies among postgraduate trainees.

**Keywords:** 360-degree evaluation, ACGME, university residents, core competencies.

## Introduction

Formative assessments constitute an indispensable component of postgraduate training at medical universities and teaching hospitals. These assessments apart from gauging the learning of trainees are also followed by the provision of constructive feedback for rectification and improvement<sup>1</sup>. The assessments and feedback in medical training at the workplace are of paramount significance in professional growth<sup>2</sup>.

Miller's pyramid of assessment suitably guides in the context of opting for an assessment tool in accordance with learning domains. This pyramid is of great assistance in gauging the competencies of the medical trainees in compliance with their educational settings<sup>3</sup>. It is imperative for healthcare personnel to be competent in communicating with patients, their attendants, and every member of the healthcare setting at large. Moreover, they should behave professionally and implement system-based practice at their workplace for the convenience of needy patients<sup>4</sup>. Procuring Multi-Source Feedback (MSF) pertinent to postgraduate residents is a step towards making them accountable to the community as well as the concerned healthcare authorities<sup>5</sup>. Apart from getting knowledge, acquisition skills are deemed necessary to satisfy the patients with respect to their healthcare and deal with them ethically. This aspect has emphasized the effectiveness of multi-source feedback in improving the well-being of the people<sup>6</sup>.

No doubt, this is an era of Competency-Based Medical Education (CBME). Employing this framework based on implementing periodic assessment and evaluation of trainees followed by comprehensive feedback in teaching hospitals endorses trainee-centered learning<sup>7</sup>.

Measuring the achievement of core competencies required of CBME enables the supervisors to assess the academic growth of trainees<sup>8</sup>. Trainees' assessment by multiple assessors provides them with an acumen into their academic deficiencies in addition to other accessory skills that are of great significance in bestowing the patients with satisfactory healthcare services<sup>9</sup>.

The present study is therefore intended to compare the acquisition of ACGME-based foundation skills as gauged in 2 cycles of 360-degree assessment that were carried out by the Quality Enhancement Cell (QEC) of Rawalpindi Medical University (RMU). Comparing the acquisition of competencies during 2 time periods

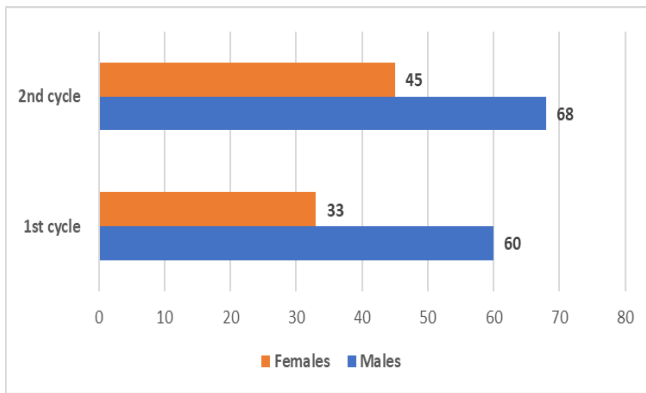
will aid us to perceive the degree of mastery achieved by our residents. Moreover, reviewing the progress of residents will also enable the respective supervisors to make an action plan for Continuing Medical Education (CME) and Continuing Professional Development (CPD) of trainees that would ultimately be beneficial to the general population in meeting their healthcare needs.

## Materials and Methods

A cross-sectional analytical study was carried out to appraise the acquisition of core competencies by postgraduate university residents of Rawalpindi Medical University. These residents were enrolled in MS and MD postgraduate training programs during 2017-18 through the Central Induction Policy of Punjab<sup>10</sup>. Rawalpindi Medical University was the first public sector medical university of Pakistan to launch Competency-Based Medical Education (CBME)<sup>12</sup> for its university residents who are undergoing training in three tertiary healthcare facilities namely Holy Family Hospital (HFH), Benazir Bhutto Hospital (BBH) and District Head Quarters (DHQ) Hospital. 1<sup>st</sup> and 2<sup>nd</sup> cycle of the 360-degree evaluation was conducted to assess the six core competencies of MS / MD residents from Jan-June 2018 and July 2018-Jan 2019 respectively<sup>11</sup>. The six core competencies to be assessed among our university residents were adopted as per Accreditation Council for Graduate Medical Education (ACGME) guidelines which included medical knowledge, patient care, professionalism, interpersonal and communication skills, and system-based and practice-based learning and improvement<sup>13</sup>. This Multi-Source Feedback pertinent to the acquisition of the aforementioned 6 core competencies is taken through a planned schedule every 6 months from the supervisors, faculty, nursing staff, patients and their attendants by purposely designed proforma. Orientation sessions were arranged for supervisors, faculty and nurses in order to facilitate them in comprehending these proforma so that the responses can truly be gathered. Proforma to be filled in by the patients or their attendants were also translated in Urdu for their understanding. A complete set of these proforma is received pertinent to each trainee duly signed and stamped by the supervisor that was analyzed in Quality Enhancement Cell of RMU. The analyzed data is presented and discussed in Deans

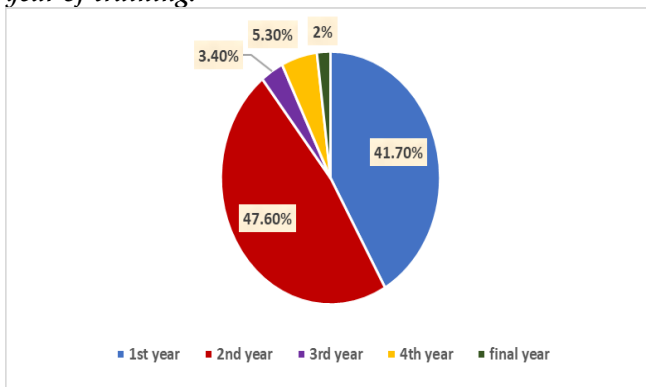
meetings periodically to identify the trend of each core competency acquired by residents and to recommend suggestions for enhancement of deficient / lagging behind competency. The data was collected from QEC through informed consent. The mean and standard deviation of each core competency with respect to 1<sup>st</sup> and 2<sup>nd</sup> cycle of the evaluation was calculated. Scores of 1<sup>st</sup> and 2<sup>nd</sup> cycles were compared by independent sample t-test. P < 0.05 was taken as significant.

Figure-1: Gender-based variations in No. of residents enrolled in both cycles of evaluation.



Residents assessed during 1<sup>st</sup> cycle were also subjected to 2<sup>nd</sup> cycle of evaluation as each resident was supposed to get a 360-degree evaluation proforma filled by their supervisor, mentor, faculty, nursing staff, etc. in this way a total of 206 evaluation proforma of residents were assessed for their year of training that is shown below in Figure 2.

Figure-2: Residents enrolled in the study from each year of training.



The Training program of residents who have undergone 1<sup>st</sup> and 2<sup>nd</sup> cycles of evaluation is illustrated below in Table 1.

## Results

About 93 and 113 residents were subjected to 360-degree evaluation during 1<sup>st</sup> and 2<sup>nd</sup> cycles of appraisal respectively. Gender wise distribution of this resident in both cycles is depicted below in Figure 1

Table-1: No. of residents enrolled in each cycle from diverse training programs.

Training Program	1 <sup>st</sup> cycle	2 <sup>nd</sup> cycle	Total
MS Gynecology & Obstetrics	15	19	34
MS General Surgery	15	17	32
MS Neurosurgery	9	12	21
MS Anesthesiology	10	10	20
MD Internal Medicine	6	11	17
MS Orthopedics	10	7	17
MD Pediatrics	4	9	13
MS Otorhinolaryngology	3	7	10
MS Urology	5	5	10
MD Gastroenterology	4	4	8
MD Cardiology	4	2	6
MS Plastic Surgery	0	5	5
MD Diagnostic Radiology	2	2	4
MD Nephrology	1	2	3
MD Dermatology	2	0	2
MS Ophthalmology	1	1	2
MS Pediatric Surgery	2	0	2
Total	93	113	206

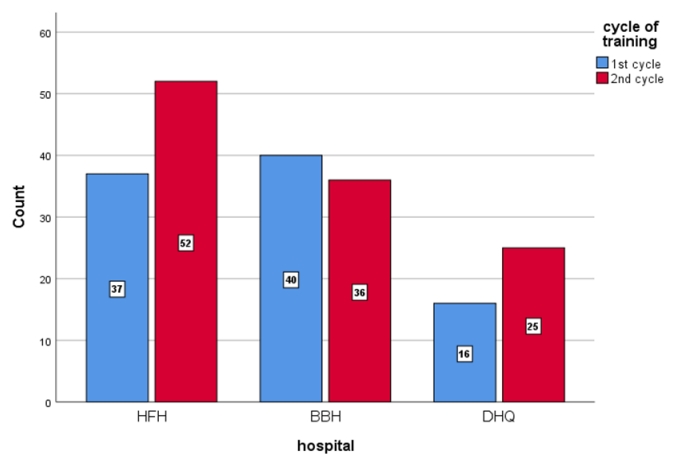


Figure 3: Residents receiving Multi-Source Feedback from RMU-affiliated teaching hospitals.

No. of residents from all teaching hospitals undergoing 1<sup>st</sup> and 2<sup>nd</sup> cycles of 360-degree evaluation is depicted below in Figure 3. 360-degree evaluation scores of the residents computed during 1<sup>st</sup> and 2<sup>nd</sup> cycles of evaluation by

gathering the responses from the doctors (faculty, supervisor, colleagues), patients, and nursing staff are presented below in Table 2.

**Table-2: Comparison of residents' core competencies as evaluated in 2 cycles of evaluation.**

Core competencies	Total score	Feedback from a supervisor, faculty, and colleagues Score (mean ± SD)		P-value
		1 <sup>st</sup> cycle (n = 93)	2 <sup>nd</sup> cycle (n = 113)	
Medical knowledge	30	20.26 ± 3.5	23.08 ± 3.49	<0.00001
Patient care	30	20.72 ± 4.21	23.31 ± 3.24	<0.00001
Interpersonal & Communication skills	20	14.29 ± 2.49	15.75 ± 2.43	<0.00001
Professionalism	35	25.31 ± 4.38	28.03 ± 3.64	<0.00001
Practice-based learning & improvement	15	9.7 ± 2.16	11.33 ± 2.12	<0.00001
System based practice	35	24.49 ± 4.48	27.02 ± 4.31	<0.00001
Parameters	Total score	Score (mean ± SD)		P-value
		1 <sup>st</sup> cycle (n = 93)	2 <sup>nd</sup> cycle (n = 113)	
Evaluation of Medical record	80	46.1 ± 17.39	55.95 ± 13.22	<0.00001
Feedback from nursing Staff	56	38.70 ± 9.89	46.43 ± 6.90	<0.00001
Feedback from Patients	30	24.56 ± 4.90	26.1 ± 3.77	0.01

On doing a specialty-wise comparison of the competencies, MS Surgery & Allied trainees were maximally scored followed by those of Medicine & Allied and Gynecology & Obstetrics trainees as shown below in Table 3.

**Table-3: Specialty-wise 360-degree Evaluation scores of university residents**

Sr. No.	Training Programs	No. of residents (n)	Score (mean ± SD)	95 % CI
1.	MS General Surgery & Allied (Plastic Surgery, Pediatric Surgery, Urology, Neurosurgery & Orthopedics)	87	250.06 ± 38.57	(241.96 - 258.16)
2.	MD Internal Medicine & Allied (Dermatology, Cardiology, Nephrology, Gastroenterology)	36	247.59 ± 42.15	(233.82 - 261.36)
3.	MS Gynecology & Obstetrics	34	246.71 ± 46.26	(231.17 - 262.25)
4.	MS Anesthesiology	20	227.22 ± 28.02	(215.01 - 239.43)
5.	MD Pediatrics	13	221.75 ± 14.19	(214.03 - 229.47)
6.	MS Otorhinolaryngology	10	228.94 ± 34.01	(208.16 - 249.72)
7.	MD Diagnostic Radiology	04	151.8 ± 32.78	(119.68 - 183.92)
8.	MS Ophthalmology	02	232 ± 42.43	(173.02 - 290.98)

As the majority of our trainees belonged to MS Surgery & Allied and MS Gynecology & Obstetrics training programs, a comparison of their core competencies as evaluated in 1<sup>st</sup> and 2<sup>nd</sup> cycle of evaluation is depicted below in Table 4.

**Table-4: Comparison of core competencies' scores of the major training programs during 1<sup>st</sup> and 2<sup>nd</sup> cycle of 360-degree evaluation.**

Core competencies	Score	MS Surgery & Allied Training Programs Mean score (Mean ± SD) (n = 88)			MS Gynecology & Obstetrics Mean score (Mean ± SD) (n = 34)		
		1 <sup>st</sup> cycle (n = 41)	2 <sup>nd</sup> cycle (n = 47)	P-value	1 <sup>st</sup> cycle (n = 15)	2 <sup>nd</sup> cycle (n = 19)	P-value
Medical knowledge	30	20.2 ± 3.34	23.91 ± 3.61	<0.0001	19.82 ± 3.99	24.1 ± 3.00	0.001
Patient care	30	21.23 ± 4.7	24.3 ± 2.84	<0.0001	19.87 ± 4.42	23.61 ± 3.68	0.01
Interpersonal & Communication skills	20	14.31 ± 2.45	16.35 ± 2.36	<0.0001	14.16 ± 3.14	16.54 ± 2.52	0.02
Professionalism	35	25.76 ± 4.63	28.91 ± 3.19	0.0003	25.25 ± 3.93	28.98 ± 3.71	0.008
Practice-based learning & improvement	15	9.94 ± 1.81	11.82 ± 1.62	<0.0001	8.69 ± 2.39	11.65 ± 2.36	0.001
System based practice	35	24.92 ± 4.25	28.18 ± 3.23	0.0001	23.49 ± 4.84	28.24 ± 3.85	0.003

The hospital-wise difference in competencies as scored in two cycles revealed highly statistically significant improvement among residents of HFH and DHQ Hospital (P < 0.0001) as presented below in Table 5:

**Table-5: Hospital-wise comparison of scores in 2 different cycles of evaluation**

Hospitals	Overall Scores (mean ± SD)		P-value
HFH	1 <sup>st</sup> cycle (n = 37)	2 <sup>nd</sup> cycle (n = 52)	< 0.0001
	204.9 ± 43.9	259.62 ± 37.6	
BBH	1 <sup>st</sup> cycle (n = 40)	2 <sup>nd</sup> cycle (n = 36)	0.003
	217.89 ± 44.12	247.78 ± 39.74	
DHQ	1 <sup>st</sup> cycle (n = 16)	2 <sup>nd</sup> cycle (n = 25)	< 0.0001
	187.01 ± 33.41	261.3 ± 17.03	

## Discussion

Feedback received by postgraduate medical trainees by multiple evaluators is of paramount significance as it helps them to identify the lacunae in their training<sup>14</sup>. Such multi-source feedback should be carried out periodically in healthcare settings for the provision of useful suggestions in order to modify the training of our future healthcare workforce in accordance with the needs of our community<sup>15</sup>.

In our study, a 360-degree evaluation of university residents was carried out by using ACGME-based Multi-Source Feedback proforma with some amendments as per Pakistani context<sup>9</sup>. Around 47.6%

of enrolled residents were in the 2<sup>nd</sup> year of their postgraduate training and most of them were working in the disciplines of Gynecology & Obstetrics and Surgery. Interpersonal and communication skills of our residents appraised in the 2<sup>nd</sup> cycle of evaluation revealed improvement with a statistically significant difference (P < 0.00001). According to ACGME postgraduate medical education framework, communication skills constitute imperative skills to be acquired by the residents for understanding the health-related problem of the patients, their correct diagnosis, and swift treatment<sup>16</sup>. A study carried out by Williams BW et al in 2016 illustrated that Continuing Professional Development (CPD) of

trainees is possible only by linking or assessing their performance in alignment with the educational framework that is implemented in their training settings for acquisition with all specified learning domains<sup>17</sup>. The top tier in Miller's pyramid of assessment is measuring clinical performance in real clinical settings. 360-degree evaluation is one of the essential tools for Workplace Based Assessment (WPBA), which carries high weightage in postgraduate medical assessment<sup>18</sup>. Aga Khan University (AKU) Pakistan is the first one to introduce ACGME competencies-based curriculum for its postgraduate residents. Likewise, in our study, research was also done there to compare the 360-degree evaluation of communication skills of about 49 residents enrolled in internal Medicine. In our study, the communication skills score seemed to be quite improved (Table 2); contrary to this mean overall score during 1<sup>st</sup> year of residency at AKU was better than those measured in succeeding years<sup>19</sup>. The discrepancy in communication skills-related scores of AKU from that of RMU might be the assortment of responses for the very first time as faculty, staff, and colleagues might have faced difficulty in understanding the questions pertinent to the core competencies.

Numerous residency programs in America and foundation programs in the UK are utilizing ACGME competencies-based 360-degree evaluation; Moreover, this assessment tool is also employed for family physicians and surgeons in Canada<sup>20</sup>. Professionalism among our university residents also showed significant improvement with more training ( $P < 0.00001$ ). A similar study done on 2<sup>nd</sup> and 3<sup>rd</sup>-year residents in multiple teaching hospitals in Iran verified good scores and higher aptitude among them to become professional doctors<sup>21</sup>. Multi-rate assessments of the attained competencies among our postgraduate trainees were executed by securing responses from at least 3 faculty members, 3 colleagues, 3 members of nursing staff, 3 peers, and 3 patients or their attendants. This multi-source feedback is chiefly carried out in order to ensure the fairness, validity, and inter-rater reliability of the measure's competencies<sup>22</sup>. Likewise, the 360-degree assessment of UK trainees was perceived valuable as program supervisors were enlightened about many academic attributes of their training through this exercise<sup>23</sup>.

Even the non-faculty ratings of the trainees pertinent to core competencies in our study showed statistically significant escalation during the 2<sup>nd</sup> cycle of evaluation (Table 2). A similar study by Chandler N et al demonstrated high scores for professionalism and

interpersonal skills both by the medical faculty as well as by non-medical personnel<sup>24</sup>. Hence getting feedback from all multiple members of the healthcare workforce involved in patient care apart from patients who are end users is imperative in order to avoid biases in opinion and to get a true picture of the scenario.

Overall, the 360-degree evaluation score of residents enrolled in the MS Gynecology & Obstetrics program at RMU-affiliated teaching hospitals was  $246.71 \pm 46.26$  with 95% CI (231.17 - 262.25). The improvement in scores of these trainees pertinent to core competencies during the 2<sup>nd</sup> cycle in comparison with that of the 1<sup>st</sup> cycle was also determined to be statistically significant as evident in Table 4. Incorporating multi-source feedback while formatively assessing the Gynecology & Obstetrics residents in international healthcare settings also proved to be quite beneficial for improving the healthcare of community<sup>25</sup>. Securing feedback from the patients regarding the professional attitude and ethical behavior of trainees also revealed a considerable statistical increase in the score of the 2<sup>nd</sup> cycle than that of the 1<sup>st</sup>; hence illustrating the acquisition of requisite competencies by our trainees. Although feedbacks from the patients are remarkably important, it should be coupled with the reflective practice of the trainees periodically that will not only be efficacious in enhancing the professionalism and communication skills of our residents<sup>26</sup> but will also bring a paradigm shift in our public health care settings in the goodwill of our patients<sup>27</sup>.

## Conclusion

Postgraduate residents enrolled in MS MD training programs in public sector teaching hospitals of Rawalpindi revealed substantial improvement in their core competencies on 360-degree evaluation. Procuring feedback from the patients repeatedly can considerably be advantageous in the betterment of the population's healthcare.

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