

Enhancing Depth of Reflection of Family Medicine Residents: Results of an Intervention

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ABSTRACT

The ability to reflect in professional practice is the cornerstone of self-directed learning. Reflective practice in medicine is an important teaching-learning modality for improving decision-making and clinical reasoning. It is a strategy for self-regulation of clinical and academic performance. This study was undertaken with the aim of improving the reflective ability skills of family medicine residents through the introduction of reflective practice at Aga Khan University. This was a case study using a pre-post design. A questionnaire was administered to assess the baseline level of reflection in family medicine residents, followed by a workshop on reflective practice to orient residents about the process and levels of reflection. Residents were asked to document reflective logs on a blog, feedback was provided. Post-intervention data were collected by re-administration of the questionnaire to assess the change in the reflective level. Pre-post questionnaire data were analysed for comparisons using the Wilcoxin Sign Rank test on SPSS version 19. Out of 15 eligible residents, a total of 13 residents were available during the study period. In a pre-intervention questionnaire, reflective levels across the domains indicated that residents used reflection 50% of the time which increased post-intervention to more than 80% of the time. The degree of pre-post difference was lowest in the 'Habitual Action Domain' and largest in the domains of 'Reflection' and 'Critical Reflection' (4.1-4.8 and 3.8-4.5). Reflective practice is an effective strategy to develop residents as reflective thinkers by increasing their depth of reflection. Facilitation of their reflection through feedback enhances their ability to reflect.

Keywords: Clinical reasoning, reflection, reflective practice, critical thinking, intervention.

BACKGROUND

The ability to reflect in professional practice is the cornerstone of self-directed learning. It develops physicians as life-long learners [1] and inculcates professional identity based on their values, beliefs and attitudes. Clinical competence requires physicians to strive towards continuous self-assessment for improvement [2]. Reflective practice in medicine is an important teaching-learning modality for improving decision-making and clinical reasoning [3]. It is a useful and a powerful strategy for self-regulation of clinical and academic performance [4].

Residents learn through experience. Reflecting and learning from these experiences is integral to preventing erroneous clinical reasoning. These can occur due to errors in diagnosis and management by using shortcuts, maxims and rule of thumb. Biases leading to errors can be internal or external [5]. Teaching residents the skills of reflective reasoning can counter these biases leading to better clinical reasoning. Studies among residents have shown that they tend to view situations and issues from a narrow perspective indicating a superficial level of reflection which can transform into an extensive analytical process if nurtured appropriately [6].

There is a scarcity of literature on residents' baseline reflective thinking and abilities. This study aimed to determine a baseline level of reflection of residents and if teaching reflective practice improves reflective ability levels of family medicine residents.

METHOD

This was a Case Study using a pre-post design to assess the effect of the introduction of reflective practice in the Family Medicine Residency for improving the level of reflection among residents. The study setting was the Aga Khan University Family Medicine Residency Program. A purposive sampling method was used. The Family Medicine Residency Program had 19 residents out of which four were at Resident Level 1 (first year), seven at level 2 (second year), three at level 3 (third year) and five at level 4 (fourth year). Excluding all level 1 residents and two of the level 3 residents who were in their external rotations (emergency room and rural) and hence not available for the intervention the sample came out to be 13. First-year residents were excluded from the intervention as they were in their inpatient rotation and still acclimatizing to the environment of the department and the hospital. The data collection tool was a structured questionnaire adapted from Kember *et al.* [7] to assess the levels of reflection as it best depicted the levels of reflection among learners with well-delineated domains. The tool was selected after consulting key manuscripts from literature and was shared with fellow faculty and educational experts for clarity and content. This tool included the domains of superficial

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reflection (Habitual Action) to increasingly deeper levels of reflection (Understanding, Reflection and Critical Reflection). Habitual Action (knowing-in-action) refers to the action performed automatically without much thought due to previous frequent repetitions. It has four items. Understanding (thoughtful action) in which pre-existing knowledge is used without attempting to appraise the knowledge as per the situation. Reflection (reflection on action) is the internal exploration of issues with meaning to self, resulting in a change in concept. Critical reflection (a deeper aspect of reflection on action) refers to a critical review of presuppositions from conscious and unconscious learning and their consequences. A seven-point Likert scale was used for residents to place themselves in the descriptors of the four domains. The scale ranged from: 6=100% of the time, 5=90% of the time, 4=70% of the time, 3=50% of the time, 2=30% of the time, 1=10% of the time and 0=Not at all. The domains were not shown to the residents in the administered questionnaire. The questionnaire was piloted on four residents graduating from the program in 2013 for clearing ambiguity and clarification. There were no changes required after piloting. All questionnaires were coded with serial numbers for the pre-post survey and residents were assigned serial numbers. Ethical approval was obtained from the university's Ethical Review Committee. Informed consent was obtained after which the questionnaire was administered to the residents by the departmental secretary at the end of their weekly academic session.

The intervention included a half-day Reflective Practice workshop organized in the core curriculum session for the residents. The objectives of the workshop were: to differentiate between reflection & reflective practice, identify levels of reflection through exercises and apply the reflective writing framework on a critical case they were told to bring for the workshop. Anita Berlin's model of reflection [8] was chosen since it was most suitable for writing reflections at the resident level having applicability to the residents' situation and ease of use. The model included a description of the clinical dilemma, emotions involved, outcome of the dilemma, and evaluation of the process, self-analysis and conclusion.

Residents were then required to keep an online reflective log for a month detailing the clinical encounters where they needed reflection most, their approach to resolving the issue and their plan for such encounters in the future. A page was developed in the AKU Family Medicine Blog on Moodle with the provision of timely feedback by the researcher. They were required to document 10 clinical dilemmas each. The questionnaire was re-administered six weeks post-intervention in a morning meeting to assess the change in the level of reflection.

Residents' pre and post-intervention reflective ability data was entered in SPSS Version 19 and analysed, using frequencies, mean, mode, interquartile range and non-parametric measure Wilcoxin Sign Rank Test.

RESULTS

Out of 15 eligible residents, a total of 13 residents were available during the study period. All thirteen consented to take part and were involved for the entire period of the study. The residents who could not participate were scheduled in the emergency room and rural rotations. Eleven were women and there were two men with an average of 3.4 years (SD 3.78) of clinical experience. Six were at level three and four of the program whereas seven were at level two.

Results of the four domains of reflection are given in Table 1. Overall in all four domains, there was a shift in the post-intervention interquartile ranges scores towards deeper reflection though the P-value was significant on only two of the variable of critical reflection ($p=0.002$ and $p=0.01$)

The overall change in the four domain mean scores are given in Fig. (1). None of the P values were significant.

One resident demonstrated no difference in the post-intervention reflection level on most of the items. Mean pre and post-intervention values in the domains of Critical Reflection for this resident were (3.6 to 3.6) (Fig. 2).

Table 1: Residents Pre (Baseline) and Post-intervention reflective level data in the four domains. (N=13)

1. Habitual Action Domain

S.No.	Variable	Median (Inter Quartile Range)		P-value
		Pre	Post	
1.	When I see patients with common problems, I can deal with them intuitively.	4 (2,4,5)	4(2,5,5)	0.7
2.	In my clinical practice I have so much to do that I have started doing them instinctively.	3 (1.5,4)	3 (2,4,5)	0.7
3.	As long as I can remember my basic medical knowledge I do not have to think too much.	4 (3,5)	4 (3,5)	1.0
4.	If I follow what my seniors do I do not have to think too much.	4 (2,4)	2 (1.5,4)	0.5

2. Understanding Domain

S.No.	Variable	Median (Inter Quartile Range)		P-value
		Pre	Post	
1.	In my clinical practice I need to think through to apply principles of medicine in majority of cases.	4 (3.5,4.5)	5 (3,5.5)	1.0
2.	To be a competent clinician, I need to understand the content and application of it in medicine.	6 (4.5,6)	5 (5,6)	0.5
3.	I need to understand the material taught by my seniors to perform practical skills.	5 (3.5,5)	5(4.5,5.5)	0.2
4.	During residency, I need to constantly think about the clinical content, I am being taught.	5 (4.5,6)	5 (4,6)	0.7

3. Reflection Domain

1.	I think about what I am doing in my clinical practice and think of alternative ways of doing it.	4 (3,5)	5 (4,5.5)	0.6
2.	I reflect and contemplate on my actions to see whether I could have improved on what I did.	4 (3.5,5)	5 (4,6)	0.1
3.	I reappraise my clinical practice experience, so I can learn from it and improve for my next clinical encounter.	4 (3.5,5)	5(4.5,5.5)	0.2

4. Critical Reflection Domain

1.	As a result of my academic experience in the residency I have positively changed the way I do clinical practice.	5 (4,5)	5 (5,6)	0.07
2.	The residency program has challenged some of my firm beliefs of clinical practice.	3 (2,4)	5 (4,5.5)	0.002
3.	As a result of the residency I have changed my normal way of practicing medicine.	4 (3,5)	5 (4,6)	0.01
4.	During the residency I have found errors in my clinical practice in what I had previously believed to be right.	3 (2,5)	4 (3.5,5)	0.2
5.	For good clinical care it is essential to consider facts, principles and rules.	6 (5,6)	6 (5,6)	1.0
6.	Sometimes I wonder why do I make the same mistakes again and again.	3 (2,4.5)	3(2.5,4.5)	1.0
7.	I document my clinical dilemmas because I am required to.	3 (2,4)	4 (3,4.5)	0.2
8.	I document my clinical dilemmas in order to resolve those.	4 (2.5,5)	5 (4,6)	0.1
9.	I document my clinical dilemmas in order to do better in future.	4 (3.5,5)	5 (4,6)	0.6

Likert scale: 6=100% of the time, 5=90% of the time, 4=70% of the time, 3=50% of the time, 2=30% of the time, 1=10% of the time and 0=Not at all

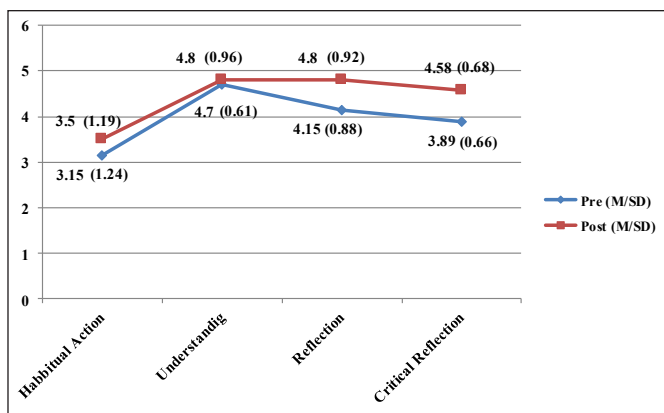


Fig. (1): Residents' reflective level in the four domains on a seven point likert scale (Mean pre and post scores).
Mean Pre and Post Scores of 'Habitual Action Domain' are for positive Items 1 and 2 only

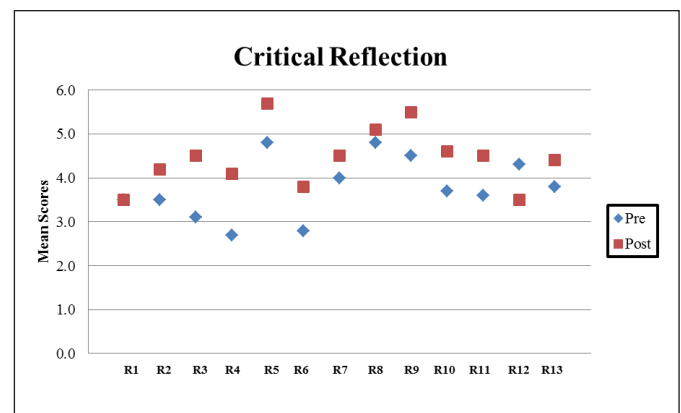


Fig. (2): Individual resident reflective levels in 'critical reflection domain' (Mean pre and post scores).

DISCUSSION

This study was among the first of its kind on measuring baseline levels of reflection and the effect of 'reflective practice' intervention on the change of residents' reflective levels. The post-intervention shift in the residents' levels of reflection indicates that it improved the depth of reflection in the majority of the residents.

In the pre-intervention questionnaire, reflective levels across the domains indicated that residents used reflection 50% of the time which increased post-intervention to more than 80%. The degree of pre-post difference was lowest in the 'Habitual Action Domain' and largest in the domains of 'Reflection' and 'Critical Reflection'.

The pre-intervention scores demonstrated the superficial nature of residents' reflective ability. Residents often do not think analytically when they are familiar with a clinical situation conforming to pattern recognition and may miss the iceberg problem lying below the surface. Sometimes the familiar situation can give unpleasant and unexpected outcomes much to the residents' discomfort and distress.

A positive shift of interquartile range suggested improvement in reflection for critical reasoning and critical thinking skills and reflective ability. Statistical significance was seen on two items of 'Critical Reflection Domain', which test the level of iterative reflection resulting in a change of practice due to a shift in the belief paradigm. The reflective exercises helped them to understand the significance of analysing common clinical situations for hidden issues as supported by their reflective logs on common situations quote K "although it was a common problem but I realized it is important to think about it". It can be postulated based on literature [9] that this leads to the possibility of reduced errors of cognition. As residents received feedback on their reflective logs there was an improvement in the level of reflection. This is supported by the literature [10].

Two residents demonstrated a small change after intervention. One resident showed no change at all. This may suggest not all residents use this form of learning in their practice as learning styles vary amongst individuals. Recognition of such residents early in the program allows Program Director to look into the needs for supporting these residents. Literature reveals that doctors do vary in their degree of reflection depending on personal characteristics [11].

The 'Understanding Domain' tests a deeper level of reflection (reflecting in action). Residents' mean scores increased from 70% to 90% after the intervention. Khanum *et al.* [12] also showed improved reflective ability in obstetric residents on a post-intervention

survey. It seems that residents' improved their thinking ability leading to higher post-intervention scores.

In the 'Reflection Domain' (reflecting on action) scores changed from 70% to 90% after the intervention. The introduction of reflective practice in residency programs does influence clinical reasoning and decision-making skills positively [13].

Residency programs in South Asian culture usually follow an apprenticeship model obstructing a thoughtful inquiry into the reasoning for clinical dilemmas. In addition, the nature of being a resident where supervisors are always available may prevent them from trying to find solutions to dilemmas through their own thought processes. The marked increase in mean scores after intervention indicates an inculcation of reflective practice for improving clinical practice.

Post-intervention scores in the 'Critical Reflection Domain' (in depth reflecting on action) increased in all but one item (5); Item 2 and 3 showing statistical significance (P-values .002 and 0.01 respectively). A decrease in non-significant scores on Item 5 suggests that now residents are in the habit of critical thinking and reflecting rather than accepting information at face value. It is encouraging to see a significant change in thinking and reflective ability to a level where residents feel challenged. As critical thinking improves, the ability to solve complex clinical dilemmas improves [14].

Another important aspect of this study was residents exploring their own emotions through reflective logs and becoming comfortable with those emotions and feelings. This was a first-time experience for all of the residents. Residents do not find it easy to express their emotions in a professional context as the prevailing culture in medicine perceives people expressing their emotions, as ineffective and weak. This is further glorified by the media through programs like "House" led by a brilliant critical thinker who is assumed as a non-caring physician. Acknowledging own emotions not just demonstrates a caring doctor but is an important step towards self-efficacy, with avoidance of burn out which is a cause of medical errors [15]. Understanding emotions, own and others, is emotional intelligence that forms an essential aspect of metacognition [16]. Quote SI "I cared for her but should I have been so involved with her that I found it difficult to let go. It was hard for me to accept her death".

The limitation of the study included a small sample size in a single program. In addition, as the program director was the main investigator it may have affected the response of the residents resulting in a possible response bias. However, to combat this bias, an independent faculty interviewer conducted the focus groups.

Reflective practice is an effective strategy to develop residents as reflective thinkers by increasing their depth of reflection. Facilitation of their reflection through feedback enhances their ability to reflect and implement a holistic approach towards patients with an increased focus on care and compassion aspect of professionalism.

CONCLUSION

Inculcating reflective practice in residents helps in improving clinical reasoning and develops them as lifelong learners.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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