

Perception of family medicine residents towards use of portfolio in their assessment in joint program of family medicine, Jeddah, Saudi Arabia, 2015

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Abstract

Background: Recently, medical education all over the world transfer from the measure of ability of student to recall information towards evaluation of student performing under simulation or real life. One of the new methods of assessment is portfolio.

Objective: To assess the perception of family medicine residents and trainees in joint program of family medicine in Jeddah toward use of portfolio in their assessment as well as to identify the barriers to use portfolio as a tool of assessment.

Materials and Methods: A quantitative cross sectional survey was done including all residents and trainees enrolled in training from level 1 to level 4 in joint program of family medicine in Jeddah for the academic year 2015–2016. Total number of residents is 110 (males and females). Data were collected by a self-administered valid and reliable questionnaire. It is composed of two parts; first part includes inquiry about demographic data of the residents and second part consist of 23 items inquires about information regarding perception of residents towards use of portfolio.

Result: The study included 120 physicians. Majority of them (95%) aged between 25 and 34 years. Females represent 60% of them. Nearly half of the family medicine residents (46.7%) reported attending any course regarding portfolio. The highest agreed upon statement regarding use of portfolio was that “writing the portfolio is a stressful process” (weighted mean 4.22 ± 1.10) whereas the lowest agreed upon statements were “the portfolio should be part of every medical program” (weighted mean 1.96 ± 1.00), and “enjoying writing the portfolio” (weighted mean 1.92 ± 0.93). The overall portfolio score ranged between 0 and 44 with a mean of 14.08 and standard deviation of 10.26. The only significantly associated factor with perception score was level of training as family medicine residents and trainees of the first training level had perception toward use of portfolio score significantly higher than those of higher levels of training, $p < 0.001$. The commonest agreed upon barriers in using portfolio as assessment tool in residency program were increase paper works (4.66 ± 0.80), time consuming (4.60 ± 0.77), little guidance, difficulties in writing, not certain what to include (4.13 ± 1.01) and little emphasis, and interfere with clinical learning.

Conclusion: The perception of the family medicine residents in joint program of family medicine, Jeddah, Saudi Arabia towards use of portfolio in their assessment is relatively suboptimal. Attending training courses in portfolio did not improve the residents' perception.

KEYWORDS: Portfolio, medical education, family medicine residents, perception

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Introduction

Since a long time, architects, engineers, and others professionals have used the portfolio as a method of their professional achievements.^[1] In the last years, medical education has transferred from being a traditional teacher-centered process to one that is a student-centered. In all aspects of medical education methods of delivering information and

methods of assessment have been changed. Recently, medical education all over the world transferred from measure of the ability of student to recall information toward evaluating students' performance under simulation or real life. One of the new methods of assessment is portfolio.^[2]

A portfolio is an evidence of all activity done by the residents during the rotation or block, so it is an accumulation of a resident's work, which gives proof of the accomplishment from claiming knowledge, skills, and attitudes. Furthermore, expert development in training will be through a procedure of self-reflection and act over a period of time.^[3] The importance of portfolio is admitted through promotion of student center learning, deep learning and reflective learning. Also, portfolio measures the resident's progression, strength, and weakness points and directs the residents to the steps of improve themselves through reflection. Portfolio is used as a method of effective learning and document of learning evidence. This type of assessment can increase the skills of communication and feedback.^[4]

Portfolio is coming in paper based, video, audio or photographs or anything that provide evidence of learning. Also, this evidence can be collected individually or in groups and can be presented to another learner or teacher for review. Use of portfolio can lead to a lot of benefits like, reflective and integrating learning, encourage real life practice, uses of different style of learning methods according to preference of learner, can give formative and summative assessment, and can give a model for continuing and lifelong learning.^[5]

Many of problems arise when using the portfolio as an assessment tool in training. Lack of well defined structure, guidelines, and lack of past examples of portfolio can lead to student confusion and anxiety about the idea, value, and scope of the task. Also, there is a conflict between student's goals and their supervisor's goals in constructing the portfolio. Another problem is matching program objectives with portfolio assessment criteria.^[6]

Family medicine residency program in Saudi Arabia started to use portfolio. It was introduced recently in the curriculum of the residency program of family medicine and used for assessment of the residents. It is composed of 4 elements; learning contract or objectives, evidence of learning, reflection, and logbook. All levels of residents now use portfolio for formative assessment.^[7]

Several studies were carried out regarding perception of students and residents towards use of portfolio as assessment tool. In Singapore in 2005, about 72% of student felt that the portfolio improved their communication skills, 68% revised their work and 65% practiced self directed learning.^[8] While in Scotland in 2009, students perceived that portfolio built their understanding and reflecting process. But they had concerns about the amount of paper workload.^[5] In South Africa in 2013, a study was conducted by Jenkins *et al.*^[9] showed difficulty in use of portfolio by both the trainers and trainees of family medicine. Also acceptability of the portfolio related to clear objectives, good format and availability of tool in training site.^[9] Finally, an Egyptian study in 2010 showed that the portfolio helped nursing

students in the learning process and increase self-directed learning.^[10]

The aim of this study was to evaluate the perception and attitude of family medicine residents and trainees in joint program of family medicine in Jeddah city toward use of portfolio in their assessment.

Materials and Methods

The study was carried out in the joint program of family and community medicine in Jeddah. This program is under the supervision of Saudi Commission for Health Specialties. It trains residents from different sectors in Jeddah such as, Ministry of Health (MoH), National Guard, and Ministry of Defense, King Faisal Health Specialist hospital and King Abdul-Aziz University hospital, Jeddah, Saudi Arabia. A quantitative cross sectional survey was done including all residents and trainees enrolled in training from level 1 to level 4 in joint program of family medicine in Jeddah for the academic year 2015–2016. Study involved both males and females. Diploma residents were excluded because they were not using portfolio.

Sample size was calculated by using the Raosoft® software by the website <www.raosoft.com/samplesize.html>. The total number of residents and trainees' population at family medicine department is 150. The required sample size was estimated at the 95% confidence level with an estimated 50% response distribution and a margin of error of $\pm 5\%$. The required minimum sample size was determined to be 109; the final sample size was taken as 120 to account for a 10% non-response rate.

Data were collected by a self-administered questionnaire. It has been used before by other investigator as well^[6] and proved to be valid and reliable. It is composed of 2 parts; first part includes inquiry about demographic data of the residents such as gender, age, level of training, and previous courses in portfolio using. Second part consist of 23 items inquires about information regarding perception of residents towards use of portfolio. Permission to use this questionnaire from author was taken through e-mail on 2 September 2015.

The main dependent variables were the perception of family medicine residents toward building of portfolio and as a learning activity. A total score was computed in the way that the positive perception was given a higher score and the negative perception was given a lower score. For example, the statement of "I enjoy writing the portfolio", if the response was agree or strongly agree, a score of 2 was given, if fair, a score of 1 was given, if disagree or strongly disagree, a score of 0 was given. A total score was computed for every resident and used for comparison. The independent variables were age (categorized), gender, level of training, and past course or training in use of portfolio.

Data management was done using statistical package for Social Sciences software (SPSS), version 22. Categorical data (such as gender, educational level) were presented

in the form of frequency and percentage. Continuous data (such as total perception score) was presented as median, inter-quartile range and mean ranks as it was abnormally distributed as evidenced by significant Komongrove–Smironove test. For comparison between demographic data regarding perception score, Mann–Whitney was used to compare two groups (male and females) whereas Kruskal–Wallis test was used to compare means of more than 2 groups (age 25–30, 31–35 and >35 years categories). Significance was considered if p value ≤ 0.05 .

Result

Out of 141 physicians invited to participate in the study, 21 were excluded either due to refusal to participate in the study ($n = 6$) or incomplete responses ($n = 15$). Thus, the study included 120 physicians.

Table 1 summarizes the background characteristics of the respondents. Majority of them (95%) aged between 25 and 34 years. Females represent 60% of them. More than half of them were either in the training level 3 (29%) or 4 (28.3%). More than one third of them were working either in MoH (44.2%) or Armed Forces hospital (34.1%).

Approaching half of the family medicine residents (46.7%) reported attending any course regarding portfolio.

From table 2, it is concluded that:- The highest agreed upon statement regarding use of portfolio was that “writing the portfolio is a stressful process” (weighted mean 4.22 ± 1.10), followed by “using resources other than textbooks to write the learning issues” (weighted mean 3.50 ± 1.02) and “reviewing others’ portfolios is very useful” (weighted mean 2.85 ± 1.10).

Table 1: Background characteristics of the participants

Background characteristics	Frequency	Percentage (%)
<i>Age (years)</i>		
25–34	114	95.0
≥ 35	6	5.0
<i>Gender</i>		
Male	48	40.0
Female	72	60.0
<i>Level of training</i>		
Level one	19	15.8
Level two	32	26.7
Level three	35	29.2
Level four	34	28.3
<i>Sector</i>		
National Guard	8	6.7
Ministry of Health	53	44.2
Armed Forces Hospital	41	34.1
King Faisal Specialized hospital	1	0.8
University hospital	12	10.0
Missing	5	4.2

The lowest agreed upon statements regarding use of portfolio were “the portfolio has changed the way of thinking when encountering the problems” (weighted mean 2.13 ± 0.91), “the portfolio is a useful additional learning tool” (weighted mean 2.11 ± 0.98), “the portfolio should be part of every medical program” (weighted mean 1.96 ± 1.00), and “enjoying writing the portfolio” (weighted mean 1.92 ± 0.93). The overall portfolio score ranged between 0 and 44 with a mean of 14.08 and standard deviation of 10.26. It is abnormally distributed as evident from figure 1 (p -value of Kolmogrove–smirnov “K–S” test = 0.035).

Table 3 showed different factors associated with the perception toward use of portfolio. Perception score toward portfolio score of the male family medicine residents and trainees was slightly higher than that of females (mean ranks were 61.08 and 59.64, respectively). However, this difference was not statistically significant. Perception score toward portfolio score of the younger family medicine residents and trainees (25–34 years) was slightly higher than that of those aged 35 years or older (mean ranks were 60.61 and 58.50, respectively). However, this difference was not statistically significant. Family medicine residents and trainees of the first training level had perception toward use of portfolio score significantly higher than those of higher levels of training, $p < 0.001$. Perception score toward portfolio of the family medicine residents and trainees working in armed forces hospital and MoH was higher than that of those working in National Guard or University sectors (mean ranks were 60.16 and 59.52 versus 51.31 and 43.63, respectively). However, the difference was not statistically significant. Attending any training courses in use of portfolio was not significantly associated with the perception toward portfolio score among family medicine residents and trainees in joint program of family medicine in Jeddah.

As displayed from Table 4, the commonest agreed upon barriers in using portfolio as assessment tool in residency program were increase paper works (4.66 ± 0.80), time consuming (4.60 ± 0.77), little guidance, difficulties in writing, not certain what to include (4.13 ± 1.01) and little emphasis, and interfere with clinical learning.

Discussion

Portfolio-based learning is nowadays a popular method of education and training. It is based on competency or performance assessment instead of traditional assessment of knowledge.^[2] The current study was carried out to evaluate the difference in perception between different levels of trainee in residency program of family medicine, joint program in Jeddah, Saudi Arabia as well as to identify the barriers to use portfolio as a tool of assessment in the program of family medicine.

Generally speaking, family medicine residents had negative attitude towards portfolio as evidenced by finding that only 9.5% and 11.8% of them agreed that portfolio should

Table 2: Family medicine residents' perception toward use of portfolio

Statement	Strongly Agree	Agree	Fair	Disagree	Strongly disagree	Weighted mean \pm SD
	N (%)	N (%)	N (%)	N (%)	N (%)	
I enjoy writing the portfolio (<i>n</i> = 119)	1 (0.8)	5 (4.2)	25 (21.0)	40 (33.6)	48 (40.3)	1.92 \pm 0.93
I can appreciate that my written communication has improved (<i>n</i> = 119)	1 (0.8)	18 (15.1)	36 (30.3)	48 (40.3)	16 (13.4)	2.50 \pm 0.94
It has helped me in self-directed learning as I can analyze problem on my own (<i>n</i> = 120)	2 (1.7)	18 (15.1)	31 (26.1)	41 (34.5)	27 (22.7)	2.39 \pm 1.05
Reviewing others' portfolios is very useful (<i>n</i> = 120)	7 (5.8)	29 (24.2)	37 (30.8)	33 (27.5)	14 (11.7)	2.85 \pm 1.10
Writing the portfolio is a stressful process (<i>n</i> = 120)	67 (55.8)	29 (24.2)	11 (9.2)	9 (7.5)	4 (3.3)	4.22 \pm 1.10
Writing the portfolio has helped my personal and professional development.	4 (3.3)	9 (7.5)	34 (28.3)	46 (38.3)	27 (22.5)	2.31 \pm 1.01
While I write the portfolio, I usually think about the case.	5 (4.2)	29 (24.4)	37 (31.1)	35 (29.4)	13 (10.9)	2.82 \pm 1.06
The portfolio encourages self-reflection.	1 (0.8)	29 (24.4)	36 (30.3)	35 (29.4)	18 (15.1)	2.66 \pm 1.04
I normally write a portfolio on a regular basis in every rotation.	0 (0.0)	22 (18.3)	29 (24.2)	42 (35.0)	26 (21.7)	2.40 \pm 1.03
There is adequate guidance to write portfolio.	0 (0.0)	20 (16.8)	34 (28.6)	38 (31.9)	27 (22.7)	2.40 \pm 1.02
I use resources other than textbooks to write the learning issues.	13 (10.9)	61 (51.3)	24 (20.2)	15 (12.6)	6 (5.0)	3.50 \pm 1.02
I have started to use the same principle (of writing the portfolio) in problems that encounter in day-to-day clinical exposure.	2 (1.7)	16 (13.3)	35 (29.2)	44 (36.7)	22 (18.3)	2.43 \pm 1.00
Writing the portfolio has given me an insight into outcome-based education.	0 (0.0)	14 (11.7)	35 (29.2)	42 (35.0)	29 (24.2)	2.28 \pm 0.96
The portfolio should be part of every medical program.	1 (0.9)	10 (8.6)	19 (16.4)	39 (33.6)	47 (40.5)	1.96 \pm 1.00
I usually reflect on the problems that I am discussing.	1 (0.8)	29 (24.4)	32 (26.9)	34 (28.6)	23 (19.3)	2.59 \pm 1.08
Whenever I write the portfolio I think of the 8 outcomes.	4 (3.4)	19 (16.0)	40 (33.6)	36 (30.3)	20 (16.8)	2.59 \pm 1.05
The portfolio is a useful additional learning tool.	0 (0.0)	14 (11.8)	22 (18.5)	46 (38.7)	37 (31.0)	2.11 \pm 0.98
I usually read the relevant chapter in books before I write the portfolio.	0 (0.0)	16 (13.4)	23 (19.3)	54 (45.5)	26 (21.8)	2.24 \pm 0.95
The portfolio has changed the way I think when I encounter the problems.	0 (0.0)	9 (7.6)	31 (26.1)	46 (38.7)	33 (27.7)	2.13 \pm 0.91
The portfolio writing has changed my approach to learning.	1 (0.8)	11 (9.2)	28 (23.5)	49 (41.2)	30 (25.2)	2.19 \pm 0.95
Writing the portfolio has helped me to monitor the learning goals.	1 (0.8)	20 (16.8)	26 (21.8)	45 (37.9)	27 (22.7)	2.35 \pm 1.04
Writing the portfolio has helped me to recognize my strength and weakness (<i>n</i> = 118)	2 (1.7)	24 (20.3)	26 (22.0)	41 (34.7)	25 (21.2)	2.47 \pm 1.09
Writing the portfolio has helped me to revise my work (<i>n</i> = 119)	4 (3.4)	17 (14.3)	35 (29.4)	38 (31.9)	25 (21.0)	2.47 \pm 1.08

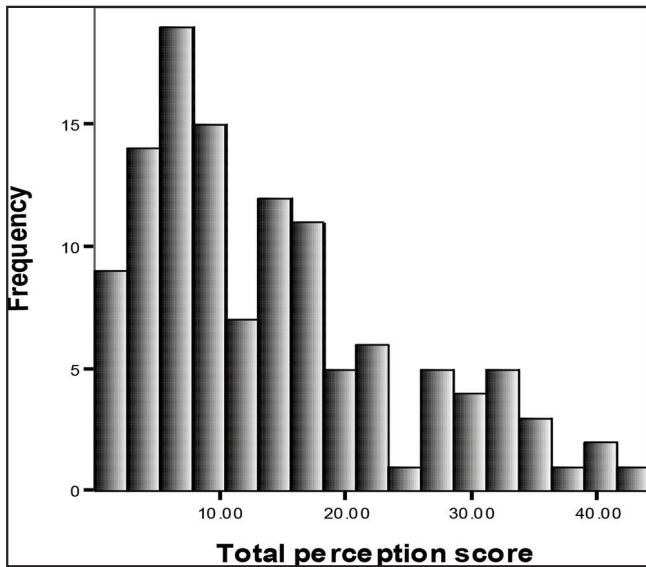


Figure 2: Distribution of overall perception toward portfolio score among family medicine residents, Jeddah.

be part of every medical program and it is useful additional learning tool, respectively. On the other hand, majority of them (80%) agreed that it is a stressful process. In a study conducted by Elngo et al.^[6] in Singapore, 64.5% of the medical students reported that portfolio is a useful additional learning tool and 50% of obstetrics and gynecology trainees in a study conducted by Lonka et al.^[11] reported the same. The negative perception towards portfolio reported in the present study could be attributed to main 3 facts. Family medicine residents considered writing the portfolio as an additional paper workload and time consuming as majority of them reported. They tended to postpone and accumulate their work which leads to their stress towards the end of their training rotation as also most of them considered writing the portfolio as a stressful process. Existence of little guidance, difficulties in writing, not certain what to include, little emphasis, and interfere with clinical learning could contribute to their negative perception.

In the current study, it is evident that perception of residents of first level was significantly higher than that of higher levels indicating that new generations of residents were more willing of this approach of learning. In another study conducted

Table 3: The association between gender of the family medicine residents and trainees in joint program of family medicine in Jeddah and perception toward use of portfolio in their assessment

Gender	Males N = 48			Females N = 72			p-value
	Median	IQR	Mean rank	Median	IQR	Mean rank	
	11.5	7–17.75	59.64	11	6–23.25	61.08	0.824*
Age	25-34 N = 114			≥35 N = 6			
	Median	IQR	Mean rank	Median	IQR	Mean rank	
	11.5	6–20.0	60.61	11	6–19.25	58.50	0.885
Level of training	Median	IQR	Mean rank	p-value*			
First (n = 19)	26	22–34	100.95	<0.001**			
Second (n = 32)	11.5	6–16.75	56.53				
Third (n = 35)	8	5–15	49.03				
Fourth (n = 34)	10	6–17	53.44				
Working sector	Median	IQR	Mean rank	p-value*			
National Guard (n = 8)	11.5	4.25–19.25	51.31	0.413			
Ministry of Health (n = 53)	12	6–21.5	59.52				
Armed Forces (n = 41)	11	7–21	60.16				
University (n = 12)	8.50	2.25–16.75	43.63				
Attending training courses in portfolio	Yes N = 56			No N = 64			
	Median	IQR	Mean rank	Median	IQR	Mean rank	
	11	7–17	59.54	12	6–21.75	61.34	0.776

*Man

Table 4: Barriers in using portfolio as assessment tool in residency program

Statement	Strongly Agree N (%)	Agree N (%)	Fair N (%)	Disagree N (%)	Strongly disagree N (%)	Weighted mean \pm SD
Time consuming (<i>n</i> = 115)	81 (70.5)	28 (24.4)	2 (1.7)	2 (1.7)	2 (1.7)	4.60 \pm 0.77
Increase paper work (<i>n</i> = 114)	88 (77.2)	20 (17.5)	2 (1.8)	1 (0.9)	3 (2.6)	4.66 \pm 0.80
Little emphasis, and interfere with clinical learning (<i>n</i> = 115)	53 (46.1)	36 (31.3)	16 (13.9)	7 (6.1)	3 (2.6)	4.12 \pm 1.04
Little guidance, difficulties in writing, not certain what to include (<i>n</i> = 115)	53 (46.1)	35 (30.5)	19 (16.5)	5 (4.3)	3 (2.6)	4.13 \pm 1.01
Lack of supervisors' feedback in continuous basis (<i>n</i> = 114)	31 (27.2)	27 (23.7)	28 (24.6)	25 (21.9)	3 (2.6)	3.51 \pm 1.18

by Segers et al.,^[12] they compared first and second year students, and revealed no differences in learning approaches.

Despite portfolio being designed basically as a tool to integrate theory and practice, the process of writing and compiling the portfolio mostly had adverse effect on learning. This is very evident in the present study as only 5% of the respondents enjoyed writing the portfolio, only 10.8% agreed that writing the portfolio has helped their personal and professional development, only 16.8% claimed that there is an adequate guide to write portfolio and 11.7% agreed that the portfolio has given them an insight into outcome-based learning. On the other hand, 80% found writing the portfolio as a stressful process. A study carried out by Collins and Wilkie,^[13] suggested that students were rarely able to evidence critical thinking within portfolios similar to that of finding other assessment tools.

Generating discussion about the weaknesses and strengths of including different parts within the portfolio and the most effective use of formative and summative assessment might allow students to recognize some of the wider influences on assessment.^[14] In the current study, only 22% of the family medicine residents agreed that writing the portfolio has helped them to recognize their strength and weakness.

For educational practice, only 16.8% of the respondents claimed that there was adequate guidance to write portfolio. This finding implies the importance of teachers encouraging and providing guidance to students to make explicit utilization of portfolio effectively.

Portfolio assessment can support student learning when it is communicated to, followed and discussed with students as a learning tool as well as considered as an integral part of the learning environment.^[15] In the present study, among barriers considerably mentioned by family medicine residents in using portfolio was little guidance by supervisors as well as lack of supervisors' feedback in continuous basis. Therefore, if guidance and feedback sessions with students focus on the discussing and illustrating the learning effects of portfolios,

residents' perceptions of the learning benefits of portfolio assessment might be improved.

One of the interesting findings of the present study was the non-significant role of attending training courses in portfolio on the perception of the physicians towards using portfolio as an assessment tool in their residency program, even those who did not attend such courses score little bit higher compared to those attended these courses. This finding raised a question about the content and quality of such courses.

Although the present study offers interesting findings, mainly identifying the barriers in using portfolio as assessment tool in residency program, more work has to be conducted in this context. Although many medical schools implementing new modes of assessment, such as portfolio assessment, to enhance deep learning, up to date evidence to support the effectiveness of portfolio is scarce. Therefore, future research on wider scale should be implemented to validate the results. In addition, qualitative research can indicate how residents themselves relate their attitude towards assessment practice to how they approach their learning.

Among important limitations of this study, it was carried out only among family medicine residents from one program in Jeddah; therefore generalizability of results over the entire population of residents in the kingdom is questionable. Detailed questions regarding the training course in portfolio is missing.

Conclusion

In conclusion, the perception of the family medicine residents in joint program of family medicine, Jeddah, Saudi Arabia towards use of portfolio in their assessment is relatively suboptimal. This perception was higher among residents of the first level than higher levels. Attending training courses in portfolio did not improve the residents' perception. We recommended a strong focus at the quality and contents of the local portfolio training courses should be considered.

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