

Factors influencing quality of academic research: perception of faculty researchers at Oman Medical College

Jahan F¹, Siddiqui MA², Khabouri ZAI³, Riyami RFMAI³ and Ahuja A^{4*}

¹Department of Family Medicine, Oman Medical College, Oman

²Professional Faculties, University of Calgary, Canada

³Medical Student, Oman Medical College, Oman

⁴Department of Pharmacy, Oman Medical College, Oman

Abstract

There is a need for academic research in medical schools as it helps in teaching and clinicians' ability to improve practice outcomes. Improvement in patient outcomes is often linked to the ability of physicians to change and adopt new practices within their health care settings. This study explores factors that may affect the quality of research as well as some possible ways for promoting quality research and understanding barriers for doing quality research. A cross sectional study was carried out at Oman Medical College (OMC) on Medicine and Pharmacy faculty. Data was collected using a structured self-filled questionnaire. Survey questionnaire had four components. Statistical analysis was performed using SPSS (IBM SPSS Statistics 24.0). Data was expressed in frequencies from the questionnaire responses which were calculated for all the variables as numbers and percentages. Independent sample t-test was used to compare differences between the two groups using Parametric data. Mann-Whitney test was used to compare differences between the two groups using non-parametric (not normally distributed) continuous data. Forty-two teaching faculties participated in the present study. Faculty experience about generating research idea on their own was 57% where as proposal writing was 54%. Minimum experience in grant proposal writing was 59% where as experience in publishing was 54% and scholarly presentation was 49%. Institutional factors affecting research were statistical support (51%), formal supervision and training (47%) ($p = 0.147$; 95% CI -2.89-18.51). Significant difference was seen with previous research training (mean rank score 24.63) and without any previous research training (mean rank score 16.41) responses ($p < 0.035$). Teacher researcher showed positive perception and importance of research in effective teaching and practice. Research is an integral part of the teaching practice and professional development. Research training and skill, financial support, technical and logistic support, mentorship and team-work are the main factors affecting quality academic research. The results of this study will be helpful to design the professional development activities and more effectively incorporate active learning into the curriculum.

Introduction

Effective and informed physicians in practice strive to meet the challenge of achieving a high-quality health care system. An evidence based educational system that understands the processes of teaching, learning and practice, impact positively on teaching quality and academic research [1]. This understanding and innovation comes from research in medical education. Medical education research is focused on the education and development of clinicians across the medical training process and continuing professional development (CPD) [2].

Medical education research is mandatory for clinical academics which often has the positive relation between academic research and teaching [3-4]. Academic research improves the processes and outcomes of physician education and training which impact and improve quality education [5-7]. The quality of teaching in Higher Education Institution (HEIs) is strongly connected to research which plays a significant role in shaping the teaching and learning process. It is very important to have nexus between research and teaching. When the research is based on teaching it will provide hands on implications for other teachers [8-9]. Academic research remains a prime source of knowledge and innovation which develops their academic reputation and standards.

The idea of research-teaching nexus is one of the mission goals of Oman medical college (OMC). It is important to ensure quality of research in HEIs by adopting international models used in assessing

research quality and address factors which could affect the quality of academic research and publications.

OMC is the first private Health Sciences College in Oman and was established in 2001. The College offers 7-year MD (Doctor of Medicine) and a 5-year B Pharm (Bachelor of Pharmacy) programs. The curriculums for MD and B. Pharm courses have been developed in academic partnership with West Virginia University, USA and have been approved by the Ministry of Health and the Ministry of Higher Education. Teaching and learning strategies at OMC include integrated components of large class format, tutorials, lab work, problem based learning and clinical skills. This study explores teacher researchers' views about factors that may affect the quality of research and what makes quality research and academic publications.

Methodology

A cross sectional study was conducted at Oman Medical College. All full time as well as part time teaching faculties of Pharmacy, basic

Correspondence to: Alka Ahuja, Professor of Pharmaceutics and Head of Research Oman Medical College, Muscat, Oman, E-mail: alka@omc.edu.om

Key words: academic research, medical faculty, quality of research, teaching

Received: January 03, 2018; **Accepted:** January 23, 2018; **Published:** January 26, 2018

and clinical sciences who consented to participate were included in the study. Data collection was carried out using a structured self-administered questionnaire, especially designed for this study. Survey instrument was made after literature search which was further reviewed by and agreed on after several brain storming sessions and understanding, so that the questionnaire would maximize the response rates. Questionnaire was distributed to the faculty after validating the questionnaire for its design and length by carrying out a pilot study on five faculty members.

The questionnaire was prepared and approved by the Research and ethical review committee of Oman Medical college. Participants were enrolled after taking written informed consent. The principal investigator ensured uniformity and two trained research assistants assisted principal investigator in data collection. A questionnaire was designed comprising of four sections. The first section consisted of demographic details of the participants. Section two contained questions about faculty perception regarding institutional factors affecting quality of research. Section three was about faculty personal experience and perception about research. and fourth section was about the factors or barriers influencing the quality of academic research.

Statistical analysis was performed using SPSS (IBM SPSS Statistics 24.0). Data was expressed as frequencies for questionnaire responses calculated for all variables in numbers and percentages. Independent sample t-test was used to compare differences between two groups with parametric data and Mann-Whitney test was used to compare differences between two groups with non-parametric (not normally distributed) continuous data.

Results

A total of 42 faculty members participated in the study out of which 21 (50%) were males and majority were aged below 50 years. Among all participants, 11 (26.2%) were PhD qualified and 10 (23.8%) were MDs (Table 1). Nearly two third of participants had teaching/ research experience of more than 5 years and about one quarter of the participants had published 1-5 research articles. Half of the participants had received formal teaching training and 61.9% study participants had received formal research training.

Participants were asked multiple questions about perception regarding institutional factors affecting quality of research. Nearly one third of participants disclosed that annual appraisal/ assessment is not effective for their progress on research and nearly half of the participants felt that timely feedback was effective to promote their research (Table 2). More than half of the participants, identified that quality of their program (MD/Pharma), quality of teaching by other faculty in their program, quality of their research experience and library resources/ data base to support research and education affected their quality of research. No significant statistical difference was observed between males (mean score 66.9) and females (mean score 59.1) responses of participants involving perception regarding institutional factors affecting quality of research ($p = 0.147$; 95% CI -2.89-18.51). Similarly, there was no significant difference in the responses of participants with previous research training (mean score 60.77) and without any previous research training (mean score 66.63) ($p < 0.273$; 95% CI -16.62-4.91).

In the questionnaire, participants were asked regarding their personal experience and perception about research. More than half of the participants thought that their personal experience was effective in generating research ideas, literature search/ search engines/ keywords and critical review of literature. On the other hand, more than fifty

Table 1. Participants Baseline Characteristics.

	Frequency	Percent
Gender		
Male	21	50.0
Female	21	50.0
Age		
<30	1	2.4
30-40	13	31.0
40-50	18	42.9
50-60	5	11.9
>60	5	11.9
Programme		
Clinical	11	26.2
MD Programme	10	23.8
Pharmacy	12	28.6
Pre-clinical	2	4.8
Pre-medical	7	16.7
Qualification		
Arab Board	2	4.8
MD	10	23.8
MRCGP	3	7.1
PhD	11	26.2
Others	16	38.1
Experience		
< 5 years	9	21.4
5-10 years	18	42.9
> 10 years	15	35.7
Publications as a First Author		
0	13	31.0
1-5	11	26.2
5-10	4	9.5
10-15	5	11.9
15-20	2	4.8
>20	7	16.7
Formal Research Training		
No	16	38.1
Yes	26	61.9
Formal Teaching Training		
No	21	50.0
Yes	21	50.0

percent of participants thought that their personal experience was not effective in receiving grant from funding agencies, publishing books/ contributing chapters and public presentations on awareness of several health issues (Table 3). These study results revealed that no significant statistical difference was observed between males (mean score 68.14) and females (mean score 71.24) responses of participants involving personal experience and perception about research ($p = 0.636$; 95% CI -16.25-10.07). Similarly, there was no significant difference in the responses of participants with previous research training (mean score 72.27) and without any previous research training (mean score 65.5) ($p < 0.294$; 95% CI -6.11-19.65).

Participants were asked about factors or barriers which affected quality of research. Their responses were in the scale of 1 to 5 (1 indicated no effect and 5 indicated maximum effect). More than half of the participants revealed that research training and skill, financial support, technical and logistic support, mentorship and team-work were the main factors affecting quality academic research (Table 4). No significant statistical difference was observed between males (mean rank score 20.17) and females (mean rank score 22.83) responses of

Table 2. Faculty perception regarding institutional factors affecting quality of research (1- minimal effect to 5- maximum effect).

	1	2	3	4	5
Annual appraisal/ assessment is effective for your progress on research	16 (38.1)	5 (11.9)	6 (14.3)	11 (26.2)	4 (9.5)
Timely feedback is effective to promote your research	10 (23.8)	4 (9.5)	6 (14.3)	17 (40.5)	5 (11.9)
Formal supervision and evaluation promotes research	7 (16.7)	4 (9.5)	7 (16.7)	16 (38.1)	8 (19)
Opportunities to teach and research in a variety of academic environments	8 (19)	5 (11.9)	12 (28.6)	11 (26.2)	6 (14.3)
Quality of your program (MD/Pharma)	2 (4.8)	7 (16.7)	12 (28.6)	11 (26.2)	10 (23.8)
Quality of teaching by other faculty in your program	6 (14.3)	3 (7.1)	9 (21.4)	19 (45.2)	5 (11.9)
Quality of your research experience	3 (7.1)	3 (7.1)	12 (28.6)	14 (33.3)	10 (23.8)
The intellectual environment and liveliness of your program	1 (2.4)	8 (19)	7 (16.7)	18 (42.9)	8 (19)
Library resources/ data base to support research and education	1 (2.4)	7 (16.7)	9 (21.4)	15 (35.7)	10 (23.8)
Adequate space for interaction with students for joint research	8 (19)	8 (19)	9 (21.4)	12 (28.6)	5 (11.9)
Work space for research /facilities	8 (19)	11 (26.2)	9 (21.4)	8 (19)	6 (14.3)
Formal training for proposal writing	5 (11.9)	5 (11.9)	12 (28.6)	16 (38.1)	4 (9.5)
Institutional research review board	7 (16.7)	4 (9.5)	10 (23.8)	13 (31)	8 (19)
Statistical support	9 (21.4)	5 (11.9)	10 (23.8)	12 (28.6)	6 (14.3)
Laboratory/equipment	10 (23.8)	9 (21.4)	9 (21.4)	8 (19)	6 (14.3)
Visibility and coherence to communities	8 (19)	9 (21.4)	10 (23.8)	12 (28.6)	3 (7.1)
Coordination with policy makers	10 (23.8)	5 (11.9)	15 (35.7)	9 (21.4)	3 (7.1)
High-capacity/high speed communication networks (internet)	3 (7.1)	6 (14.3)	8 (19)	14 (33.3)	11 (26.2)
Funding of research	7 (16.7)	8 (19)	11 (26.2)	10 (23.8)	6 (14.3)
Faculty members whom you consider mentors and seek advice about education, career development	8 (19)	4 (9.5)	11 (26.2)	12 (28.6)	7 (16.7)

Table 3. Faculty Researchers Personal Experiences and Perception about research (1- minimal effect to 5- maximum effect).

	1	2	3	4	5
Generating research ideas	5 (11.9)	3 (7.1)	11 (26.2)	14 (33.3)	9 (21.4)
Literature search/ search engines/ keywords	4 (9.5)	2 (4.8)	14 (33.3)	15 (35.7)	7 (16.7)
Critical review of literature	3 (7.1)	7 (16.7)	11 (26.2)	12 (28.6)	9 (21.4)
Designing a research study	2 (4.8)	5 (11.9)	11 (26.2)	17 (40.5)	7 (16.7)
Sample size calculation and basic statistics	3 (7.1)	6 (14.3)	19 (45.2)	7 (16.7)	7 (16.7)
Writing and presenting a research proposal	3 (7.1)	4 (9.5)	11 (26.2)	16 (38.1)	8 (19)
Writing grant proposals	7 (16.7)	9 (21.4)	12 (28.6)	9 (21.4)	5 (11.9)
Receiving grant from funding agencies	16 (38.1)	9 (21.4)	8 (19)	5 (11.9)	4 (9.5)
Analyzing and interpreting data	1 (2.4)	3 (7.1)	16 (38.1)	16 (38.1)	6 (14.3)
Oral and poster presentation in conferences	5 (11.9)	6 (14.3)	9 (21.4)	9 (21.4)	13 (31)
Knowledge about impact factor/citation index/ResearchGate scores	2 (4.8)	6 (14.3)	12 (28.6)	10 (23.8)	12 (28.6)
Submission of an article for publication	5 (11.9)	3 (7.1)	9 (21.4)	12 (28.6)	13 (31)
Publishing articles on professional interest and teaching methodologies	2 (4.8)	9 (21.4)	9 (21.4)	13 (31)	9 (21.4)
Publishing books/ contributing chapters	16 (38.1)	7 (16.7)	9 (21.4)	6 (14.3)	4 (9.5)
Invited speaker	11 (26.2)	6 (14.3)	13 (31)	10 (23.8)	6 (14.3)
Presentation for public on awareness of several health issues	11 (26.2)	10 (23.8)	9 (21.4)	8 (19)	4 (9.5)
Invited panelist	13 (31)	6 (14.3)	11 (26.2)	9 (21.4)	3 (7.1)
Key note speaker	18 (42.9)	6 (14.3)	10 (23.8)	6 (14.3)	2 (4.8)
Reviewing articles for journals	9 (21.4)	6 (14.3)	10 (23.8)	10 (23.8)	7 (16.7)
Member of Editorial boards	13 (31)	3 (7.1)	12 (28.6)	7 (16.7)	7 (16.7)
Supervision of research for students/subordinates	8 (19)	4 (9.5)	8 (19)	14 (33.3)	8 (19)
Awards in research	22 (52.4)	5 (11.9)	6 (14.3)	5 (11.9)	4 (9.5)
Awards in teaching	14 (33.3)	10 (23.8)	8 (19)	8 (19)	2 (4.8)

participants involving factors or barriers which affected quality of research ($p = 0.481$). However, significant difference was observed in the responses of participants with previous research training (mean rank score 24.63) and without any previous research training (mean rank score 16.41) ($p < 0.035$).

Discussion

Good quality research is imperative to effect positive changes in patient care and health care system [10,11]. Quality research could be affected by institutional, international, and logistical factors. Teacher researchers should be aware of the factors influencing quality and innovative research for promoting research culture in Oman [12].

Our two third study participants had teaching experience of more than 5 years. However, only one quarter published research articles. In this study, faculty perception regarding institutional factors affecting quality of research, more than one third felt that communication network had the maximum effect. Half of the participants felt that formal supervision, evaluation and feedback, data base resource had the effect on quality research. The literature also reports the positive relation between institutional infrastructure and effective teaching as well as good quality academic research [13-14]. The institutional factors are important in sustaining quality research produced by teacher researchers. The institution must value research and support teacher researchers to carry out research; this would definitely encourage teachers to produce high quality research [15].

Table 4. Barriers/ Factors affecting Quality Academic Research (1- minimal effect to 5- maximum effect)

	1	2	3	4	5
Linked to promotion	8 (19)	3 (7.1)	14 (33.3)	9 (21.4)	8 (19)
Time allotted for Research	3 (7.1)	4 (9.5)	17 (40.5)	7 (16.7)	11 (26.2)
Research training and skill	3 (7.1)	3 (7.1)	9 (21.4)	16 (38.1)	11 (26.2)
Statistical support	3 (7.1)	3 (7.1)	16 (38.1)	9 (21.4)	11 (26.2)
Financial support	4 (9.5)	6 (14.3)	6 (14.3)	9 (21.4)	17 (40.5)
Technical and logistic support such as computer and access to library data base	2 (4.8)	2 (4.8)	11 (26.2)	12 (28.6)	15 (35.7)
Mentorship and team-work	4 (9.5)	6 (14.3)	8 (19)	10 (23.8)	14 (33.3)
Collaboration of research with other institutes	3 (7.1)	4 (9.5)	16 (38.1)	9 (21.4)	10 (23.8)
Language barrier prohibits access to the publication and dissemination	7 (16.7)	4 (9.5)	14 (33.3)	9 (21.4)	8 (19)
International standard for research & publications	2 (4.8)	5 (11.9)	21 (50)	8 (19)	6 (14.3)
Social recognition in the community	4 (9.5)	7 (16.7)	17 (40.5)	8 (19)	6 (14.3)
Journals impact factor / referred journals	3 (7.1)	6 (14.3)	12 (28.6)	16 (38.1)	5 (11.9)
Quality of editorial board	2 (4.8)	8 (19)	9 (21.4)	16 (38.1)	7 (16.7)
Citation out put	2 (4.8)	6 (14.3)	16 (38.1)	14 (33.3)	4 (9.5)
Selection of Participants/Sample Size	4 (9.5)	1 (2.4)	14 (33.3)	16 (38.1)	7 (16.7)
Applied research /study design	3 (7.1)	6 (14.3)	11 (26.2)	16 (38.1)	6 (14.3)
Appropriateness of Statistical Techniques	3 (7.1)	2 (4.8)	19 (45.2)	10 (23.8)	8 (19)
Appropriate methodology	2 (4.8)	3 (7.1)	15 (35.7)	12 (28.6)	10 (23.8)
Good sampling	2 (4.8)	2 (4.8)	13 (31)	14 (33.3)	11 (26.2)
Applied research questions	2 (4.8)	4 (9.5)	9 (21.4)	15 (35.7)	12 (28.6)
Appropriate interpretation of findings	2 (4.8)	6 (14.3)	9 (21.4)	13 (31)	12 (28.6)
Well-formed rationale	1 (2.4)	2 (4.8)	11 (26.2)	19 (45.2)	9 (21.4)
Clear institutional policy	2 (4.8)	5 (11.9)	11 (26.2)	11 (26.2)	13 (31)
Research questions are worth investigating	3 (7.1)	5 (11.9)	11 (26.2)	11 (26.2)	12 (28.6)
Addressing real problem	3 (7.1)	5 (11.9)	9 (21.4)	13 (31)	12 (28.6)
Lack of research-based learning &teaching environment	4 (9.5)	7 (16.7)	8 (19)	14 (33.3)	9 (21.4)
Motivational factors such as monetary incentives and career progress	2 (4.8)	7 (16.7)	11 (26.2)	10 (23.8)	12 (28.6)
Personal interest & commitment	1 (2.4)	4 (9.5)	4 (9.5)	12 (28.6)	21 (50)

Our study showed that more than half of the study participants had experience of generating research idea, literature search, design; interpreting data, oral and poster presentation and nearly one third had experience in submission of an article to the peer reviewed journals. The least experience the participants had was regarding receiving grant, publishing book or being an invited speaker. Participatory action research has the potential to result in acceptable and sustainable educational innovations because it involves the active involvement of all stakeholders affected by these interventions [16].

More than half of the participants of our study felt that research training and skill, financial support, technical and logistics support, mentorship and team-work are the main factors affecting quality academic research. Significant difference was observed in the responses of participants with previous research training and without any previous research training ($p < 0.035$). This also matches with the Literature report regarding promotion of culture of educational research and scholarship of teaching [17].

Good quality academic research effect on teaching can be influenced by educational leadership programs, faculty development and teaching scholars program. Academic research and publications should be valued and should be linked to promotion and financial rewards. Moreover, quality research helps in teaching as teaching and research go hand in hand in HEIs [15,18]. Additionally, research resources should be made available such as books, journals, software, etc. Furthermore, staff members should be trained in skills related to publishing research.

Conclusion

Teacher researcher values quality research in academics and its importance as an integral part of the teaching practice and professional

development. Research training and skill, financial support, technical and logistic support and mentorship and team-work are the main factors affecting quality academic research. The results of this study will be helpful to design the professional development activities and more effectively incorporate active learning into the curriculum.

Conflicts of interest

There was no conflict of interest to be stated.

Authors contribution

PI and Co PI wrote the first draft of the article and performed intensive review of literature. All co-authors edited the article continuously, read and approved the final manuscript. All authors read and approved the final manuscript.

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