



BASIC RESEARCH METHODOLOGY WORKSHOP – ARE THEY EFFECTIVE IN IMPROVING RESEARCH COMPETENCY AMONG MEDICAL POSTGRADUATES

Biochemistry

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ABSTRACT

Background: Recent guidelines and regulations recommend change in post-graduate curriculum, where research methodology is an integral part of medical education. Hence, training in the basic concepts of research methodology is must for the postgraduates. In this regard the workshop was organized and the study was designed to evaluate the effectiveness of the basic research methodology workshop in improving the research competency among postgraduates

Methods: A workshop on basic research methodology was conducted for 1st year postgraduate. A predesigned, structured questionnaire tool was prepared with 21 multiple choice questions related to the topics to be covered in the workshop. The same tool was used to assess both the base line (pre-test) and after intervention (post-test) knowledge of the participants. Data expressed as frequency, proportion, mean score and SD. Pre and post –test mean scores were compared using student paired t test and McNemer test was employed to check the question wise difference between pre and post test scores. A p value <0.05 was considered as statistically significant.

Results: Out of 45 participants, 24 (53.3%) were males and 21 (46.7%) were females. The pre-test mean score was 8.71 ± 3.28 and the post –test mean score was 13.2 ± 3.27 . The difference between mean score of pretest and post-test was statistically significant ($p < 0.0001$). There was an increase in the scores in the areas pertaining to components of title ($p = 0.000$), research question /hypothesis ($p = 0.000$) and need for the study writing and also in basic concepts of types of data and its presentations ($p = 0.02$) and reference writing ($p = 0.001$) which was statistically significant. In the pre-test only 29% of the participants scored above 50% whereas in the post-test > 85% of the participants scored above 50% of the marks.

Conclusion: The workshop improved the participant's knowledge in the basic principles of research methodology. Thus formal training and workshops on research methodology can be used to familiarize the concepts of research in early years of postgraduate training.

KEYWORDS

Research methodology, Workshop, Structures questionnaire, Knowledge enhancement, Post-graduate training.

INTRODUCTION

To develop evidence based medicine, all the medical fraternity should involve in research along with patient care. Research is systematic investigation to discover new methods, to invent a technology, to develop a process, to generate new knowledge, to close the gaps in knowledge, to confirm and to clarify a phenomenon or gather factual information to confirm an idea.¹ For this to happen, one should develop critical thinking, creativity and possess basic knowledge on research methodology. Recent guidelines and regulations recommend change in undergraduate and post-graduate curriculum.^{2,3} All the postgraduates are expected to carry out dissertation as partial fulfillment of their master's degree⁴ which requires basic knowledge and skills in the field of research. Hence a workshop was designed to train the first year medical post graduates in basic research methodology and the present study was undertaken to assess the effectiveness of this workshop in improving the research knowledge of the postgraduates trained.

Methodology

A workshop on basic research methodology was conducted by Medical Education Unit on two consecutive half days for first year medical postgraduate students at our institution. On the first day the workshop had interactive lectures and group dynamics on the following topic – Research types, study designs, sampling procedure, sample size calculation, variables, data and its presentation, basic statistical tests, need for the study, aims and objectives. On the second day it included sessions on research question, hypothesis, study title, importance of review of literature, resources of literature search, reference writing, and guidelines for consent writing and how to write synopsis in the university prescribed format.

Based on the content of the sessions, predesigned, structured questionnaire tool was prepared with twenty one multiple choice questions. The same tool was used to assess the baseline and post intervention knowledge.

All the newly admitted degree post graduates ($n = 45$) were recruited for

the study. All the participants present on the day of workshop and who gave the consent ($n = 45$) were included. Study participants' were given pre-test questionnaire prior to the session to assess the baseline knowledge on research methodology. This was followed by scientific sessions on introduction to basic research methodology by nine different resource persons of the institute extended with group dynamics and small presentation of the activity by the participants. At the end of the workshop its effectiveness was assessed by the same questionnaire tool. By referring to a key of correct answer for the questions, pre and post- test questionnaires were evaluated considering score of one mark each for correct answer and zero for wrong and unanswered question.

Mean score was calculated for both pre and post-test. Results were expressed as frequency, proportion, mean score and SD. The pre-test and post-test responses were compared by using McNemer test for categorical variables and Paired t test for continuous variable. For all the results, p value less than 0.05 was considered as statistically significant. Data was analyzed using SPSS software version 18.0

RESULTS

Out of 45 postgraduates who attended the workshop, 24 (53.3%) were males and 21 (46.7%) were females (Table 1). The pre-test mean score was 8.71 ± 3.28 with a minimum score of 1 and maximum of 15. The post –test mean score was 13.2 ± 3.27 with a minimum score of zero and maximum of 18. The difference between mean score of pretest and post-test was statistically significant ($p < 0.000$). (Table 2)

Table 1: Demographic profile of the participants

Variable	N(%)
Gender	
Male	24(53.3)
Female	21(46.7)
Specialty	
Basic Sciences	02(4.4)
Medicine and allied	21(46.7)
Surgery and allied	22(48.9)

Table 2: Pre and post test mean scores of the participants

	N	Mean Score	SD	p value
Pre-test	45	8.71	3.28	<0.000*
Post-test	45	13.20	3.27	

*statistically significant

In the pre-test, more than 50% (n=23) of the participants scored between 6 and 10 where as in post test 71.1% (n=32) of postgraduates scored in the range between 11 and 15. The percentage of post-graduates scoring between the number range 16-21 increased to 15.91% (n=7) from zero of pretest score (Table 3). McNemer test showed statistically significant improvement in the post test scores in the areas pertaining to components of title, research hypothesis and question, need for the study, types of data and its representations and in reference writing and citation (Table 4).

Table 3: Pre and post-test scores (Number Range)

Number Range	Pre-test N(%)	Post-test N(%)
0-5	9 (20)	1(2.2)
6-10	23 (51.1)	5 (11.1)
11 - 15	13 (28.9)	32 (71.1)
16-21	-	7 (15.6)
Total	45 (100)	45(100)

Table 4: McNemer's Question-wise analysis of participants in pre and post-test assessment

Questions	Pre test	Post -test		P value
		Wrong response	Correct response	
Q1	Wrong response	7	25	0.000*
	Correct response	2	11	
Q2	Wrong response	1	15	0.000*
	Correct response	0	29	
Q3	Wrong response	9	26	0.000*
	Correct response	4	6	
Q4	Wrong response	9	16	0.001*
	Correct response	2	18	
Q5	Wrong response	29	9	0.424
	Correct response	5	2	
Q6	Wrong response	24	13	0.167
	Correct response	6	2	
Q7	Wrong response	5	9	0.147
	Correct response	3	28	
Q8	Wrong response	8	22	0.001*
	Correct response	4	11	
Q9	Wrong response	7	18	0.001*
	Correct response	3	17	
Q10	Wrong response	20	9	0.607
	Correct response	6	10	
Q11	Wrong response	7	27	0.001*
	Correct response	3	8	
Q12	Wrong response	17	14	0.541
	Correct response	10	4	
Q13	Wrong response	9	15	0.019*
	Correct response	4	17	
Q14	Wrong response	3	10	0.302
	Correct response	5	27	
Q15	Wrong response	15	16	0.004*
	Correct response	3	11	
Q16	Wrong response	5	11	0.648
	Correct response	8	21	
Q17	Wrong response	25	12	0.035*
	Correct response	3	5	
Q18	Wrong response	24	8	1.000
	Correct response	8	5	
Q19	Wrong response	16	4	1.000
	Correct response	4	21	
Q20	Wrong response	10	11	0.69
	Correct response	14	10	
Q21	Wrong response	2	11	0.022*
	Correct response	2	30	

*Highly significant

DISCUSSION

In the current study, the effectiveness of the basic research methodology training as a successful tool in enhancing the knowledge of the trainees has been evaluated.

Recently the scope and spectrum of medical research has tremendously expanded. There are several difficulties encountered during conduction of research such as issues related to ethical aspects, patient safety, maintenance of confidentiality and etc. Hence it is worthwhile to experience a formal training cum workshop to develop ability and competence to carryout meaningful research.⁵

In this study, post training improvements were found in participant's knowledge on the basic principles of research methodology which is evident from higher post-test mean scores. This change in knowledge is similar to findings demonstrated in previous studies.^{5,8}

An increment in the post test scores were observed in the topics pertaining to 'components of title'(Q1, p=0.00), 'research hypothesis and question' (Q2,Q3, p=0.00), 'need for the study' (Q4, p=0.001), 'methodology' (Q13, Q15,Q17,Q21, p=0.019, 0.004, 0.035, 0.022 respectively), review of literature (Q8, p= 0.001) and also in 'reference writing and citation'(Q9,Q10, p=0.001).

However, studies have reported that long sessions of 2-3 days might offer greater benefits and allow the concepts and content to be greatly expanded and effectively imbibed by the participants.^{9,10}

Even though the workshop had few sessions of group activity to give a feel of experiential or participatory learning, the evaluation was based mainly on the multiple choice questions, showing improvement in knowledge component only. To check the improvement in research writing skills, an evidence based study can be conducted to follow the participants with regards to their publication outcomes which indirectly evaluate the effectiveness of workshops more scientifically.

LIMITATION

The sample size was small as the number of participants in each workshop was restricted to only first year postgraduates. During half a day program in two consecutive days where the resource persons had to cover a huge number of topics, it was not possible to allocate more time to statistics which is vital but relatively difficult subject. Another limitation of the study was the assessment tool used mainly evaluated the knowledge component rather than the writing skills. We also need to examine the long term implications and the improvement of skills in research writing.

CONCLUSION

This study has shown that a short participatory hands-on research methodology workshop was beneficial in improving the research oriented knowledge among first year medical postgraduates. It is recommended that such workshops of longer duration with intermittent sensitization will boost the research culture and result in escalating publication rates.

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Conflict of Interest: None

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