

Perceived Barriers and Effect of Knowledge-based Intervention on the Competencies of Medical Faculty Members towards Conducting Research

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Abstract

Background: Medical research is an important aspect of health care. In order to promote research, the regulation of Medical Council of India had made publications as a pre-requisite of promotion. The present study has been planned to assess the knowledge and perception of the medical faculty towards research, and to identify barriers in undertaking research. Lack of aptitude for research emanates from lack of knowledge, motivation, resources, funding and administrative support. This study aimed to assess the perception related to knowledge, practices and barriers in undertaking research among the medical faculty.

Methods: The present study was a cross-sectional study conducted among faculty members of the Government Medical College, Srinagar, Pauri Garhwal, Uttarakhand. A pre-tested questionnaire was administered to assess the perception of respondents related to knowledge, practices and barriers in undertaking research.

Results: 39.6% of the faculty members felt that their primary activity was only teaching. 75% of the faculty members considered themselves as having some knowledge in research methods. 25% of the faculty members always had problems in accessing the scientific literature in conducting the research. Barriers were felt by the faculty members in areas of funding, support from institution, administration, etc.

Conclusion: Knowledge about source of funding, research methods, and biostatistics was perceived to be lacking. Also, faculty members felt the lack of motivation as a barrier in undertaking research.

Keywords: BARRIERS, RESEARCH METHODOLOGY, COMPETENCIES, MEDICAL COUNCIL OF INDIA

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Introduction

Research is defined as “the detailed process of gathering information or detailed study to discover and understand new information that would initiate, modify, or terminate present understanding.” Medical research is the basic, applied, and translational studies intended to aid and support the body of knowledge in the field of health aimed at better patient outcomes. It may be conducted on different subjects such as

animals, healthy human volunteers or patients. Also research can be undertaken in different fields of medicine as well as be focused on different types of health conditions such as communicable diseases, non communicable diseases, etc (1). Overall, the scope of medical research is quite varied and extensive.

Medical research is an indispensable aspect of health care. The high quality of medical care we enjoy today is built upon years of efforts by physicians and other medical professionals investigating the causes of and potential treatment for diseases. It helps us provide evidence for what we have hypothesized. Each and every statement published in our

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medical books is backed by a series of enquiry and confirmation through many experiments. When we support medical research, we are helping medical researchers build the future of medicine. Medical research helps us understand the physiology of the human body, the pathology of diseases and also informs us about the course of treatment, drug dosages, prognosis and several other aspects of a health or disease condition. The ultimate goal of medical research is prolongation of life along with improved quality of life for all.

A medical college has three main functions which include patient care, teaching, and medical research. Despite the importance of medical research in today's context, the medical education system of India does not give due emphasis to medical research. The focus of medical education is primarily on teaching clinical and related skills to undergraduate (UG's) and post graduate students (PG's). This is rooted in the perception that the future doctors are required only to treat patients for the diseases. This is reflected by the fact that the curriculum of UG's gives little emphasis to practical research methodology and therefore fails in sowing the seeds of research aptitude in the forming years of medical career. This further results in the research programs getting lowest priority in medical colleges (23rd, 4th and final year. Among the respondents, only fifteen (9%, 3). Even in post-graduate curriculum, although the completion of a thesis is an integral part of the course, it is undertaken with compromised sincerity in most of the disciplines, except a few. It is therefore observed that these students, who later join as faculties in various medical institutions remain unaware and uninterested towards research despite the availability of ample opportunities to generate a research question and undertake research as they interact with the patients. They are involved primarily in patient care and teaching of the students, while the research component is largely neglected. Furthermore, the mandate of publication as eligibility for promotions,

leads to hurried publications which seem to have limited impact on the health of people. The infrastructure of the medical education system in India is huge with 459 permitted or fully recognized medical colleges in the government and private sectors. The total number of medical undergraduates produced in India is about 62,850 per year, which is quite substantial and can have an enormous impact on the health system, if used judiciously (4). However, the aptitude for research is meager among students as well as faculty members in medical institutes which is reflected by the number of publications in indexed journals. Ray and colleagues reported that the total research output during 2005–2014 was 101,034 papers, with the average number of publications per institution being 14.5 papers per year. However, there were 332 (57.3%) institutions that did not publish a single paper during this 10-year period (5). In another study by Prathap, it was observed that the overall contribution of medical faculty to high quality research in India is very dismal (6). To promote research in India, the regulating body, Medical Council of India (MCI), has made it mandatory to publish original research articles in indexed journals as a prerequisite for promotion of faculty members (7). This mandate has served to increase the number of publications but their value in terms of applicability to improvement of health is limited.

This situation is hypothesized to be gloomier in the state of Uttarakhand, which is a relatively new state with geographically challenging terrain further impeding field based research and access to good research facilities. The situation may further be compounded by the absence of supportive administrative systems, which are still in a developing phase. All these factors cumulatively may lead to giving less importance to research as an important component for public health care provision and policy making. Uttarakhand has three relatively "infantile" government medical colleges, with limited resources to undertake the triple task of treating the patients, teaching

the students, and undertaking good quality research. The lack of an aptitude for research emanates not only from lack of resources, but also due to various other factors such as lack of knowledge, motivation and funding coupled with delays due to administrative procedures. The presence of one or more of the above listed factors has the tendency of perpetuating other factors. Therefore, the present study is planned with the intent to assess the knowledge and perception of medical faculty towards research, identify various barriers in undertaking research and evaluate the effect of a knowledge based intervention in improving the competencies of the faculty regarding research in the present institute.

Materials and Methods

Settings: The present study was conducted among medical faculties at Veer Chandra Singh Garhwali Government Medical College, Srinagar of Uttarakhand.

Overview of design: At first a cross-sectional survey regarding the perception of medical faculty towards research and various barriers related to undertaking research was conducted. The second part consisted of a cross-sectional survey before and just after a research methodology and biostatistics workshop to assess the change in knowledge of the respondents regarding various key aspects of conducting a research.

Finally, the same questionnaire was used to reassess the retention of knowledge about various components of research after 6 months among same medical faculty members. Faculties were also assessed for initiating the research work after the workshop.

Study subjects: In first component, all faculty members of the college were given a questionnaire to assess the perceived barriers on research. Then, all the faculties were invited to attend a workshop on research methodology. A total of 16 faculty members including two senior residents participated in the workshop.

Finally, a total of 7 out of 16 faculty members responded after 6 months of workshop.

Selection criteria and Quality control in the study: All faculty members of the college who consented to participate in the study were included in the study. Notice regarding invitation to participate in the workshop was also circulated through Medical education unit (MEU) with the intention of maximum participation by faculty members.

Design for sampling: No sampling was done since the whole “population” of faculty of the medical college was intended to be included in the study.

Tool for data collection: In the first part of the study, data were collected using a questionnaire to assess the perception of respondents related to knowledge, practices, barriers and facilitating factors in undertaking research. In the second component, a pre- and post-test questionnaire was used to assess the change in the knowledge about various components of research methods. This questionnaire had 23 questions related to various aspects of research methods which were divided under four headings as personal, access, resource and administrative. The personal factors included 10 questions, access three, resource and administrative factors had five questions each. The response were obtained on a Likert scale and scored from 1 to 4, with a score of 4 for the most positive response and 1 for the most negative. A section was also provided for open comments from the respondents regarding any other area of concern related to undertaking research.

Subsequently, a knowledge-based intervention in the form of a workshop was conducted among faculty members. This workshop lasted for 2 hours (2 sessions of one hour each separated by a 15-minute break). The workshop focused on providing details regarding the various aspects of making a protocol, literature search, research methodology, biostatistics and other related aspects. This was followed by a post intervention questionnaire among the same medical faculty members immediately after

the workshop and 6 months later to assess their knowledge. After 6 months, an assessment was also done to see how many faculty members had initiated a research in order to assess the final impact of this study.

Analysis: The responses obtained in first component of the study were analyzed in terms of median scores and proportions. The second component was analyzed according to the mean scores obtained before and after the workshop. Chi-square test was applied to compare the proportions while paired t test was used for comparing mean pre- and post-test scores. P value of less than 0.05 was considered significant.

Results

A total of 44 faculty members out of 75 returned the questionnaire (58.7%) in the first part of the study. Equal number of faculty members from clinical and pre/paraclinical specialties participated in the study. The participation from the specialties of Surgery, Obstetrics and Gynecology and Anesthesia was altogether absent. 75% of the faculty members were less than 40 years of age. Most participants were men. About half of the respondents were assistant professors, followed by associate professors (approx. 30%). The mean years of

experience of most (i.e. assistant professors) were less than five years only.

About half of the respondents did not perceive the importance of undertaking research as their primary activity in the role of a faculty in the medical college. Most of them (approx 40%) reported only teaching as their primary activity and another 9% reported providing health care only as their primary activity. Only 30% reported all three aspects as important. Out of 44 respondents 9 had some exclusive research experience during their entire career (Table 1). The median number of papers published by associate professors was 8. Corresponding figures for the assistant professor and professors were 5 and 6, respectively (Table 2).

About 84.1% of faculty members felt that they had limited knowledge about the research methods; however more than half of the faculty members had either complete or good knowledge on fundamentals of biostatistics. All the faculty members reported either full or good knowledge about the funding agencies in research. Around half of the faculty members felt that they were competent in analyzing the data and writing research proposals to receive grants from funding agencies. More than 70% of the faculties did not find themselves competent in developing independent research protocols or evaluating other research projects.

Table 1. Perceived primary activities by respondents

Perceived Primary activity	Number	Percentage
Only Teaching	17	39.6
Only Research	0	0
Only Providing health care	4	9.1
Teaching and Research	9	20.4
Teaching and Providing Health Care	1	2.3
Teaching, Research and Providing the health care	13	29.6

Table 2. Median number of Publications in the past 5 years according to the designation

Designation	Total No. of papers published (Range)	Mean number of paper published (1 st and 3 rd Quartiles)
Senior Residents (2)	22 (2-20)	11
Assistant Professors (21)	127 (0-28)	5(2-7)
Associate Professors (13)	102 (2-12)	8(6-10)
Professors (8)	70 (0-25)	6(5-9.5)

More than 90% of the faculties felt the need for periodic training while 36.4% faculties felt lack of motivation as a barrier which prevented them from undertaking research (Table 3).

It was observed that about 70% of the faculties perceived difficulties in access to relevant scientific literature/journals on most of the occasions. More than half of the faculties very often felt difficulty in access to statistical software also. The accessibility to research sample was also stated to be an important

problem which emphasizes the importance of geographical accessibility barriers in conducting research (Table 4).

Around 60% of the faculty members reported having sufficient time for conducting research, however more than three quarter of the faculties perceived lack of funding and availability of instruments for conducting the research as important barriers. About 60% of the faculties also reported the lack of manpower as an important barrier (Table 5).

Table 3. Barriers related to knowledge and competencies

S no.	Knowledge about	Full		Quite an extent		Somewhat		Not at all	
		No.	%	No.	%	No.	%	No.	%
1.	Research Methods	1	2.3	6	13.6	33	75	4	9.1
2.	Biostatistics	4	9.1	24	54.5	13	29.5	3	6.8
3.	Funding agencies (Yes/ No)	16	36.4	28	63.6	-	-	-	-
Competency		Fully competent		To quite an extent		Somewhat		Not at all	
		No.	%	No.	%	No.	%	No.	%
4.	In data analysis	6	13.6	17	38.6	19	43.2	2	4.5
5.	Developing independent research	1	2.3	12	27.3	25	56.8	6	13.6
6.	Writing Research proposal for receiving grant	6	13.6	15	34.1	19	43.2	4	9.1
7.	Evaluating other research projects	2	4.5	12	27.3	17	38.6	13	29.5
Others		Always		Very Often		Sometimes		Not at all	
		No.	%	No.	%	No.	%	No.	%
8.	Requirement for periodic training	21	47.7	20	45.4	3	6.8	0	0
9.	Need for conducting research	2	4.5	8	18.2	21	47.7	13	29.5
10.	Lack of motivation	5	11.4	11	25	21	47.7	7	15.9

Table 4. Perceived barriers related to access

S No	Poor accessibility to	Always		Very Often		Sometimes		Not at all	
		No.	%	No.	%	No.	%	No.	%
1.	Relevant scientific literature/ journals	11	25.0	20	45.5	11	25.0	2	4.5
2.	Statistical software's	7	15.9	23	52.3	8	18.2	6	13.6
3.	Research sample accessibility	6	13.6	18	40.9	20	45.4	0	0

Table 5. Perceived barriers related to resources

S No		Always		Very Often		Sometimes		Not at all	
		No.	%	No.	%	No.	%	No.	%
1.	Sufficient time for conducting research	4	9.1	14	31.8	18	40.9	8	18.2
2.	Lack of funding	13	29.5	22	50.0	8	18.2	1	2.3
3.	Lack of availability of instruments/ equipments	10	22.7	24	54.5	9	20.5	1	2.3
4.	Lack of manpower	10	22.7	16	36.4	15	34.1	3	6.8

Important administrative barriers reported by the faculty members included lack of proper mechanism/body such as research cell, appropriate staff, and limited availability of funds for undertaking academic activities. Lack of support from the institute or the department was reported by relatively few faculties (Table 6).

Average Pretest score was 9.6 which increased to 12.8 immediately after the intervention in form of a workshop. Though the scores were increased in each domains of the research methodology but were found to be significant only for the background and Research design domain (Table 7).

An overall improvement was reported in the knowledge as reflected by the pre- and post-test

scores after six months of the knowledge-based intervention. Improvements in individual domains were observed immediately after the intervention but got blurred after six months of the intervention (Table 8).

Discussion

The objective of the present study was to assess the perceived barriers and effect of a knowledge-based intervention through workshop on the competencies of medical faculty towards conducting research. Total number of faculty members who participated in the first survey of our study was 44 out of 75 faculties (58.7%). The response rate was much less compared to the study conducted

Table 6. Perceived barriers related to administration

S No		Always		Very Often		Sometimes		Not at all	
		No.	%	No.	%	No.	%	No.	%
1.	Lack of a proper mechanism/ body such as Research cell	13	29.5	15	34.1	12	27.3	4	9.1
2.	Lack of support from colleagues/department	4	9.1	12	27.3	14	31.8	14	31.8
3.	Lack of support from institute	2	4.5	14	31.8	18	40.9	10	22.7
4.	Limitation in availability of funds for undertaking academic activities like attending conferences, workshops, trainings etc.	11	25.0	20	45.5	12	27.3	1	2.3
5.	Lack of appropriate staff at the institute	7	15.9	19	43.2	15	34.1	3	6.8

Table 7. Pre and Post test scores of the faculty's immediately after the workshop

Research methodology Domains	Mean Pretest score	Mean Post test score	't' value	P value
Background	3.23±1.54	4.76±1.24	-5.73	0.00
Literature Search	0.85±0.90	1.38±0.65	-2.0	0.07
Sampling Fundamentals	2.15±0.69	2.23±0.83	0.36	0.72
Study Design	1.62±0.87	2.23±0.60	-4.38	0.00
Biostatistics	1.76±1.42	2.15±0.80	1.00	0.33
Total	9.62±3.64	12.8±2.31	4.02	0.00

Table 8. Pre and Post test scores of the faculties 6 months after the workshop

Research methodology Domains	Mean Pretest score	Mean Post test score after 6 months	't' value	P value
Background	3.23±1.54	4.00±1.29	-3.24	0.01
Literature Search	0.85±0.90	1.00±0.58	-2.12	0.08
Sampling Fundamentals	2.15±0.69	2.57±0.53	0.68	0.52
Study Design	1.62±0.87	2.14±0.69	-1.55	0.17
Biostatistics	1.76±1.42	2.14±0.69	-1.16	0.29
Total scores	9.62±3.64	11.85±3.78	3.53	0.01

by A Alamdari and S. Sabzwari which were 76% and 87%, respectively (8, 9). Most of those participating had to be followed up several times to obtain the completed questionnaires, which reflects their poor interest in research. The number of participants attending the Research Methodology workshop further substantiated this observation regarding lack of interest. Out of 75, only 16 faculties attended the workshop, despite all efforts of persuasion, which was a mere 21% of the total. The response rate was very poor from clinical departments like Surgery, OBG and anesthesia where none of the faculty members had participated in the first component of study. The best response was from department of Community medicine and could be a reflection of the interest of faculties in research, which is the core area of expertise of the department. This could also be because the Principal investigator belonged to this department.

The demographic data of our study participants was similar to the study by Sabzwari and colleagues (9) who also reported that maximum number of faculties were men and belonged to younger age groups.

The mean years of experience of most participants were less than five years which could be due to the fact that most of participants in our study were Assistant Professors. This was in contrast to the study by Alamdari and colleagues where most of the faculties were professors, which could be due to the assured promotion scheme of the college which provides for promotion of faculty till retirement, up to maximum post of professor. This leads to pooling of professors as compared to assistant professor (8). The presence of a young workforce may serve as an asset to an institution as they are considered to be more jubilant and receptive to new ideas, which is an essential component of research. On the other hand experience of professors leads to better execution of the research.

Despite the presence of a young workforce, it was surprising to notice that about half of the faculty members did not consider research as

a part of their job responsibility, probably due to lack of awareness and adequate sensitization during induction into a medical college. To realize this fact and to promote research in the medical colleges of the country, MCI has made it mandatory to publish original articles as a prerequisite for promotion. All newly recruited teachers are also required to undergo a course in research methodology within a specified time. It has also been suggested by MCI that medical college teachers be encouraged to pursue PhD degrees for enhancing their research interests and capabilities (10).

The average number of publications in past five years was very low (1.5) in the present study as compared to 12.2 in the study by Alamdari and colleagues (8). Major barriers perceived by the participants in our study were poor knowledge of research methodology, lack of competency in developing the research proposal individually and writing proposal for receiving funding. Almost half of the faculties demanded for organization of the regular workshops/CME in medical education. The barriers in our study were in contrast to the study by Alamdari and colleagues in which skill in doing research, knowledge of research methodology, the capacity to develop an independent research program (eg. protocol development), and skills to evaluate other research reports were reported as facilitators rather than barriers. This could be due to the major difference in nature of institutes where studies were conducted. Our results were similar to the study by Mitwalli and colleagues, who reported that lack of research training (93.2%), lack of time (89.5%) and lack of supervisors (73.3%) were perceived as barriers to conducting research. Mitwalli and colleagues also reported that 30.4% of the participants had no research involvement, but this study was conducted only among junior residents in contrast to our study which was done among faculty members (11). Another study conducted among residents reported the results similar to our study where lack of

time was primary obstacle followed by lack of interest among residents and faculties to supervise it (12).

Our study also reported that knowledge related to different domains of research can be easily increased and retained with a single workshop. This was evident by increase in mean post-test scores in each domain of Research Methodology; however this difference was found to be statistically significant only for mean post-test scores of basics and study design of Research Methodology. Mean post-test scores of each domain further dropped after 6 months using same questionnaire but this drop was not significant.

Suggestions and Recommendations

Based on results in our study, it was concluded that the knowledge regarding the various components among faculties was found to be minimal and therefore it is suggested that organization of workshops/seminars and CME's on research methodology should be regularly organized. We also observed that post-test scores were very high immediately after the intervention in the form of organization of workshop which was reduced after six months. This suggests that faculties also have to put effort on their own to maintain the practice in Research Methodology concepts. Another suggestion is that we can include some basic concepts of Research Methodology in the curriculum of MBBS which will help in regular revision of faculties about the concepts of Research Methodology. Also to generate the interest of the faculties in research and motivate them, incentives could be provided in terms of academic awards, promotions or monetary incentives for undertaking good research and publication. This should also be supported by a good administrative setup for facilitating the process of research.

Conflict of Interest

The author declares no conflict of interest.

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