Research Article

Research Equity: A Capacity Building Workshop of Research Methodology for Medical Health Professionals

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Research is a cornerstone for knowledge generation, which in turns requires capacity building for its tools and techniques. Despite having a vast infrastructure in India the research in medical science has been carried out in limited and focused institutions. In order to build the capacity in carrying out research activities a five-day planning workshop was conducted at state run medical college. Total 22 medical faculty members participated in the workshop with average public health experience of 12 years (range: 5–25 years). The knowledge was assessed objectively by multiple-choice questionnaire. The mean score increased from 6.7 to 7.9 from pre- to posttest. About seventy-percent participants showed improvement, whereas 21.0% showed deterioration in the knowledge and the rest showed the same score. Apart from knowledge skills also showed improvement as total 12 research projects were generated and eight were approved for funding by the Indian Council of Medical Research (ICMR), New Delhi. It can be concluded that a supportive environment for research can be built with the technical assistance.

1. Introduction

Medical science research means generation of new valid knowledge in science. Validity of knowledge depends upon basic scientifically proven methods and their effective application in the field of medical science. Medicine as a scientific discipline has evolved over the ages with the constant generation, testing, and application of scientific knowledge. It helped the policy makers to formulate the healthy public health policy and to shape the national health care programs in order to improve the health of people. In year 1977, the World Health Organization (WHO) had foresighted and brought the commitment among all countries across the globe to achieve “Health for All” [1]. Research is a cornerstone for guided, constant, and coordinated commitment. Focus on health research was there for centuries but global impetus was provided through the formulation of commission on health research and development, summit in Mexico, and thereafter 58th assembly issued a joint statement that urged the members “to establish or strengthen the mechanism to transfer knowledge in support of evidence base public health,

health care delivery system, and evidence based health related policies.” In 2007, 62nd world health assembly passed and adopted one of the resolution is for roles and responsibilities of WHO (WHO 62/12) in the field of research [2]. Thereafter, in 2008, the need to continue to build the progress made since Mexico summit was stressed upon at Bomako [3].

Apparently and obviously the evidence based public health policy and programs are required in resource limiting settings. Government of India (GoI) gave priority to health research and, in 2007, formulated the Department of health Research (DHR) in the Ministry of Health and Family Welfare [4]. In India, there are a total of 381 medical colleges [5] and most of the research has been carried out by a meagre 2.5% of colleges, as they contribute 96.0% of total research publications in the year 2007 [4]. Though this inequality of research has not been studied scientifically can be hypothesized that it is due to involvement of not well informed medical professionals. To bridge the information gap will certainly require bringing together medical colleges in the field of research. Effective research demands are firstly, identification of relevant topic of research and formulation

TABLE 1: Structured key for narrative responses for assessment of capacity building workshop of research methodology for medical health professionals.

S. no.	Question	Model Answer
1	What is research?	It is an endeavour to discover new or collate old facts and so forth by the scientific study of a subject or by a course of critical investigation [10].
2	What is a health system?	A health system provides a mix of health promotive, disease preventive, diagnostic, and clinical services to all sections of the population [11].
3	What do you mean by continuous and discrete variable?	Continuous: the value given to an observation for a continuous variable can include values as small as the instrument of measurement allows. Discrete: observations that can take a value based on a count from a set of distinct whole values [12].
4	What is noninterventional study? Mention types of noninterventional studies are there.	Noninterventional studies/observational studies allow nature to take its own course; the investigator measures but does not intervene. These can be (a) descriptive, (b) analytic: ecological, cross sectional, case-control cohort [13].
5	Why do we conduct focus group discussion (FGD)?	Allow people to discuss their true feelings, anxieties, and frustrations, as well as the depth of their convictions, in their own words [14].
6	What is sampling?	Sampling is a statistical method of obtaining representative data or information from a population [12].
7	What do you mean by purposeful sampling?	A strategy in which particular settings, persons, or activities are selected deliberately in order to provide information that cannot be gotten as well from other choices [15].
8	Name the various types of purposeful sampling technique?	(i) Convenience sampling, (ii) maximum variation sampling, (iii) snow ball sampling [15].
9	What is random/probability sampling?	Probability sampling methods are those in which every item in the universe has a known chance or probability, of being chosen for the sample [16].
10	Name the various types of probability sampling?	The various types of probability sampling methods: (a) simple or unrestricted random sampling (b) restricted random sampling: (i) stratified sampling, (ii) systemic sampling, (iii) cluster sampling [16].

of hypotheses and secondly, acquisition of knowledge and skills for scientifically sound methods to carry out research and lastly becomes the financial assistance for the research purpose.

On analysis of research publications, it was found that most of research work was carried over nonpriority health areas of country. So, this unguided research leads to growth of ineffective knowledge. This demanded the capacity building of researchers to identify the priority health research areas and to impart the knowledge and skills for research methods to further design a sound research protocol. This leads to birth of National Health Research Policy (NHRP) that was framed by DHR, GoI with one of the objectives to develop and manage human resources and infrastructure for health research [4]. Therefore, a capacity building workshop for medical faculty on research methodology was planned and implemented to study the improvement in knowledge and skills to formulate the research protocol.

2. Methodology

A basic five-day workshop on research methodology was planned by the public health experts of the medical college

and scientists from Indian Council of Medical Research (ICMR), New Delhi. Medical teachers from public health, internal medicine, paediatrics, dentistry, and microbiology discipline were also invited. A total of 22 participants were enrolled from seven medical colleges from Jammu and Kashmir, Himachal Pradesh, Punjab, Haryana, Chandigarh, and Uttarakhand. Eminent public health experts and scientists from ICMR facilitated the workshop. In order to gain the knowledge, a multiple choice questionnaire (MCQ) along with 10 narrative questions was administered to the participants before and after the workshop. Participants were instructed to narrate their answers in the assigned space only and no extra sheet was provided. An hour was allotted to mention their responses for both MCQ and narrative questions.

A group of facilitators prepared the key for MCQ and structured answers for the subjective questions against whom the responses of the participants were assessed. Structured answers for the narrative questions were framed by reviewing the standard textbooks and a standard key was prepared by simplifying the standard definitions (Table 1). Answers were assessed by two independent reviewers using the structured key. In case of discrepancy in scoring of the questioning

FIGURE 1

TABLE 2: Example of narrative question answered during capacity building workshop of research methodology for medical health professionals.

Question	Correct	Partially correct	Incorrect
What is research?	Research is an agent which helps us to validate our observations, hypothesis on a scientific basis	To get new ideas about scientific knowledge	A type of method which will deliver results after taking all kinds of parameters into consideration

an independent third reviewer assessed and marked the score that was considered final. On mark assigned to correct response of MCQ and for narrative questions the response was categorized into correct, partially correct, and incorrect (Table 2).

3. Results

Total 22 medical faculty members participated in the workshop. The mean public health experience was of 12 years (Range: 5–25 years). The mean score increased from 6.7 to 7.9 from pre- to posttest. Based on MCQ, it was further assessed that about 73.6% of participants showed improvement, whereas 21.0% showed deterioration in the knowledge and the rest showed the same score.

Based on assessment of subjective type of questionnaire, it was observed that there was an improvement for the entire questions in the posttest. Maximum improvement was

observed for the questions like “What is sampling?” “What is random and purposeful sampling?” and “Name the various types of probability sampling methods” (50.0% to 77.3%). Correct response increased from 0.0% to 22.7% for the question “Name the various types of purposeful sampling techniques.” For the same question about 72.7% of participants were partially correct in the posttest as compared to 18.2% in the pretest. Slightly a less number of participants were able to mention the correct response to “What are noninterventional studies? Please mention the types of noninterventional studies” (40.9% to 36.4%), whereas, for the same question, about 45.5% of participants were partially correct in the posttest as compared to 4.5% in the pretest. Overall, reduction in the incorrect responses was observed among majority of the participants after the workshop (Figure 1).

A total of 12 research projects were generated and eight were approved for funding by the Indian Council of Medical Research (ICMR), New Delhi. The focused area for

the research was neuroepidemiology, setting up rural cohort, oral health, environmental factors affecting diabetes mellitus, and congenital anomalies in children and public health gynaecology. Till date, all projects were completed and submitted their reports to the funding agency. A total of 5 research papers were prepared and published in recognized national and international journals. In the continuation of research various subsequent research projects were planned and submitted for the funding.

4. Discussion

The continuing medical education programs are required to raise the professional standards and to improve the knowledge and skills. Various courses were designed and successfully showed improvement in knowledge and skills [6, 7]. A systematic analysis of various CMEs for medical professionals showed that there was an improvement in the patient care-related activities and it was mentioned that the use of didactic lectures alone was not useful [8]. Overall performance cannot be raised just by improving the knowledge alone; it requires development of objective-based skill. The intended skill that needs to be transferred requires practical demonstrations and an opportunity for hands on training. So, the course formulation requires a delicate balance of theory and practice is to be in concordance with the objectives of training course. The evidence had shown that the training program of fixed duration is a useful method to improve the activity of well-informed medical professionals.

Apart from sharing of the knowledge its generation is also a crucial step. Knowledge has its own life cycle, which is produced at different levels that could be or could not be known to each other; thereafter, it integrates at one place by the means of broadcasting, searching, teaching, and sharing. Then it becomes a subjective and objective form, which processed under an environment and during this, the problematic areas become obvious which further requires brainstorming in order to generate or modify the existing knowledge. This completes the cycle and research helps to add, subtract, and modify the knowledge. Research has its own standard methods that are to be known and well comprehended before its execution. For the present study it was felt that the research is a field that requires attention from entire medical professionals—especially academicians—in resource-limited settings. India contributes enormously to public health research but by small numbers of professionals or institutes. India has various health research institutes and scientists with potential research calibre but requires capacity building. Role of medical colleges and their faculties has been largely underestimated (but a large scope) and not yet explored to its full potential in the field of research. This can fill the possible gap in the demand and supply of researcher in health research field. So far, in India 90.0% of research has been carried out by 10.0% of the medical faculties and only 1.0% of it is on the priority health areas.

In addition to deficiency in the health research field, an organized research also positioned as a priority area. The required increase in the demand can be fulfilled by

the capacity building of public health professionals in the medical colleges through training in research methodology. It is important to transfer knowledge and skills about identifying the health research area, formulation of hypothesis, choosing correct design to verify the hypothesis, and writing the research protocol and result dissemination. Training programs of such a nature will certainly help to maintain the life cycle of knowledge and helps to streamline the knowledge in the medical research field.

Provision of technical assistance during the training has been feasible and effective method to build the capacity [9]. In the present study, participants had already public health knowledge and experience, but there was limited capacity to conceptualize and formulate research protocol. A research workshop was conceptualized prepared, and implemented by the eminent scientists. Study participants prepared the research projects and submitted for the funding. Projects were reviewed and approved and the financial assistance was provided and now all the research projects were completed. The experience has shown that the objective-based capacity building measure along with mentoring by the researcher has been effective. This helped to build the research environment in small institutions, which certainly have the capacity to carry out the research. Conducive environment along with technical assistance would certainly bring the desired change. This helps to build, maintain, and constantly improve the research environment in the medical institutions.

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