

Evaluation of the approved research proposals in Hamedan University of Medical Sciences

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ABSTRACT

Background Evaluating the research projects in qualitative and quantitative terms is necessary to clarify their advantages and disadvantages and to resolve the possible failures.

Purpose The study aims to assess the quality of the approved research projects. The objective is to determine whether the design of the research in the approved proposals is accurate in regard of different scientific aspects.

Methods Questionnaires of 78 approved research proposals in University of Medical Sciences, which were conducted by a faculty member, has been evaluated in terms of the principles of sampling, study methodology and consistency between these two items.

Results Mistakes in sampling techniques, with a rate of 45.2%, were more evident than other items. 10.3% of study methodologies were incorrect, and the consistency of methodology and sampling was inaccurate in 26.7% of projects. 53.8% of projects had some kind of mistake in them.

Conclusion Holding advanced workshops on research methodology and more strict supervision at the time of approving research projects are recommended.

Keywords QUESTIONNAIRE, RESEARCH PROPOSAL, EVALUATION, SAMPLING, RESEARCH METHODOLOGY

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Introduction

Scientific research is one of the basic tools in science development and development planning. Qualitative and quantitative evaluation of research proposals could clarify the possible advantages and disadvantages of these proposals and recognize the failures, if there are any, so that they could be resolved by appropriate measures.

Various reports have been published about the quality of research projects, which show that in a high percentage of scientific literature, there's no clear expression of the applied statistical method or these methods were not used properly at all

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945 articles that were published in five authentic medical journals in China in 1995 were evaluated and the results were compared with a similar study performed in 1985. The rate of articles with no obvious statistical mistake in '85 and '95 were 22% and 46% respectively. The result shows a relative improvement in applying statistical methods, although 54% of the articles still had distinct errors.

Reviewing 145 articles in American Journal of Gynecology showed that 18% of these articles had serious and uncorrectable mistakes in statistical methods.

Assessing the published articles in medical journals in 1998, Rigby suggested that a revision in the judgment of articles must be undertaken.

Altman and Johnson reviewed 150 articles in medical journals in 1990 and clarified the errors in designing, analyzing and interpreting the data.

They concluded that in spite of more statistics training, there are still numerous published articles that have statistical errors.

In another survey carried out by Sych, the statistical methods applied in six medical journals were evaluated. This study showed that between 1988 and 1992, central indices were the most useful statistical indices and their usage rate was 44% to 56%. The rate of using statistical tests in these journals was 26-33%.

In 1996, Harrison et al. reviewed the published articles in the journals of orthodontics in Britain and Europe between 1989 and 1993 and indicated that only 3% of the literature had used randomized clinical trials.

The main objective of this study is to evaluate the approved research projects of one of the medical universities in Iran in terms of the title, study methodology, determining the objectives and hypotheses, the method of sampling and the correlation between them.

Materials and Methods

This is a cross-sectional descriptive study of 78 approved research proposals, that conducted by a faculty member, have been reviewed in Hamedan University of Medical Sciences.

To do this, the approved questionnaires of these proposals, which had been filed in the research directorate of the university, were studied. According to the prepared checklist, validity or invalidity of each item in the checklist was examined.

To enhance the reliability and agreement of this study, each questionnaire was surveyed as follows:

1. Both researchers examined each approved questionnaire separately. If there was complete consensus in the checklists filled by each researcher, the data were documented as the result of survey.
2. If there was any kind of divergence in at least one item of the two checklists, the item was discussed and criticized and the results were based on the resultant consensus.
3. The results were analyzed with Epi_Info 6.04 software and the research objectives were examined.

The definitions of the variables evaluated are as follows:

- If the method of sampling and estimating sample size was based on the principle of randomized sampling it was considered "no mistake in sampling". Otherwise, there was "mistake in sampling".
- If the research methodology was designed in a manner that could achieve the objectives of the study, there was "no mistake in methodology", and if achieving some of the objectives was not possible due to the design of the research, it was considered "mistake in methodology".
- If the sampling method of the study could not evaluate the hypotheses, answer the research questions or achieve the study objectives, there was "mistake in the sampling related to the methodology". Otherwise, the relation between the sampling and the methodology was considered accurate.
- If the article's title was not clear and self-explanatory, the title was considered "inexpressive", and otherwise it was "expressive".
- If there was any kind of drawback in at least one of the items of title, methodology or sampling method, the project was considered "with mistake". Otherwise there was "no mistake in the project".

Results

This study, which was performed on 78 approved research proposals, shows that 60 projects (76.9%) were performed by a faculty member of basic sciences, and the remaining, by a faculty member of clinical sciences. In 50% of the projects, the conductors were Masters of Science (M.S.). Physicians performed 32.1% of these projects, and 17.9% of the researchers had Ph.D.

TABLE 1 THE FREQUENCY DISTRIBUTION OF THE NUMBER OF MAIN COLLABORATORS IN THE APPROVED PROPOSALS

Number of main collaborators	Number of studies	Percentage
0	4	5.1
1	27	34.7
2	24	30.8
3	11	14.1
4	5	6.4
5	4	5.1
6	3	3.8
Total	78	100

TABLE 2 ABSOLUTE AND RELATIVE FREQUENCY DISTRIBUTION
OF THE QUALITY OF RESEARCH PROPOSALS

Quality	With mistake		No mistake		Total	
	Number	Percent	Number	Percent	Number	Percent
Title	2	6.5	76	93.5	78	100
Sampling	28	45.2	32	54.8	60	100
Methodology	8	10.3	70	89.7	78	100
Sampling related to methodology	16	26.7	44	73.3	60	100
Conjoint mistakes in title, methodology and sampling	2	3.3	76	96.7	60	100
At least one mistake	42	53.8	36	46.2	78	100

The frequency distribution of the main collaborators of the approved research projects is presented in Table 1.

The table shows that the conductors who have selected only one collaborator had the greatest relative frequency (34.7%) and that only 5% of the projects had no collaborator.

The census method was used in 18 approved research proposals and the remaining projects (76.9%) used sampling methods. A considerable proportion (45.2%) of the projects that have conducted some kind of sampling had clear errors in adaptation with the principles of sampling. Table 2 gives the qualitative data of the research projects.

The results of qualitative survey of the research projects demonstrate that, except two projects, all (93.5%) had expressive titles. Table 2 suggests that 89.7% of the approved projects had an accurate methodology. In 26.7% of 60 projects that have used a sampling method, the elective methodology had no consistency with the sampling method. In general, 53.8% of the approved research projects had some kind of mistake in them.

Table 3 shows that, in terms of the conductor of the project to be a trainee or assistant should be noted that 50% of the projects were proposed by trainees and the other 50% by an assistant professor or higher.

Discussion

The results of this study show that about 54% of the approved research proposals in the study population were not completely accurate.

One of the objectives of this study was to determine the proportion of projects that have used a scientific method for sampling. We did not investigate the details of sampling. Instead, completing the checklist, we just considered whether

defining samples has a scientific basis or not. Concerning the limitations of census method and the advantages of sampling, sampling have been used in most of the approved research projects. Almost half of these projects had some kind of mistake in sampling. The results show that in determining the sample size, some of the researchers did not use any scientific criteria, but just their own choice. This is likely due to the fact that the proposed projects had not been controlled thoroughly. Moreover, lack or absence of an expert in sampling in each stage of designing the project could be one of the major causes of this problem. It seems, however, that there is a true necessity in teaching sampling methods to the faculty members by the specialists in this field.

Another objective was to answer the question that in preparing questionnaires of the research proposals, how many of the researchers developed their hypotheses and research questions based upon the methodology of the study. Of course, there are two points that should be considered in developing the study hypotheses and questions; first whether the hypotheses and questions have been expressed accurately, and second, whether there is any consistency between the sampling and the methodology, according to the objectives, questions, hypotheses and type of the study. In this study, the researchers examined the latter point. Assessment of the former requires another study that will involve the evaluation of the references and scientific justification of the study hypothesis, type of the hypotheses, the criteria and standards for developing a hypothesis, directional or nondirectional hypotheses.

There was some error in the consistency of sampling and methodology in 25% of the projects. The supervision of experts in sampling and methodology in the course of approving the projects is also necessary to reduce this problem.

TABLE 3 ABSOLUTE AND RELATIVE FREQUENCY DISTRIBUTION OF THE QUALITY OF RESEARCH PROJECTS ACCORDING TO THE SCIENTIFIC RANKING OF THE CONDUCTOR

Quality	Trainee		Assistant Professor or higher	
	Accurate	Inaccurate	Accurate	Inaccurate
Title	39	0	37	2
Sampling	16	13	16	15
Methodology	35	4	35	4
Sampling related to methodology	20	9	24	7

Furthermore, we emphasize the need for teaching sampling and methodology to the researchers.

As the analysis of the data shows, all but 2.5% of the approved research projects had no problem in expressiveness of the title. The rate of mistakes in methodology was relatively low, although these few mistakes could be due to the lack of supervision by expert specialists.

In general, it should be noted that the rate of mistakes was relatively high in the approved projects. Similar studies also suggest the same result. Although in recent years, the Ministry of Health and Medical Education, seriously emphasized that the faculty members should conduct research projects, and several workshops have been held on research methodology by the Ministry and universities of medical sciences to familiarize the scientific board members with the scientific principles of research methodology, it seems that in order to reduce the mistakes, advanced workshops on research methodology and more strict supervision by the experts are necessary.

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