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## Review Article

## How to plan and write a budget for research grant proposal?

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## ABSTRACT

Medical research can have an enormous positive impact on human health. Health research improves the quality of human lives and society which plays a vital role in social and economic development of the nation. Financial support is crucial for research. However, winning a research grant is a difficult task. A successful grant-winning application requires two key elements: one is an innovative research problem with best probable idea/plan for tackling it and appropriate planning of budget. The aim of the present paper is to give an insight on funding agencies providing funding for health research including traditional Indian medicine (from an Indian perspective) and key points for planning and writing budget section of a grant application.

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## 1. Introduction

Why health science research is important and why should it to be funded? Science and technology innovations and health research can have an enormous impact on human health. They improve public health, quality of human lives, longevity and have made society better [1,2]. Healthy humans with better quality of life are crucial for the social and economical development of the nation [3]. Medical research led to the expansion of knowledge about health problems/conditions and their mechanism, risk factors, outcomes of treatments or interventions, preventive measures and proper management. Clinical studies or trials provide important information about the safety and efficacy of a drug/intervention. Innovative basic science research had led to the discovery of new technology, efficient diagnostic and therapeutic devices. So, currently, an effort with multidisciplinary approach is a demand for better understanding of clinical conditions and providing safest health care to the community [2,4].

Whether it is basic or applied, clinical or non-clinical, all research needs financial support. Considering the importance of research in economic growth of a nation, many countries are increasing their budget for research and development in science. A study on impact of GDP (Gross Domestic Product) on research and development in science among Asian countries has found that one who spends more on research has more research outcomes in the

form of total number of research documents, citations per documents and h-index [5]. About 95% of the NIH (National Institutes of Health, USA), budget goes directly to research awards, programs, and centers; training programs; and research and development contracts [6]. Total expenditure carried out for research in India is too less than USA and China. Percentage of GDP for research and development in India is 0.88%, while South Korea, USA and China have 4.292%, 2.742 and 2.1% respectively [7].

Owing to the increasing competition among the researchers, especially the young ones, for their academic growth, preparing and planning a winning research proposal becomes very essential. A successful grant-winning application requires two key elements: (1) innovative research problem with best probable idea/plan for tackling it and (2) appropriate planning of budget. The aim of the present paper is to give an insight on funding agencies (from an Indian perspective) and key points for planning and writing budget section of a grant application.

## 2. What is the purpose of the budget plan in a grant application?

A budget is the quantitative expression of a financial plan for future expenses on the project in a given period of time [8]. Budget plan is a key element of a grant application. It demonstrates the required cost for the proposed project. It is a prediction of expenses and serves a plan for funders on how the organization will operate the project, spend the money in a given set of period and where their money will go. It shows the funders exactly what they can

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support and also helps the institution and investigating team in management of the project. Moreover, budget plan requires for accountability [9].

### 3. Which are the funding agencies that sponsor health research in India?

Various national and international sponsoring agencies have identified health problems of priority for funding a research. Some of the leading funding agencies providing grant for health research including alternative systems of medicine in India are given in Table 1. State Universities/deemed Universities also have a provision of funding for medical research.

### 4. What constitutes a research project budget?

Proforma of the research grant applications and presentation of budget section may vary among the sponsoring agencies. However, major parts of budget plan in the applications of the above mentioned funding agencies are quite similar. The budget section is broadly divided into two categories: direct and indirect costs.

#### 4.1. Direct costs:

These are the costs incurred specifically to carry out a project [10]. Direct costs include expenses towards personnel, materials, equipments, consumables and travel. These particulars are further categorized into recurring and non-recurring expenses on the basis of their occurrence during the study period. A brief description of the sub-sections under direct cost is given below:

##### 4.1.1. Personnel:

Budget for personnel can be mentioned in this section in case human resources are required for the study and as per funding agency guidelines. Salaries with allowances can be budgeted for human resources such as site manager, research assistant, junior research fellow (JRF), senior research fellow (SRF), research associate, technician, data entry operator and attender. Most of the Indian funding agencies do not have a provision for salaries for the principal investigator (PI) and co-investigators (Co-PI). Ministry of AYUSH [11] and Rajiv Gandhi University of Health Science (RGUHS), Karnataka [12] provide one-time minimal fees for investigators and

supporting staff respectively. There is a provision for salaries of investigators in Wellcome trust-DBT India alliance grants [13].

##### 4.1.2. Recurring expenses:

Recurring expenses are those which are variable and which keep on occurring throughout the entire project duration. Particulars categorized in this category are consumables, chemicals, glass-ware, laboratory test charges, diagnostic kits, stationery, prints, photocopies, communication, postage, telephone charges, survey tools, questionnaires, publication charges, reprints, binding etc. Other expenses could be allowances for patients/participants, food charges and physician fees.

##### 4.1.3. Non-recurring expenses:

Non-recurring expenses are those which are one-time in nature or which do not recur at regular intervals. Particulars included in this category are equipments or instruments with its accessories, software's, computer, printer, electrical and electronic items and accessories of the existing instrument in your lab. Percentage of budget allocated for equipment varies among the funding agencies from 25% to 90% of the entire budget. Some of the agencies do not have provision for equipment in budget. Vision Group on Science and Technology allocated their maximum grant (up to 90%) for development of infrastructure of laboratories [14].

##### 4.1.4. Traveling expenses:

Budget allocated for traveling can be used for attending meetings, conferences, workshops and training programs. Foreign travel is not allowed by any Indian funding agency. Traveling expenses for collection of data, survey and visit to other centers in multicentric study can be budgeted in this sub-section.

#### 4.2. Indirect costs:

These are the costs which cannot be directly attributed to specific expenses of a project, but are required to run a project. It is also termed as overhead charges. Laboratory, electricity, water, library and other facilities are provided by the institution to run a proposed research project. Therefore, a fixed cost (usually) of about 5–15% of the total budget is provisioned as institutional overhead charges which goes to the institution directly. The range may, however, be flexible on the basis of the type of funding agency.

**Table 1**  
List of funding agencies those promote health research.

Sl. no.	Funding agencies	Website
1.	ICMR (Indian Council of Medical Research)	<a href="http://www.icmr.nic.in">www.icmr.nic.in</a>
2.	DHR (Department of Health Research), Ministry of Health and Family Welfare	<a href="http://www.dhr.gov.in">www.dhr.gov.in</a>
3.	Ministry of AYUSH (Ministry of Ayurveda, Yoga and Naturopathy, Unani, Siddha and Homeopathy)	<a href="http://www.ayush.gov.in">www.ayush.gov.in</a>
4.	Central Council for Research in Yoga and Naturopathy	<a href="http://www.ccryn.org">www.ccryn.org</a>
5.	Central Council for Research in Ayurvedic Sciences	<a href="http://www.ccras.nic.in">www.ccras.nic.in</a>
6.	Central Council for Research in Unani Medicine	<a href="http://www.ccrum.nic.in">www.ccrum.nic.in</a>
7.	Central Council for Research in Siddha	<a href="http://www.siddhacouncil.com">www.siddhacouncil.com</a>
8.	Central Council for Research in Homeopathy	<a href="http://www.ccrhindia.org">www.ccrhindia.org</a>
9.	DBT (Department of Biotechnology)	<a href="http://www.dbtindia.nic.in">www.dbtindia.nic.in</a>
10.	DST (Department of Science and Technology)	<a href="http://www.dst.gov.in">www.dst.gov.in</a>
11.	Science and Technology of Yoga and Meditation, Ministry of Science and Technology	<a href="http://www.dst.gov.in/science-and-technology-yoga-and-meditation">www.dst.gov.in/science-and-technology-yoga-and-meditation</a>
12.	SERC (Science and Engineering Research Council)	<a href="http://www.serb.gov.in">www.serb.gov.in</a>
13.	CSIR (Council for Scientific and Industrial Research)	<a href="http://www.csir.res.in">www.csir.res.in</a>
14.	UGC (University Grants Commission)	<a href="http://www.ugc.ac.in">www.ugc.ac.in</a>
15.	DAE (Department of Atomic Energy)	<a href="http://dae.nic.in">dae.nic.in</a>
16.	DRDO (Defense Research and Development Organization), Life sciences research board.	<a href="http://www.drdo.gov.in/drdo/boards/lrsrb/fplsrb.htm">www.drdo.gov.in/drdo/boards/lrsrb/fplsrb.htm</a>
17.	VGST (Vision Group of Science and Technology, Karnataka)	<a href="http://www.vgst.in">www.vgst.in</a>
18.	INSA (Indian National Science Academy)	<a href="http://insaindia.res.in">insaindia.res.in</a>
19.	Wellcome trust-DBT Alliance India	<a href="http://www.wellcomedbt.org">www.wellcomedbt.org</a>

**Table 2**  
Sample budget summary (year wise).

Items	Total	1st year	2nd year	3rd year	Balance 10% of the total
Salary (research fellow)	7,19,200	2,30,000	2,30,000	2,59,200	
Equipment	6,40,000	6,40,000	–	–	
Books	15,000	15,000	–	–	
Other non-recurring expenditure	–	–	–	–	
Recurring expenditure	9,95,000	3,92,000	5,87,000	16,000	
TA/DA	90,000	30,000	30,000	30,000	
Institutional support	97,260	–	–	97,260	
Fee of PI and Col	90,000	–	–	90,000	
Miscellaneous expenses	36,000	18,000	18,000	–	
Total	26,82,460	13,25,000	8,65,000	4,92,460	2,68,246

## 5. Budget justification

Most of the funding agencies require submission of a budget justification with all the items described above. Sometimes it is also called as budget narrative. Explanation of need for each line item in the budget with item-wise and year-wise breakdown has to be provided. Quantification of total costs of each line-item and document cost calculation should be done. When writing a budget justification, it is important to follow the same order as that in an itemized budget. For example, if equipment such as color doppler is required, then justify the need of a device with respect to the proposed methodology of the study. Similarly, for non-recurring expenses, breakdown the consumables item-wise and year-wise with its cost and calculation according to the protocol of the study and justify accordingly.

## 6. Budget summary

An item-wise and year wise summary of the total budget is usually required in most of the applications. Budget summary outlines the proposed grant and often (most of the format) appears at the beginning of the proposal. It should always be prepared at the end, after the grant proposal has been completely developed. A sample budget summary (as an example) for a proposed study for the duration of three years is shown in Table 2. In the personnel section, a research fellow salary with allowances is budgeted year-wise. The salary of the research fellow for the first and second year is Rs. 2,30,000 per year (JRF) with an enhancement to Rs 2,59,000 for the third year (SRF) as per the guidelines of the funding agency. As non-recurring expenses are one time in nature, a budget for equipment was budgeted only for the first year. Under the section of recurring expenses, more budgets are allocated in the second year for consumables because recruitment of subjects in large number will be done during the second year of the proposed study. Similarly, expenses toward travel, investigator fee and other miscellaneous costs year-wise have been budgeted. The emoluments and guidelines on service conditions for research personnel employed in research project by ICMR has been given in reference section [15,16].

## 7. How to plan a simple research budget?

Planning of the research budget begins with an innovative research question, objectives and design of the study. Before starting to write a budget plan, it is essential to understand the expectations of funding agencies, University/Institute and the team of researchers. It is imperative to keep in mind that the research proposal will be reviewed by both scientific and financial (non-scientific) experts. Hence, the proposal should be prepared in such a way that it can be easily understood by even non-scientific experts.

Firstly, a list of what is essential and would add value for research such as focus of research, primary and secondary outcomes of the

study, the source of the sample, study setting, sample design and sample size, techniques used to collect data, method of data analysis and available resources should be made [17].

Secondly, the instructions, format of the application and rules of the funding agency should be read thoroughly. Budget specifications, limitations of recurring and non-recurring costs, and necessity of budget justification with cost breakdown should be checked. Note that one should not deviate or modify the proforma of the funding agency.

Thirdly, a list of items should be made and categorized into recurring and non-recurring expenses. Breakdown of the budget into item-wise and year-wise with cost calculation should be done. It should be ensured that costs are reasonable, allowable and related to the research proposal, so that the budget appears realistic. Travel expenses should be calculated as per the rules of the funding agency.

Fourthly, item-wise and year-wise justification of the requirement in a same sequence of format should be provided. A well-justified budget can enhance the evaluation of the research proposal by reviewers and funding body.

The last most important part is to review the budget and verify the costs and calculation. It is better, if other research team members can review the budget plan and re-calculate the costs thoroughly. Remember, too high budget and too low budget with respect to the research proposal are suspicious and chances of receiving a grant are less.

## Sources of funding

None.

## Conflict of interest

None.

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