

MD/MS Thesis as a Training Tool

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Summary

As part of the MD/MS thesis, a postgraduate resident plans, conducts, analyses, and reports a research study under the guidance of the faculty members of the department. At the end of this process, the resident is expected to know the principles of conducting scientific research. Such an integral component of the resident's training program bears close examination. The thesis does help a resident plan a research study, collect and analyze data, and compile the results. However, lack of dedicated time for thesis-work (especially in patient-care disciplines), the absence of intermediate timelines, and variation in the research ability and interest of faculty guides limit its usefulness. Addressing these issues, ensuring availability and the optimal use of resources, as well as regular monitoring and evaluation at the departmental level, shall go a long way in meeting the goals of a thesis.

Key words: Postgraduate, research, thesis, training

INTRODUCTION

Across the length and breadth of India, irrespective of college or specialty, there is one shared experience for all MD/MS residents—the writing and publication of their theses. This is a requirement of the Medical Council of India (MCI), and as such is met by all residents. The MCI has also stated the aims of completing this difficult task—“Writing the thesis is aimed at contributing to the development of a spirit of inquiry, besides exposing the candidate to the techniques of research, critical analysis, acquaintance with the latest advances in medical science and the manner of identifying and consulting available literature.”^[1] Given that most (if not all) doctors learn the ropes of scientific research during their thesis work, it behooves us to assess its usefulness as a training tool.

BENEFITS

To start, thesis-writing teaches the resident how to frame a research question which is feasible, interesting, and relevant to the resident and the scientific community. It enables her to choose a meaningful question which is suitably complex, yet still suited to her competency. It also provides an insight into the specific ethical considerations unique to her particular thesis, and she learns how to address them appropriately.^[2]

The choice of the study design is inherently linked to the research question, and is also a great learning opportunity - the resident learns how to choose a design, keeping in mind not only the question it answers but also the limited time and resources available. When outlining the objectives of the study, she grapples with the formidable challenge of ensuring that each objective is specific, measurable, achievable, realistic, and time-bound.^[2,3]

The review of literature is also a critical undertaking which not only guides but also guided by the direction the thesis takes. She learns how to search databases, sift through irrelevant publications to get to the relevant, cite these publications, and generate bibliographies. Most importantly, she learns how to critically analyze any article she reads. This ability to appraise scientific material will aid her in her future career, whether she pursues active research or not.^[4]

Data collection sees the resident hone her communication, organizational, and problem-solving skills, and nurtures her ability to work independently.^[5,6] The entire academic

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Submitted: 15-Apr-2019

Revised: 11-Jun-2019

Accepted: 16-Apr-2020

Published: 16-Jun-2020

How to cite this article: Khaitan A, Goswami K, Kant S, Gupta SK. MD/MS thesis as a training tool. *Indian J Public Health* 2020;64:201-3.

Access this article online

Quick Response Code:



Website:
www.ijph.in

DOI:
10.4103/ijph.IJPH_177_19

process involved also provides several opportunities for her to polish her writing and presentation skills.^[5] Moreover, she acquires in-depth knowledge of a specific domain and may learn a new set of skills and interventions. The biostatistical analysis is also a critical skill which she ideally learns at the time of the data analysis. She learns how to have regular and solution-oriented meetings with her guides over the difficulties which inevitably crop up during the course of data collection and analysis.^[7]

CHALLENGES

No standardized evaluation criteria are in place to gauge the resident's learning from the thesis process - hypothesis generation and testing methodology, literature review, etc.^[8,9] This can shift the approach to being outcome-oriented rather than process-oriented. For example, a resident might outsource the entire statistical analysis to her colleague in the Department of Community Medicine or Biostatistics.

Often, no fixed timeline is in place. Thus, in the absence of intermediate deadlines, clinical and other duties inevitably take precedence over the thesis. The consequent procrastination inevitably compromises the quality of learning and the content generated.^[3] Her research question gets limited to those which can be answered and submitted within this time frame. This eliminates many study designs, effectively rendering them nonexistent in the realm of thesis research. Moreover, the thesis is a relatively short undertaking - the resident must make her submission within 2/2½ years. Thus, the issues of a meeting of sample size and follow-up period in interventional studies are not always addressed.

Plagiarism and data fabrication are two of the most glaring threats to a thesis.^[3,9,10] They are not only unethical but also defeat the very purpose of the entire venture. However, they do not occur in a vacuum. Most residents are overburdened with their duties as they are a crucial part of the workforce. With other residents and seniors also indulging in similar practices, and in the absence of a strong mechanism to detect these transgressions, residents may resort to such measures. Due to the cumulative workload and no time officially allocated to the thesis, residents struggle to cope.^[11]

Data manipulation to get "significant" results have also been observed, and this violates the integrity of sound scientific research.^[9]

Moreover, the thesis guide, who sets the tone for the entire journey, may have an adverse effect on the learning. The guide may have inadequate experience in the field of research and teaching.^[3,9] Further, if a guide is adamant on a specific topic of her own interest, she compromises her resident's learning opportunity.^[9] In interventional studies, the intervention may be beyond the skill-set of the resident, thus creating the possibility that the resident does not perform it herself, and instead outsources it.

THE WAY FORWARD

Formal workshops on research methodology for all postgraduates have already been mandated by the MCI.^[10,12] Some of the topics can be introduced in the undergraduate curriculum as an optional module since many students opt to embark upon research projects^[13] and start publishing during MBBS itself.^[10,14] The MD/MS course should be structured with some time explicitly allocated to thesis data collection. This will not only improve the quality of the data and the learning process but also lighten the burden on the resident.

In addition to the guide, it is the usual practice to have one or more co-guides for an MD/MS thesis. Greater involvement of co-guides at all stages of the thesis needs to be encouraged. This may help in better supervision of the thesis work. Regular monitoring of thesis progress may be undertaken by a departmental review committee every 6 months or so. The biostatistical analysis must also be done by the resident herself.

Apart from the routine use of plagiarism-checking software, a random sample of data may be cross-checked to look for data fabrication, where feasible.

In interventional studies, the intervention should necessarily be taught to the resident by the end of her thesis. Follow-up studies can be planned for the thesis, both observational as well as interventional. One resident can undertake the initial baseline work as her thesis, and a subsequent resident's thesis may complete the follow-up after the required period.

Identification of and preparation for foreseeable ethical dilemmas should be a *sine qua non* of the thesis protocol since each study presents unique ethical challenges. Similarly, an explicit timeline should be framed and committed to in the protocol itself.^[3,5]

The MCI guidelines on the teacher-resident ratio must also be followed strictly, while at the same time ensuring that the guides have adequate training in research methodology and statistics.^[10,11] Faculty development workshops are one possible option.

Resources are often required for thesis work, namely, purchase of reagents, consumables, and payment to volunteers in community-based theses, etc., Grants for thesis protocols, such as the one awarded by the Indian Council of Medical Research^[15] can be awarded by other national associations as well.^[11,16] Institutions must also introspect and increase the allocation of funds to the MD/MS thesis program, if necessary. Funds for this purpose can also be provided at the departmental level for thesis-related expenditure. Awards focusing on the soundness of theses' methodology serve as an excellent incentive for residents to increase their efforts.^[3,11]

Institutional libraries must maintain an updated database of theses, and a ready list of thesis topics for quick perusal, to avoid repetitious research.^[9,10]

Publication in a peer-reviewed journal should be encouraged.^[5] In meeting publication standards, the resident is more likely

to be original and less likely to plagiarise, and this may also result in a decrease in redundant studies.^[5,17,18]

CONCLUSION

The MD/MS thesis is replete with opportunities to sensitize and orient medical postgraduate students in the conduct of scientific research. However, if the challenges are not addressed, then one must consider the opportunity cost of embarking on a thesis. It takes time, energy, and resources away from patient care services. One must prevent the thesis from devolving into a liability for the residents' training program, from the asset these authors believe it to be.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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