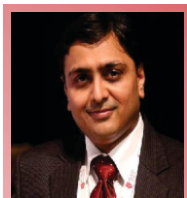


Physiotherapy Thesis - Challenges, Common Fallacies and Means to Overcome Them



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Introduction to Physiotherapy Research

Physiotherapy is a Health care profession concerned with human function & movement aimed at maximizing its potential. It uses physical approaches to promote, maintain & restore physical, psychological & social wellbeing, taking account of variations in health status. The role of a Physiotherapist involves administration and interpretation of tests related to bodily functions and structures, and the provision of a range of therapeutic and preventive measures to patients suffering from disabilities, dysfunctions and pain. But by large, Physiotherapy is still a non-dosage specific field where still lot of researches are being done to understand the exact or specific dosages required in the treatments/restoration/prevention of various conditions.

Challenges faced by the novice researcher

New PG Physiotherapy candidates are full of concerns regarding the application of research knowledge in practice for their PG thesis. Although few of the universities in India have incorporated research at an under-graduation level, this is expected to be an observational research, more or less limited to a retrospective study. Thus, many times, they may neither be exposed to, nor be interested in research. Although the thesis in PG is mandatory, most of the young learners consider clinical learning devoid of research and Evidence Based Physical Therapy (EBPT). EBPT incorporates the application of the learners' clinical Physiotherapy knowledge backed by latest evidences favouring the same considering the patients' needs and necessities. This requires a thorough knowledge of the client's functional aspects backed by the latest trends in the practice of that condition at a global level. This also necessitates the formulation of a clinical research question in current practice.

The Research Question

The Research Question is the soul of every thesis. It not only directs the end point of the thesis, but also marks the pathway to be taken towards completion of the thesis. Research question helps to understand contents of the thesis, including the methodology, tools, outcome measures and statistical tests that may be used in the particular thesis. It helps choose an appropriate protocol to be followed in completion of the thesis and let the researcher understand the need for the study. A good research question should guide towards appropriate references; explain about the condition to be studied and treatments currently available. It should note the gaps present in the current chain of evidences and the specific treatment to be studied and guide towards collection of preliminary data in the condition to be studied. It should also help the researcher anticipate results and potential pitfalls and describe the significance of the research including potential benefit for individual subjects or society at large.

Hypothesis

The hypothesis directs the methodology which considers the measures of exposure and outcome. It should be tested by making a comparison between the two or more groups. It guides the authors to develop a plan for data collection and management, determine the statistical methods for analysis and also estimate the magnitude of the expected difference between the two groups, as a basis for determining sample size (power calculation). This will guide to assess study feasibility, sample recruitments and analysis.

Study Title

This is the most important part of every research as the title forms the face of the study. An improper title will be a deterrent for any study and shall not arouse interest in the readers. The title should be descriptive of the study and should be concise, clear and non-ambiguous.

Challenges in writing Introduction

The introduction is the prima facia of the research. The introduction should be of the current study, rather than about the known knowledge of the conditions and diseases. It should always be in the funnel format, i.e. from broad global concerns to small local concern. Many times, the young researcher writes in great lengths about everything else other than their own study which may turn down the review board and readers. Introduction should be short and specific incorporating the need for conducting the present research in around 2–3 pages maximum. Bold statements like “such evidences do not exist” or “there have been no studies on this topic” etc. should be avoided.

Conducting the Review

The next challenge faced is collecting literature for reviewing. Although textbooks do give some baseline information, they can only answer background questions. For understanding research in its better aspect, answers to the foreground questions must be sought for which reading latest literature is mandatory. This can be obtained by subscribing to various peer reviewed, indexed journals or going through online databases. Database like the Google scholar may be useful to find articles, but specific databases like Pubmed, Cochrane, PEDro and CINAHL are also useful in Physiotherapy thesis. But the reader should be clear in understanding methods to navigate through them e.g., using the key words, filters, bullions, truncation symbols, MeSH terms etc.

Documentation of the reviewed literature is also an art. A review should always have a story and a flow to it. This may be from the historical to the newer perspectives or may be compartmentalised based on the research question/s. Writing briefly about the authors, their study, design, results, conclusion and applicability is desired.

Aim and Objectives

Generally PG thesis may have a single aim to answer to a specific research question. The study objectives should be clearly and precisely stated. They should be simple, specific, and stated in advance to performing the research and should be attainable, measurable and realistic.

Research design and Statistics

The research design should be identified and should be appropriate to answer the research question/s under study. The researcher may describe the type of research proposed (e.g. experimental, correlational, survey, qualitative) and specific study design that will be used (e.g. pre-posttest, control group, cross-sectional; prospective longitudinal, cohort; blinded randomized control). The research design, methods and procedures should help answer the specific research question/s as mentioned in the study objectives.

The sampling procedures should be specific and scientific. The researcher should always describe the sampling approach including determination and justification for sample size. A larger sample size may increase the cost and duration of the study and will be unethical to expose human subjects to any potential unnecessary risk without additional benefit. A smaller sample size can also be unethical if it exposes human subjects to risk with no benefit to scientific knowledge. Calculation of sample size has been made easy by computer software programs. The principles underlying the estimation of the software sample size should be well understood. The researchers have to identify the procedures that will be used to recruit, screen and follow study volunteers as well as specifically define the study sample (number and characteristics of subjects to be included and excluded). In intervention studies, clarification of subject allocation to treatment and comparison groups and criteria for discontinuation should be defined.

Another challenge faced is on statistics which is considered as a huge hurdle. Thus, involving the statistician from the earliest part of the research is an excellent idea. Statisticians can help in understanding the basis of statistical tools, data variables and tests before actual exploration of data. Choosing good and appropriate, valid and reliable outcome measures is also an important step to a successful thesis.

Why conduct the Pilot Study?

Before the actual research, performing the pilot study is another crucial step in Physiotherapy thesis. It is useful in multiple ways. In observational studies, it may help understand the outcome measure or may help in validating the research tools. In experimental studies, it may help in rectification and finalization of the processes and the procedures which may be used in the study. Pilot study is never meant to analyse the end results. It will help the researcher understand if he is on the right track. This also helps rectify any lacunae that may weaken the study as well as prevent any potential confounders that may cause bias in the study. Permissions for obtaining/ using outcome measures can also be done in this phase.

Materials and Methods

The methodology should be elaborate to explain every procedural detail to the level of replication of the entire study in the similar given environment. Processes of sampling, consent, measures, tests, and data entry need to be provided in elaborate details. A very important consideration in the thesis methodology is following the universal guidelines for the procedure documentation. Researchers are advised to go through CONSORT guidelines (CONSolidated Standards Of Reporting Trials) for experimental, STROBE guidelines (STrengthening the Reporting of OBServational studies in Epidemiology) for observational and STARD guidelines (STatement for Reporting studies of Diagnostic accuracy) for diagnostic studies.

Ethical Clearance and Research Registration

Another important step, before actual initiation of the study, is getting clearance from the Ethics Committee. This is mandatory for any medical research, including Physiotherapy research to ensure that the researcher shall not violate the rights and dignity of their subjects. It is advisable for every researcher to be certified in Good Clinical Practices, in order to ensure safeguarding of their subjects. Methods for data collection and for avoiding/ minimizing subject risks should be included. Always include a timeline for subject evaluations, duration of intervention and tentative budget for the project. The researcher should document the methods for maintaining subject confidentiality (plans for coding data and for securing written and electronic subject records) and should indicate duration of storage of personal information post study completion. These methods will vary with the research type (qualitative, quantitative) and thus should sufficiently describe justification of the approach for answering the defined research question. Methods should also be described in adequate detail so that IEC members may assess the potential study risks and benefits.

Also it is important to register the study with national clinical trials registry (Clinical Trials Registry of India, CTRI). Many Physiotherapy researchers are still unaware of the importance of registering their studies to safeguard their intellectual rights. CTRI does register Post graduation Physiotherapy thesis and also observational studies. Also, it is advantageous to publish of your hypothesis as a defensive publications. Journals like 'Journal of Medical Thesis' does publish Research Hypothesis which helps protect intellectual property of the researchers.

The master chart and Scientific Misconduct

Although the master chart seems to be the last and inconspicuous part of the research, fact is that it is the most important piece of evidence in every research. The basic analysis of the entire study data is done from the master chart and thus, it should be created properly without any fallacies. The PG candidate should be clear with the data being analysed and should make the master chart elaborately. Avoid making single headings for multiple components. E.g., for male/ female, yes/ no options, make 2 different columns rather than a single column and enter '1' for every 'yes' or 'no'. This is extremely important in summation and averaging. In experimental studies, it is advised to make different sheets for control and experimental groups. MS Excel has multiple, user friendly options and tools which should be learnt before making the master chart. Also, many statistical tests for parametric data can be performed in Excel, including descriptive statistics, paired and unpaired t test, ANOVA, Correlations, covariance etc. For all other tests, including non-parametric tests and Correlations etc., using statistical packages like the SPSS is beneficial. Taking guidance from a good statistician always helps but learn your own basic test procedures as well. Few of the researchers tend to indulge in research malpractices during this phase by falsification and fabrication of their data. This is strongly condemned and the researchers have to understand that such malpractices can easily be detected by basic analysis of the master-chart. Also ensure that the master chart does not disclose the identity of the subjects in any way as this is considered as breach of confidentiality. Hence, coding of the case report forms before making the master chart is a good practice.

Results, Discussion and Conclusion of the Study

This is another crucial part of any Physiotherapy thesis. Often good studies lose their value due to improperly interpreted and explained results. The PG candidate should choose appropriate, self-explanatory graphs and tables for explanation of their results.

The discussion should focus on the important findings and rationalisation of these findings and should avoid repetition of results. Utilising a good reviewed literature is extremely helpful in this stage. Also, the confounders of the study should be well identified and expressed in the discussion (unless they are being written separately as limitations).

The conclusion should be a good amalgamation of the aim, objectives, research question and hypothesis. Any conclusion, whether it accepts or rejects the null hypothesis, is an important contribution to Physiotherapy research. Conclusion should only be based on the results obtained and should not have any comments outside the preview of the study, including indirect study implications. Any suggestions

or added information can be written as a scope for further study.

References Guidelines

References should always be recent, complete and preferably in the Vancouver format. The details can be found in most of the standard journal and sites. References should be given to all the published articles, books, websites (mentioning the date of viewing them), and even to unpublished but accepted works.

Summary

Thesis has been an integral part of every Post Graduate Physiotherapy candidate and is associated with them for a lifetime. In today's electronic era, every published or unpublished thesis can be utilised by future researchers as a reference. But it should be remembered that every research is completed only when published in a good peer reviewed indexed journal. Thus, it becomes not only important and ethical, but even legal to lay down all the facts associated with the study in a truthful and honest manner. Malpractices like plagiarism, although may seem easy, but are deterrents in the future prospects of the candidate. Almost all of the universities and journals run anti-plagiarism software's and getting indulged in such act may not only cause rejection of this wonderful piece of literature, but may also blacklist the candidate for life. Research is all about a bit of dedication, understanding, honesty and hard work on the researchers' side and about a lot of truth, facts and probabilities of the findings for verification of these facts, which under any costs, must not be altered, but be expressed with all its integrity. Only then can the candidate truly contribute to his professions growth and stability in a noble way.

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Conflict of Interest: Nil
Source of Support: None

Full Thesis and Master Chart available on
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How to Cite this Article:

Shimpi AP. Physiotherapy Thesis - Challenges, Common Fallacies and Means to Overcome Them. *Journal Medical Thesis* 2016 Jan-Apr; 4(1): 3-6