An insight into Research Methodology for Dental Undergraduate and Post Graduate Students.

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ABSTRACT: Research can be a pleasant experience when simple rules are followed. Speciality of dentistry is now escalating to global heights, imparting the state of art teaching training and treatment modalities. Research is either discovery of new facts new principles or new interpretation. It is an attempt to reveal to the world something that was either or never thought of or was in the domain of conjecture at best being looked at suspicion. The keystone of research and development is documentation of clinical findings of various diseases and conditions and their incidence and prevalence. As a strategy for greater integration of research findings and clinical experience this review focuses on helping the dental undergraduate and post graduate students to improve evidence based practice and use his/her prudence to select his/her research area and conduct enquiry in a systematic manner in the process of therapeutic innovations through clinical research.

INTRODUCTION:

Post graduate study is an opportunity for personal skills development and for professional recognition and status. It is both challenging and demanding. It promotes personal growth and research skills. Research is an integral component of post graduate curriculum of dentistry in India. The research so done under the supervision of the guide is submitted to the University for obtaining a post graduate degree.

A majority of the students consider and conduct research merely as a requirement by the University and pass through the process mechanically instead of involving every bit of it as a learning experience. I looks that learning clinical skills related to the subject is overemphasized at the cost of acquiring research skills. There needs to be a healthy balance between the two, for post graduation can be a stepping stone for becoming full time research workers for many.

The term "Research Culture" [1] needs to be driven deeply among not only post graduate students but also undergraduate students. The reasons for doing so become clear if we go through the related dental colleges and 104 of these colleges offer Post graduation courses in various branches of Dentistry. On an average 2193x3 post graduate students at any statistics given below and our country has 269 functioning Dental Colleges at this given point of time. Out of this about 104 colleges offer post graduation courses. On an average 1800 post graduate students come out of our colleges with post graduation in any given year. About 19700 students can enter into 1st BDS every year in our country. The enormous number of students indicates an immense potential for research activities. Unfortunately one can see very few research publications at international level by our students. The process of conceiving an idea, planning it out, and then executing it is fundamental to any successful project, especially in the realm of research. Planning a research project thoroughly is indeed the cornerstone of meaningful publications. Certain important points to be remembered are as follows

Clarity of Purpose: Planning helps researchers define the purpose and scope of their study. It allows them to clearly outline what they want to achieve, what questions they want to answer, and what outcomes they expect.

Resource Allocation: Through planning, researchers can assess the resources required for their project, be it human resources, funding, materials, or time. This ensures that the necessary resources are available and allocated efficiently.

Methodological Rigor: A well-thought-out plan includes a detailed methodology. Planning helps researchers decide on the research design, data collection methods, and analytical techniques. This ensures the study is conducted with scientific rigor, enhancing the credibility of the results.

Ethical Considerations: Ethical aspects of research, such as informed consent and participant confidentiality, are integral to any study. Planning allows researchers to address these ethical considerations beforehand, ensuring the rights and well-being of participants are protected.

Anticipating Challenges: No research project is without challenges. Through careful planning, researchers can anticipate potential obstacles and devise strategies to overcome them. This proactive approach is crucial for

maintaining the project's momentum and ensuring its successful completion.

Quality of Output: A well-planned research project is more likely to generate high-quality data and, consequently, meaningful results. This quality is essential for meaningful publications, as it contributes to the advancement of knowledge in the respective field.

Effective Communication: When researchers plan their project meticulously, they are better equipped to communicate their methods, results, and conclusions clearly and effectively. This is vital for presenting their work at conferences and in publications, reaching a wider audience and garnering interest from the scientific community. In summary, planning is the foundation upon which a successful research project is built. It provides researchers with a roadmap, guiding them from the initial idea to the meaningful publication of their findings. By investing time and effort into planning, researchers can significantly enhance the quality and impact of their work.

VITAL QUESTION:

What is the quantum of research generated by them?

How much of it can be conducted as "Quality Research"?

How much of this research is getting published in international Journals?

What is the quantum of research contribution by India to International Dental Research?

Why much of the research conducted in India at post graduate level and even beyond goes un published

It is apparent that in India tremendous quantity of dental research is done but a major part remains unpublished either due to quality deficit or due to lack of interest in pursuing with the game of publication or both.

Generating quality research by conducting research systematically and instilling in motivating students with "Research Culture" might ease out the situation in future.

Research Methodology and general Epidemiology must be offered as "taught courses" for all post graduate students by experts in the area so that the background knowledge for conducting quality research can be provided. Dental Council of India is working tremendously in order to qualitatively improve research so that our country can contribute substantially to international Dental Research by publishing more studies in International Dental Journals.

The next relevant issue is the topic selection for Post Graduate research. This is a crucial issue which significantly determines the nature and context of research. The topic selected by post graduate students should be relevant to Indian context and be need based. It should also be focused to bridge the existing gaps in the knowledge or resolve glaring contradictions. Substantial research at post graduate level in India should not be a mere replication or duplication of the studies done elsewhere but should be original in nature. Students should be encouraged to do original research and not just lean on key article and just pass through the motions and merely reproduce the study without qualitatively augmenting research. There are ways to circumvent this hassle and the students should be trained to develop such skills which enable a balance between originality and meaningful discussion.

The researchers all over the world are really interested to know the oral health situation in India along with the exclusive methods in operation. What hold good in western countries may not always hold good in developing countries because of entirely different socio-psycho-cultural composition. Below are the pre requisites points for good research

- **Focus** Area of interest/expertise
  Meaningful progress
- **Rationale** Clinically relevant
  Proof of concept
  Challenge /change current treatment methods
- **Validity** Will the results be useful and to whom?
  In-vitro studies – Good Internal Validity
  Clinical studies – Moderate to good External Validity
- **Feasibility** Time
  Study population/ Samples
  Infra-structure
  Skill/aptitude
- **Ethics** Do unto other what you would do unto you.
- **Budget** Materials
  Manpower, Equipment

Traditionally used herbs and remedies form a repository and a strong source of research topic. Economically cost effective methods like ART Are more relevant than implants and other expensive methods. Research related to Dental Health Insurance Policy making, Health care utilization, Patient Satisfaction and behavioral research, Oral Health Promotion related research, Dental Fluorosis related research including development of simple and cost effective methods and all preventive and promotive research in reduction of non communicable diseases like Cancer, Diabetes, Cardiovascular Disease, and Stroke should be given higher priority than others. Students need to keenly observe the oral health problems in local populations and conduct needs assessment before they embark on selection of a research topic.

A shift in prioritization of research emphasizing more on prevention oriented public health and clinical measures are much required. Nevertheless other kinds of research based on local needs can also be considered as areas of research.

A lot of applied research and a very poor track record of basic research is another problem that needs to be solved in our country. Post graduate students who pick up fundamental research should be encouraged and the supervisors should facilitate such a research since that has immense potential to change the very course of dentistry.

RESEARCH CULTURE:

A research culture is one which comprises respect, resources, activity, funding ,mutual trust and sharing support for productive research. The establishment and maintenance of research culture is a sensitive and complex issue. Exposing students to a learning environment enriched with research culture always ignites the" instinct of inquiry "in their minds.

Peer support Systems- Establishing a research culture

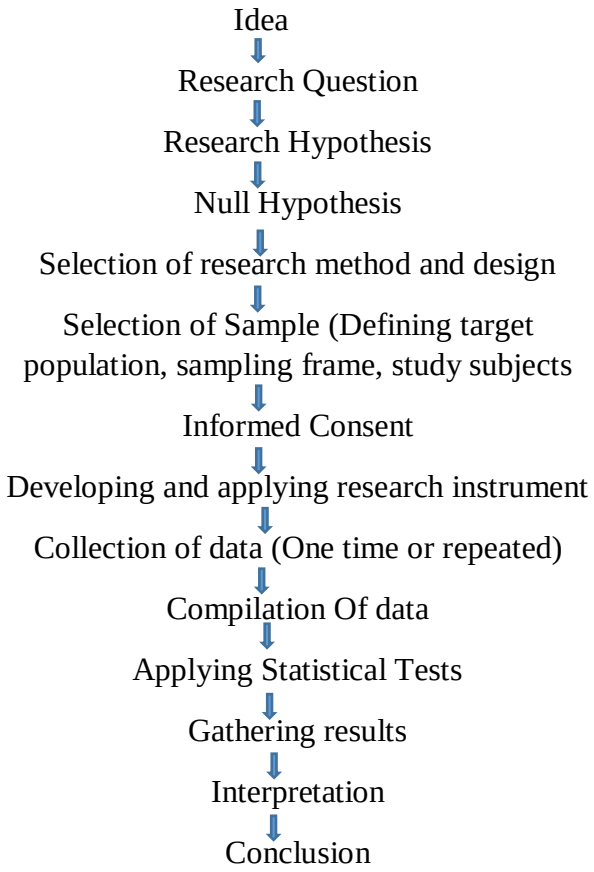
Formal research seminar series offers a good opportunity for learning research skills. Such sessions offer presentation of research in progress seminar papers by students and staff, followed by Discussions.

It is imperative to introduce the students to research right at undergraduate level so that research doesn't remain alien to them till later. The latent zeal for inquiry should be ignited at

undergraduate level in order to produce full time researchers for future.

Unsystematic reviews, Questionnaire surveys should be assigned as an academic requisite at undergraduate level. Groups of students should be allowed to engage in one specific research , inducing team spirit. Students can learn how to work together, apart from learning communication skills and interpersonal skills.

RESEARCH METHODOLOGY: Research methodology refers to a systematic way of conducting research by following specific procedural steps in order to answer a research question.[2]



Research Methods: All the research done at UG level and PG Level can be broadly classified under three categories.

DESCRIPTIVE RESEARCH: It includes majorly observational studies which are surveys. They provide a rich ground for developing an etiological hypothesis. Further research can be done to prove or refute the veracity of it.

They are the studies which involve large populations. They generate huge data and sometimes called "Data Driven research".

ANALYTICAL RESEARCH: They are comparative studies done in order to check the existence of association between the suspected cause and expected outcome. They are comparative and analytical by nature. They are either retrospective or prospective studies. They help in assessing the "Risk" of an individual towards developing a disease or health related problem. Risk associations throw enough light on etiology, case control and cohort studies are two different types of analytical studies.

EXPERIMENTAL RESEARCH: It includes a deliberative intervention or manipulation of independent variable in order to assess its effect on dependent variable. This type of research is very popular and is done on few selected subjects. When subjects are randomly allocated to study arm and control arm following a strict protocol, where one group is exposed to active intervention and the other group into passive intervention or no intervention followed by assessment of outcomes and comparison, the design is called "Randomized controlled Trial". It is considered as a gold standard in Evidence Based Dentistry[3,4] .Experimental studies are done to establish the causal association between two variables.

CONCLUSION: Research in Dentistry encompasses a whole gamut of endeavors that ultimately help to improve oral and

maxillofacial health. The wealth of information in the various areas of research has increased exponentially It is daunting task for one individual especially dentists to keep up with the complexity of our speciality that is constantly being formulated. Multidisciplinary research is providing new basic understanding, novel products and innovative technologies that improve basic knowledge of human health and quality of life[5]. The dental education and methodology should be to educate an individual to acquire the technical skills required for the provision of patient care and think critically understand the scientific method and apply this to the practice of the profession. The issue of promoting research in Dental curriculum has broad ramification and there is no doubt that research promotions among dental undergraduate and post graduate students will lead to a larger commitment of students to preserve academic careers and will also challenge faculty to increase and expand their research capability and productivity.

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