



(RESEARCH ARTICLE)



## Knowledge and awareness among dental and life science students towards research: A questionnaire based cross-sectional study

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### Abstract

The aim of this study was to assess the knowledge and attitudes towards research and explore career interests among dental and life science students following their participation in an internship training program in bioresearch. The materials and methods involved a questionnaire-based survey conducted among CRI (Compulsory rotatory internship) dental students, postgraduate MDS students, and life science students who took part in the internship program organized by the Central Research Laboratory. Prior to the internship, participants were administered the questionnaire. The results revealed an overall research knowledge rate of 66% among participants, with CRI dental students demonstrating a higher rate at 72%. Additionally, 72% of the participants expressed positive views regarding research as a viable career option in their respective fields. This study primarily aimed to analyse research knowledge and attitudes among dental and life science students. Findings indicated a strong interest in research among students, highlighting the importance of targeted training in biomedicine and statistics. In conclusion, the study suggests that tailored training programs focusing on research methodology and statistics would be beneficial for medical and dental students entering the field.

**Keywords:** Knowledge; Dental students; Life science students; Research; Attitude

### 1. Introduction

The field of medical and dental science are dynamic and continually evolving, emphasizing the importance of utilizing available evidence in patient care decisions. Clinicians are urged to integrate their individual clinical expertise, acquired through practical experience, with external evidence derived from relevant research <sup>[1]</sup>. Research experiences during undergraduate studies have been consistently linked to heightened research interests during postgraduate studies and subsequent career advancements <sup>[1]</sup>.

India stands as a prominent hub for bioresearch, esteemed by both domestic and international clinicians for research endeavours. This preference is attributed to various factors, including the availability of cutting-edge technology, nationally and internationally accredited hospitals equipped with comprehensive facilities, a proficient cadre of

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qualified and experienced healthcare professionals, a diverse patient population, high enrolment rates, cost-effective trial research, and adherence to research guidelines and regulations that align with international standards [2].

In spite of all the advantages, and being the second most populated country with 17.5% of total world population, India accounts for only 1.23% (3411 studies of 276,813 as per data available on [clinicaltrials.gov.in](http://clinicaltrials.gov.in) as of (01-07-2018) of global clinical trials [3]. In the Indian dental education system, there's a notable absence of integration of research within the curriculum. Research initiatives consistently receive minimal emphasis and priority within Indian dental institutions.

Research in oral hygiene not only impacts the immediate practice of dentistry but also influences its long-term development and the quality of patient care, thus significantly shaping the dental profession [4]. Efforts to encourage research engagement among dental students have been introduced through various activities. Moving forward, to elevate dental education in India, it's imperative to motivate students to actively participate in research within the curriculum and to revolutionize learning methodologies. The transformative power of research has been evident in dentistry's evolution in recent years. Therefore, it's essential to equip students across health disciplines with the necessary information and skills for effective medical and dental research. This includes not only dental students but also life science students, who play a crucial role in bioresearch and medical advancement [5,6].

Numerous studies have explored the knowledge, attitude, and practices of research principles among healthcare professionals in the medical field [7,8,9]. The aim of this particular study was to evaluate the understanding, perspective, and application of research-related concepts among both dental students and life science students. Thus, in view of this, the present study was planned to study the knowledge and awareness about the medical research among the postgraduate dental, life science students and CRI dental students.

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## 2. Materials and methods

The study was conducted as a questionnaire-based cross-sectional survey at Meenakshi Ammal Dental College and Hospital in Maduravoyal, Chennai. The study population consisted of dental and life science students who had undergone internship training in Bioresearch at the Department of Central Research Laboratory. The sampling included 20 postgraduate life science students from the departments of microbiology and biochemistry, 16 CRI dental students, and 4 first-year MDS (Master of Dental Surgery) students, totaling 40 participants.

The questionnaire used in this study was structured into three sections. The initial segment aimed to gauge participants' knowledge, followed by a section designed to assess their awareness of medical research. The final part of the questionnaire focused on eliciting respondents' interests and attitudes toward research. Participants were instructed to select the most appropriate option for each question based on their perspective.

A verbal consent was obtained from the central research laboratory organized the internship training. The questionnaire was developed, pre validated, modified and self-structured based on the objective of the study. Self-administered questionnaire was used to collect the data from the participants. The purpose of the study was explained and written verbal consent was obtained from all the participants before being given the questionnaires.

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## 3. Results

Data collected from the questionnaire were entered into Microsoft Office Excel 2007 software and subsequently analysed using SPSS software.

The statistical analysis of the results has been conducted and organized into distinct groups. Each section is presented through tables and flowcharts for clarity. Table 1 outlines the comprehensive breakdown of the students' overall knowledge. Figure 1 supplements this by visually representing the frequency and distribution of basic research knowledge among the participants. In Table 2, the results concerning participants' awareness and attitude toward research are detailed. Figure 2 provides a representation of the frequency and distribution within this context. Table 3 highlights the findings pertaining to participants' interests in research, while Figure 3 visually presents this information for better comprehension. In this study, the participant pool consisted of 40 students, comprising 6 (15%) males and 34 (84%) females. The mean age of the students was  $22.3 \pm 1.9$  years. Among the participants, 4 (10%) were first-year MDS students, 16 (40%) were CRI dental students, and 20 (50%) were postgraduates in life sciences, specializing in microbiology and biochemistry.

**Table 1** Representing the percentage of knowledge based upon direct questions on research

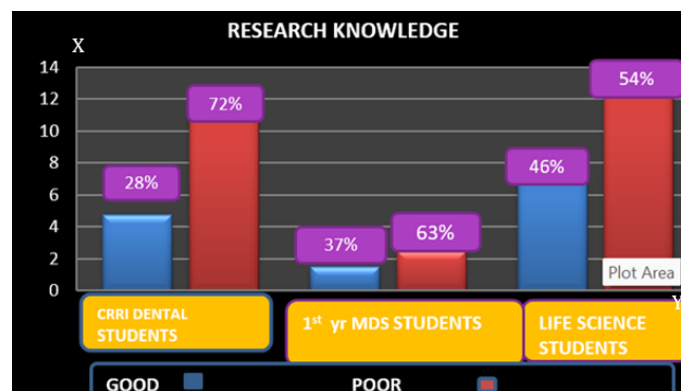
S. No	Questions	Yes (%)	No (%)
1	Do you have knowledge about basics of research?	25 (62%)	15(38%)
2	Do you find any difficulty in understanding the research concept	24 (60%)	16(40%)
3	Do you have any experience in writing research before?	8 (20%)	32(80%)
4	Have you done research before?	5 (12.5%)	35(87.5%)

**Table 2** Representing the awareness and attitude of students

S.No.	Questions	Yes (%)	No (%)
1.	Are you inclined towards research?	38(95%)	2 (5%)
2	Do you think research is necessary in improving the knowledge in your filed?	38(95%)	2(5%)
3	Do you think students will get benefit from research?	39(97%)	1(3%)
4	Do you think patient management improves with continued medical research?	35(87.5%)	5(12.5%)
5	Do you think research can be a good career option in your field?	29(72.5%)	11(27.4%)

**Table 3** Representing the interests towards research among the participants

S.no.	Questions	YES (%)	NO(%)
1	Have you participated in research training before?	19 (47.5%)	21(52.5%)
2	Do you think training in research will be useful?	40(100%)	0
3	Do you training in research should be made compulsory?	29(72.5%)	11(27.5%)
4	Have you got introduction to a New advanced equipment recently?	34(85%)	6(15%)



**Figure 1** Knowledge on research among the participants

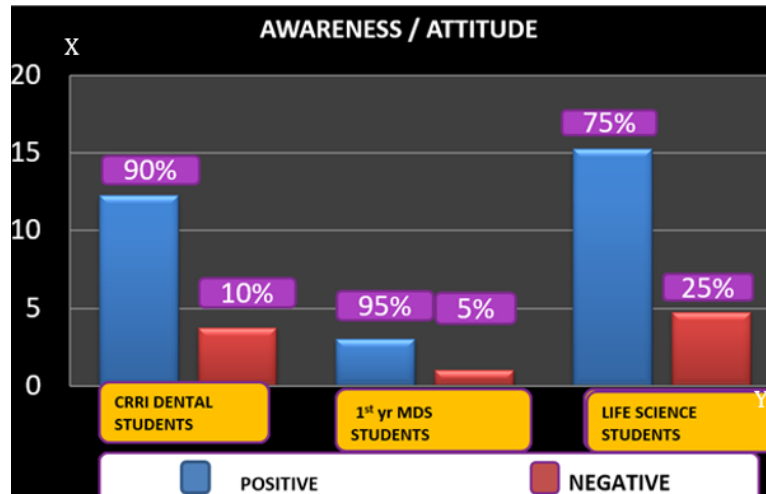


Figure 2 Attitude and awareness among the participants towards Research

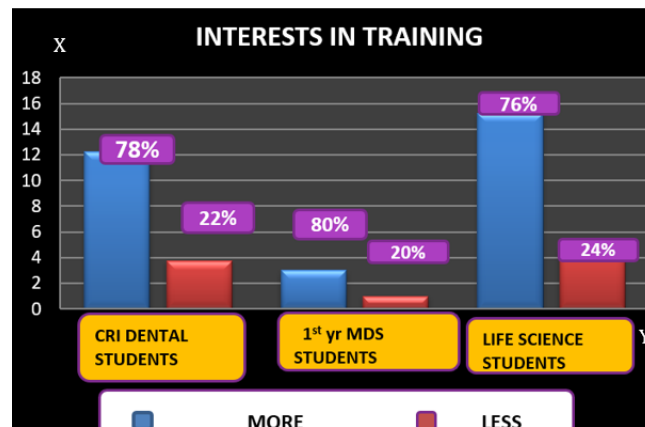


Figure 3 Interest in Research among the participants

#### 4. Discussion

Research plays a pivotal role in medical education, providing invaluable insights and advancements in the field. While postgraduate students are typically introduced to research methodologies and protocol design during their residency, the level of research output from dental students and life science graduates in India lags behind that of developed nations.

To address this gap, it's imperative to integrate specific research skills into all facets of the postgraduate curriculum. By infusing research-oriented elements throughout their training, students can develop a routine practice of conducting research even after completing their residency. This approach not only fosters a culture of inquiry and innovation but also equips future healthcare professionals with the tools and mindset necessary to contribute meaningfully to the scientific community. Furthermore, by nurturing a research-oriented mindset early in their careers, dental students and life science graduates can become active participants in advancing medical knowledge and addressing pressing healthcare challenges within India and globally. Through targeted education and hands-on experience, the potential for impactful research contributions from these students can be realized, ultimately elevating the standard of healthcare and scientific achievement in the country. The study reveals that overall research knowledge among the participants stands at 66%, with CRRi dental students exhibiting a higher rate of 72%. Notably, 80% of MDS students displayed a keen interest in research, surpassing other groups. These findings align with a study by Habib et al in 2018 [10]. Furthermore, all participants demonstrated a positive attitude toward research training, with an overall 88% showing good awareness and positivity. MDS students and Dental CRRi students displayed particularly high rates of 95% and 90%,

respectively, in this aspect. Additionally, 72% of the students considered research a promising career option in their field.

However, despite the evident enthusiasm for research, only 16% of students had prior research experience, and a mere 2% had published papers. This trend resonates with findings from a study by Rohini et al in North India [11]. Notably, none of the Dental CRI students had previous research experience or publications. This suggests a disconnect between interest and participation, potentially influenced by perceived burdens associated with research.

Interestingly, 72% of participants expressed a desire for research training to be made compulsory in the curriculum, consistent with previous research. [9] Nearly half of the participants had prior training in bioresearch, indicating a strong inclination towards research-oriented programs. Moreover, all students who participated in research training for the first time displayed a positive attitude towards it, highlighting its perceived value for future endeavours. Importantly, none of the participants deemed research training as unfruitful for their future, emphasizing the awareness of its significance. Following the training, students reported increased confidence in research, with many being introduced to advanced equipment in bioresearch.

However, the study has its limitations, including potential recall bias due to its questionnaire-based nature and its restriction to a single institution, limiting generalizability. Additionally, the data included fewer MDS students compared to other participants, warranting caution in interpretation.

Vast research strategies being applied in dental practise and in life science sector. In dentistry, advanced diagnostic and treatment methodologies being studied. Contemporary research in dentistry is predominantly focused on cutting-edge areas such as regenerative dentistry, cone beam computed tomography (CBCT), nanodentistry, advanced orthodontic corrections, and implant dentistry. These fields represent the forefront of dental innovation, driving advancements in treatment modalities, diagnostic techniques, and materials science to enhance patient outcomes and improve oral health care delivery [12,13,14].

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## 5. Conclusion

In the present study, it was evident that both MDS and CRI dental students possessed commendable knowledge of research and harboured positive attitudes toward conducting it. However, they faced challenges in translating this attitude into practice due to a lack of foundational training in research methodology, motivation, and time constraints. Notably, many postgraduate students primarily engage in research solely for their dissertation, highlighting a narrow scope of research involvement. To address this, it's imperative to sensitize students to the importance of research in healthcare.

Furthermore, faculty members and institutions should actively support and encourage students in their research pursuits. Providing mentorship, guidance, and resources will empower students to overcome barriers and actively contribute to the advancement of research in their respective fields. Ultimately, these efforts will lead to a more robust research culture within dental and life science education, positively impacting healthcare outcomes and advancing scientific knowledge.

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## Compliance with ethical standards

### *Disclosure of conflict of interest*

No conflict of interest to be disclosed.

### *Statement of ethical approval*

Publication of the report was approved by the Ethical committee of the university of MAHER.

### *Statement of informed consent*

Informed consent was obtained from all individual participants included in the study.

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