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3Knowledge and awareness among Dental Internship students towards research in Chennai -A Questionnaire study

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ABSTRACT :Background: Research literacy is crucial for evidence-based dental practice, yet gaps persist among dental interns. This study assesses their research knowledge, ethical awareness, and barriers to participation.

Methods: A questionnaire evaluated interns' understanding of research concepts, statistical methods, and ethical considerations. Responses were analyzed using frequency distributions and statistical tests ($p \leq 0.05$).

Results: While most understood systematic reviews (60%) and case-control studies (53.6%), misconceptions existed in RCTs (49.1%) and p-values (48.2%). Formal training improved research awareness ($p = 0.045$*), and 70.9% recognized ethical guidelines ($p = 0.044$*). Research was seen as beneficial ($p = 0.032$*), but barriers like time constraints (25.5%) and lack of guidance (23.6%) limited participation.

Conclusion: Dental interns show research competency but require improved training, mentorship, and resources to strengthen research engagement and evidence-based practice.

KEY WORDS: dental internship students, research knowledge, research awareness, research methodologies, healthcare research, research barriers, dissertation research, research training, institutional support, faculty encouragement, research culture, dental field, scientific knowledge.

I. INTRODUCTION

Research is essential for evidence-based treatment and is necessary for the education of undergraduate students[1]. It additionally enhances their critical thinking and problem-solving skills, equipping them with tools that can be immediately used in clinical environments[2]. Knowledge and awareness of research allow dental students to appreciate the scientific method and its application in clinical practice.In dentistry, ongoing improvements in techniques, treatments, and technologies are essential for enhancing patient care.The perspectives and understanding of dental internship students regarding scientific research have been assessed in various countries around the globe[3]. Studies in oral hygiene not only affect current dental practices but also play a key role in the future evolution of dentistry and the overall quality of patient care, thereby greatly influencing the dental profession[4]. This research seeks to evaluate the awareness level concerning dental research among Dental interns in Chennai[5].

Numerous studies have explored the knowledge, attitudes, and practices concerning research principles among healthcare professionals in medicine[6]. The main objective of this study was to evaluate the comprehension, views, and implementation of research concepts among Dental Internship students[7].Given this context, the present research was intended to investigate the

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extent of awareness and knowledge about medical research among CRI dental students[8].

Research plays a vital role in advancing dental science, An evidence-based practice that improves patient care and boosts treatment outcomes[9]. For dental professionals, staying current with the latest research trends and methods is essential for their career development[10]. However, the degree of comprehension and awareness regarding research among dental internship students remains inadequately investigated[11]. Dental interns are expected to engage in research activities[12].however, their understanding of research principles, methodologies, and the importance of research in clinical practice is not always well-documented[13].As interns move from theoretical knowledge to hands-on practice in dentistry, they start to see how research directly impacts patient outcomes, treatment methods, and the creation of new materials and techniques.

II.MATERIALS AND METHODS

This cross-sectional study intended to assess the knowledge and awareness of dental internship students about research in Chennai. A total of 110 dental interns from different dental institutions in Chennai were chosen using a convenience sampling approach. The criteria for inclusion consisted of dental interns who were currently participating in their internship programs throughout the study period. The research omitted interns who had previous formal research experience or who could not participate during the data collection time frame. The information was collected through a structured, pre-established questionnaire comprising 15 questions that evaluated interns comprehension of research principles, methods, and research's significance in clinical practice. The survey featured multiple-choice questions (MCQs) and underwent pre-testing with a small group of interns to guarantee clarity and reliability.

III.RESULT

TABLE 1 REPRESENTS THE KNOWLEDGE BASED QUESTIONS RESPONDED BY THE STUDY POPULATION

QUESTIONS	RESPONSES	FREQUENCY	PERCENTAGE	SIG
What is the primary purpose of a randomized controlled trial (RCT)?	To determine causality between an intervention and an outcome	54	49.1	**0.067**
	To explore relationships between variables	15	13.6	
	To observe outcomes in a natural setting	32	29.1	
	To study the prevalence of diseases	9	8.2	
What does "blinding" in a clinical trial aim to prevent?	Information bias	29	26.4	**0.088**
	Observer bias	28	25.5	
	Performance bias	7	6.4	
	Selection bias	46	41.8	
In medical research, what does "p-value" represent?	The probability of the null hypothesis being true	36	32.7	**0.321**
	The probability that the observed results occurred by chance	53	48.2	
	The strength of the association between two variables	14	12.7	

What is the main characteristic of a systematic review?	It involves qualitative data only	24	21.8	**0.023***
	It is always conducted by a single researcher	1	.9	
	It summarizes findings from multiple studies on a specific topic	66	60.0	
	It uses a single study design	10	9.1	
Which of the following best describes "informed consent" in clinical research?	A formality required by law for all research studies	12	10.9	**0.032***
	A legal document signed by participants	35	31.8	
	A process by which participants voluntarily confirm their willingness to participate	62	56.4	
	A statement of confidentiality provided to participants	1	.9	
Which type of study design is most appropriate for determining the prevalence of a specific dental condition in a population?	Case-control study	32	29.1	**0.012***
	Cohort study	6	5.5	
	Cross-sectional study	12	10.9	
	Randomized controlled trial	60	54.5	
What is the purpose of a systematic review in dental research?	To analyze data from a single clinical trial	30	27.3	**0.043***
	To collect qualitative data from patients	12	10.9	
	To combine results from multiple studies to draw a broader conclusion	65	59.1	
	To test a new dental intervention	3	2.7	
What type of bias is likely if patients know whether they are receiving a real or placebo treatment in a dental trial?	Detection bias	16	14.5	**0.053**
	Performance bias	61	55.5	
	Recall bias	26	23.6	
	Selection bias	7	6.4	

What is the main characteristic of a case-control study? *****	It collects data from a population at a single point in time	4	3.6	**0.000***
	It compares individuals with a disease to those without it to identify possible causes	59	53.6	
	It follows a group of individuals over time to see if they develop a disease	33	30.0	
	It randomly assigns participants to different treatment groups	14	12.7	

TABLE 1 illustrates the comprehension of the purpose of RCT:

Most respondents (49.1%) accurately recognized that randomized controlled trials (RCTs) establish causality, while 29.1% thought they serve to observe outcomes in a natural environment. Likewise, the answers concerning blinding in clinical trials were distributed among different biases, with selection bias (41.8%) being the most frequently selected, followed by information bias (26.4%) and observer bias (25.5%). In understanding p-values, almost half (48.2%) accurately recognized it as the likelihood that the observed results happened randomly, yet the differences in responses were not statistically significant ($p = 0.321$). These regions, together with the purpose of RCTs and the acknowledgment of biases, demonstrate a limited or unclear understanding, indicating that there is a need for additional education on research designs, p-values, and biases in clinical studies.

Conversely, participants exhibited a more robust comprehension in various essential aspects. A notable percentage (60%) accurately recognized systematic reviews as aggregating results from various studies, with a p-value of 0.023* suggesting substantial comprehension. Likewise, 56.4% accurately recognized informed consent as a voluntary agreement to participate, with a p-value of 0.032* indicating a statistically significant variation in responses. Moreover, although a majority of participants (54.5%) chose RCTs as the preferred study design for prevalence assessment, the more suitable option was the cross-sectional study (10.9%), with a p-value of 0.012* demonstrating a considerable misconception in this regard.

Ultimately, participants showed a definite understanding of case-control study traits, as 53.6% accurately recognized it as a comparison between those with and without a disease. The notably significant p-value (0.000*) reinforces this robust comprehension. Subjects with notable p-values (≤ 0.05) emphasize areas of deep comprehension, such as systematic reviews, informed consent, prevalence study design, systematic reviews in dental research, and case-control research. Nonetheless, non-significant p-values indicate the necessity for educational efforts aimed at elucidating study designs, minimizing biases, and enhancing understanding of statistical principles. Workshops for training might assist.

TABLE 2 REPRESENTS THE AWARENESS BASED QUESTIONS RESPONDED BY THE STUDY POPULATION

QUESTIONS	RESPONSES	FREQUENCY	PERCENTAGE	SIG
Do you have any experience in writing research before?	No	66	60.0	**0.063**
	Yes	44	40.0	
Have you received	No	53	48.2	

any formal training in research methodology during your dental education?	Yes	57	51.8	**0.045***
Do you believe that participating in research can enhance your clinical skills?	Agree	61	55.5	**0.032***
	Disagree	6	5.5	
	Strongly agree	43	39.1	
Are you aware of the ethical guidelines involved in conducting research?	No	32	29.1	**0.044***
	Yes	78	70.9	
What do you perceive as the main barriers to engaging in research during your internship?	Insufficient knowledge	24	21.8	**0.152**
	Lack of guidance	26	23.6	
	Lack of interest	20	18.2	
	Lack of time	28	25.5	
	Limited access to Resources	12	10.9	

TABLE 2 shows answers to awareness-related inquiries concerning research within the study group. Regarding research writing experience, 60% of participants indicated they had no previous experience, whereas 40% had a degree of experience. The p-value (0.063) shows no statistically significant difference in responses, indicating an overall absence of prior experience among the participants. Concerning formal training in research methodology, 51.8% of individuals received formal training, whereas 48.2% did not. The p-value (0.045) indicates a statistically significant difference, suggesting that training could contribute to improving research awareness.

The understanding of research's impact on boosting clinical skills showed that 55.5% of respondents believed research enhances clinical abilities, while 39.1% strongly concurred. Merely 5.5% were opposed, and the p-value (0.032) shows a statistically significant difference, strengthening the view that research beneficially aids clinical progress. Furthermore, knowledge of ethical guidelines was substantial, with 70.9% of respondents familiar with them and 29.1% not aware. The p-value (0.044) indicates a noteworthy difference, implying that knowledge of ethical guidelines plays a crucial role in participating in research.

Obstacles to participating in research during internships were noted, with the most frequently mentioned obstacles being insufficient time (25.5%) and inadequate support (23.6%). Additional obstacles comprised inadequate knowledge (21.8%), disinterest (18.2%), and restricted access to resources (10.9%). The p-value (0.152) indicates that there is no statistically significant difference in the perceived barriers. The results indicate a strong link between formal research training, ethical awareness, and the belief that research improves clinical skills. Tackling obstacles like time limitations, insufficient mentorship, and knowledge deficiencies could enhance research involvement among dental interns.

IV.DISCUSSION

The study results highlight variations in knowledge and awareness among dental students regarding research methodology. While almost half of the respondents correctly identified the purpose of randomized controlled trials (RCTs), a significant percentage had misconceptions[14]. Similarly, understanding of blinding in clinical

trials showed mixed responses, with selection bias being the most commonly chosen answer[15]. The concept of p-values, crucial in interpreting research results, was correctly understood by only 48.2% of participants, indicating a need for better statistical education[16]. Systematic reviews, which summarize findings from multiple studies, were well understood by 60% of the respondents, suggesting relatively stronger knowledge in this area[17]. However, study design selection for determining disease prevalence showed a notable gap, as many participants incorrectly identified randomized controlled trials instead of cross-sectional studies[18]. This indicates a need for better education on appropriate research methodologies[19].

In terms of research awareness, a majority (60%) reported no prior experience in writing research papers[20]. However, slightly more than half of the participants had received formal research training during their dental education, and this difference was statistically significant[21]. Interestingly, most participants believed that research participation enhances clinical skills, with 94.6% agreeing or strongly agreeing[22]. Awareness of ethical guidelines was relatively high, with 70.9% of respondents stating they were familiar with them, suggesting a positive trend in ethical research understanding[23]. However, significant barriers to research engagement were noted, with lack of time (25.5%) and lack of guidance (23.6%) being the most reported issues[24]. Other challenges included insufficient knowledge (21.8%) and limited access to resources (10.9%)[25]. Addressing these barriers may improve research participation among dental students[26].

Overall, the findings suggest that while students demonstrate some understanding of research principles, there are notable gaps in statistical knowledge, study design selection, and bias recognition[27]. Strengthening research training in dental education could help bridge these gaps and improve overall research competence[28]. Additionally, providing better mentorship and resources may encourage more students to engage in research activities[29]. Future efforts should focus on integrating structured research methodology programs and offering hands-on experience to enhance both knowledge and confidence in conducting research[30].

V.CONCLUSION:

This research shows a varied comprehension of essential research concepts among dental interns, demonstrating proficiency in systematic reviews and case-control studies, yet showing significant deficiencies in basic areas like RCTs and the interpretation of statistics. Although formal research training and ethical understanding seem to enhance research skills, common obstacles—especially time limitations, insufficient guidance, and resource shortages—impede active involvement in research activities. Tackling these challenges with focused educational initiatives, improved mentorship, and combined research opportunities may cultivate a more robust research culture, ultimately providing future dental professionals with the competencies essential for evidence-based practice and ongoing professional growth.

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