

Assessment of knowledge, attitude and practices towards research; the perspectives of dental graduates

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ABSTRACT

Background: Research is a systematic approach to reasoning and documenting clinical observations and problems that we encounter in clinical settings. It is a prerequisite for developing new skills and knowledge by all medical and dental professionals, which is beneficial for society.

Aim: To assess research related knowledge, attitude, and practices among dental undergraduate and graduate students of a private dental college in Lahore city.

Methods: Cross sectional with survey design was used in Dental College of Lahore Medical and Dental College, Lahore. The study took place between April 1st and July 1st, 2024. A total of 180 graduates and undergraduates of the college were selected. Data collection was done using a self-administered, structured, validated questionnaire. The questionnaire was divided into sections including sociodemographic factors, research knowledge, attitude, and research experience questions. For assessing knowledge, 10 dichotomous questions of true and false statements were used. A 5-point Likert scale (strongly disagreed, disagreed, neutral, agreed, and strongly agreed) was used to assess the attitude towards research; 7 positive and 7 negative questions were asked.

Results: A total of 180 participants 31.3% males and 68.9% females—were selected. 69.4% were graduates, and 30.6% were undergraduates. One-way ANOVA significance was found for knowledge and practices towards research with respect to age groups $p < 0.05$; however, an insignificant result was found with respect to attitude. Independent sample t test for gender and knowledge was insignificant $p > 0.05$. Insignificant result found for gender and practice; however, for attitude, significant result obtained; $p < 0.05$. Statistically significant results obtained for knowledge, attitude, and practices towards research with graduates and undergraduates, i.e., $p < 0.05$.

Conclusion: The dental undergraduates and graduates' students demonstrated good research knowledge and a positive attitude towards scientific research conduct, but the research practices were very low. Students should be actively engaged in research by making system-based reforms with respect to basic research knowledge and guidance to promote research culture.

Keywords: House Officers, Research, Knowledge, Assessment, graduates.

INTRODUCTION

Scientific progress depends on good research work that highlights the problems affecting the human health system and derives new scientific and technological advancements for treatment and cure¹. Prevention of diseases, correct diagnosis, and formulation of new and effective treatment plans depend on good research in the health system^{1,2}. Research is important to carry out continuous developmental activities; that is why academic institutions give weightage to research activities worldwide³. Research conduct has been considered a vital part of undergraduate and postgraduate training in the field of dentistry as well⁴. In academics, for successful conduction of a study, knowledge of epidemiological principles is needed, as is accurate data analysis from clinical investigation⁵. Meticulous attention is required in third world countries in the field of research to cope with worldwide medical and dental practices. The quality and number of ongoing research activities depict the progress of the scientific knowledge in dentistry^{5,6}.

Research projects are a part of the dental curriculum worldwide, and so in Pakistan. Basic understanding of research principles and biostatistics is a part of the second-year curriculum as well as in postgraduate programs⁷. Students do research, but many fail to get their research projects approved and published. Likewise, research culture is lacking in many institutions^{7,8}. Research work is generally focused on the university level; postgraduates and undergraduates' students stick to reading material given by the universities and do not indulge in research work. Motivation for research conduct is low, and students are less familiar with research writing^{9,10}.

Insufficient and poor attention to research activities in

systems and communities results in scientific and knowledge lags nationally and internationally¹¹⁻¹³. Young students must be motivated to pursue research processes in their careers. Furthermore, encourage students to attend scientific workshops, conferences, and symposia. By understanding and identifying students' perspectives, interests, and attitudes, we could suggest teachers' mentors increase student interest in research-based activities by designing and training better research protocols and giving incentives to teachers and students. This will result in continuing dental practice development, which will have a significant impact on dentistry. The objective of the current study was to find out the knowledge, attitude, and practices towards research of undergraduate and postgraduate students of a dental college.

METHODOLOGY

This cross-sectional study was carried out in the Dental College of Lahore Medical and Dental College from 1st April till 1st July 2024. The participants were undergraduate and graduate students of the respective college. Non-probability convenience sampling was used to sample selection.

Inclusion criteria: dental graduates, including HOs and postgraduate residents; undergraduate students of 3rd & 4th year.

Exclusion criteria: students of 1st and 2nd year BDS, MBBS students, medical officers, and specialists. Sample size was determined by Rao Soft Calculator considering the 87.3% prevalence of positive attitude towards research writing among students, 14 keeping the margin of error 5% and confidential level of 95%. The sample size calculated was 180. Sample size was determined by Rao Soft Calculator considering lack of knowledge about research writing methodology experience by medical students against the prevalence rate of 83%, 14 keeping margin of error 5% and confidential level of 95%. Ethical clearance was

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obtained from the Dental College Ethics Committee. Participation in the study was voluntary, and confidentiality was assured. Informed consent was taken. Undergraduate students and graduates were contacted during their clinical rotations in the dental clinics of the college by the study representatives. Participation in the study was entirely voluntary. Questions were designed according to target population culture, knowledge, and expected experience. The data collection authors were responsible for supervising the data collection as well as being responsive to ensure that the protocol of the study followed precisely. Data collection was done using a self-administered, structured questionnaire. The questionnaire was developed and modified from the studies published in well-reputed journals. Close-ended questions in the English language were included.^{15,16} The questionnaire was divided into sections including sociodemographic factors, research knowledge, attitude, and research experience questions. The sociodemographic details included age, gender, and academic status. For assessing knowledge, 10 dichotomous questions of true and false statements were used. The right answer was scored 1 and the wrong answer was scored zero. (The higher score depicted the better knowledge.) 5 points A Likert scale (strongly disagreed, disagreed, neutral, agreed, strongly agreed) was used to assess the attitude towards research; 7 positive and 7 negative questions were asked. For positive attitude questions, strongly disagreed was scored one and strongly agreed was scored 5 (a higher score indicated a better attitude). For negative attitude questions, score 1 was given to strongly agree, and score 5 was for strongly disagree. (Higher the score, better was the attitude.) For assessing research practices, seven dichotomous questions of yes and no statements were asked. (Score 1 was given for yes and zero for no; the higher score showed better practices towards research. The total score of the questionnaire was found through summing the scores of all items and finding mean scores. Furthermore, each domain was calculated by summing its item scores and finding mean scores.

A pilot study including 25 students was done to evaluate the reliability, validity, and clarity of the tool. Three expert researchers from the college assessed the content validity, and for clarity, the face validity was assessed. The Cronbach's alpha coefficient of research knowledge questions was .775, for attitude domain 0.687, and for research practices 0.744. After questionnaire tool coding and checking the data entry was carried out using Microsoft Excel, and SPSS version 26 was used for data analysis. For quantitative analysis, e.g., age, mean and SD were calculated, and for qualitative variables, frequency and percentages were calculated. An independent sample t test and one-way ANOVA were used to check knowledge, attitude, and practices of research between different age groups, genders, and statuses of students. The level of significance was kept at 0.05.

RESULTS

A total of 180 participants of both genders were selected for the current study. 56(31.3%) were males and 123(68.9%) were females, with ages ranging from 19 to 28 years with a mean age of 24.16±SD 2.19. 125(69.4%) were graduates, and 55(30.6%) were undergraduate students of the respective college. The frequency distribution of answers for questions regarding attitude, knowledge, and practice of research is shown in Tables 1 and 2. Comparison of knowledge, attitude, and practices of research with demographic characters is shown in Table 3. One-way Anova significance was found for knowledge and practices towards research with respect to age groups p<0.05. An insignificant result, i.e., p > 0.05, was found with respect to attitude. Independent sample t test for gender and knowledge was insignificant p< 0.05. A statistically insignificant result was found for gender and practice; however, the test for attitude was significant p<0.05 (Table 3). Statistically significant results obtained for knowledge, attitude, and practices towards research with respect to graduates and undergraduates, i.e., p<0.05 (Table 3).

Table 1: Frequency distribution of answers of participants about attitude questions (n=180)

Questions	Strongly disagree n(%)	Disagree n(%)	Neutral n(%)	Agree n(%)	Strongly agree n(%)
Science has extended human life span	0(0.00)	0(0.00)	23(12.8)	84(46.7)	73(40.6)
Science provides deeper understanding of the world	0(0.00)	2(1.10)	31(17.2)	80(44.4)	67(37.2)
Scientists are fascinating and imaginative individuals	0(0.00)	1(0.6)	26(16.1)	84(46.7)	66(36.7)
Use of scientific methodology forms the foundation of medical process	0(0.00)	2(1.1)	30(16.7)	84(46.7)	64(35.6)
Research should be made a part of curriculum	0(0.00)	2(1.1)	34(18.9)	78(43.3)	66(36.7)
Research writing is empirical for becoming specialist	0(0.00)	4(2.2)	31(17.2)	78(43.3)	67(37.2)
Research training should be offered to all undergraduates	8(4.4)	11(6.1)	35(19.4)	77(42.8)	49(27.2)
Scientific methods impose excessive restrictions	51(28.31)	76(42.2)	42(23.3)	5(2.8)	6(3.3)
The negative effects of science outweigh the positive ones	55(30.6)	87(48.3)	33(18.3)	1(0.6)	4(2.2)
Scientific ways of thinking are monotonous and boring	58(32.2)	79(43.9)	37(20.6)	2(1.1)	4(2.2)
Undertaking research puts a burden on students	54(30.0)	92(51.1)	29(16.1)	2(1.1)	3(1.7)
Research conduction is waste of time if it does not uplift my career	59(32.8)	81(45.0)	34(18.9)	3(1.7)	3(1.7)
Clinical research does not improve patient outcomes	59(32.8)	86(47.8)	29(16.1)	2(1.1)	4(2.2)
I am not interested in conducting research	60(33.5)	73(40.6)	37(20.6)	6(3.3)	3(1.7)

Table 2: Frequency distribution of answers of questions on the research practice/ research knowledge (n=180).

Questions	Yes n(%)	Non(%)
I read journals regularly	35(19.4)	145(80.5)
I took part in workshops on research methodology	79(43.9)	101(56.1)
I have experience in drafting a research protocol	61(33.9)	119(66.1)
I have published articles in journals	46(25.6)	134(74.4)
I have research papers/ poster presented experience	92(51.1)	88(48.9)
I have participated in designing a questionnaire	60(33.8)	120(66.2)
I have analyzed research data	45(25.5)	135(74.5)
Assessment of research knowledge		
Is inform consent optional in research involving human subject?	88(48.9)	92(51.1)
Does literature review help in identifying gaps in current research?	139(77.2)	41(22.8)
Can small sample size effect the generalizability of research findings?	145(80.6)	35(19.4)
Is peer review process intended to ensure the quality and validity of research paper?	196(93.9)	11(6.1)
Is p value less than 0.05 typically considered statistically significant?	161(89.4)	19(10.6)
Is blinding used to prevent bias in medical trials?	162(90.0)	18(10.0)
Is a control group necessary in experimental research?	155(86.1)	25(13.9)
Is hypothesis generally developed after the research design is finalized?	102(56.7)	78(43.3)
Does rejecting the null hypothesis implies that the alternative hypothesis is true?	142(78.9)	38(21.1)
Can a hypothesis be supported but not necessarily proven true?	174(96.7)	6(3.3)

Table 3: Comparison of knowledge, attitude and practices of research with demographic characters (n=180).

Variables	Knowledge Mean \pm SD	Attitude Mean \pm SD	Practice Mean \pm SD
Age^a			
<22	1.20 \pm 0.21	1.88 \pm 0.28	1.88 \pm 0.28
23-24	1.20 \pm 0.71	1.90 \pm 0.33	1.90 \pm 0.33
>24	1.26 \pm 1.20	2.00 \pm 0.34	2.00 \pm 0.34
p	0.02	0.07	0.00
Gender^b			
Male	1.22 \pm 0.15	1.94 \pm 0.44	1.46 \pm 0.32
Female	1.19 \pm 0.17	1.95 \pm 0.26	1.78 \pm 0.39
p	0.71	0.00	0.12
Status^b			
Graduates	1.24 \pm 0.14	1.96 \pm 0.36	1.84 \pm 0.38
Under graduates	1.19 \pm 0.20	1.91 \pm 0.27	1.61 \pm 0.17
P	0.00	0.00	0.00

^aOne-way Anova, ^bindependent sample t test

DISCUSSION

For becoming a competent dental practitioner, one should have a basic idea of research conduction procedure and methodology. This cross-sectional study was conducted to access research related knowledge, attitudes, and practices among dental undergrads and graduate (postgraduates, house officers) students in a private dental college in Lahore city.

For successful research conduct in academics, good knowledge of epidemiological principles and accurate analysis of the data to derive truthful outcomes are needed^{15,16}. In the current study, the basic research knowledge was accessed via questionnaire related to the research conduct process. It was found that the research-related knowledge of both undergraduates and graduates (house officers, postgraduates) group was satisfactory, as the maximum number of participants answered correctly. However, when graduates and undergraduates were compared, the research-related knowledge of graduates was significantly better than that of undergrad students. In contrast, Soe¹⁶ and coworkers reported 56.9% of their students had moderate knowledge, whereas only 4% possessed good knowledge. Alsabaani¹⁵ and coworkers concluded poor knowledge of research in three schools of medicine, dentistry, and pharmacy. Likewise, few other studies have concluded poor to moderate research-based knowledge in undergraduate students. Razieh¹⁷ and coworkers reported that their students had poor understandability of statistical findings and research writing. Few other studies reported the parallel findings^{18,19}.

Similarly, Abdullah²⁰ and coworkers reported only 2.8% of students with good awareness of research and the majority, 66.5%, with poor awareness. Likewise, 80.5% reported no or lack of previous research experience. The reason for better research knowledge in the current study could be explained by the fact that in our college, research activities are a compulsory part of the UHS second year course. Carrying out research is mandatory for each student, and they have been taught research methodologies as a part of their university curriculum.

In the current study, the difference in research related knowledge was seen within gender, where male participants had better knowledge of research related questions, but the difference was not significant. In contrast, Soe¹⁶ and coworkers found significantly better knowledge of research in females and a better attitude towards research in males. Similarly, when knowledge was assessed among different age groups, a good number of students possessed better research-related knowledge in the oldest age group as compared to younger groups. In accordance with the results of the current study, mean scores of knowledge and attitude within the oldest age group were highest in the study carried out by Soe¹⁶ and coworkers. They claimed that age is significantly related to knowledge but not attitudes. They reported significantly improved research related knowledge within academic years.

Attitude towards research conduct is one of the pillars of evidence-based health care practice¹³⁻¹⁵. The attitude agreement with positive statements and maximum disagreement with negative statements of the participants in the current study was assessed via asking 7 positive and 7 negative statements. Maximum agreement with positive statements and maximum disagreement with negative statements were seen. In the current study, the mean attitude scores were better in graduates than undergraduate students. When attitudes were compared with respect to gender, it was seen that female participants significantly showed a better attitude towards research conduct. Similarly, it was found that the senior age group had a better attitude towards research as compared to the younger groups, but the difference was insignificant. Abdullah²⁰ and coworkers reported 56.3% of students with a positive attitude towards research writing. Asabaani¹⁵ and coworkers reported 56.3% of students showing a positive attitude towards research activities. Alsaleem and Mubarak²¹ also reported parallel results. Soe¹⁶ found 81.94% of students with a positive attitude, whereas 83.3% had a moderate level and 11.3% had a good attitude. They stated that the mean score of knowledge and attitude was highest in the oldest age group and reported that age was significantly associated with knowledge but not with attitude.

Bonner and Sando²² reported a better score of knowledge and positive attitude in senior students. Grossman²³ and coworkers in an African dental school found that dental students know the importance of conducting research yet they don't do it, and many did not enjoy the research conduction process. Practicing research plays a vital part in updating modern and smart dental practice. Very few, i.e., 43.9%, participants of the current study took part in research workshops. 33.9% of participants had ever drafted a research paper. The majority of the graduates and undergraduates' students said that they had never published any research papers. Likewise, 74.5% never actually analyzed any scientific research data. However, practice of research was significantly better in the postgraduate and graduates' groups as compared to undergraduates. Similarly, a significant difference was found when compared in age. This can be attributed to the fact that research and methodology projects are required for postgraduate courses, and students find time and become more serious in conducting research. Similarly, a lack of research culture has been seen in some other developing countries.

Other studies also stated that lack of proper motivation/reward, educational burden, and activities are a few elements that are the reasons for suppressing research culture^{24,25}.

System-based reforms to help dental students with respect to basic research knowledge, guidance, and facilitation should be incorporated in the education system. For any dentist who carries out evidence-based and modern dental practices, knowledge and familiarity with research are needed, and to do so, research projects in dental colleges must be done when enrolled as a dental student. All these amendments not only encourage young minds but will also increase interest in research. Further studies are required to evaluate the best possible strategies for facilitating the research interests of students, thus establishing a better research system.

The limitation of the study was that it was a cross-sectional study, so a causative conclusion had not been established. Moreover, the questionnaire tool used could have an element of central tendency bias (extreme statements avoided by the participants) and social desirability bias (participants' tendency to answer positively so that has to be viewed by others positively).

CONCLUSION

The dental undergraduates and graduates' students demonstrated good research knowledge and a positive attitude towards scientific research conduct, but the research practices were very low. Students should be actively engaged in research by making

system-based reforms with respect to basic research knowledge, guidance, and facilitation to promote research culture.

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