



EPISTEME OF BIOETHICS AMONG UNDERGRADUATE AND POSTGRADUATE DENTAL STUDENTS OF VARIOUS DENTAL COLLEGES ACROSS TAMIL NADU, INDIA - A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: The field of dentistry is multi-dimensional in nature. Each dimension on its own are facing many ethical dilemmas in day-to-day practice. These ethical dilemmas appear based on the knowledge, attitude and practice of bioethics by the dental practitioners.

Aim: This study aims to assess the knowledge, attitude, practice and awareness level of bioethics among the undergraduate and post graduate students across Tamil Nadu.

Materials and Methods: One hundred and ninety-five individuals participated in the study. Among them 141 were undergraduate and 54 were postgraduate dental students. A set of 20 closed ended questions were given to the participants and the answer obtained were tabulated and recorded. Descriptive statistics was performed to know the gender distribution among study population and inferential statistics was performed using chi-square test to determine the association between the undergraduate and postgraduate students.

Result: Among the questions obtained from undergraduate and post graduate students it was found that only 7.8% undergraduate and 11.1% postgraduate students had excellent awareness about bioethics and 53.9% and 51.9% undergraduate and postgraduate students respectively had good awareness. This awareness levels reflected on their clinical practice as well. The association between undergraduate and postgraduate students was done and p value <0.05 was found to be statistically significant.

Conclusion: We in the field of dentistry, practising bioethics is very important to deal with the patients and help them to progress further in their treatment so it is very essential for the undergraduate and postgraduate students to have knowledge and develop skills in their day to day practice. Lack of awareness and knowledge leads to lack of practice of bioethics. Hence, it is necessary to inculcate the basic knowledge for the students from an undergraduate level to have a successful dental practice without any ethical issues.

KEY WORDS: Bioethics, Dentistry, Awareness, Dental Practice, Knowledge

INTRODUCTION

Dentistry as such is complex with many clinical procedures done on a patient. For a successful dental practice, knowledge and above all skills forms the baseline to quote this baseline knowledge and practice of bioethics has become a requirement of professional accreditation for dental students.

Bioethics is basically the combination of biological knowledge with a set of human values^[1].

There are three universal principles of bioethics-respect for persons, beneficence and justice which, forms the background for health care professionals to guide and put them into clinical practice^[2,3]. These principles by Belmont



report(1978) later Beauchamp's and Childress proposed its application to all health practices.^[4] Hippocrates oath, the hallmark ground is now redefined by Nuremberg code and Helsinki declaration^[5]. However, Nuremberg code is purely for patients or subjects under experimental research which is applicable for some clinical procedures^[6]. But in recent times many dental colleges are not emphasizing the importance of Hippocrates oath which may be due to the lack of awareness. Most students are not aware of the ICMR (Indian Council of Medical Research) guidelines for research^[7] like Hippocrates oath code of dental ethics which was given by ADA (American Dental Association) that serves as standard for dental professionals in their practice^[8]

Nowadays, ethical issues are becoming more complex concerning to the dental surgeons in contrary to past^[9]. This is also Attributable to the changing attitude of patients. The knowledge and practice of bioethics should embark from an undergraduate level. Teaching of bioethics to dental students should begin before they are into clinical practice^[10]. This will conversely mitigate the violations of ethical laws. If bioethics persists as a part of dental curriculum, the seriousness of this topic will be integrated in a dental student from the classrooms^[11]. And so new methodology should refine the traditional ethics and teach according to the current scenario and it should also involve unique perceptions to people different socioeconomic status, cultural and geographic background^[12]. Hence, the curriculum can only be designed based on the knowledge and awareness levels of the students^[7]

Awareness of bioethics differs from person to person, place to place etc but it is a universal principle, which has to be followed by all medical professionals or people who are associated with treating patients. The value of bioethics should be inculcated to every dental professional graduating from a dental college to ensure that high standards of clinical practice are maintained^[13]. In recent scenario, the ethical issues in clinical practice as well as in the field of research are increasing day by day mainly due to the lack of knowledge and awareness about bioethics.

Assessment of awareness levels not only helps dental students and dental professionals to know their stance but also helps to improve and work on it in near future. So, the present study was conducted with an objective to assess the knowledge,

attitude and practice of bioethics among undergraduate and postgraduate dental students in Tamil Nadu. The awareness level of students were assessed to know the level of awareness each student has and this will reflect on their successful ethical clinical practice.

MATERIALS AND METHODS

A cross-sectional study was conducted among undergraduate and postgraduate dental students to assess the knowledge, attitude and practice of bioethics across Tamil Nadu, India. The research was conducted among undergraduate and postgraduate dental students of various dental colleges across Tamil Nadu, conforming to convenience sampling technique, the questionnaire based cross-sectional study was conducted for a period of 3 weeks in the month of September 2019 among 195 dental students out of which 141 undergraduate students and 54 postgraduate dental students participated in the study. Permission and ethical clearance were obtained from the Department of Public Health Dentistry, SRM dental college, Ramapuram. Considering it, the questionnaire-based study; verbal consent was taken from the participants. The questions by validated from the experts in the field of bioethics before questioning the participants. The inclusion criteria comprised of all the individuals willing to participate in the study. The exclusion criteria comprised of people not willing to participate in the study, Individuals of other medical profession and Individuals of other profession were excluded from the study. A set of 20 closed ended questions were used to collect data from the study. The questionnaire consisting of questions such as awareness, knowledge, their viewpoints and practical situations about bioethics was given to the undergraduate and post graduate students and data were collected. Statistical analysis was performed using SPSS version 25.0, (SPSS Inc, Illinois, Chicago, USA). Descriptive statistics was performed to know the gender distribution among study population and among all the questionnaire asked regarding the survey. Inferential statistics was performed using chi-square test to determine the association between the undergraduate and postgraduate students regarding the knowledge, attitude and practice of bioethics.

RESULTS

Table 1: Distribution of study population

	Frequency	Percentage
Undergraduate students (1st, 2nd, 3rd, 4th years and interns)	141	72.0
Postgraduate students	54	28.0
Total	195	100.0

Totally, 195 individuals attended this questionnaire-based survey in which 141 were undergraduate dental students and 54 were postgraduate dental students. Table 1 shows the

distribution of study population among dental students and among them 72% were undergraduate students and 28% were postgraduate dental students.

**Table 2: Association between undergraduate and postgraduate students done with Chi-Square Tests.**

questionnaire	options	Undergraduate students		postgraduate students		P-value
		Frequency	Percentage	Frequency	Percentage	
Awareness about bioethics	Excellent	11	7.8	6	11.1	0.904
	Good	76	53.9	28	51.9	
	Fair	46	32.6	18	33.3	
	Poor	8	5.7	2	3.7	
	Total	141	100.0	54	100.0	
Have you taken Hippocrates oath at the time of joining dentistry?	Yes	102	72.3	28	51.9	0.847
	No	39	27.7	26	48.1	
	Total	141	100.0	54	100.0	
Have you heard of Dental quacks?	Yes	68	48.2	48	88.9	0.712
	No	73	51.8	6	11.1	
	Total	141	100.0	54	100.0	
Do you know that there are 4 principles of bioethics?	Yes	27	19.1	24	44.4	0.548
	No	79	56.0	22	40.7	
	May be	35	24.8	8	14.8	
	Total	141	100.0	54	100.0	
Will you explain the patient about your treatment procedure before you start the treatment?	Always	119	84.4	52	96.3	0.853
	Sometimes	22	15.6	2	3.7	
	Never	0	0	0	0	
	Total	141	100.0	54	100.0	
Have you truthfully answered the questions asked by patients in all situations?	Always	96	68.1	40	74.1	0.546
	Sometimes	41	29.1	14	25.9	
	Never	4	2.8	0	0	
	Total	141	100.0	54	100.0	
Will you always say the side effects of a treatment before you start?	Always	94	66.7	34	63.0	0.901
	Sometimes	41	29.1	19	35.2	
	Never	6	4.3	1	1.9	
	Total	141	100.0	54	100.0	
Will you ask the patient's desire before treatment?	Always	112	79.4	46	85.2	0.976
	Sometimes	27	19.1	8	14.8	
	Never	2	1.4	0	0	
	Total	141	100.0	54	100.0	
Do you use complicated medical terms in front of patients?	Always	5	3.5	38	70.4	0.913
	Sometimes	71	50.4	16	29.6	
	Never	65	46.1	0	0	
	Total	141	100.0	54	100.0	
Is the importance of ethics being emphasized in clinical classes?	Always	58	41.1	23	42.6	0.741
	Sometimes	77	54.6	30	55.6	
	Never	6	4.3	1	1.9	
	Total	141	100.0	54	100.0	
Will you take a detailed case history before start of the treatment without having trust on patients' early records?	Always	96	68.1	28	51.9	0.624
	Sometimes	34	24.1	24	44.4	
	Never	11	7.8	2	3.7	
	Total	141	100.0	54	100.0	



Will you use sterilized instruments for all patients even in a crowded day?	Always Sometimes Never Total	108 27 6 141	76.6 19.1 4.3 100.0	40 14 0 54	74.1 25.9 0 100.0	0.403
Will you inform a patient if your endodontic file gets broken in the root canal during the procedure?	Always Sometimes Never Total	67 49 25 141	47.5 34.8 17.7 100.0	24 19 11 54	44.4 35.5 20.4 100.0	0.187
If there is a class II cavity will you wait for RCT or take primary measures?	Always Sometimes Never Total	17 49 75 141	12.1 34.8 53.2 100.0	6 5 43 54	11.1 9.3 79.6 100.0	0.311
Have you ever informed the patient that you have injured normal tissue during scaling?	Always Sometimes Never Total	32 68 41 141	22.7 48.2 29.1 100.0	16 22 16 54	29.6 40.7 29.6 100.0	0.890
Do you use lead aprons for patients who undergo multiple exposures during taking x-ray?	Always Sometimes Never Total	37 42 62 141	26.6 29.8 44.0 100.0	16 22 16 54	29.6 40.7 29.6 100.0	0.989
Will you prescribe antibiotics for all extractions?	Always Sometimes Never Total	62 70 9 141	44.0 49.6 6.4 100.0	28 23 3 54	51.9 42.6 5.6 100.0	0.015*
Do you prescribe drugs in their generic name/brand name / both?	Generic name Brand name Both Total	35 33 73 141	24.8 23.4 51.8 100.0	8 12 34 54	14.8 22.2 63.0 100.0	0.395
Do you discuss your treatment plan with his/her relative?	Always Sometimes Never Total	54 73 14 141	38.3 51.8 9.9 100.0	20 30 4 54	37.0 55.6 7.4 100.0	0.575
If the patient comes with a history of any failure from a wrongly done treatment from another doctor. Do you tell the reason of failure directly to the patient?	Always Sometimes Never Total	53 71 17 141	37.6 50.4 12.1 100.0	10 26 18 54	18.4 48.1 33.3 100.0	0.778

Table 2 shows the distribution of questionnaire among undergraduate students in which more than 7.8% of the students have excellent awareness of bioethics in which 11.1%

of the students have excellent awareness of bioethics. Association between undergraduate and postgraduate students



done with Chi-Square Tests. P-values <0.05 were considered to be statistically significant.

DISCUSSION

In the field of dentistry, we treat patients on a day to day basis. Its all about giving the patient proper dental care, in order to achieve a successful dental practice. Every practising dentist or a dental student treating patients should be aware of the basics of bioethics which will reduce the ethical issues that are rising day by day. Ana Amelia Barbieri et al suggested that bioethics is a fundamental reflection in clinical practice [4]. These issues will not arise when the dentist had a proper knowledge and awareness of bioethics. This awareness and knowledge should be inculcated from an undergraduate level in order to put these into clinical practice.

Dr. Barry Schwartz suggested in his study that to deal effectively with ethical dilemmas, the teaching of bioethics should be from an undergraduate level [14]. However, in order to implement this we should assess how much the students are aware of, so that new teaching systems can be implemented [7]. Consequently, the present study was an effort to assess the knowledge, attitude and practice of bioethics among undergraduate and postgraduate dental students across Tamilnadu, India. Almost all students had awareness of bioethics except the 5.7% of undergraduate students and the 3.7% of postgraduate students, although interestingly, 53.9% of undergraduate students had good awareness of bioethics than the 51.9% of suggesting that the upcoming dentists had more awareness than the existing ones.

Hippocrates oath was recognised to be the historical gold standard oath for ethics and people working on patients were expected to follow the oath taken by them. Substantively, around 27.7% undergraduate and 48.1% postgraduate students did not take Hippocrates oath at the time accession. Consequently, many colleges are taking more initiative to make the students take up the oath of ethics in the recent past than the earlier years. Dental quacks are increasing in the field of dentistry, as people practice dentistry without a proper degree. So, awareness about such things is very important to educate the public regarding the same. Around 88.9% postgraduate and 48.2% of the undergraduate students have awareness about dental quacks and 11.1% postgraduate and 51.8% have never heard of dental quacks.

There are 4 basic universal principles of bioethics which when followed reduce ethical issues. These principles are the baseline but surprisingly only 19.1% of undergraduate students had knowledge regarding the principles and postgraduate students (44.4%) had better knowledge compared to undergraduate students. Even explaining the treatment procedure before the treatment comes under one of the laws of ethics. 84.4% undergraduate and 96.3% of the postgraduate students always explain the procedure before treatment and 15.6% of undergraduate students and 3.7% postgraduate students sometimes explain the procedure to the patient before treatment and none of undergraduate and post students never start the procedure without explaining which shows that both undergraduate and postgraduate students have the basic awareness and apply that into practice

Truthfulness to the patient is a very important aspect of bioethics. Patients tend to ask many questions to the dentist during the treatment, it is the duty of the dentist to answer them all truthfully in almost all situation. 68.1% and 74.1% of the undergraduate and postgraduate students respectively have always answered truthfully to the patient and surprisingly 2.8% of the undergraduate students never be truthful to the patient's questions. This may be due to the lack of awareness of bioethics.

Patients' choice for treatment must be respected (Autonomy) before the dentists formulates a treatment plan. The platter of choice should be made available to the patient and the dentist should explain the advantages, disadvantages and risks involved in each type of treatment. The patient must have all these information in order to make a decision [4]. 79.4% undergraduate and 85.2% postgraduate students will always ask for patient's desire before treatment which is a good sign but only 66.7 % of the undergraduate and 63% postgraduate students tell the side effects of the treatment and 1.9% postgraduates will never tell the sides effects of the treatment which clearly says that that group of people doesn't put the principles of bioethics in their clinical practice and none of the post graduate students never ask for patients desire which shows postgraduate students have better knowledge and practice of bioethics.

Doctors should always explain in way that a patient understands. If they use complicated medical terms in front of the patient, it is against laws of ethics. Surprisingly only 3.5% of undergraduate and 70.4% of the postgraduate always used complicated medical terms in front of the patient. Postgraduate students mostly always used which means they are against the law of ethics and 46.1% undergraduate students never used complicated medical terms in front of patients.

Teaching of bioethics from an undergraduate level [10] is very essential so that it is incorporated in the clinical practice from an much earlier stage. For 41.1% undergraduate and 42.6% postgraduate students the importance of bioethics is always emphasized in clinical classes and for 4.3% undergraduate and 1.9% postgraduate students it is never been emphasized in clinical classes.

Taking a detailed case history is very necessary even though patient has previous records, the clinical conditions are dynamic so it is better to take a case history before we start the procedure. More than half of the students participated in the study (68.1% undergraduate and 51.9% postgraduate) will always take case history before they start the treatment. Almost all students always sterilize the instruments for all patients (76.6% undergraduate and 74.1% postgraduate) which will prevent hospital acquired infections to the patients. If an endodontic file is broken in the root canal the first step, we have to do is inform the patient. If the dentist doesn't inform the patient and continue with the treatment it is completely against ethics [14]. Among the undergraduate students 47.5% always informs and 17.7% never informs the patient regarding this and among the post graduate students 44.4% always informs and 20.4% never informs the patients. This shows that both undergraduate and postgraduate students act similarly in these situations. Similarly, there can be soft tissue injuries



during scaling in which among the undergraduate 22.7% always and 29.1% never informs the patients and among the postgraduate students 29.6% always and 29.6% never inform the patient.

Radiation exposures more than a limit is hazardous to the patient so when there is a need for multiple exposure then protective aids like lead aprons and thyroid collars should be given to the patient (principle-non maleficence). But most due to lack of awareness and time many students tend to forget during the exposures. Only 26.6% undergraduate and 29.6% postgraduate students always use lead aprons for multiple exposures and unexpectedly 44.0% undergraduate and 29.6% of postgraduate students never use lead aprons for multiple exposure.

Prescribing drugs after treatment is an important aspect of the treatment course and drugs which are prescribed to the patient in generic name usually costs less than when prescribed in brand name. It is surprising that only 24.8% undergraduate and 14.8% postgraduate students prescribe drugs in generic name and 23.4% undergraduate and 22.2% postgraduate students prescribe drugs in their brand name. Interestingly, 51.8% undergraduate and 63.0% postgraduate students prescribe drugs both in the brand name and generic name. Not all extraction needs antibiotic therapy. Unnecessary use of antibiotics may cause antimicrobial resistance^[15] which is a harm to the patients and against the law of bioethics. Among undergraduate students 44.0% always and 6.4% never prescribe antibiotics to all extractions and among postgraduate students 51.9% always and 5.6% never prescribe antibiotics to all extractions.

Confidentiality is an important aspect of bioethics. Unless the patient is willing to discuss their condition with their relative or the person accompanying them, it is against the law of bioethics to discuss without the patient's consent. Confidentiality must also exist between the dentists. Among undergraduate 38.3% always and 9.9% never inform the patient's relative without patient's consent. Among the postgraduate students 37.0% always and 7.4% never inform the patient's relative without patient's consent. Among the undergraduate 37.6% always and 12.1% never reveal the mistakes done by other dentist to the patient. Among postgraduate students 18.4% always, 33.3% never reveal the mistakes done by other dentist to the patient. The association between undergraduate and postgraduate students was done and it was found that p value <0.05 was found statistically significant. Only one question regarding the prescription of antibiotics was found statistically significant with a p value of 0.015.

CONCLUSION

Bioethics is an integral part of clinical practice. When it is not followed may lead to many serious ethical issues. Lack of practice of bioethics is mainly due to the lack of awareness and knowledge of bioethics. This study shows the knowledge and awareness levels including its practice in clinical scenarios among the undergraduate and postgraduate dental students. A positive association was obtained on

prescribing antibiotics for all types of extraction among the undergraduate and post graduate dental students.

Ethical statement: Not applicable

Consent statement: Not applicable

Conflict of interest: None

REFERENCES

1. Potter VR. *Bioethics, the science of survival. Perspectives in biology and medicine.* 1970;14(1):127-153. 10.1353/pbm.1970.0015
2. Summers J, Morrison E. *Principles of healthcare ethics. Health Care Ethics.* 2nd ed. Sudbury: Jones and Bartlett Publishers. 2009:41-58.
3. Beauchamp TL, Childress JF. *Principles of biomedical ethics.* Oxford University Press, USA; 2001:180-187.
4. Amélia BA, Alves FF, Judica RC, Symone T. *Bioethics—A Fundamental Reflection.* 2013;12(3):125-129.
5. Adhikari S, Paudel K, Aro AR, Adhikari TB, Adhikari B, Mishra SR. *Knowledge, attitude and practice of healthcare ethics among resident doctors and ward nurses from a resource poor setting, Nepal. BMC medical ethics.* 2016 Dec 1;17(1):68-76.
6. Marinozzi S, Corbellini G, Ottolenghi L, Ripari F, Pizzuti A, Pezzetti M, Gaj F. *From Nuremberg to bioethics: an educational project for students of dentistry and dental prosthesis. Annali di stomatologia.* 2013 Jan;4(1):138-142.
7. Janakiram C, Gardens SJ. *Knowledge, attitudes and practices related to healthcare ethics among medical and dental postgraduate students in south India.* 2018;12(1):1112-1129
8. Hugo FN, Rosalen PL, Marcondes FK. *Hippocrates oath. International journal of community dental research* 2012 Jan;2(9(3):114-119.
9. Murariu A, Pricop M, Bobu L, Geletu G, Danila V, Balan A. *e al., Ethics dimensions in dentistry. Romanian Journal of Oral Rehabilitation.* 2016 Jan 1;8(1):113-123.
10. Berk NW. *Teaching ethics in dental schools: trends, techniques, and targets. Journal of dental education.* 2001 Aug;65(8):744-50.
11. Aires CP, Hugo FN, Rosalen PL, Marcondes FK. *Teaching of bioethics in dental graduate programs in Brazil. Brazilian oral research.* 2006 Dec;20(4):285-299.
12. Cowley C. *The dangers of medical ethics. Journal of Medical Ethics.* 2005 Dec 1;31(12):739-42.
13. Mallela KK, Walia R, Chaitra Devi TM, Das M, Sepolia S, Sethi P. *Knowledge, attitudes and practice about research ethics among dental faculty in the North India. Journal of international oral health: JIOH.* 2015;7(Suppl 2):52:103-109.
14. Schwartz B. *Dental ethics: our future lies in education and ethics committees. Journal-Canadian Dental Association.* 2004;70(2):85-88.
15. Kandemir S, Ergül N. *Grievances in cases using antibiotics due to orodental problems and assessment of the need for antibiotics. International dental journal.* 2000 Apr;50(2):73-77.