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# Assessment of knowledge, attitude, and practice regarding intellectual property rights among medical, dental, and nursing professionals in a tertiary institution in Bhubaneswar City, Odisha: A cross-sectional survey

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## Abstract:

**BACKGROUND:** To assess the knowledge, attitude, and practice (KAP) about intellectual property rights (IPRs) among medical, dental, and nursing students and faculties in a tertiary institute through cross-sectional survey in Bhubaneswar City, Odisha.

**MATERIALS AND METHODS:** This study was a cross-sectional survey conducted from October to December, 2021 in a tertiary institution in Bhubaneswar city, Odisha. A self-structured, 29 close-ended questionnaires based on IPRs was used in the survey. The data obtained were tabulated and analyzed statistically using the Statistical Package for Social Sciences version 23.0. All the components of KAP were measured as absolute and relative frequencies. They were also assessed as mean and standard deviation. Descriptive analysis through frequency distribution was calculated and the Chi-square test was applied. The correlation between the domains was determined using Pearson's correlation coefficient.

**RESULT:** A total of 489 participants participated in the survey, out of which 196 (40.1%) were males and 293 (59.9%) were females; 177 (36.2%) were interns, 147 (30.1%) were postgraduates, and 165 (33.7%) were faculties from all the three fields (medical, dental, and nursing). A total of 192 (39.3%) participants were from medical, 198 (40.5%) from dental, and 99 (20.2%) were from the nursing field. The mean KAP scores were significantly ( $P < 0.0001$ ) higher among nursing interns respondents (2.963, 0.637, and 0.390), dental postgraduate respondents (2.213, 0.844, and 0.351), and dental faculties (1.953, 0.876, and 0.481). The mean knowledge score was significantly ( $P < 0.0001$ ) greater among females than males and the mean attitude and practice scores were significantly ( $P < 0.0001$ ) greater among males than females. Pearson's correlation coefficient was found to be significant for knowledge-attitude, knowledge-practice domain. The values obtained were statistically significant.

**CONCLUSION:** This study showed that more KAP was found in dental faculties, dental postgraduates, and nursing interns. However, the need to know IPR is still lacking among the healthcare professionals. Since IPR is the need of the hour and it has a potential ahead, it is necessary to include it in the curriculum so as to increase the knowledge about IPR among individuals, which will enable to creation of dynamic innovations in the near future.

## Keywords:

Copyrights, healthcare, intellectual property, patent, trademark

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## Introduction

Intellectual property rights (IPRs) are constitutional protections that regulate the utilization of human inventions. The industrial domain includes patents, designs, and trademarks. A patent is an innovation and the focus is on patent rights. An individual or a team who creates a new procedure, equipment, or production by their talent or labor owns that concept in the rules. They are the only one who have the right to utilize it and benefit from it.<sup>[1]</sup>

The academic, artistic, lyrical, or creative creation, as well as a moving picture and recorded music, are all eligible for copyright protection.<sup>[2]</sup> Software applications, statistics, and aggregates, notably multiple databases, are examples of creative writing. The material product developed is not the objective of this privilege, but the shape imprinted on it by the creator. The painting remains to the person who created it in the conceptual way of the esthetic form made apparent by that paint and canvas.<sup>[3]</sup>

Something that distinguishes the ownership of products or activities is referred to as a trademark. It could be a word, a sign, a logo, a shade, or a music. The quality or prestige connected with the items and their distinct origin is symbolized by the trademark. It sets one company out from the rest. The advantages of trademarks are numerous. It enables customers to easily select objects with appealing features. It motivates businesses to increase the excellence of their products. It would be impossible to tell the copies apart from high-quality items if there were no identifying marks.<sup>[4]</sup> The fund's benefit to produce high-quality commodities will be reduced because the revenues will be the same as for lower-quality ones. Brand safeguard confers "monopoly power" over the distinct trademark, prohibiting others from using the same, or a suspiciously identical mark.<sup>[5]</sup>

IPR has a very crucial role in the field of healthcare system. The innovations must be protected because each product or service is distinctive. If that is not protected through IPR, anybody can use the prototype or a blueprint to develop a similar product of their own and do a business out of it. With the increasing demand for new innovations and research, IPR is the need of the hour.<sup>[6]</sup> Its importance and laws under it have been known for ages, but utilizing it in day-to-day practice is the major concern.<sup>[7]</sup>

Modernization and advancements in electronic technology have brought about alterations in both the intellectual sector and the practical experience areas, which are both rapidly materializing and developing.<sup>[8]</sup> As a result, the value of IPRs has risen,

encouraging decent usage and preventing imitation. It is a government-granted permission that allows others to restrict, utilize, or implement an original concept or approach.<sup>[9]</sup> Creation of an idea for medical benefits, IPR is necessary to combat malpractices in the healthcare field, such as unauthorized replication of an institution's identity. Health workers and researchers should be cognizant of the advantages they possess. Few studies have been conducted to showcase the importance of IPRs globally.<sup>[10,11]</sup> The study conducted by Deshpande *et al.*<sup>[12]</sup> also had similar results with respect to the present study. The current pandemic of coronavirus disease 2019 (COVID-19) has increased the demand for research work and innovation of novel products in the various fields of the health sector for benefiting the society, and IPR plays a very important role. In India, very scanty literature exists to assess the literacy and opinions about IPR in the healthcare service providers.

The study is new of its kind, as that IPRs are the need of the hour for more innovations and betterment in the field of health and medicine, so basic knowledge about it is a must among the healthcare professionals. As COVID-19 scenario has increased, the demand for IPR has increased and it is very important for each and every individual to know about it and utilize it for their novel ideas. This study will give a baseline data about the knowledge, attitude, and practice (KAP) regarding IPRs, upon which qualitative studies can be conducted and several programs, seminars, and workshops can be planned to increase the knowledge, which will directly increase the attitude and practice among individuals. Incorporating this essential topic as a topic among the students will help provide basic knowledge about IPRs, so that any innovation made can be safeguarded.<sup>[13]</sup> Given the above, this current study aims to assess the KAP about IPR among medical, dental, and nursing students and faculties in a tertiary institute through a cross-sectional survey.

## Materials and Methods

### Study design and setting

This study was a cross-sectional survey conducted from October to December 2021 in a Tertiary Institution in Bhubaneswar city, Odisha.

A self-structured close-ended questionnaire based on IPRs was created. The questionnaire was divided into various sections of sociodemographic data and KAPs toward IPRs. The questionnaire was prepared in English containing 31 items. The face validity of the questionnaire was tested by distributing it to the interns and postgraduates posted in the department where certain modifications were done and the time required to fill the questionnaire was assessed. Four subject

specialists double-checked the questions' structure. The next step included assessing the content validity in which the modified questionnaire was distributed among the expert panel, which was formed by the faculty members. A panel of four professionals, including two dentists, a medical professional, and a biostatistician, assessed the content validity. Two questions with an Aiken's index of <0.7 were discarded and the final questionnaire thus comprised of 29 items.

Sociodemographic data (age, gender, field of service, and designation) were obtained. A total of 29 components were assessed (knowledge-14, attitude-9, and practice-6). Knowledge was assessed with the questions having options Yes/No/Do not know (1/0/9, respectively), attitude was assessed on a 5-point Likert scale (strongly agree, agree, neutral, disagree, and strongly disagree) ranging from +2 to -2. Reverse coding was framed for negative questions. Practice of IPR was assessed with questions having options Yes/No (1/0, respectively).

A pilot research was done prior to data collection, and questions that were considered to be challenging were reframed. The reliability coefficient (Cronbach's alpha) was found to be 0.883.

Prior to the survey, the examiner and recording assistant were trained and calibrated in the department under the guidance of the guide. The questionnaire was manually distributed to the respondents. Participants present were included in the study, and who did not give consent were excluded from the study. The investigator gave the participants instructions for filling out the questionnaire, which they returned on the same day.

### Study participant and sampling

The sample size was calculated by the G power software; the minimum sample for the study was 111. Faculties, postgraduates, and interns who are willing to participate in the study and subjects who gave informed consent were included in the study. Twelve participants did not give consent and were excluded from the study. So the total sample size was 489.

### Sampling technique

The stratified Cluster Random Sampling method was used. One institution out of four tertiary institutions present in Bhubaneswar city was randomly selected by lottery method. The study participants were interns, postgraduates, and faculties from medical, dental, and nursing wing.

### Data collection tool and technique

The data were entered into Microsoft excel sheets. The data obtained were tabulated and analyzed statistically using the Statistical Package for Social Sciences (SPSS)

package version 23.0. The normality of the data was assessed prior to analysis using the Shapiro-Wilk's test/ Kolmogorov-Smirnov test. All the items of KAP were measured as absolute and relative frequencies. They were also assessed as mean and standard deviation. Descriptive analysis through frequency distribution was calculated, and the Chi-square test was applied. The correlation between the domains was assessed using Pearson's correlation coefficient. A probability of less than 0.0001 was considered significant.

### Ethical consideration

The study was approved by the Institute Ethics Committee (IEC) of Kalinga Institute of Medical Sciences Bhubaneswar, Odisha with Reference No. KIIT/KIMS/IEC/753/2021.

## Result

A total of 489 participants participated in the survey, out of which 196 (40.1%) were males and 293 (59.9%) were females; 177 (36.2%) were interns, 147 (30.1%) were PGs, and 165 (33.7%) were faculties from all the three fields (medical, dental, and nursing). A total of 192 (39.3%) were from medical, 198 (40.5%) from dental, and 99 (20.2%) were from the nursing field [Figure 1].

The study showed explicit results in relation to the IPR, only 51.4% medical, 43.4% dental, and 36.4% of nursing professionals had an idea to protect their ideas from being copied. Furthermore, 44.3% medical, 40.4% dental, and 34.3% of nursing did not have any knowledge about the importance of IPR in the field of research and development.

A total of 41.7% medical, 40.9% dental, and 52.2% of nursing professionals did not have any idea regarding protecting their ideas from being copied. In addition, 44.3% medical, 51.5% dental, and 51.5% of nursing had knowledge about the importance of IPR in the field of research and development. Furthermore, 69.8% medical,

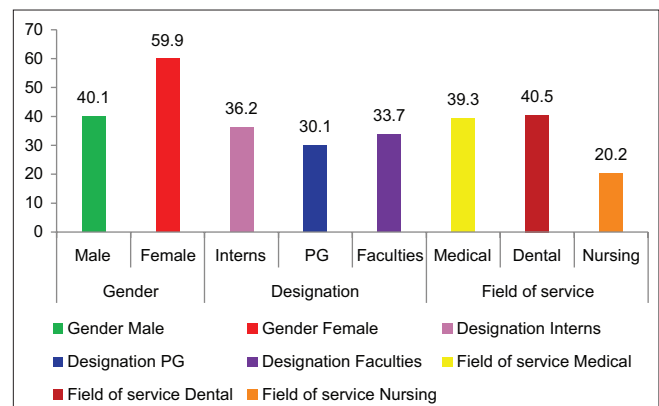


Figure 1: Demographical features of the subjects

84.8% dental, and 59.6% of nursing professionals knew about the importance of copyright on articles and publications. Moreover, 17.7% medical, 24.7% dental, and 25.3% of nursing professionals did not know that the protection of IPR is through law and registrations, and 27.1% medical, 13.6% dental, and 26.3% of nursing had no idea regarding the same. Only 45.3% medical, 36.4% dental, and 39.4% of nursing had knowledge about first-to-file and first-to-invent rules in IPR.

Majority of the professionals from among all the three fields desired to attend lectures about IPR to get a better insight into it. A total of 62% medical, 49% dental, and 50.5% of nursing professionals admitted that the protection of IPR is to stop exploitation.

Most of the professionals did not practice IPR, neither they had visited the official website nor they had filed patent for their innovation.

The relationship between the field of service of the study participants and mean KAP regarding IPRs was assessed. The mean KAP scores were significantly ( $P < 0.0001$ ) higher among nursing interns respondents (2.963, 0.637, and 0.390), dental postgraduate respondents (2.213, 0.844, and 0.351), and dental faculties (1.953, 0.876, and 0.481) [Table 1].

The relationship between the gender of the study participants and mean KAP regarding IPRs was determined. The mean knowledge score was significantly ( $P < 0.0001$ ) greater among females than males and the mean attitude and practice scores were significantly ( $P < 0.0001$ ) greater among males than females [Table 2].

A correlation analysis was done using Pearson's correlation coefficient, and it was found to be significant when knowledge was compared with attitude and practice domains ( $P < 0.0001$ ). Significant results were also

obtained when attitude was compared with practice and knowledge and practice were compared with knowledge and attitude, respectively ( $P < 0.0001$ ) [Table 3].

## Discussion

Patents, copyrights, and other unquantifiable commodities are all forms of intellectual property in India. Within the past decade, there has been an increasing demand for IPR mostly in the field of research and development in the healthcare system. COVID-19 scenario within the past 2 years has increased this need for a better healthcare system in India as well as globally.<sup>[14]</sup> Novel techniques are being employed by the healthcare workers to work efficiently and have less fatigue. IPR is the need of the hour and every individual from all fields should have knowledge about it and should implement it for future benefits.<sup>[15,16]</sup> The present study was conducted with the aim of evaluating the KAP about IPR among medical, dental, and nursing students and faculties in a tertiary institute.

In the present study, the female participants were more than the male participants in contrast to another study conducted by Deeksheetha *et al.*<sup>[17]</sup> wherein, the male (54%) participants were higher than the female (43%) participants.

In the present study, 41.7% of medical, 40.9% of dental, and 52.2% of nursing professionals did not have any idea regarding protecting their ideas from being copied as compared with another study conducted by Ahmed *et al.*,<sup>[18]</sup> where 47% of participants were not aware of the need to protect the IPRs. A total of 44.3% of medical, 51.5% of dental, and 51.5% of nursing had a knowledge about the importance of IPR in the field of research and development in the present study.

In our study, most professionals knew about the importance of copyright on articles and publications,

**Table 1: Field of service and designation of the subjects and relationship between the mean knowledge, attitude, and practice scores**

INTERN	Medical		Dental		Nursing		Chi-square	P
	N	Mean±SD	N	Mean±SD	N	Mean±SD		
1	63	2.092±1.427	73	2.002±1.499	41	2.963±2.305	102.876	<0.0001*
2	63	0.590±0.649	72	0.546±0.658	41	0.637±0.539	155.409	<0.0001*
3	63	0.214±0.193	73	0.294±0.297	41	0.390±0.368	106.362	<0.0001*
<b>PG</b>								
1	60	1.931±1.308	65	2.213±1.417	22	1.923±0.907	86.973	<0.0001*
2	59	0.755±0.375	65	0.844±0.472	22	0.749±0.361	109.890	<0.0001*
3	60	0.244±0.252	65	0.351±0.267	22	0.265±0.209	70.667	<0.0001*
<b>FACULTY</b>								
1	68	1.925±1.577	59	1.953±1.290	36	1.833±1.058	91.460	<0.0001*
2	69	0.752±0.298	59	0.876±0.362	36	0.660±0.199	123.220	<0.0001*
3	69	0.181±0.189	59	0.418±0.291	36	0.171±0.213	88.000	<0.0001*

\*Significant, 1-Knowledge, 2-Attitude, 3-Practice

which showed similar results as compared with another study conducted by Kumar *et al.*<sup>[19]</sup> on the dental task force.

In our study, 17.7% of medical, 24.7% of dental, and 25.3% of nursing professionals did not know that the protection of IPR is through law and registrations as compared with another study where 27.1% of medical, 13.6% of dental, and 26.3% of nursing had no idea regarding the same, conducted by Kumar *et al.*<sup>[19]</sup>

Majority of the professionals from all three fields desired to attend a lecture about IPR to get a better insight into it in this study, which showed a similar result in a study done by Kumar *et al.*<sup>[19]</sup> In our study, 62% of medical, 49% of dental, and 50.5% of nursing professionals admitted that the protection of IPR is to stop exploitation. Although in another study conducted by Kumar *et al.*<sup>[19]</sup> on dental professionals, few participants accepted the same fact and the result was statistically significant.

In the present study, the mean knowledge score was significantly ( $P < 0.0001$ ) greater among females than males, which showed a similar result in the study conducted by Deeksheetha *et al.*<sup>[17]</sup> on dental practitioners where the knowledge of females (16.67%) regarding IPR was slightly higher than males (12.67%).

This study showed that more KAP was found in dental faculties, dental postgraduates, and nursing interns. However, the need to know what IPR is about is still lacking among healthcare professionals. With the emerging demand in the field of research and development, IPR plays a very crucial role.<sup>[20]</sup> A greater percentage of interns, postgraduates, and faculties from all three wings wish to attend seminars/conferences related to IPR. An increase in their knowledge will directly affect their attitude and practice, which will help them, mostly the interns and the postgraduates, in their future works.

**Table 2: Gender-wise comparison with mean knowledge, attitude, and practice of the subjects**

Gender	Male		Female		Chi-square	P
	N	Mean±SD	N	Mean±SD		
Knowledge	194	1.891±1.313	293	2.235±1.596	342.419	<0.0001*
Attitude	194	0.761±0.491	292	0.687±0.484	519.556	<0.0001*
Practice	195	0.292±0.282	293	0.275±0.263	242.180	<0.0001*

\*Significant

**Table 3: Pearson’s correlation coefficient between knowledge, attitude, and practice**

ρ	Knowledge and attitude	Knowledge and practice	Attitude and knowledge	Attitude and practice	Practice and knowledge	Practice and attitude
Pearson’s correlation	0.169**	0.105*	0.169**	0.226**	0.105*	0.226**
P	0.000	0.021	0.000	0.000		

\*Significant

### Limitation and recommendation

The limitation of the study is the design, that is cross-sectional study design. More qualitative and quantitative studies should be conducted where the participants can share their ideas and views regarding IPR. Larger sample size can be taken for future studies. There are several ways to promote awareness of IPR among university healthcare professionals. More information should be made available on social networks. A user-friendly guide on how to file for IP as well as information on IPR on the university’s site and internet will provide the much-needed information about IPR to students. Conducting seminars, conferences and online interactive sessions can increase the knowledge regarding IPR. Including a section about IPR in the regular course can also help the students to aware themselves of the topic right from the beginning, this will help them further to protect their novel ideas from being copied and encourage many for new innovations in the field of health for a better future.

### Conclusion

This study has indeed opened a gateway to conduct further more studies. It is very important in today’s scenario since it is a novel study including all the three wings (medical, dental, and nursing). IPR is the need of the hour and should be a part of research and innovation. Lack of knowledge about it will not help to use its advantages. It is utmost important for the institutions to incorporate IPR into the basic education system and practice that in their innovations so that no novel idea is being breached.<sup>[21]</sup> Thus, we can encourage new ideas to have a more advanced, simpler, and better healthcare system as a whole.

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### Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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