Influential Factors on Dental Students' Knowledge of Medical Law and Ethics: A Cross-Sectional Study

by Erdianto Setya Wardhana

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Abstract

Understanding medical law and ethics is essential for dental students, providing a legal framework for patient rights and healthcare quality. This study aims to identify key factors influencing dental students' knowledge of medical law and ethics.

A cross-sectional design was used, involving 284 pre-clinical and clinical students from Universitas Islam Sultan Agung Semarang. The study examined age, education, information, socio-cultural background, environment, occupation, and experience, using a validated knowledge questionnaire. Data were analyzed through multiple linear regression.

The results revealed that information and socio-cultural background significantly influenced knowledge ($p < 0.05$), while age, education, occupation, environment, and experience did not ($p > 0.05$). The regression equation was $Y' = -0.103 + 0.048 X_1 + 0.018 X_2 + 0.027 X_3 + 0.329 X_4 + 0.269 X_5 + 0.184 X_6 + 0.137 X_7$. The F-test showed all variables collectively influenced knowledge significantly ($p < 0.05$). The R Square value of 0.794 indicates that 79.4% of the variation in students' knowledge is explained by the tested factors, with the remaining 21.6% influenced by unexamined variables.

This study highlights the importance of information and socio-cultural factors in shaping dental students' understanding of medical law and ethics

Keyword : Dentistry, Students, Ethics, Health Education, Knowledge

Introduction

A dentist is required to uphold a professional demeanor when addressing matters concerning ethics, legal obligations, and regulatory compliance. In 2012, an incident of ethical and legal negligence by a dentist led to patient injury, as outlined in the Indonesian court decision number 257/Pid.B/2015/PN.Dps. In this instance, the dentist conducted a tooth extraction without adhering to the appropriate procedures, and this conduct was judged to be unlawful for failing to meet professional standards and prescribed operational protocols[1,2].

The dental care provided by dentists represents a commitment to serving the community and must adhere to legal material and formal requirements, conducted with high levels of competence and professionalism. Medical ethics govern the interactions of dentists with their peers, the public, and government authorities, as well as guide responsible behavior towards patients. Presently, ethical standards in modern dentistry are evolving rapidly. Learning to address practical ethical challenges and fostering a professional identity are essential steps in the path to becoming a proficient and reputable dentist[3,4].

There is increasing public concern regarding the ethical behavior of healthcare professionals, often reflected in complaints about unethical conduct and a rise in legal actions against healthcare providers. Public awareness of their rights, including health-related rights, is growing, spurred by information available through various media[5]. This heightened awareness encourages dentists to conduct thorough examinations according to existing standards and to communicate effectively with patients and their families. Actions by doctors and dentists that contradict the professional code of ethics are considered ethical violations[6,7].

Professional ethics codes are taught to medical and dental students during their preclinical education, yet ethical violations among dentists remain common. This issue often stems from a lack of understanding of the Medical Code of Ethics and insufficient professional discipline,

leading to numerous legal and ethical breaches by doctors [8,9]. Therefore, it is crucial for healthcare professionals to be more aware of ethical standards and to perform their duties in accordance with legal requirements. This underscores the importance of integrating comprehensive education in medical ethics and law into medical and dental training programs, which plays a crucial role in shaping the behavior of students who will directly interact with patients [10,11]. According to Jahan (2021), an individual's behavior is fundamentally shaped by their knowledge. The depth of knowledge regarding professional ethics and dental medical law is influenced by factors such as access to information, education, environment, occupation, age, experience, and socio-cultural and economic backgrounds [12].

Understanding medical law and ethics is crucial for dental students, as medical law establishes the legal framework that ensures patient rights and guarantees high standards in healthcare delivery. Ethics guide the moral conduct of healthcare providers, shaping their interactions with patients, colleagues, and the broader community [13,14]. As future healthcare providers, dental students must have a deep understanding of both medical law and ethics to effectively navigate the complexities of clinical practice and avoid legal and ethical challenges. Comprehensive education in these areas not only equips students with the knowledge to make informed decisions but also fosters a sense of responsibility and professionalism [15,16].

Several factors influence dental students' knowledge of medical law and ethics, including educational curricula that provide comprehensive training in these areas, accessibility of information through various media, learning environment, and emphasis on ethical and legal topics within academic institutions. Additionally, factors such as age, previous healthcare experience, and socio-cultural backgrounds significantly contribute to students' understanding [17,18].

As societal awareness of health-related rights and ethical standards increases, there is a growing demand for healthcare professionals who

are not only technically skilled but also ethically responsible and legally informed. This emphasizes the need for continuous improvement in educational approaches to medical law and ethics, ensuring that future dental professionals are well-prepared to uphold the highest standards of patient care [19,20]. Therefore, the aim of the study was to analyze the factors that most influenced the level of knowledge of medical law and ethics among dental students.

Methods

The research methodology employed is observational analytic with a cross-sectional study design. This design allows for the assessment of various factors at a single point in time to determine their relationship with the level of knowledge of medical law and ethics among dental students. The procedure involved administering a validated and reliable questionnaire to the participants, collecting data on their demographics and knowledge levels, and then analyzing this data using multiple linear regression analysis.

The study population comprises active undergraduate dental students (preclinical) and professional program students (clinical clerkship) at the Faculty of Dentistry, Sultan Agung Islamic University, Semarang, Indonesia. The sample consists of 284 participants, specifically undergraduate dental students in their second, third, and fourth years. Professional program students in their first, second, and third years. Participants were selected through stratified sampling to ensure representation across the different years of study.

The research utilized a questionnaire to assess the knowledge levels of medical law and ethics and the factors influencing this knowledge. The questionnaire was adapted from studies by Narayanan et al. (2016) and was subjected to validity and reliability testing to ensure accuracy and consistency [21]. The factors examined in the study include age, education level, access to information, socio-cultural background,

environmental influences, occupation, prior experience

This study was conducted in accordance with ethical standards and obtained ethical clearance from the Research Ethics Committee of the Faculty of Dentistry, Sultan Agung Islamic University. The ethical approval was granted with Approval Number 388/B.1-KEPK/SA-FKG/VII/2022. All participants provided informed consent, and their confidentiality and anonymity were maintained throughout the study.

Data collected from the questionnaires were analyzed using multiple linear regression analysis. This statistical method was employed to determine the relationship between the various factors and the level of knowledge of medical law and ethics among the dental students. The results were interpreted to identify which factors had the most significant influence on the students' knowledge levels.

Result

This study involved 284 active participants who are undergraduate dental students (preclinical) and professional program students (clinical clerkship) at the Faculty of Dentistry, Sultan Agung Islamic University, Semarang, Indonesia. Descriptive analysis was conducted to describe the socio-demographic characteristics of the participants, including gender distribution, age, and educational level. Based on Table 1, out of the total 284 participants, 95 (33.5%) are male, and 189 (66.5%) are female. This indicates that the majority of the study participants are female. Table 2 illustrates the age distribution of the study participants. The age range of participants is between 18 and 26 years, with the majority falling in the 21-23 years age group (49.3%). A total of 75 participants (26.4%) are within the 18-20 years age range, while 69 participants (24.3%) are in the 24-26 years age range. The mean age of the participants is 22.4 years with a standard deviation of 1.9 years, indicating relatively small age variation among the participants. Table 3 shows the distribution of participants based on their educational level. A total of 180 participants (63.4%) are undergraduate dental students

(preclinical), consisting of 50 second-year students (17.6%), 60 third-year students (21.1%), and 70 fourth-year students (24.6%). The remaining 104 participants (36.6%) are professional program students (clinical clerkship), comprising 40 first-year students (14.1%), 35 second-year students (12.3%), and 29 third-year students (10.2%). This indicates a fairly balanced distribution between undergraduate and professional program students, with a slightly higher number of undergraduate students.

Table 1. Distribution and frequency

Sociodemographics of research

Characteristics	N	(%)
Gender		
Male	95	33.5 %
Female	189	66.5 %
Age (years)		
18-20	75	26.4 %
21-23	140	49.3 %
24-26	69	24.3 %
Undergraduate Dental Students (Preclinical)		
- Second Year	50	17.6 %
- Third Year	60	21.1 %
- Fourth Year	70	24.6 %
Professional Program Students (Clinical Clerkship)		
- First Year	40	14.1 %
- Second Year	35	12.3 %
- Third Year	29	10.2 %

The research data underwent normality testing using the Kolmogorov-Smirnov test. The Kolmogorov-Smirnov normality test results showed that the Asymp. Sig. (2-tailed) value of 0.071 is greater than 0.05, indicating that the regression data in this study are normally distributed.
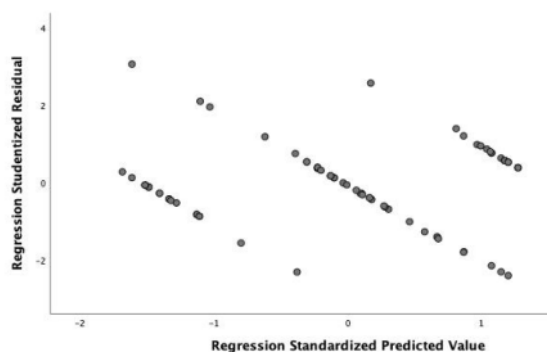
Figure 1 Heteroskedasticity Test

Heteroskedasticity testing was also conducted to determine the presence of heteroskedasticity in the study. Figure 1 showed the results of the scatterplot output for the heteroskedasticity test. To strengthen the data findings, heteroskedasticity testing was performed using the Glester method. Based on the Glester method test results (Table 2), the significance

values for all factors were greater than 0.05, indicating no heteroskedasticity across all variables. Multicollinearity testing was conducted to ensure there was no intercorrelation among independent variables in the regression model. The results of this test can be seen with the correlation coefficient values of VIF and Tolerance in the table 2.

Table 2. Glester Method Heteroskedasticity (Sig.) and Multicollinearity Test Results

Factor	(Sig.)	Multi Colli nearity	(VIF)
(Constant)	0,375		
Age	0,222	0,235	4,251
Education Level	0,975	0,103	9,665
Occupation	0,331	0,175	5,715
Information	0,591	0,153	6,527
Socio-cultural	0,308	0,249	4,009
Environment	0,991	0,553	1,808
Experience	0,077	0,394	2,536

The multicollinearity test showed that all factors had tolerance values greater than 0.10 and VIF values less than 10.00, indicating no multicollinearity in the tested data across all factors. After conducting multicollinearity,

normality, and heteroskedasticity tests, and obtaining qualifying test results, multiple linear regression analysis was performed. Based on the multiple linear regression analysis (Table 3), the following equation was derived: Y' = -0.103 + 0.048 X1 + 0.018 X2 + 0.027 X3 + 0.329 X4 + 0.269 X5 + 0.184 X6 + 0.137 X7. The regression coefficients indicate the ability of each independent variable to increase knowledge. Following the multiple linear regression analysis, partial t-tests were conducted (Table 3).

Table 3. Multiple Linear Regression and T-Test Results

Factor	Regression Coefficient (B)	T-Test (Sig.)
(Constant)	-0,103	0,684
Age	0,048	0,569
Education Level	0,018	0,801
Occupation	0,027	0,886
Information	0,329	0,008
Socio-	0,269	0,007
Environment	0,184	0,114
Experience	0,137	0,103

Based on the partial test results (Table 3), the significance values for the information and social-

cultural factors were less than 0.05, indicating that information and social-cultural factors have a significant positive influence on knowledge level. The partial test results also showed that the significance values for age, education level, occupation, environment, and experience were greater than 0.05, suggesting that age, education level, environment, occupation, and experience do not significantly affect the knowledge variable. Following the partial tests, an F-test was conducted.

Table 4. F-Test (Simultaneous) and Determinant Test Results

	F-Test	Determinant Test
Sig.	0,000	
R Square		0,794

Based on the F-test results (Table 4), the significance value was less than 0.05, indicating that age, education level, occupation, information, social-cultural factors, environment, and experience collectively have a significant impact on knowledge. After the F-test, a determination test was conducted. Based on the determination test results (Table 4), an R square value of 0.794 was obtained, indicating that the combined contribution of the independent variables (Age, Education Level, Occupation, Information, Social-Cultural Factors, Environment, and Experience) to Knowledge in this study is 79.4%, while the remaining 21.6% is influenced by other factors not examined in this study.

Disscussions

The results of Table 7 indicate that the factor most influencing the level of ethical and legal knowledge is information. This is because ethics and legalities in dental medicine represent crucial competency standards. This drives dental students to seek as much information as possible regarding dental ethics and laws to enhance their competence [17,22]. The relationship between information and knowledge is explained by Lehrer (2018), who describes how information begins with an event, represented as symbols, which can be text, numbers, sounds, images, combinations thereof, or structured data. When perceived by human senses,

this data transforms into information, and when transferred to others, it becomes knowledge [16,23].

Information concerning dental ethics and laws is also accessed through various platforms, including social media platforms where experts in ethics and laws share insights. Social media's accessibility, low cost, and ubiquitous availability contribute significantly to increasing awareness and knowledge of dental ethics and laws. This finding aligns with Bakir et al. (2021) and Yeni (2015), whereas Wardani et al. (2014) reported different results, finding no significant relationship between information accessibility and knowledge levels [24,25].

Table 5's research findings show that socio-cultural factors significantly influence the level of dental ethics and legal knowledge. Individuals with favorable socio-cultural backgrounds tend to possess better knowledge, whereas those from less favorable backgrounds may have poorer knowledge [11,26]. This applies particularly to knowledge about dental ethics and laws. Socio-cultural factors also motivate dental students,

especially clinical students, to adhere strictly to dental ethics and laws, as violations can affect how others perceive them. Clinical students are bound by ethical and legal rules specific to dental practice, adherence to which is enforced with penalties if violated [27,28].

Table 5's results also reveal that educational level does not significantly affect dental ethics and legal knowledge. This is because education regarding dental ethics and laws is standardized across curricula, ensuring all students receive similar education. However, individual understanding and personal factors may lead to varying levels of knowledge among students [29]. Table 5 further shows that age does not significantly affect the level of dental ethics and legal knowledge. This suggests that older individuals do not necessarily possess higher knowledge levels, and conversely, younger individuals may not necessarily have lesser knowledge. Various personal experiences and other factors contribute to one's knowledge, regardless of age [19,29].

Additionally, Table 5 indicates that experience does not significantly correlate with the level of dental ethics and legal knowledge. The experience referred to here pertains to learning experiences gained by students. This is because learning experiences within a single faculty and university are relatively uniform, given standardized curricula on dental ethics and laws [26,30]. Table 5's results also indicate that occupation does not significantly influence the level of dental ethics and legal knowledge. This is because dental ethics and laws are fundamental principles that all students must know, regardless of whether they are in the pre-clinical (non-working) or clinical (working) stages. Therefore, both groups of students should ideally possess similar knowledge levels [29,31,32]. Lastly, Table 7 shows that age, education level, occupation, information, socio-cultural factors, environment, and experience collectively impact knowledge. Knowledge is multifactorial and results from human perception, contributing to 79.4% of the total variance observed in Table 7. The remaining 21.6% is attributed to unexamined factors in this study [16,17].

Conclusion

Based on the research findings, it can be concluded that the factor of information had the most influence on the knowledge of dental law and ethics at the Faculty of Dental Medicine, Sultan Agung Islamic University. Meanwhile, both information and socio-cultural factors influence the knowledge of dental law and ethics at the Faculty of Dental Medicine, Sultan Agung Islamic University. Factors such as age, education level, occupation, experience, and environment did not affect the knowledge of dental law and ethics at the Faculty of Dental Medicine, Sultan Agung Islamic University

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