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Level of knowledge and learning exposure on cleft lip and palate treatment among undergraduate Universitas Indonesia dental students

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ABSTRACT

Background: *Cleft lip and palate are the most common congenital orofacial anomalies. Dental students must have a basic knowledge, understanding, and awareness of comprehensive cleft management. The Faculty of Dentistry Universitas Indonesia undergraduate program uses the problem-based learning (PBL) method to teach dental students about cleft management.* ***Purpose:*** *This study aims to determine the level of knowledge and exposure to learning with the PBL method regarding comprehensive cleft management.* ***Methods:*** *A cross-sectional design was used, and data were collected from 253 dental students using an online questionnaire via Google Forms.* ***Results:*** *Ten preclinical students (8.5%) had a low level of knowledge, 56 (47.5%) had a sufficient level of knowledge, and 52 (44.1%) had a high level of knowledge of comprehensive cleft management. Among the clinical students, 6 (4.4%), 65 (48.1%), and 64 (47.4%) demonstrated low, sufficient, and high levels of knowledge, respectively. Furthermore, most students were content with the lectures on comprehensive cleft management (46.24% satisfied and 20.55% very satisfied) and the supervision received during the lectures (43.48% agreed and 23.71% strongly agreed). Most students believed the lectures on cleft management could be applied when they graduate as dentists. The Chi-square test showed no significant relationship between learning exposure and the student's knowledge level.* ***Conclusion:*** *Most Faculty of Dentistry Universitas Indonesia students who had learned about cleft lip and palate using the PBL method had sufficient knowledge about comprehensive cleft management. However, no significant relationship was observed between learning exposure and knowledge level.*

Keywords: *learning exposure; level of knowledge; students; cleft lip and palate*
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INTRODUCTION

Cleft lip and palate are the most prevalent congenital birth defects in the craniofacial region, affecting 1 out of 700 live births worldwide.[1–3] The Indonesian Basic Health Research (Riset Kesehatan Dasar Indonesia) reported an increase in the percentage of this defect from 0.08% in 2013 to 0.12% in 2018.[4,5] Cleft lip and palate can negatively affect the aesthetics, dentition, speech, hearing, and stomatognathic systems.[6]

Managing patients with cleft lip and palate requires a multidisciplinary team approach, including an oral and maxillofacial surgeon, ENT doctor, speech therapist, psychologist, pediatrician, restorative dentist, and orthodontist. Dentistry plays an essential role in several aspects of cleft treatment.[7] For example, fabricating presurgical orthopedic appliances and feeding plates, orthodontic treatment, primary cleft lip repair, primary cleft palate repair, secondary alveolar bone grafting, secondary lip and nose repair, palatal fistula closure, pharyngeal flap surgery, orthognathic surgery, and dental care for deciduous, mixed and permanent teeth, are essential parts of the treatment process. Thus, undergraduate dental students must have basic knowledge, understanding, and awareness about the comprehensive management of patients with cleft lip and palate.[7]

Exposure to learning during the preclinical period can influence the knowledge level of undergraduate dental

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students. A recent study revealed that the awareness of comprehensive cleft lip and palate management among dental students is inconsistent with the learning exposure provided; hence, there is a need for increased material in the academic curriculum and additional interdisciplinary training from other professional medical personnel.[8] Sruthi et al.[9] reported that dental students must be fully aware of comprehensive cleft lip and palate management.

The undergraduate dentistry program at the Faculty of Dentistry Universitas Indonesia, one of the leading dental schools in the country, consists of a seven-semester preclinical program and a four-semester clinical or professional program. The undergraduate preclinical program has used the problem-based learning (PBL) method since 2003, wherein dental students study various topics in small groups to develop their knowledge content and independent learning abilities. Learning activities are implemented through group discussions, clarification from lecturers as resource persons, and practicums and skills labs.[10–12] With this method, the students are more engaged and can learn various abilities, including problem-solving, teamwork, obtaining information, explaining new information, discussing, and formulating conclusions.[13,14] The cleft lip and palate lectures are part of the curriculum for semester five preclinical students. The students are introduced to the diagnosis of cleft lip and palate, risk factors for cleft occurrence, embryology of the disease, and comprehensive multidisciplinary management of patients with cleft lip and palate.

However, research on the relationship between exposure to learning and the level of knowledge among undergraduate dental students regarding the management of cleft lip and palate has yet to be conducted in Indonesia. Thus, this study aimed to determine the exposure level and knowledge of comprehensive cleft lip and palate management among dental undergraduates at Universitas Indonesia.

MATERIALS AND METHODS

This cross-sectional study involving preclinical and clinical dentistry students was conducted from May 2022 to September 2022 and utilized an online questionnaire modified from one previously used by Mohan et al.[15] and Brand et al.[16] The online questionnaire in Google Forms was divided into three parts: the identity of the respondent, knowledge of the student, and learning exposure. The knowledge section of the questionnaire consisted of 15 questions, each of which received a score of one for a correct answer. The knowledge level scale was calculated from the percentage of the total score for correct answers using the following formula:

$$\text{Percentage} = \frac{\text{correct number of values} \times 100\%}{\text{number of questions}}$$

The percentage of the total score for the student's knowledge was then categorized as follows: (a) ≥76%–100%, good level of knowledge; (b) 56%–75%, sufficient level of knowledge; (c) ≤55%, low level of knowledge.

The learning exposure section of the questionnaire consisted of eight positive questions, and the responses were measured using a Likert scale as follows: (1) strongly disagree/very dissatisfied/never/very bad; (2) disagree/dissatisfied/once in one semester/bad; (3) neutral/twice in one semester; (4) agree/satisfied/three times in one semester/good; (5) strongly agree/very satisfied/more than three times in one semester/very good. The learning exposure level was ascertained from the total score as follows: (a) <21, low level of learning exposure; (b) 21–32, moderate level of learning exposure; (c) ≥33, high level of learning exposure.

The authors validated the questionnaire, and a trial was carried out on 15 students to determine their understanding of filling out the questionnaire. The students demonstrated a good understanding of the questions included. The questionnaire was modified from the questionnaire previously used by Mohan et al.[15] and Brand et al.[16] After developing the questionnaire in Bahasa Indonesia, the authors conducted content validity on the questionnaire. After that, the authors conducted a trial on 15 students to see if they understood the questionnaire well.

Following the Helsinki Declaration, this study was approved by the Dental Research Ethics Committee at the Faculty of Dentistry Universitas Indonesia, Jakarta. The ethical certificate number is 51/Ethical Approval/FKGUI/VIII/2022.

After the research data was sorted and collected, the data was processed using IBM SPSS version 25. Data analysis in this study consisted of two stages: univariate analysis and bivariate analysis. The Chi-square test results were used to determine the relationship between learning exposure and the students' level of knowledge.

RESULTS

A total of 253 students (118 preclinical [46.6%] and 135 clinical [53.4%]) participated in the study without any dropouts (Table 1). Forty-eight students were male (19%) and 205 were female (81%).

Table 1. Demographic distribution of the students

Variable		Frequency	Percentage	Total
Gender	Male	48	19	253 (100%)
	Female	205	81	
Program	Preclinical	118	46.6	253 (100%)
	Clinical	135	53.4	

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Table 2. The students' level of knowledge about the comprehensive management of cleft lip and palate

Variable		Students' level of knowledge			Total (%)
		Low	Sufficient	High	
Gender	Male	5 (10.4%)	26 (54.2%)	17 (35.4%)	100
	Female	11 (5.4%)	95 (46.3%)	99 (48.3%)	100
Program	Preclinical	10 (8.5%)	56 (47.5%)	52 (44.1%)	100
	Clinical	6 (4.4%)	65 (48.1%)	64 (47.4%)	100

Table 3. Responses to questions pertaining to learning exposure

Question	Answer choices	Student responses		
		Preclinical (n = 118)	Clinical (n = 135)	Total (n = 253)
How often do you receive lectures about comprehensive cleft lip and palate management? (During one semester)	1: never	1 (0.84%)	2 (1.48%)	3 (1.18%)
	2: one time	23 (19.5%)	38 (28.14%)	61 (24.11%)
	3: two times	35 (29.7%)	41 (30.37%)	76 (30.03%)
	4: three times	25 (21.19%)	31 (22.96%)	56 (22.13%)
	5: more than three	34 (28.81%)	23 (17.03%)	57 (22.53%)
Are you satisfied with the lecture on comprehensive cleft lip and palate management?	1: very dissatisfied	-	-	-
	2: dissatisfied	3 (2.54%)	5 (3.7%)	8 (3.16%)
	3: neutral	31 (26.27%)	45 (33.33%)	76 (30.03%)
	4: satisfied	62 (52.54%)	55 (40.74%)	117 (46.24%)
	5: very satisfied	22 (18.64%)	30 (22.22%)	52 (20.55%)
Have you been well supervised when receiving lectures on the comprehensive management of cleft lip and palate?	1: strongly disagree	-	-	-
	2: disagree	5 (4.24%)	12 (8.88%)	17 (6.72%)
	3: neutral	35 (29.7%)	31 (22.96%)	66 (26.08%)
	4: agree	53 (44.91%)	57 (42.22%)	110 (43.48%)
	5: strongly agree	25 (21.18%)	35 (25.92%)	60 (23.71%)
Have you been given sufficient references to learn the comprehensive management of cleft lip and palate?	1: strongly disagree	-	-	-
	2: disagree	5 (4.24%)	11(8.15%)	16 (6.32%)
	3: neutral	28 (23.73)	23 (17.03%)	51 (20.16%)
	4: agree	53 (44.91%)	66 (48.9%)	119 (47.03%)
	5: strongly agree	32 (27.12%)	35 (25.92%)	67 (26.48%)
Did you get sufficient clarification from the resource person regarding the comprehensive management of cleft lip and palate?	1: strongly disagree	-	-	-
	2: disagree	1 (0.84%)	8 (5.92%)	9 (3.55%)
	3: neutral	19 (16.1%)	16 (11.85%)	35 (13.83%)
	4: agree	63 (53.4%)	59 (43.7%)	122 (48.22%)
	5: strongly agree	35 (29.7%)	52 (38.52%)	87 (34.38%)
Does the clarification given by the resource person help you understand the comprehensive management of cleft lip and palate?	1: strongly disagree	-	-	-
	2: disagree	-	4 (2.96%)	4 (2.96%)
	3: neutral	17 (14.4%)	20 (14.81%)	20 (14.81%)
	4: agree	64 (54.23%)	63 (46.66%)	63 (46.66%)
	5: strongly agree	37 (31.35%)	48 (35.55%)	48 (35.55%)
Will the comprehensive cleft lip and palate management lectures provided during the pre-clinic period be applicable when you become a dentist?	1: strongly disagree	-	1 (0.74%)	1 (0.4%)
	2: disagree	1 (0.84%)	5 (3.7%)	6 (2.37%)
	3: neutral	9 (7.62%)	23 (17.03%)	32 (12.64%)
	4: agree	56 (47.45%)	60 (44.44%)	116 (45.85%)
	5: strongly agree	52 (44.06%)	46 (34.07%)	98 (38.73%)
In your opinion, what is the quality of the cleft lip and palate comprehensive management lectures provided by the Faculty of Dentistry Universitas Indonesia?	1: very bad	-	-	-
	2: bad	2 (1.7%)	3 (2.22%)	5 (1.97%)
	3: neutral	18 (15.25%)	30 (22.22%)	48 (18.97%)
	4: good	71 (60.17%)	70 (51.85%)	141 (55.73%)
	5: very good	27 (22.88%)	32 (23.7%)	59 (23.32%)

Table 4. The students' learning exposure level regarding the comprehensive management of cleft lip and palate

Variable		Learning exposure level			Total (%)
		Low	Moderate	High	
Gender	Male	1 (2.1%)	33 (68.8%)	14 (29.2%)	100
	Female	1 (0.5%)	117 (57.1%)	87 (42.4%)	100
Program	Preclinical	0 (0%)	70 (59.3%)	48 (40.7%)	100
	Clinical	2 (1.5%)	80 (59.3%)	53 (39.3%)	100

Table 5. Relationship between learning exposure and students' level of knowledge regarding comprehensive management of cleft lip and palate

Learning Exposure Level	Students' Level of Knowledge			*p-value*
	Low	Sufficient	High	
Low + Moderate	12 (4.7%)	75 (29.6%)	65 (25.7%)	0.292
High	4 (1.6%)	46 (18.2%)	51 (20.2%)	

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As shown in Table 2, ten preclinical students (8.5%) had a low level of knowledge, 56 (47.5%) had a sufficient level of knowledge, and 52 (44.1%) had a high level of knowledge. Among the clinical students, 6 (4.4%), 65 (48.1%), and 64 (47.4%) demonstrated low, sufficient, and high levels of knowledge, respectively.

Most students were content with the lectures on comprehensive cleft lip and palate management using the PBL method (46.24% satisfied and 20.55% very satisfied). Most students thought they had been well supervised when receiving the lectures (43.48% agreed and 23.71% strongly agreed) and most believed the lectures received during the preclinical period could be applied when they graduate as dentists (Table 3). Table 4 shows that none of the preclinical students expressed dissatisfaction with the learning exposure; 70 (59.3%) thought they received moderate learning, and 48 (40.7%) thought they received high learning exposure. However, two clinical students (1.5%) thought they received low learning exposure, 80 (59.3%) thought they had received moderate learning exposure, and 53 (39.3%) thought they had received high learning exposure.

The Chi-square test was used to determine whether there was a significant relationship between learning exposure and the level of knowledge of comprehensive cleft lip and palate management, with a simplified group of one of the variables (Table 5). This simplification was performed because each variable had three cells with an expected count of <5 and ≥20%; hence, an alternative test was carried out by combining one group of variables and testing the hypothesis according to the number of groups in the variable formed. No significant relationship was found between learning exposure and the level of knowledge in this study.

DISCUSSION

Cleft lip and palate are the most frequent congenital disabilities in the craniofacial region worldwide, including Indonesia.[1,2,17,18] The etiology of cleft lip and palate is multifactorial, involving genetics and environmental factors.[19] Cleft lip and palate can affect children and their families due to the functional difficulties associated with speech, feeding, social interaction, child development, and dental conditions.[17,20,21]

Dentistry is an essential and inseparable part of integrated services for patients with cleft lip and palate. A well-organized undergraduate teaching method is essential to achieve this objective. The diagnosis of cleft lip and palate, its etiology and risk factors, embryology, and the full range of interdisciplinary care for patients with cleft lip and palate are all taught to students of the Faculty of Dentistry Universitas Indonesia. The PBL method has been used at the Faculty of Dentistry Universitas Indonesia since 2003. It motivates students to recognize and apply research principles, relate the knowledge gathered, collaborate with others, and communicate effectively.[12] Schmidt et al.[21] reported that PBL significantly impacts learning and achievement compared to alternative methods where learning is not centered on problem-solving. Students taught using the PBL method demonstrated higher learning acquisition compared to those taught under controlled circumstances, where problems were not the center of attention, and students were not pushed to use their existing knowledge.[22]

Contrary to the study by Javith et al.[23] in India, the number of female students was greater than that of male students in the present study. However, this research aligns with the demographic trend data published by the American Dental Association (ADA), which states that in 2021, 51.6% of all U.S. dental school graduates were female.[24] Based on the results, one male and one female student demonstrated low levels of learning exposure. Male students dominated those with moderate learning exposure compared to female students. Females dominated the student body with a high level of learning exposure.

The learning exposure experienced by preclinical and clinical students was similar, based on the results of the current study. The percentage of students who perceived a moderate learning exposure was the same (59.3%) between the preclinical and clinical groups. Likewise, the percentage of preclinical (40.7%) and clinical (39.3%) students who perceived a high learning exposure was similar. None of the preclinical students perceived a low learning exposure; however, two clinical students (1.5%) believed their learning exposure was low, which might be related to the exposure from PBL classes. This condition may be because preclinical students had just received exposure to learning about clefts, so their understanding was still strong. In comparison, clinical students were exposed to learning about clefts in preclinic, 1 or 2 years before filling out the questionnaire.

According to a study in Shanghai, PBL can increase autonomy in the learning process, emphasize self-direction, and arouse curiosity among dental students.[25] In contrast to the study by Revathy and Arthanari[26] in India, the current study comprised both preclinical and clinical students exposed to comprehensive learning about managing cleft lip and palate. The percentage of preclinical students with low knowledge level (8.5%) was higher than that of clinical students (4.4%). Similarly, a lower percentage of preclinical students (44.1%) demonstrated higher knowledge levels compared with clinical students (47.4%). This result may be because clinical students are more exposed to cleft lip and palate management through their interactions with oral and maxillofacial surgery residents during cleft surgery at the Universitas Indonesia hospital and at cleft surgery charity missions. Andrews et al.[27] reported that the high level of exposure to learning from active learning programs, such as those implemented at the Faculty of Dentistry Universitas Indonesia, will impact the students' level of knowledge both theoretically and in terms of implementation. Thus, students are expected to possess the knowledge to carry out comprehensive cleft management and achieve optimal outcomes.[27]

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This study has limitations in the number of research subjects, as it was conducted at only one dental school, which may limit its generalizability to undergraduate dental students in Indonesia. Based on the results of the current study, learning exposure is one of the factors affecting the level of knowledge about the comprehensive management of cleft lip and palate among undergraduate dental students. Clinical students demonstrated higher levels of knowledge because the information obtained regarding the management of cleft lip and palate was not just theory-based but also experience-based.

In conclusion, most students from the Faculty of Dentistry Universitas Indonesia, who had learned about cleft lip and palate using the PBL method had sufficient knowledge about the comprehensive management of cleft lip and palate. However, no significant relationship between learning exposure and knowledge level was observed. This study can be continued with a national discussion to develop a comprehensive undergraduate lecture curriculum on cleft lip and palate in undergraduate dental education in Indonesia.

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