

The Differences In Knowledge Levels About Bone Graft Materials Among Preclinical Students At The Faculty Of Dentistry Of USU, Clinical Students At The Faculty Of Dentistry Of USU, And General Dentists In Medan

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Abstract:

Background: A bone graft is living tissue that may stimulate bone repair when transplanted into a bone defect, either alone or combined with additional materials. In practice, dentists frequently encounter situations that require bone grafts for dental and oral treatments. Therefore, dental students as potential dentists and dentists as healthcare practitioners must have knowledge related to bone graft materials. The aim of this research is to determine the variations in knowledge levels regarding bone graft materials among pre-clinical students of the Faculty of Dentistry at USU, clinical students of the Faculty of Dentistry at USU, and general dentists in Medan City.

Materials and Methods: This research used descriptive analytic study with a cross-sectional approach using a closed questionnaire consisting of 16 questions. The sample was collected using simple random sampling method, with a total of 506 respondents who had agreed to give informed consent. The respondents consist of 108 general dentists, 104 clinical students, and 294 pre-clinical students. The Chi-Square Test was utilized to analyze the data.

Results: This study found a significant difference in knowledge levels comparing pre-clinical and clinical students of the Faculty of Dentistry at USU, as well as general dentists in Medan City with a p-value of 0.000 ($p < 0.05$).

Conclusion: According to the findings of the study conducted among pre-clinical students and clinical students of the Faculty of Dentistry at USU, as well as practicing dentists in Medan City, it can be concluded that significant disparities exist in the knowledge levels pertaining to bone graft materials.

Key Word: Bone Graft; Knowledge; Dental Students; Dentist

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I. Introduction

Bone defects in the oral cavity can occur due to various factors, including tooth extraction, periodontal disease, trauma, cysts, tumors, infections, congenital abnormalities, and jaw atrophy resulting from advanced age or systemic diseases.^{1,2} Despite advancements in dentoalveolar reconstruction, rehabilitation of jaw bone defects can be performed for various reasons, such as preserving normal anatomical contours, eliminating empty spaces, enhancing aesthetics, and utilizing implant dentistry for occlusion and articulation restoration, all of which can significantly improve the quality of life for patients. Currently, a number of methods, including bone grafting, have been developed to remove bone disorders by substituting missing bone structure.^{2,3}

A bone graft is a transplant of living tissue, either alone or in association with additional substances that may aid the damaged bone repair.⁴ For instance, bone grafts serve multifaceted roles, including providing structural support, bridging osseous defects between bone and implants, and expediting the healing process in various skeletal pathologies.^{5,6} Recently, bone graft materials may be obtained from the patient's own body (autograft), another individual of the same species (allograft), a different species (xenograft), synthetic materials (alloplast), or naturally occurring materials with the ability to regenerate bone.^{4,7} In order to replicate the bone tissue that needs to be repaired, bone grafts should be determined according to their physicochemical, mechanical, and biological characteristics, such as architecture, porosity, resistance, biocompatibility, biodegradability, osteoconduction, osteoinduction, and/or osteogenesis.⁸ Knowledge is the result of an individual's understanding of something through their sensory perception.⁹ Knowledge is defined as everything that is known through human experience, and knowledge grows as an individual's level of competence increases. Knowledge is closely linked to education, with the expectation that higher levels of education will result in a broader and more comprehensive understanding.¹⁰ Dental students are a group of individuals from various ages and backgrounds who are pursuing education in oral and dental health.¹¹ A dentist is a medical professional who treats a variety of conditions

associated with the oral health. In practice, dentists frequently get into situations where bone grafting is necessary for oral and dental care. As a result, both dental students and dentists as future medical professionals require to be educated about bone graft materials.

In a study conducted by Kothari et al. on dental students at a university located in Tamil Nadu, India (Saveetha University), regarding knowledge of autogenous dental bone graft materials, it was found that out of 100 respondents, only 57% of the students had knowledge about autogenous dental bone graft materials.¹² Research conducted by Araújo in Sobral, Brazil, revealed that dentists received knowledge about bone graft materials during their undergraduate studies, and those who graduated approximately 10 years ago are already familiar with these materials.⁸ Based on the aforementioned findings, the researchers were interested in comparing the knowledge levels about bone graft materials among preclinical students of the Faculty of Dentistry at USU, clinical students of the Faculty of Dentistry at USU, and general dentists in Medan, as this study has not been conducted previously in Indonesia.

II. Material And Methods

This research conducted an analytical study with a cross-sectional design. This design conducted to measure the dependent and independent variables that are used at a single point in time. The study employed the simple random sampling approach for collecting the samples. The sampling was conducted using the simple random sampling method. The total population meeting the inclusion criteria consisted of 506 respondents who provided informed consent. The respondents consisted of 108 general dentists, 104 clinical students, and 294 pre-clinical students. The instrument of this research was a questionnaire that included respondents' personal data. The data were collected by distributing the questionnaire to the pre-clinical dental students of the Faculty of Dentistry at USU, clinical dental students of the Faculty of Dentistry at USU, and general dentists in Medan. The questionnaire included 16 questions assessing knowledge about bone grafts.

Knowledge levels were categorized into three tiers: good (if the respondent's score was 76%-100%), fair (if the respondent's score was 56%-75%), and poor (if the respondent's score was <56%). SPSS version 22.0 was utilized for both univariate and bivariate data analysis. Tables containing the data were characterized and summarized using univariate analysis, whereas the chi-square approach was used for bivariate analysis. The bivariate analysis results provided p-values, which were then compared with $\alpha = 0.05$. If the p-value was less than $\alpha = 0.05$, there was a significant difference in knowledge among preclinical students of the Faculty of Dentistry at USU, clinical students of the Faculty of Dentistry at USU, and general dentists in Medan.

III. Result

Table no 1: Frequency distribution of respondents' level of knowledge.

Knowledge Levels	Good		Fair		Poor	
	n	%	n	%	n	%
	47	9.5	70	14.1	380	76.5

Based on the table no 1, it can be observed that 47 respondents (9.5%) had a good level of knowledge, 70 respondents (14.1%) had a fair level of knowledge, and 380 respondents (76.5%) had a poor level of knowledge.

Table no 2: Distribution of respondents' knowledge levels based on groups.

Group		Knowledge						P-Value
		Good		Fair		Poor		
		n	%	n	%	n	%	
Group	Pre-clinical Dental Students	9	3.2	21	7.4	256	89.4	0,000
	Clinical Students	33	31.7	21	20.2	50	48.1	
	General Dentists	5	4.6	28	25.7	76	69.7	
Total	47	9.5	70	14.1	380	76.5		

Based on Table no 2, pre-clinical students have a good level of knowledge with 9 respondents (3.2%), a fair level of knowledge with 21 respondents (7.4%), and a poor level of knowledge with 256 respondents (89.4%). Clinical students who have a good level of knowledge consist of 33 respondents (31.7%), with a fair level of knowledge consisting of 21 respondents (20.2%), and a poor level of knowledge consisting of 50 respondents (48.1%). General dentists who have a good level of knowledge are represented by 5 respondents (4.6%), with a fair level of knowledge represented by 28 respondents (25.7%), and a poor level of knowledge represented by 76 respondents (69.7%).

IV. Discussion

This study is a descriptive analytical research with a cross-sectional design, aimed at determining the differences in knowledge levels about bone graft materials among preclinical students of the Faculty of Dentistry at USU, clinical students of the Faculty of Dentistry at USU, and general dentists in Medan. A survey questionnaire comprising 16 questions was employed to assess the knowledge levels regarding bone graft materials. All respondents completed the entire questionnaire. Knowledge levels were categorized as good (scores 12-16), fair (scores 9-11), and poor (scores 0-8).

The majority of preclinical students of the Faculty of Dentistry at USU have poor knowledge level, according to 256 respondents (89.4%). It occurs because some respondents of pre-clinical lectures did not include bone transplant materials. However, there are some pre-clinical respondents who have examined bone graft materials but have a poor knowledge level of them. According to research conducted by Juniarti et al., knowledge can decline due to several factors, such as a lack of seriousness during learning activities, including joking during lectures, and insufficient involvement in learning activities, such as reluctance to take notes or participate in discussions.¹³ In addition, this phenomenon could arise from students' failure to utilize rehearsal practices (repeated learning), potentially leading to lapses in their grasp of crucial material.¹⁴

Repeated learning can extend short-term memory storage and facilitate the transfer of learned material into long-term memory. The absence of repeated learning implementation among students may be attributed to the exclusion of bone graft procedures from the competencies outlined in the Indonesian Dentist Competency Standards for general dentists. Such procedures are primarily employed by specialist dentists. Consequently, this learning may be revisited upon enrollment in specialist dental education programs.

The knowledge level among clinical students of the Faculty of Dentistry at USU revealed that 50 respondents (48.1%) had poor knowledge. This phenomenon stems from the respondents' knowledge regarding bone graft materials, which are not integrated into the requisite criteria or competencies for clinical students. As a result, this material is never reviewed.

The knowledge level of general dentists in Medan showed that the majority of respondents had poor knowledge, with 76 respondents (70.4%), followed by those with fair knowledge, 28 respondents (25.9%), and those with good knowledge were 4 respondents (3.7%) (Table 2). General dentists' lack of understanding of bone graft materials may be attributed to an inability to recollect (recall) previously learned material. This might be due to the extended time between obtaining knowledge and attempting to recall it, or because the material is never used or examined. Mubarak states that experience is one component that influences knowledge level.¹⁵

Furthermore, the large proportion of general dentists with a poor knowledge of bone graft materials are potentially due to their inexperience with bone grafting procedures, which leads to the lack of awareness of bone graft materials. Gulia et al. discovered that many general dentists are unaccustomed with bone transplant operations and recommend patients to specialist dentists.¹ Table 2 indicates that based on data analysis using the Chi-square test, the obtained value is 0.000 or $p < 0.05$, indicating a significant difference in the level of knowledge among pre-clinical students of the Faculty of Dentistry at USU, clinical students of the Faculty of Dentistry at USU, and general dentists in Medan.

V. Conclusion

According to the findings of the study conducted among pre-clinical students and clinical students of the Faculty of Dentistry at USU, as well as practicing dentists in Medan City, it can be concluded that significant disparities exist in the knowledge levels pertaining to bone graft materials.

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