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Knowledge Level of Clinical Dental Students in Faculty of Dentistry, Universitas Sumatera Utara Regarding the Anesthetic Technique of Inferior Alveolar Nerve Block

Tingkat Pengetahuan Mahasiswa Kepaniteraan Klinik Fakultas Kedokteran Gigi Universitas Sumatera Utara Mengenai Teknik Anestesi Blok Nervus Alveolaris Inferior

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Abstract

The inferior alveolar nerve block technique (Fischer's method) is a local anesthetic technique that is often used in daily dental and surgical treatment. However, the failure rate reaches 15-20% because many factors affect the technique's success. Therefore, this descriptive study aims to determine the knowledge of clinical dental students regarding the inferior alveolar nerve block technique and the management of the failure associated with its characteristics. A cross-sectional approach was employed by using a validated questionnaire consisting of 2 parts, namely 6 general questions and 12 knowledge questions, which were distributed to 68 clinical dental students in the Department of Oral and Maxillofacial Surgery, Faculty of Dentistry, Universitas Sumatera Utara in 2019. The results showed that 51.5% of the students had good knowledge, 41.2% had fair knowledge and 7.4% had less knowledge. The highest percentage of students based on male gender had fair knowledge (10 people out of 15) and the female had good knowledge (30 people out of 53). The clinical dental students' level of knowledge based on whether they have ever or never failed to perform an anesthetic block technique is in a good category. In conclusion, most of the clinical dental students at the Department of Oral Surgery in 2019 had a good level of knowledge about the inferior alveolar nerve block technique and its failure management.

Keywords: The anesthetic technique of inferior alveolar nerve block, knowledge, clinical dental students.

Abstrak

Teknik blok nervus alveolaris inferior (teknik Fischer) merupakan anestesi lokal yang sering digunakan pada perawatan gigi sehari-hari maupun perawatan bedah. Namun tingkat kegagalannya mencapai 15-20% dikarenakan terdapat beberapa faktor yang memperngaruhi keberhasilan teknik blok nervus alveolaris inferior. Tujuan dari penelitian ini untuk mengetahui pengetahuan mahasiswa kepaniteraan klinik mengenai teknik blok nervus alveolaris inferior dan penatalaksanaan kegagalannyadikaitkan juga dengan karateristik yang dimiliki. Penelitian ini merupakan penelitian deskriptif dengan pendekatan *cross sectional* dengan menggunakan kuesioner yang sudah tervalidasi. Terdiri dari 2 bagian yaitu 6 pertanyaan gambaran umum dan 12 pertanyaan pengetahuan yang disebarkan ke 68 mahasiswakepaniteraan klinik Departemen Bedah Mulut FKG USU tahun 2019. Hasil penelitian menunjukkan persentase sebesar 51,5% kategori pengetahuan baik, 41,2% pengetahuan cukup dan 7,4% kurang. Persentase terbanyak mahasiswa kepaniteraan klinik berdasarkan jenis kelamin laki-laki adalah kategori pengetahuan cukup (10 orang dari 15) dan perempuan dikategori pengetahuan baik (30 orang dari 53). Tingkat pengetahuan mahasiswa kepaniteraan klinik berdasarkan pernah atau tidak pernah gagal melakukan teknik anestesi blok dan pernah atau tidak mengulang siklus kepaniteraan klinik di Departemen Bedah Mulut termasuk kategori baik. Kesimpulan dari penelitian adalah sebagian besar mahasiswa kepaniteran klinik di Departemen Bedah Mulut pada Tahun 2019 memiliki tingkat pengetahuan yang baik mengenai teknik blok nervus alveolaris inferior dan penatalaksanaan kegagalannya

Kata kunci: Teknik anestesi blok nervus alveolaris inferior, pengetahuan, mahasiswa kepaniteraan klinik.

INTRODUCTION

Pain control using anesthesia becomes very important to reduce patients' fear. Local anesthesia known as the loss of sensation in a limited area of the body without losing consciousness is the type commonly used in dentistry. Also, local anesthetics work by blocking conduction processes in peripheral nerves. They consist of topical and injection anesthetics. Furthermore, the latter type is mostly used in posterior teeth extraction, especially in the lower jaw.

One of the local anesthetics is inferior alveolar nerve block which is often used in daily dental care and treatments that require surgical procedures. Inferior alveolar nerve block anesthesia is known as the Fischer technique of mandibular block, usually combined with buccal or lingual infiltration. However, its failure rate is quite high, reaching 15-20% even though the procedure is performed correctly by an experienced clinician.[1]

According to the study conducted by Nasution in 2014, a description of the success of starch in local anesthetics performed by clinical students in the Oral Surgery department in 2013 was observed.[2] The results showed 17.8% failed local anesthesia with the Fischer's method.[2] These are not much different from the reports by Uthophia, Gunawan and Yuza in 2015 at Padjajaran University. Of the 100 samples, 12 were found to be unsuccessful using the mandibular block technique. Also, the data showed that direct injection with the alveolar nerve block technique was ineffective between 13-29% while the indirect was 15%.[3]

Furthermore, Yongki et al. performed a clinical experiment in 2016 using 20 patients as samples which were divided into two groups to observe effectiveness between direct and indirect inferior alveolar nerve block techniques. The results showed 20% failures using the direct technique and 50% for the counterpart.[4]

You et al. in 2015 at Yonsei University Dental Hospital examined the association between inferior alveolar nerve block failure and patients' mandibular skeletal characteristics. In 693 cases, failure was recorded in 67 persons. Patients with a normal mandible experience an anesthetic failure rate at 7.3% of the 67 failure cases. In retrognathic and prognathic mandibular conditions, there were 14.5% and 9.5% of the 67 failure cases, respectively. This shows that one of the factors influencing the failure of inferior alveolar nerve block anesthesia is the individuals' mandibular skeletal characteristics.[5]

Inferior alveolar nerve block anesthesia needs to be delivered carefully because it tends to induce various complications which cause patients to be afraid of receiving the next treatment. In 2018, Indhimathi and Hemavathy conducted a study with questionnaire instruments related to the inferior alveolar nerve using 122 samples.[6] The results showed that 15.7% of clinical dental students and 18% of final-year dental students reported hematoma as the complication detected after the injection was administered. Another 11.4% and 7.9% of the aforementioned students respectively observed that trismus was common in these patients.[6]

To avoid complications, several factors need to be considered before the anesthesia is performed. Some of the important factors in the succession of the inferior alveolar nerve block anesthetic technique are the experience, skills, and knowledge of the clinicians, while others include the patient.[9,10,11] The high failure rate experienced in the anesthetic procedure of inferior alveolar nerve block also makes it necessary for clinicians to consider alternative techniques.[1]

There has been no previous discussion on the knowledge level of clinicians regarding inferior alveolar nerve block techniques and the alternatives that can be used in case failure occurs. Therefore, this study aims to determine the knowledge level of clinical dental students in the faculty of dentistry, Universitas Sumatera Utara regarding the inferior alveolar nerve block technique, the factors influencing its failure, and the required management actions.

MATERIALS AND METHODS

The clinical dental students in the Department of Oral Surgery, Faculty of Dentistry, Universitas Sumatera Utara in 2019 were used as samples in this descriptive study. Furthermore, their knowledge level regarding the inferior alveolar nerve block technique and its failure management were examined using the survey method and a cross-sectional approach.

The study was conducted from April to May 2021. Of the 225 total population, 68 samples were obtained using the simple random sampling method. This was based on the criteria that the students had handled patients personally in the Oral Surgery department. The measuring instrument used was an already validated questionnaire.

The questionnaire consisted of respondents' characteristics, their general description, and questions related to knowledge of inferior alveolar nerve block techniques & its alternative techniques in case of failure. The general description contained 6 closed questions and 1 open question while the questions related to knowledge were 12. Moreover, the questions related to knowledge with correct answers had a score

of 1 and the counterparts with incorrect answers had a score of 0. Based on the assessment, the respondents' knowledge level was stated to be good once their correct answer score ranged from 76-100% of all questions. Once 56-75% of all questions were answered correctly, then it was categorized as fair. Meanwhile, when the respondent answered <56% of all questions correctly, then it was categorized as less knowledge.

RESULTS

According to Table 1, most of the respondents were 24 years old i.e. 38.2% (26 people), 23.5% (16 people) were 25 years old, 25% (17 people) were 23 years old, 7.4% (5 people) were 26 years old, 2.9% (2 people) were 27 years old, 1.5% (1 person) was 22 years old and another 1.5% (1 person) was 28 years old. The total females were 53 people (77.9%) while males were 15 (22.1%).

The general description consisted of 7 questions. This included basic questions such as have the respondents ever performed anesthesia or not? Did they fail while delivering the inferior alveolar nerve block? Did they find the anesthetic technique difficult? (table 2). The results showed that the majority of respondents had undergone a clinical clerkship period of 1-2 years, namely 42 people (61.8%). Subsequently, the most frequently asked questions by respondents when taking a history of the patients' lifestyle were about alcohol drinking habits in 20 people (19.8%), sleeping patterns in 16 people (15.8%), dietary habits in 10 people (9.9%), and smoking habits in 16 people (15.8%). Meanwhile, the rarely asked question was on regular exercise which was only answered by 1 person (1.0%).

The result of respondents' knowledge about the inferior alveolar nerve block anesthetic technique and its failure management in mandibular dental treatment showed that up to 35 people (51.5%) were in the good category (table 3). These were associated with the characteristics and general descriptions of the respondents. The characteristics are related to gender (table 4), while the general descriptions are the experience of whether they have ever or never failed to perform an anesthetic block technique. Hence, the know-ledge level in most males i.e 10 people (66.7%) was discovered to be fair, while and in up to 30 females (56.6%) it was good.

DISCUSSION

Out of the 12 questions related to anesthetic techniques, 2 which were based on anatomical marks and needle insertion depth were answered incorrectly by the majority of students. All respondents claimed to have heard and known about the inferior alveolar nerve block anesthetic technique, indicating that they have basic knowledge of it. A total of 65 students know the definition of local anesthesia as loss of sensation in a limited area of the body without losing consciousness.

A total of 52 students have known that the nerves anesthetized by Fischer's method are incisive, lingual, inferior alveolar, and mental nerve. Up to 48 students had correct knowledge about the origin of the inferior alveolar nerve branch. The results also showed that 54 students know the alveolar nerve is a combination of the mental and incisive nerves. Furthermore, these are consistent with Malamed's writing in 2020, which stated the inferior alveolar nerve is the most posterior branch of the mandibular nerve division (from the trigeminal nerve). It is where Fischer's method anesthetizes the incisive, mental, and lingual nerves.[7]

Up to 47 students answered the questions regarding anatomical marks that indicate the needle insertion point incorrectly. In a previous study, the anatomical marks for performing anesthetic injection procedures with the inferior alveolar nerve block technique are coronoid notch, pterygomandibular raphe, and the occlusal plane of the mandibular posterior teeth.[7] The needle insertion point is between the pterygomandibular raphe and the coronoid notch. Moreover, the exact point is obtained through an imaginary line drawn from the inside of the pterygomandibular raphe to the coronoid notch.[8]

While performing the mentioned technique, it is important to note 3 parameters, namely injection height, anteroposterior needle position (which helps to find the right needle insertion point), and needle insertion depth which determines the inferior alveolar nerve's location. The height of the injection is marked by placing the left hand's thumb in the coronoid notch or 6-10 mm above the occlusal plane. Malamed's paper in 2020 stated that once the needle is inserted, the feeling of touch or contact with the bone is certain. The tip of the needle is said to be located far posteriorly (medially) when not in contact with the bone.[7]

Inferior alveolar nerve block anesthesia is performed directly or indirectly. The direct technique means being performed from the homolateral side and the indirect is from the contralateral commissure. Needle fracture, trismus, hematoma, pain after injection, and transient facial paralysis are common local complications following this anesthesia. In total, 92.3% of the students know the local complications that commonly occur with inferior alveolar nerve block anesthetic technique. When using the direct

technique, there is a risk of the anesthetic solution going too far medially, causing damage to the medial pterygoid muscle. This causes post-treatment trismus and/or the occurrence of a hematoma.

The cross-sectional study conducted by Indhimathi and Hemavathy in 2019 using measuring instruments on final-year dental students and clinical dental students at Saveetha Dentistry University, Chennai is in line with this current study. The results showed that 15.7% of clinical dental students and 18% of final year dental students reported hematoma as the most common complication after administering inferior alveolar nerve block injection. Another 11.4% and 7.9% of both students respectively stated trismus as a common complication, while 5.7% and 9% of the respective students believed in the accident of facial paralysis.

The tear generated while inserting the needle into the mucosa caused trismus, hence, there can be needle fracture during insertion. Facial paralysis is then caused by needle insertion too posteriorly which leads to the entering of anesthetic solution into the parotid gland. Complications of hematoma occurred due to needle penetration into the blood vessel accompanied by the deposition of anesthetic solution. A previous study found that complications of nerve damage after injection due to direct trauma from the needle initiate intraneural hematomas' formation. Neurotoxicity tends to also occur because of the anesthetic solution used and patients' history of injury.[5]

In detail, the knowledge level of clinical dental students regarding the factors influencing anesthesia failure is quite good. Among the 4 questions, 1 related to needle insertion depth was answered wrongly by the majority (66.2%) of respondents. Based on several journals, needle insertion depth until contact is made with the bone in the inferior alveolar nerve block technique ranges from 19-25 mm[8] and 20-25 mm.[1] According to Malamed in 2020, the depth required to contact the bone is about 20-25 mm,[7] while a depth over 25 mm indicates the positioning of the needle more posteriorly.

A total of 51 students know that topical anesthetics usage prevents failure in administering inferior alveolar nerve block. The failure commonly experienced is usually related to patients' fear of injection which tends to lower the pain threshold. This is in accordance with Malamed's paper in 2020, while performing inferior alveolar nerve block anesthesia procedure, topical anesthetics were given for 1-2 minutes before placing the needle tip at the mouth's tip.[7]

The results showed 51 of the 68 students knew that the failure of the inferior alveolar nerve block anesthetic technique was influenced by anatomical factors, patients, and clinicians. This is in line with the previous study of Subbiya et al. in 2020, which suggested several parameters that need to be considered to reduce the failure rate of Fischer's method, such as knowing anatomical & patient factors, anesthetic solution materials, and injection techniques performed. The location of the mandibular foramen, variations in the mandibular canal, patients' fear, local infection, the volume and the concentration of anesthetic solution used, and means to locate the needle position need to be considered by clinicians. Patient habits also need to be assessed before administering local anesthetics.[17]

Based on 11 questions related to the inferior alveolar nerve block technique, the results of the clinical students' knowledge level showed 51.5%, 41.2%, and 7.4% had good, fair, and less knowledge respectively (table 3). Regarding the appropriate handling technique whether the patients still feel pain after inferior alveolar nerve block anesthetic administration, 56 clinical dental students provided correct answers. They also answered correctly in terms of additional injecttions with the intra-ligament periodontal technique. Hence, most of these students have good knowledge of alternative techniques during inferior alveolar nerve block failure.

Kanaa et al in 2012 reported 182 samples with a negative response in the pulp after administration of inferior alveolar nerve block anesthesia.[12] A total of 82 people were successfully characterized as not feeling pain with no need for additional anesthesia. However, the anesthesia failed in 100 people by feeling pain & having a response to pulp testing and reinjection with the same technique was performed. The results showed the success percentage of this option was 32% and it was also the least successful method compared to additional injections.

Pradhan et al. in 2016 stated that pain during needle insertion was less in the intra-ligament tech-nique than the inferior alveolar nerve block.[13] Haghgoo and Taleghani conducted a study in 2015 to evaluate the effectiveness of intra-ligament periodontal inject-tion as a primary injection instead of the additional injection for first molar pulpotomy treatment. The results showed that it was effective for pulpotomy of primary molars in 88/75% of all cases. Also, there was no significant difference between the intraligament and block techniques.[14]

Shabazfar et al. in 2012 conducted a meta-ana-lysis of the sets of literature related to intraligament periodontal injection as an alternative to inferior alveolar nerve block from 1979-2012 literature.[15] This was carried out from British and German journals related to both independent variables over 33 years from many published journals. Relevant outcome parameters included the failure rate of both techniques, pain

during injection, additional injections required, cardiovascular compromise caused, and differences between intraligament periodontal techniques and inferior alveolar block in adult patients. Undesirable side effects, latency time, amount of anesthetic agent, and duration of anesthesia were also considered. The failure rate, pain during injection, and additional injection required showed no significant difference between the two techniques.[15]

The result was due to differences in anesthetic solutions and the dental practitioner's experiences. Meanwhile, the incidence of cardiovascular effects signifycantly occurred after the inferior alveolar nerve block injection was administered. In performing a conservative treatment, the administration of inferior alveolar block is not always emphasized. However, for the treatments requiring oral and maxillofacial surgery, the intraligamental periodontal injection cannot be used as an alternative technique but as an additional anesthetic provided that the administration of inferior alveolar nerve block does not work effectively.

Regarding the respondents' general description, the results showed that 48 of the 68 students carried out anamnesis related to the patients' lifestyle (table 1). Out of the several questions from the clinicians, 4 were most frequently asked. These consisted of statements related to patients' alcohol drinking habits (19.8%), sleeping patterns (15.8%), diets (9.9%), and smoking habits (15.8%). The patients' alcohol drinking habits decreased the efficiency and slowed down the local anesthetic solution's action, as well as affected the anesthesia dose administered.

Alcohol intake causes temporary pain relief, however, as the body tolerates and addicts to the substance, patients need to increase the dose and quantity consumed to achieve analgesic properties. The ethanol content in alcoholic beverages causes damage to every cell in the body. This is due to the concentration of alcohol in all body fluids surrounding the cells including blood, urine, saliva, spinal fluid, and tears. Alcohol is changed into acetaldehyde in the body and is more toxic than the original compound.[9]

Local anesthetics work by depressing the central nervous system and are anticonvulsants which can be used to reduce seizures' duration. In the cardiovascular system, they act directly on the myocardium which causes a decrease in electrical stimulation flow. Afterward, the rate of conduction and contraction of the peripheral blood vessels decreases due to the relaxation of the blood vessels' smooth muscle. Alcohol and local anesthetic pHs play an important role in the efficiency of anesthetic solution induction. The acidic pH of alcohol changes the blood pH by altering the kidneys' ability to maintain phosphate levels in the blood. Once the blood pH is acidic, cell function decreases, and an environment that tends to prevent local anesthetic molecules' dissociation is created. The local anesthetics work at a pH ranging from 7.3 to 7.4 which is the normal blood pH in the human body.[9]

Local anesthetics' administration in alcoholic patients causes liver dysfunction and abnormal blood clotting. This then leads to uncontrollable blood loss during tooth extraction after the administration. Apart from alcohol consumption, the habit of drinking coffee also influences anesthesia failure. The patients of King Saud University Clinic reported that they of-ten failed to experience the anesthetic effect (numbness) due to excessive coffee consumption and thereby requested for dosage increase.[10]

Coffee contains caffeine, which is also found in tea and energy drinks. Caffeine affects the central nervous system (CNS) & cognitive performance, improves memory, changes the state of mind, and increases alertness but has a negative effect on sleep quality. Excessive caffeine intake has been linked to anxiety, headaches, nausea, and restlessness. In the CNS, this substance works by blocking adenosine receptors that regulate neurotransmitters' release. Caffeine acts as an antagonist to adenosine A1 and A2A receptors by increasing neuronal activity, preventing adenosine binding to its receptors, and having a stimulatory effect on neurons.[10]

A study by Sangeetha, et al. in 2020 found a significant relationship between the amount of caffeine consumed (mg) and the experience of failing local anesthetics. Patients with a habit of consuming high caffeine, up to 133.4 mg, experienced local anesthetic failure. Several other factors influencing it include smoking status, systemic conditions, and drugs consumed. This is because nicotine and caffeine have a stimulant effect. However, smoking increases the clearance of caffeine by minimizing the substance's effect on adenosine receptors.[10]

In taking the history of the patients' lifestyle, respondents were also asked about their smoking habits. A study by Al-Noori et al. in 2020 consisted of 103 participants were divided into two groups of 55 smokers and 48 non-smokers.[11] Participants were administered with local anesthesia Lidocaine 2% in each group where 68 respondents had received anesthetic blocks, both inferior alveolar and lingual blocks, while 38 patients received infiltration anesthesia. Each received an average of 1-5 cartridges of anesthetic solution. A significant difference was discovered in the amount of anesthesia required between the group administered with the inferior alveolar nerve block compared to the infiltration technique in the smokers' group.

The nicotine in cigarettes has an antagonistic mechanism of action with local anesthetic solutions, where it opens channels for sodium to enter.[11] Therefore, smoking patients require more anesthetic solutions than non-smoking counterparts. Especially in the group of smokers with complaints of pain (symptomatic) compared to non-symptomatic.

This study also assessed the respondent's knowledge level regarding inferior alveolar nerve block anesthesia techniques based on gender. The females have a better percentage of knowledge. According to the table, clinical dental students that have good knowledge are 26.7% of the male population and 56.6% of the women population.

The above results are in line with the study by Anwar et al. in 2019 regarding the intelligence of males compared to females in the learning process using survival analysis.[16] Anwar et al. used secondary data from students that had completed their education and graduated the bachelor degree program from 11 faculties at Syiah Kuala University, Banda Aceh. From the results, female students tend to have 125.5% potential to complete their education faster than the males. The same also applied in this current study where the female students have the potential to be 127% faster in completing their education.

Knowledge entails the meaning of a person's abilities and skills about a particular object. A reflection from a failure can be the basis of someone's knowledge. Associating the experiential knowledge gained by a person with science promotes easier understanding. This is in accordance with the current study. Based on students' level of knowledge regarding whether they failed to perform the inferior alveolar nerve block anesthetic technique, students that failed to perform the technique were in the good category (59.1%). This number has exceeded half of the overall students that possess a good level of knowledge and have never failed.

Probably, the described situation occurred because the failed students have mastery-oriented behavior where they do not only focus on the experience of failure but also accept challenges and maintain a strong motivation to learn. Students in the less knowledge category are 4, and only 1 person that has experience failed in performing the technique. This also shows the technique's success is determined by various factors, not only on the experience and knowledge of the clinicians.

Gugule A et al. in 2013 conducted an experimental study on alcohol drinking and its relationship to the mandibular block technique (Fischer). The results showed different reactions in each sample, depending on the type of alcohol and the background of the sample (sample region). Patients that consumed an average of 14% alcohol after the administration of a mandibular block followed by additional infiltration injections reacted rapidly compared to patients that consumed 17%-45% alcohol even though they were given the same number of doses and injections. The onset of reactions in each patient is different depending on the alcohol content in the drink and its amount of intake.[18]

According to the results, the failure experienced by 13 students with good knowledge when performing alveolar nerve block anesthesia was possibly related to patient factors, including alcohol consumption habits. Moreover, based on the knowledge level of clinical dental students that have or never repeated the dental cycle, 22 students have repeated this department, consisting of 13 people in the good category and 9 in the fair category.

In this study, several limitations feature while discussing the success rate of the intra-ligamental technique as an additional anesthetic or as an alternative for the failure management of inferior alveolar nerve block. From the results, 28.4% (Table 2) of the students did not perform anamnesis regarding the patients' lifestyle and up to 22 persons had failed to perform the inferior alveolar nerve block technique. The possible failure experienced by the 22 persons was because they did not perform anamnesis related to the patients' lifestyle. Although the knowledge possessed by clinicians in giving anesthetic injections correctly plays an important role, while other factors include the patients' lifestyle. Therefore, before a local anesthetic injection is administered, history taking is advised to minimize failure of injection based on the patients' factor.

In conclusion, based on the knowledge level of clinical dental students regarding inferior alveolar nerve block anesthetic technique and its failure management in the Faculty of Dentistry, Universitas Sumatera Utara, 51.5%, 41.2%, and 7.4% had good, fair, and less knowledge respectively. Knowledge in the good category (76% - 100%) included questions about the history of students that have heard and known about alveolar nerve block anesthetic techniques, local anesthetic definitions, anesthetized nerves, inferior alveolar nerve description, common local complications, factors influencing the technique failure, proper needle position in administering inferior alveolar nerve block anesthesia and other additional techniques. Knowledge in the fair category (56% - 75%) was about the alveolar nerve and its divi-sion as well as topical anesthetics' administration to patients that are afraid of injections. The knowledge of respondents in the less category (<56%) included anatomical marks for the needle insertion point before administration and the insertion depth while performing

the inferior alveolar nerve block technique.

It indicates that the success of the alveolar nerve block technique lies in the knowledge and in the clinical dental students' skills as well as other clicnical condition Anatomical factors such as the location of the foramen, accessory innervation, and patients' lifestyle are also considered. In the general description, 70.6% of students were discovered to have conducted anamnesis related to the patients' lifestyle which affected the work of local anesthetics. Smoking and caffeine drinking habits, as well as alcohol consumption, also contribute to the local anesthetics' performance.

TABLES

Table 1. Respondents' general description

	General Description	Ever		Never	
		n	%	N	%
1.	Have you ever injected patients using an inferior alveolar nerve block anesthetic technique?	68	100	0	0.0
2.	Have you ever failed to perform an inferior alveolar nerve block anesthetic technique?	22	32.4	46	67.6
3.	Have you ever repeated the cycle of clinical clerkship in the oral surgery department?	22	32.4	46	67.6
4.	Did you ask about the patients' lifestyles?	48	70.6	20	28.4

Table 2. Knowledge of inferior alveolar nerve block technique

No.	Question	Corecct		Incorecct	
		n	%	n	%
1.	Have you ever heard and known about the inferior alveolar nerve block anesthetic technique?	68	100.0	0	0.0
2.	In your opinion, the definition of local anesthetic is?	65	95.6	3	4.4
3.	Which nerves are anesthetized by delivering a direct inferior alveolar nerve block anesthetic technique (Fischer's Method)?	52	76.5	16	23.5
4.	What is the inferior alveolar nerve?	54	79.4	14	20.6
5.	The inferior alveolar nerve is a branch of which nerve division?	48	70.6	20	29.4
6.	Prior to deposition of anesthetic solution, what are the anatomical clues to the dentist indicating the correct needle insertion point?	21	30.9	47	69.1
7.	In your opinion, what local complications are common when using inferior alveolar nerve block anesthesia techniques?	63	92.6	5	7.4

8.	In your opinion, the failure of the inferior alveolar nerve block anesthetic technique is influenced by several factors, such as:	64	94.1	4	5.9
9.	In your opinion, in performing the inferior alveolar nerve block anesthetic technique, the tip of the needle is	58	85.3	10	14.7
10.	In performing the technique of inferior alveolar nerve block anesthesia, it is necessary to consider the depth of needle insertion into the mucosa. In your opinion, how many millimeters are the depth of needle insertion until it touches the bone in an adult?	23	33.8	45	66.2
11.	In case the patient is afraid of the injection, topical anesthesia can be given to prevent failure of the inferior alveolar nerve block anesthetic procedure.	51	75.0	17	25.0
12.	In case the patient still feels pain after inferior alveolar nerve block anesthesia, what is the most appropriate technique to treat this condition:	56	82.4		17.6

Table 3. The respondents' knowledge level regarding the inferior alveolar nerve block anesthetic technique and its failure management

Knowledge	N	%
Good	35	51.5
Fair	28	41.2
Less	5	7.4
Total	68	100.0

Table 4. Level of Knowledge associated with gender and ever or never failed to perform an anesthetic block technique

Knowledge	Gender			
	Male		Woman	
	N	%	n	%
Good	4	26.7	30	56.6
Fair	10	66.7	20	37.7
Less	1	6.7	3	5.7
Total	15	100.0	53	100.0
Knowledge	Had ever or never failed to perform inferior alveolar nerve block techniques			
	Ever		Never	
	N	%	N	%
Good	13	59.1	21	45.7
Fair	8	36.4	22	47.8
Less	1	4.5	3	6.5
Total	22	100.0	46	100.0

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