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RESEARCH ARTICLE

Acknowledgment and Attitude of Dental Students About Fillers as a Non-Surgical Esthetic Procedure

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ABSTRACT

Introduction: **Hyaluronic acid dermal fillers are widely accepted today in order to improve appearance or to oppose the aging process, especially in females.**

Objectives: **The aim of this cross-sectional study was to analyze the Acknowledgment of the adverse effects of lip filler among dental students in government dental colleges and private departments of dentistry.**

Material and Methods: **An online self-structured questionnaire of three domains comprising fourteen items, the first domain covered demographic data (gender, age. Type of education, academic year and working status), the second domain consisted of five items (the primary source of information about dermal filler, the most often occurring side effect, the most common site where the adverse consequence of filler appear in. The main cause of complications and the possible reason for doing lip filler). The last domain, which is the attitude towards dermal fillers consisted of four items having had a dermal filler injection before, the person you agreed to expert this non-surgical procedure, whether the doctor or expert person, the possible indication to use dermal fillers in dental clinics.**

Results: **The majority of students who answered the questionnaire were from private departments; the percentage of females is higher than that of males; the highest number of participants were second-year students. Swelling is the most common side effect of dermal filler, and the vast majority of students prefer to have this nonsurgical procedure performed by a doctor and not by an experienced person in the aesthetic field.**

Conclusions: **Most complications are associated with injection technique, volume, placement, and sterility. Every procedure should take into account a small, slow injection combined with massage to introduce the product evenly and gently.**

Keywords: Adverse effect, dental students, filler.

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1. Introduction

Non-surgical procedures have been more common and well-accepted in recent years [1]. Dermal fillers are second in popularity among non-surgical procedures behind botulinum toxin A, making up 30% of all non-surgical operations, and its prevalence has increased by an estimated 58% in the last five years, according to data from the International Society of Aesthetic Plastic Surgery for 2021 [2]. The proper application of these products necessitates a specialist understanding of facial anatomy, the study of facial morphology, aging and product properties, the technique aims to repair age-related alterations and optimize facial proportions [3], [4].

Aging causes complicated but predictable face changes. The rate at which these alterations impact the face varies depending on both intrinsic or extrinsic elements such as genetics, sunlight exposure, tobacco usage, ethnicity, air pollution, systemic disease, and others [5].

Many people believe that pouty and flipped lips indicate a youthful and appealing appearance. That is why a variety of lip augmentation treatments, both surgical and noninvasive, have been proposed. Utilizing hyaluronic acid fillers

to improve lip volume is one of the most popular services in our daily face aesthetic practice [3], [4], [6].

The phrase beautification refers to improving the lips in relation to the typical lip sizes, which should be 1:1.6. This proportion may vary in Asian and African patients [6].

In 2018, almost 2.6 million injectable operations used a variety of soft tissue fillers, representing a 312% rise from 2000 to 2017 [7]–[9]. One of the most commonly utilized non-surgical regenerative therapies is hyaluronic acid (HA)-based dermal filler [10]. Its natural occurrence provides non-immunogenic qualities, making it superior to conventional filler materials [11]. It also has anti-inflammatory and antioxidant properties. Furthermore, HA strongly promotes wound healing and tissue regeneration by offering a proper framework for cell growth [12]. Because of its numerous benefits, HA is widely employed in other sites of tissue regeneration, including orthopaedics to heal rheumatoid arthritis and osteoarthritis [13].

The original manufacturing of hyaluronic acid from animal sources was switched to a bacterial origin. In this technique, various genetically engineered bacteria species such as B. subtilis, Group C and A Streptococci are utilized to manufacture hyaluronic acid, which is then isolated. Further, it is modified chemically to establish cross-links between the hyaluronic acid polymers [14].

Many clinicians have documented a variety of concerns with lip fillers, including ischemia, tissue necrosis, and vision loss [15]–[17].

Early adverse effects include edema, erythema and bruising, which are a typical physiological response to the injection of a foreign material and this reaction can often be reduced by chilling the injected site. Slow injections of local anesthetics in tiny doses minimize pain. Bruising is reported to be decreased by applying aloe vera, vitamin K lotion or arnica. Allergies might develop within hours if the patient has previously been exposed. Bumps and Lumps form when an improper filler is injected in an incorrect area or injected superficially. These can arise quickly or as a result of material clumping caused by muscular action. Vascular deterioration becomes obvious within a day in case of arterial blockage caused by unintentional Compression or intravascular injection caused by the filler volume. Using a blunt cannula rather than a sharp needle for injection reduces accidental occur intravascular injection [18].

Hyaluronidase may be injected around the vasculature to reduce the negative effects of hyaluronic acid fillers. Additional supportive therapies include topical nitroglycerin, warm compresses, and aggressive massage [19].

People obtain, receive, and share health data from many different sources, including pharmaceutical firms, insurance, healthcare experts, friends and family, social media, commercials, educational materials and the internet. In the last years, More and more Americans have been using the internet to research health and medical issues and comparable rates among Europeans [20], [21]. However, both high-quality and low-quality health data can be obtained online, and few social media platforms distinguish between legitimate and untrustworthy sources of data. As a consequence, buyers must make their own selections concerning how much trust to invest in a source and the reliability of the information it provides. These decisions are influenced by their level of health and digital literacy, prior information, personal circumstances, and personal views [22]. The present cross-sectional study included undergraduate dental students in many governments' dental colleges and private departments of dentistry. An online self-structured questionnaire comprising 14 items including the primary source of information about dermal filler, the most common side effect, and the most common site where the adverse effect of filler appears. The main cause of complications and the possible cause for doing lip filler and others. The collected data appeared in the result below and was discussed to obtain the best benefit from this study.

2. Materials and Methods

2.1. Study Design

The present cross-sectional study included undergraduate dental students in many governments (Mustansiriyah University, Al Iraqia University and the University of Babel) dental colleges and private (Al Safwa University, Al Turath University and Alhikma University) Department of Dentistry. An online self-structured questionnaire of 3 domains comprising 14 items, the first domain covered demographic data (gender, age, type of education, academic year and working status), the second domain consisted of 5 items (the primary source of information about dermal filler, the most common side effect, the most common site the adverse effect of filler appear in, The main cause of complications and the possible cause for doing lip filler) to determine the knowledge of dental students towards dermal filler. The last domain, which is the attitude towards dermal filler, consisted of 4 items having a dermal filler injection before, the person you agreed to expert this non-surgical procedure, did the doctor or expert explained the common potential adverse effect associated with fillers, the possible indication to use dermal fillers in dental clinics.

The students were encouraged to reply willingly via a survey link published on social media platforms (such as Telegrams and WhatsApp), and participant identity will be anonymized. The questionnaire was circulated to 441 dental students between November 2023 to February 2024.

2.2. Statistical Analysis

The collected data was imported as Excel for analysis and then exported to the data editor of SPSS ver. 25, Descriptive data analysis and chi-square test were conducted to compare variables, and A p-value of ($\leq$0.05) was considered significant (S) for statistical analysis.

3. Result

A total of 10 questionnaires were collected from 441 dental students in the first, second, third, fourth and fifth years of many governmental and private colleges of dentistry.

Fig. 1 illustrates the number of dental students in governmental colleges (Group I) was 174 (39.5%) while the number of dental students in private dental colleges

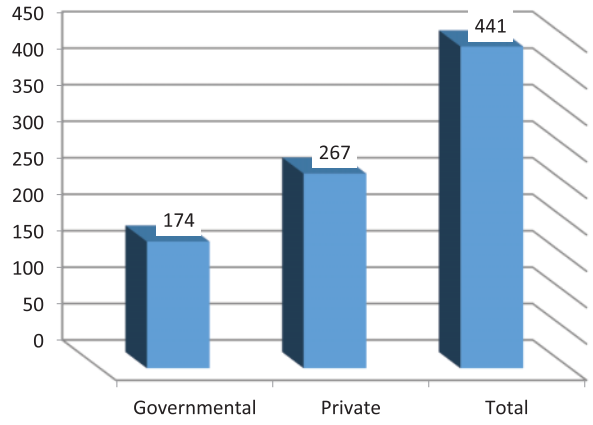

Fig. 1. Distribution of dental students.

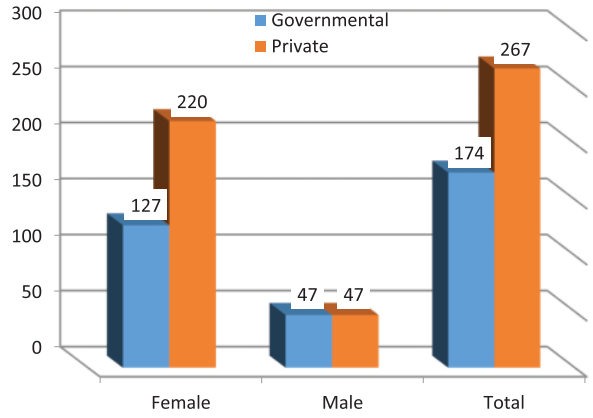

Fig. 2. Male to female ratio.

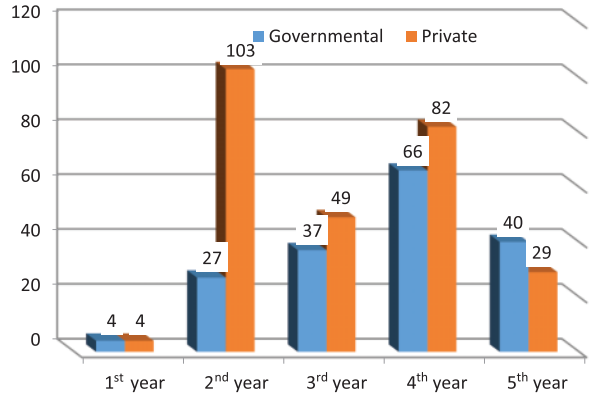

Fig. 3. The academic year of the dental students.

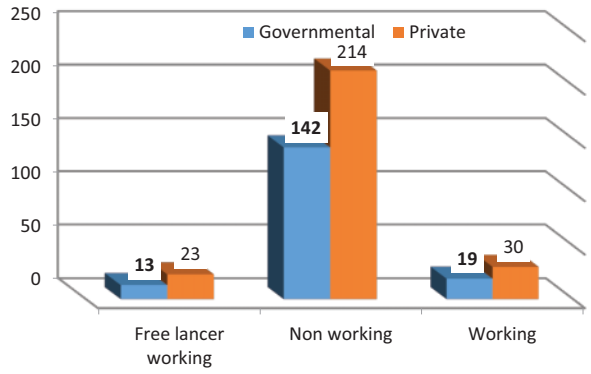

Fig. 4. The working status of the students.

Table I shows dental students' knowledge and attitude towards dermal filler. Non-significant differences in frequency were seen among dental students' groups regarding the following: the primary source of information about dermal filler, the main cause of complications, and doing lip filler, a non-surgical esthetic procedure. Swelling, the most common side effect of dermal filler was reported as the highest percentage among the other most common side effect, number 62 (35.6%) and number 95 (35.5%) in Group I and Group II, respectively. In addition, 192 respondents of Group II (71.9%) and 107 (61.5%) of Group II had an opinion the most common adverse effect appeared in the lip followed by cheeks and marionate line, statistically Significant differences (0.048) were observed.

Regarding the Domain of dental students' attitude towards dermal filler, 37% of private dental students had done filler injection, conversely, 19% of governmental students. The highest percentage of participants (70.7%, 64.9%) in Group I and II each in order had the knowledge of common potential adverse effects associated with dermal filler from the doctor or expert 29.2%, 35% in the same order had no information Chi-square test reported Significant difference (0.048) in frequency. Concerning the possible indication to inject dermal filler in dental clinics highest % (74.7%, and 71.1% in Group I and II, respectively) for achieving better dental and esthetic followed by (17.3%, 18.7% in the same group order) for achieving better facial esthetic only, the least % regarding the purpose to achieve better dental esthetic. The chi-square test showed a significant (0.034) relationship between both groups.

(Group II) who participated in this questionnaire was 267 (60.5%).

Fig. 2 illustrates that the female participants in both groups recorded the highest responses in comparison to male participants, 82.4% and 73% in private colleges and governmental colleges, respectively, while the male response percentages were 17.6%, and 27% in the same order as female responses.

Fig. 3 demonstrates the highest number of participants, 103 (38.6%) from the second year in Group II compared to only 27 (15.5%) from Group I.

Fig. 4 illustrates the working status. The highest % reported among the studied sample was non-working students.

4. Discussion

A crucial component of patients' knowledge and awareness is the relationship between the doctor and the patient. Better patient outcomes can be attained through positive interactions. Good communication skills, which involve doctors explaining and answering patients' questions and concerns, are one element that can contribute to the development of this strong doctor-patient relationship. Increasing patient awareness and knowledge of cosmetic procedures is largely dependent on communication.

In light of our findings, Table I shows that there was no statistically significant variation in the frequency of knowledge about dermal fillers among the dental student groups. According to our research, social media serves as

TABLE I: Dental Students' Knowledge and Attitude Towards Dermal Filler

	Governmental		Private		X^2	p-value
What is your primary source of information regarding dermal fillers?						
	No.	%	No.	%		
Books	28	16.09195	37	13.85768	2.380	0.123
Friends and relatives	11	6.321839	14	5.243446		NS
Social media	98	56.32184	123	46.06742		
your doctor	37	21.26437	93	34.83146		
Total	174	100	267	100		
Filler injections is a popular esthetic procedure that have many side effects, what is the most common side effect by your opinion?						
	No.	%	No.	%		
Allergy reaction	30	17.24138	52	19.47566	5.788	0.016
Asymmetry	42	24.13793	56	20.97378		S
Brusing	6	3.448276	6	2.247191		
Infections	18	10.34483	27	10.11236		
Others	12	6.896552	15	5.617978		
Pain	4	2.298851	16	5.992509		
Swelling	62	35.63218	95	35.58052		
Total	174	100	267	100		
In your opinion, what is the most common adverse effect of filler use?						
	No.	%	No.	%		
Cheeks	36	20.68966	34	12.73408	3.886	0.048
Forehead	2	1.149425	5	1.872659		S
Lip	107	61.49425	192	71.91011		
Marionate line	24	13.7931	30	11.23596		
Tear troughs	5	2.873563	6	2.247191		
Total	174	100	267	100		
What is the main cause of complications?						
	No.	%	No.	%		
Severity	30	17.24138	33	12.35955	1.882	0.170
Site of injections	76	43.67816	113	42.3221		NS
The type of filler	68	39.08046	121	45.31835		
Total	174	100	267	100		
Had you done a filler injection before?						
	No.	%	No.	%		
No	155	89.08046	230	86.14232	2.773	0.046
Yes	19	10.91954	37	13.85768		S
Total	174	100	267	100		
Who should perform this non-surgical procedure?						
	No.	%	No.	%		
Doctor	149	85.632184	226	84.64419	2.887	0.049
Experienced person in esthetic field	25	14.367816	41	15.35581		S
Total	174	100	267	100		
Did the doctor or expert explain the common potential adverse effect associated with fillers?						
	No.	%	No.	%		
No	61	35.057471	78	29.21348	2.889	0.048
Yes	113	64.942529	189	70.78652		S
Total	174	100	267	100		
What are the possible indications to use dermal fillers in a dental clinic?						
	No.	%	No.	%		
Achieving better facial esthetic	30	17.241379	50	18.72659	6.592	0.034

TABLE I: Continued

	Governmental		Private		X^2	p-value
Achieving better dental esthetic	14	8.045977	27	10.11236		S
Achieving better dental and facial esthetic	130	74.712644	190	71.16105		
Total	174	100	267	100		

*Note: p-value ≤ 0.05, X^2 Chi square; NS non-significant, S significant.

many people's main information source. People therefore get a lot of information from social media, which may be inaccurate or overstated for the procedure [23].

The most frequent side effects linked to fillers are those related to local injections, which include edema, erythema, pain, and ecchymosis. These negative effects typically last less than a week, are mild, and are consistent with Moreover [24].

Foreign body granulomas and hypersensitivity reactions, which may appear as induration, erythema and nodular swelling at the injected area within days or sometimes years after the injection, are the second most frequent side effects of fillers [25]. Due to the possibility of a surface skin breach, injectable fillers come with an infection risk. Fillers have been linked to a wide range of bacterial, viral, and fungal infections. After lip augmentation, reactivation of herpes simplex infection is frequently observed. This can be avoided in patients who are actively infected, or in patients who have recurrent infections, by starting antiviral therapy prior to the procedure. Staphylococcal and streptococcal infections are another common cause of bacterial infections such as cellulitis and abscesses, and they may need to be treated with broad-spectrum oral antibiotics. There have also been reports of Mycobacterium chelonae infections and abscesses following the use of tainted fillers [26], [27].

Our results demonstrated a substantial difference between the lip region and the midface, nasolabial fold site and perioral line in the same line with the work of Colon *et al*. in terms of swelling, bumps or lumps and firmness [28].

Regarding the primary cause of complications, there are no discernible differences in our current research. The most frequent side effects, which are typically temporary, are those related to injections. The most serious side effect of hyaluronic acid filler injection is vascular occlusion. Vascular occlusion is less likely if one has a thorough depth understanding of the anatomy of the facial vessels. Prompt intervention following early detection of a vascular occlusion can greatly reduce the chance of long-term consequences.

Fortunately, the majority of filler injection-related side effects are minor and self-limiting. A thorough in-depth understanding of the vascular anatomy in the face, appropriate injection techniques, and meticulous skin preparation can help minimise the rare infectious and vascular complications associated with filler injections. Prompt intervention and early detection can greatly reduce the chance of long-term [29].

When fillers are taken into consideration, the majority of side effects are not unique to a single filler type. They could be the consequence of volume increase or technical errors like incorrect injection needle, placement site, or indication [30]. When people's knowledge of dermal filler side effects is taken into account, the highest percentage of participants (70.7%, 64.9%) in Groups I and II each in order knew common potential side effects from a doctor or expert while 29.2% and 35% in the same order had no information. The chi-square test revealed a significant difference (0.048) in frequency, highlighting the significance of healthcare providers informing patients about the risks and benefits [31].

The highest percentage (74.7% and 71.1% in Groups I and II, respectively) of dental clinics have indicated that injecting dermal fillers may be a good way to improve dental and aesthetic outcomes. These results are in line with the results of Funt D. and Pavicic T., who discovered Dermal fillers have gained favour in recent years due to their ability to provide the rejuvenating and boosting visual enhancements that were previously only possible with surgery, but with little money spent and almost no recovery time. Over 1,600,000 dermal filler procedures were carried out in 2011, according to data from the American Society for Aesthetic Plastic Surgery (ASAPS); this made dermal fillers the second most common nonsurgical cosmetic treatments in the United States after neuromodulators, which are often combined with dermal fillers [32].

5. Conclusion

Given the variety of dermal fillers that can be used for facial aesthetics, it is crucial to have a deep understanding of the pertinent product attributes. It is imperative that clinicians possess a comprehensive comprehension of facial anatomy, along with the necessary training and experience, to guarantee accurate product selection, preparation, and injection technique. It's critical to choose the right patient, and it's crucial to thoroughly look into the patient's history of medical injections before beginning treatment.

Most complications are associated with injection technique, volume, placement, and sterility. Every procedure should take into account a small, slow, deep injection combined with massage to introduce the product evenly and gently. Physicians should be well-versed in the warning signs and symptoms of complications and equipped with readily available agents.

Conflict of Interest

Authors declare that they do not have any conflict of interest.

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