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## The Attitude and Perception of Dental and Medical Interns Toward Dental Smile Enhancing Treatments

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### Abstract:

#### Background:

Perception of beauty is different from one individual to another, and this may influence their desire for aesthetic treatment. There are many studies that compared dentists to the general population's perception of smile treatments. However, only a few studies were carried out to compare the perception of fresh graduate dentists with a comparable group of another medical medical background.

#### Objective:

This study aimed to compare how medical and dental interns perceive dental smiles and how much they ask for dental enhancement treatments.

#### Methods:

A cross-sectional study targeting dental and medical interns in the kingdom of Saudi Arabia using an online survey. An online questionnaire was formulated and distributed through social media. Comparisons between groups were made using the Chi-square test with a *p-value* of significance kept under 0.05.

#### Results:

204 participants responded to the survey, 107 dental and 97 medical interns (52.5%, 47.5%), respectively. When the participants were asked to rate their satisfaction with their smiles, almost 60% of the dental interns rated their smiles 8/10 or more on a scale of (1-10). When they were asked about the cause of the dissatisfaction, their responses were varying. About 84% of dental interns reported having complications of varying sources because of the smile-enhancing treatment, compared to only 50% of the medical interns.

#### Conclusion:

Dental and medical interns interacted in the same manner toward smile-enhancing treatments. Dental interns seem to show more satisfaction with their smiles. They also showed more ability to spot and identify the harmful effects of those procedures.

**Keywords:** Dental smile, Smile perception, Smile enhancing, Dental aesthetic, Dentist perception, Smile satisfaction, Dental appearance.

### Article History

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## 1. INTRODUCTION

The aesthetic concept is closely related to dentistry. It has been conceptualized that a person's first impact is made by appearance, and this will last for a long time [1]. One of the major components of facial beauty is dental appearance. The

perfect appearance publicized by the media, such as TV shows, Snapchat, and Instagram applications, has a strong impact on society's beauty consciousness. Thus, there is an increased demand for aesthetic treatment from individuals in our society [2, 3].

One of the most common reasons for patients to seek dental treatment is their dissatisfaction with their dental appearance [4, 5]. As the mouth is in the center of the face, people usually focus on the lips and teeth with whom one

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speaks with. A smile has a great appeal in individual attractiveness, also, it is used to express feelings. Relationships have been discovered between emotional stability, self-esteem, and dominating personality qualities, as well as the perceived beauty of a person's smile [3, 6].

From a dental perspective, tooth color, form, and location, as well as the quality of restorations and the general arrangement of the dentition, particularly of the anterior teeth, are all essential elements impacting overall dental appearance. Additionally, top lip position, tooth exposure, and periodontal presentation were found to influence what is considered a pleasant smile. Although each feature may be studied alone, they must all work together to form a symmetrical and harmonious entity that provides the ultimate aesthetic impact [2, 3].

Perception of beauty is different from one individual to another, and this may influence their desire for aesthetic treatment. Factors such as age, gender, ethnicity, socioeconomic status, marital status, level of education, occupation, familial influence, cultural exposure, and social media have a great effect on people's perception of beauty [7 - 10]. There are many studies conducted to evaluate dental students and the general population's insight into dental aesthetics [11]. These studies are of high importance as they will assess how people and dental students evaluate dental beauty and will give guidance for dental students to understand patient aesthetic needs. However, few studies were conducted to evaluate student self-perception about their smile and teeth [12 - 14]. Only one study was conducted in Saudi Arabia, at King Saud University, Riyadh to evaluate dental students' self-perception. They found that most dental students were confident about their smiles [15].

The aim of this study is to investigate the attitude and perception toward dental smile-enhancing treatments among dental and medical interns. The hypothesis was that having a dental background, the dental interns might change their perception toward smile-enhancing treatments if compared with a comparable group from a different background.

## 2. MATERIALS AND METHODS

This cross-sectional study investigated dental and medical interns in the kingdom of Saudi Arabia using an online survey. The study was conducted in an interval of about 4 months starting from October 2021. The ethical approval was obtained from the Ethical Review Board (IRB ID: PSAU2021006), Prince Sattam bin Abdulaziz University, Alkharj, Saudi Arabia. The data collection process started in December 2021 and was completed in January 2022. Dental and medical interns from different universities in Saudi Arabia were contacted and requested to fill out the survey. The survey was designed to

exclude any participant who did not fit one of the tested groups, *e.g.* dental or medical students, qualified dentists or medical doctors, *etc.* An online questionnaire was formulated and distributed through social media, Twitter, and WhatsApp groups targeting dental and medical interns. The survey items were created by (IA, the main investigator) and the reliability was tested by conducting a pilot study on 40 participants, where data were analysed using IBM SPSS statistic version 22.0 to determine the consistency using Cronbach's coefficient alpha. The sample size was determined based on similar previous studies that assessed the perception of smile esthetic among dental and non-dental populations which targeted sample sizes between 150- 250 [5 - 25]. Therefore, our current study comprised a similar sample size number.

The questionnaire was composed of a cover page that described the research and approved the subjects' confidentiality. Followed by a section that asked about the demographic data of the participants, which were age, gender, and nationality. In addition, the specialty, whether medical or dental, was asked in the same section. In the second section, the participants were asked to rate how satisfied they are with their smiles. They also were asked about the causes of dissatisfaction, if any. Further, if any smile enhancement treatment was received and the time, type of procedures, and experienced complications if applicable. The third section was questioning whether the subjects wanted to receive smile-enhancing treatment and the reasons behind their responses. They were also asked if they thought these types of treatments were harmful or not. The fourth section was composed of 2 questions about promoting dental enhancement treatment and two questions about different terms that were used commercially to express smile-enhancing treatments. Finally, they were asked if the lifetime guarantee promoted by some clinics encouraged them to get that kind of treatment.

All the statistical analyses were performed in the statistical software IBM SPSS version 22 (IBM Co., Armonk, NY, USA) where descriptive as well as inferential statistics were conducted. Comparisons between groups were made using the Chi-square test with a *p-value* of significance kept under 0.05.

## 3. RESULTS

Of the 250 total targeted subjects, 204 participants responded and completed all items of the survey, 107 dental interns and 97 medical interns (52.5%) and (47.5%) respectively. Analyzing the participant age showed that 75% of participants were 24 years old and 25% were between ages 25 to 30 years old. Gender analysis showed that 111 subjects were male (54.4%), and 93 subjects were female (45.6%). Nationality results showed 145 Saudi participants (71.1%) and 59 non-Saudi participants (28.9%) (Table 1).

**Table 1. Characteristics of the subjects (n: 204).**

Variables	Frequency Percentage
Age	
21-25	153 (75%)
25-30	51 (25%)

(Table 1) contd....

Variables	Frequency Percentage
<b>Gender</b>	
Male	111 (54.4%)
Female	93 (45.6%)
<b>Nationality</b>	
Saudi	145 (71.1%)
Non-Saudi	59 (28.9%)
<b>Group Specialty</b>	
Medical Intern	97 (47.5%)
Dental Intern	107 (52.5%)

**3.1. Satisfaction Rate**

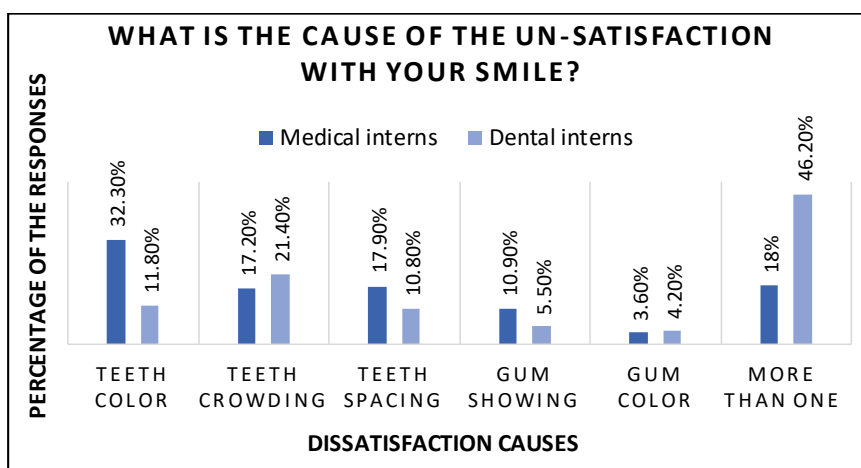
Looking at satisfaction rates across both genders, a statistically significant difference was detected between males and females ( $p$ -value < 0.0001). The female group was more satisfied with their smile compared to male interns, as about 58% of the females rated their smile as 8/10 and above compared to around 30% from the male side (Table 2).

When the participants were asked to rate their satisfaction with their smiles, almost 60% of the dental interns rated their

smiles 8 or more on a scale of (1-10), where 10 was the highest score of satisfaction. In contrast, only 26% of the medical interns rated their smile as 8 or more, this was statistically significant ( $p$  < 0.0001). When they were asked about the cause of the dissatisfaction, their responses varied. For instance, over 30% of medical interns referred to tooth color as the main cause of dissatisfaction and 46.2% of dental interns reported having more than one of the suggested causes of dissatisfaction (Fig. 1).

**Table 2. Comparison across gender.**

Variables	Male	Female	p-value
<b>Nationality</b>			
Saudi	77.5%	63.4%	.028
Non-Saudi	22.5%	36.6%	
<b>Group Specialty</b>			
Medical Intern	41.4%	54.8%	.056
Dental Intern	58.6%	45.2%	
<b>Rate how much you are satisfied with your smile.</b>			
1	0.9%	00%	.000
2	2.7%	00%	
3	8.1%	1.1%	
4	14.4%	2.2%	
5	9.9%	7.5%	
6	15.3%	17.2%	
7	20.7%	12.9%	
8	9.9%	20.4%	
9	8.1%	21.5%	
10	9.9%	17.2%	



**Fig. (1).** Dental and medical interns’ responses regarding the dissatisfaction causes about their smiles.

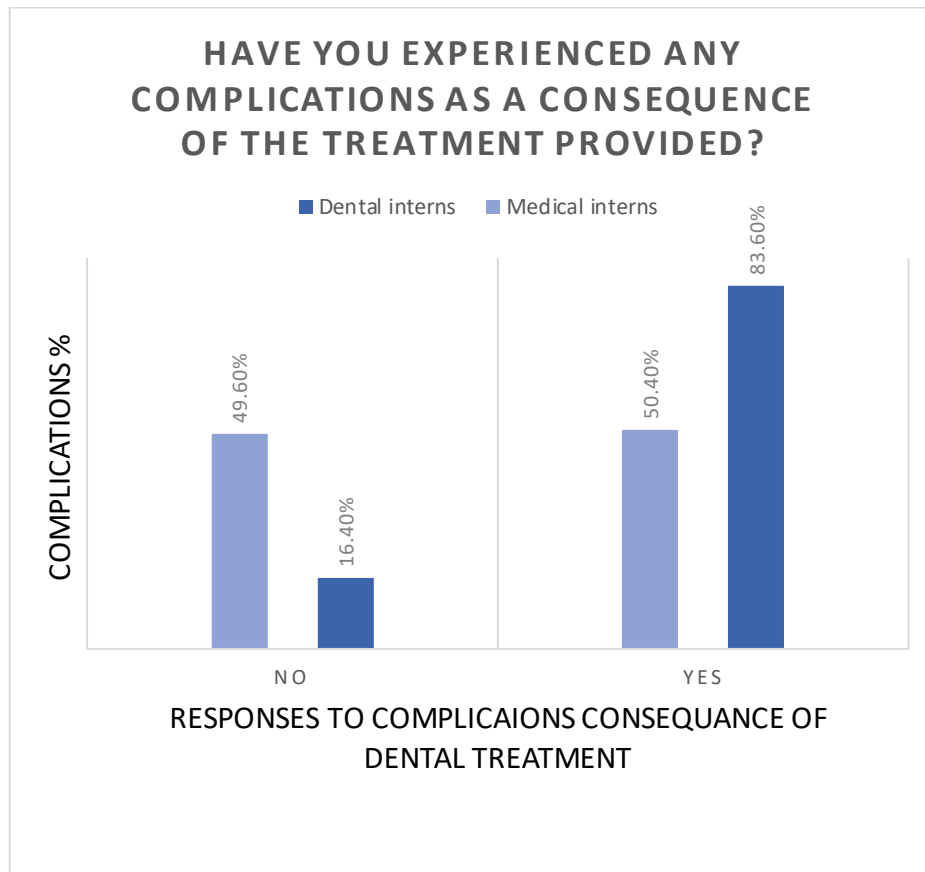


Fig. (2). The percentage of experienced complications after smile-enhancing procedures for both tested groups.

### 3.2. Smile-enhancing Procedures

About 88% of dental interns have had some smile-enhancing procedures compared to about 52% of the medical interns, this was statistically significant ( $p < 0.0001$ ). The majority of both groups received this kind of treatment 2 to 4 years ago. Orthodontic treatment using braces was the most frequent procedure for both groups; 26% of dental interns and 41% of medical interns (Table 3).

### 3.3. Complications after Receiving Smile-enhancing Treatment and the Main Reason to Consider Smile-enhancing Treatment in the Future

The percentage of dental interns who reported complications of varying sources because of the smile-enhancing treatment was 84% compared to only 50% of the medical interns; this was statistically significant ( $p < 0.0001$ ) (Fig. 2). Almost 70% of the two groups said they would consider smile-enhancing treatments in the future, mainly to correct the malalignment of the teeth or to make their teeth look whiter (Table 3).

### 3.4. Participants' Perception of Whether the Smile-enhancing Treatment was Harmful or Not

Around 28% of dental interns thought that smile-enhancing treatments were always harmful to oral health in the long term.

From both groups, 40% revealed that they knew that those procedures were harmful from what they heard from the surrounding family or friends who have had complications (Table 3).

### 3.5. How to Avoid Complications?

The patients' self-care of oral health and the knowledge and skill of providing dentist were the main factors that were chosen from the participants, over 80% in both groups, to avoid post-dental smile-enhancing treatment complications (Table 3).

### 3.6. Promoting Smile-enhancing Treatments, Terms used to Describe them, and Treatments Guaranteed

Around 60% of both groups agreed that dental smile-enhancing treatments were acceptable to be promoted publicly, and almost 70% of the dental interns thought that these treatments were over-promoted. The highest percentage of medical and dental interns did not consider commercial terms like Hollywood smile, 3D smile, and Snap-on smile as scientific terms, with 34% and 26%, respectively. Moreover, 36% of dental interns found these terms attracted them to seek such treatments, whilst it was only 26% of the medical interns. A lifetime guarantee offered with those treatments was found to encourage about 40% of both groups to ask to have these procedures (Table 3).

Table 3. Comparison across specialty

Variables	Medical Interns	Dental Interns	p-value
<b>Rate how much you are satisfied with your smile (10 is totally satisfied).</b>			
1	0.9%	00%	.000
2	1.7%	00%	
3	9.1%	1.1%	
4	13.4%	1.2%	
5	10.9%	8.5%	
6	14.3%	16.2%	
7	21.7%	13.9%	
8	10.9%	21.4%	
9	7.1%	20.5%	
10	9.9%	17.2%	
<b>What is the cause of the un-satisfaction with your smile?</b>			
Teeth color	32.3%	11.8%	.176
Teeth crowding	17.2%	21.4%	
Teeth spacing	17.9%	10.8%	
Gum showing	10.9%	5.5%	
Gum color	3.6%	4.2%	
More than one of the above	18%	46.2%	
<b>Have you ever done any dental smile enhancement treatment?</b>			
Yes	52.2%	88.2%	.000
No	47.8%	11.8%	
<b>When did you have it done?</b>			
4-2 years ago	33.5%	47.8%	.000
5 years or more years ago	15.6%	25.4%	
Last year	17.9%	21.9%	
I have not done any	27%	4.8%	
<b>What type of dental smile enhancement treatment have you done?</b>			
Braces	41.6%	26.2%	.051
Crowns and veneers	10.7%	17.1%	
Teeth bleaching	10%	12.8%	
Gum surgery	3.5%	10.8%	
More than one of the above	32.3%	24.8%	
<b>Have you experienced any complications as a consequence of the treatment provided?</b>			
Yes	50.4%	83.6%	.000
No	49.6%	16.4%	
<b>What type of complications have you experienced?</b>			
Bad smell	21%	17.7%	.267
Teeth sensitivity	33.8%	3.5%	
Gum inflammation	32.3%	35%	
Root resorption	8.1%	3.8%	
Both teeth sensitivity and gum inflammation	1.6%	00%	
Many teeth have restorations	3.2%	00%	
<b>Would you consider a dental smile enhancing treatment in the future?</b>			
Yes	65.8%	68.8%	.065
No	18.9%	25.8%	
Not sure	15.3%	5.4%	
<b>Why would you do the treatment if you answered yes to the above question?</b>			
To improve the shape of teeth	6.4%	6.3%	.342
To correct the malalignment of teeth	42.6%	50.6%	
To improve the colour of teeth	38.3%	24.1%	
To improve the gum appearance	12.8%	18.9%	
<b>Do you think dental smile enhancing treatment is harmful to oral health in the long term?</b>			
Yes, if it is done improperly	55.8%	57.9%	.087
Sometimes even when done properly	13.6%	10.9%	
Always No	12.6%	3.3%	
Always Yes	18%	27.9%	
<b>Why do you think it is harmful?</b>			
I have read and learned about the complications.	28.1%	18.5%	.235
I have experienced some complications because of treatment	31.3%	40.4%	
I have heard of somebody who had complications	40.6%	41.1%	

(Table 3) contd.....

Variables	Medical Interns	Dental Interns	p-value
<b>What do you think is the most critical factor that has to be considered by the treatment seeker to avoid post-dental smile-enhancing treatment complications?</b>			
The patient self-care of his oral health	40.5%	35.5%	.145
The knowledge and skill of providing dentist	54.1%	51.6%	
The quality of material used during procedures	5.4%	12.9%	
<b>Do you agree that dental smile-enhancing treatment is acceptable to be promoted publicly?</b>			
Strongly agree	26.1%	22.6%	.234
Agree	35.1%	44.1%	
Neutral	31.5%	23.7%	
Disagree	5.4%	9.7%	
Strongly disagree	1.8%	00%	
<b>Do you agree that dental smile-enhancing treatment is overpromoted?</b>			
Strongly agree	27.1%	26.9%	.345
Agree	31.5%	39.7%	
Neutral	30.4%	20.5%	
Disagree	9.1%	8.5%	
Strongly disagree	1.8%	4.3%	
<b>Terms like (Hollywood smile, 3D smile, Snap-on smile) are scientific terms?</b>			
Strongly agree	8.1%	7.5%	.134
Agree	12.6%	24.9%	
Neutral	20.7%	16.1%	
Disagree	24.3%	24.7%	
Strongly disagree	34.2%	26.7%	
<b>Terms like (Hollywood smile, 3D smile, Snap-on smile) are attractive to me, and I would like to have those kinds of treatment in the future?</b>			
Strongly agree	13.6%	13.9%	.125
Agree	12.7%	23.7%	
Neutral	22.4%	20.4%	
Disagree	20.8%	20.4%	
Strongly disagree	32.4%	21.5%	
<b>Lifetime guarantee offered with dental smile-enhancing treatments is encouraging me to seek such treatments?</b>			
Strongly agree	12.6%	11.9%	.567
Agree	25.3%	29%	
Neutral	33.2%	31.1%	
Disagree	11.7%	15.1%	
Strongly disagree	17.1%	12.9%	

#### 4. DISCUSSION

The perception of the appearance of the smile is different from one individual to another and is affected by several factors. Media, gender, age, marital status, education level, socioeconomic status, influence from family members and friends, and occupation are examples of different factors that might influence the individual smile self-perception [16 - 24]. Moreover, someone's smile could be affected by many factors, such as tooth shape, color, size, and position; gingival color, shape, and amount of gingival display, and finally, the lip position [6].

The females in our study had a higher satisfaction rate with their smiles compared to the male participants. This contrasts with a previous study that was conducted in 2012 by Silva et al. where they found females were more dissatisfied with their smiles. This could be from an inference that females were more aware and sensitive about their appearance [7]. In our study, the female dental interns received more aesthetic enhancement treatment with 89% compared with 48% of male participants, so this perhaps could explain the findings

Dental interns, who finished their undergraduate formal dental education to be qualified dentists, were compared to a comparable group, medical interns, who were within their range of age and level of education. In the current study, 60%

of the dental interns rated their satisfaction with their smile as 8/10 or above, compared to medical students with only 26%. This result is similar to the result of another study conducted in 2018 at Taif university. The aim was to evaluate the smile self-perception among dental, medical, and pharmacology students. 6% of medical and 7% of dental students used to cover their smiles with their hands. In addition, 75% of the medical students believe that someone else had a better smile than theirs, compared to 63% of the dental students [25].

In our study, a significant proportion (46.2%) of dental interns reported having more than one of the causes of satisfaction. Because of their scientific expertise, dentists, and people with dental backgrounds, appear to be more critical when evaluating smile aesthetics than the general population [26]. The most common cause of dissatisfaction among medical interns was their tooth color, similar to the results of Alharthy and co-authors' study. They found that 76% of the medical interns wished to have whiter teeth [25]. The scientific background of the dental interns also could have an effect on spotting the complications that resulted after smile-enhancing treatments. In the current study, 84% of dental interns reported having complications of varying sources compared to only 50% of medical interns.

Looking at orthodontics as the most common treatment

modality received by both groups, gingival inflammation was the most common cause of complications recorded by both groups. The orthodontic brackets and elastics might interfere with effective dental plaque removal and thus will increase the risk of gingivitis [27 - 29].

Different options were given to assess the type of smile-enhancing treatment for both medical and dental interns who preferred orthodontic treatment. Similarly, the study was conducted at King Saud University (KSU), where most dental students preferred orthodontic treatment to correct the malalignment of teeth [15]. The demand for orthodontic treatment was high due to increased concerns about appearance and aesthetics.

As around 60% of dental and medical interns found promoting smile-enhancing treatment as acceptable, it is crucial to emphasize the importance of ethics when providing this type of treatment to patients. It is also important to increase awareness among dental students that providing cosmetic treatment which involves severe destruction of the teeth is unethical. If the patient has unrealistic expectations about their smile, it is important to address these issues early in the diagnosis and discussion process. In addition, it should be clear to the patients the side effects of the treatment in the long term.

Surprisingly, about 50% of dental interns either agreed or were neutral to terms of similarity to “Hollywood smile”, 3D smile, and Snap-on smiles, as scientific terms, compared to around 40% of the medical interns. In addition, about 40% of the dental interns found a lifetime guarantee, encouraging them to receive dental aesthetic treatment. It is essential to increase dental interns’ knowledge in dental school about scientific terms and their procedures. In addition, terms like Snap-on smile, Hollywood smile, *etc.* should be avoided while dealing with patients. The treatment seeker may ask for unneeded procedures that could be harmful to dental and oral health. Side effects such as gingival recession, tooth sensitivity, veneer debonding and fracture of teeth, veneer replacement, and mobility might be caused by smile-enhancing procedures, and this is why no lifetime guarantee should be given to these types of treatment. Future research should also take into account the impact of recently introduced substances such as bleaching gels, remineralizing agents, and probiotics. These compounds have been shown to have a major impact on the oral environment, and they may have an impact on the study’s findings [30 - 32].

Every study poses some limitations, and this study not exceptional, this is a cross-sectional study using an online questionnaire and smile photographs were not used. Future studies should introduce the concept of the digital smile design which can be used in the aesthetic dentistry to strengthen diagnosis vision, communication and represent an important marketing and visibility tool. Moreover, the mentioned above variables, that could affect responses outcome, should be included as independent variables to assess their effect on the perception and satisfaction of the targeted sample about their smile.

The aim of this study was to investigate the attitude of dental interns toward enhancing their smiles with dental treatments with a comparable non-dental group. The study

showed no statistically significant differences between the two groups, however, further studies with larger samples and additional independent variables are recommended.

## CONCLUSION

Within the limitation of the study, it can be concluded that dental and medical interns are generally interacting in the same manner toward smile-enhancing treatments. However, dental interns seem to show more satisfaction with their smiles. They also showed more ability to spot and identify the harmful effects of smile-enhancing procedures.

## ETHICS APPROVAL AND CONSENT TO PARTICIPATE

The ethical approval was obtained from the Ethical Review Board (IRB ID: PSAU2021006), Prince Sattam bin Abdulaziz University, Alkharj, Saudi Arabia.

## HUMAN AND ANIMAL RIGHTS

No animals were used in this research. All human research procedures followed were in accordance with the ethical standards of the committee responsible for human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2013.

## CONSENT FOR PUBLICATION

Informed consent was obtained.

## STANDARDS OF REPORTING

STROBE guideline was followed.

## AVAILABILITY OF DATA AND MATERIALS

Not applicable.

## FUNDING

None.

## CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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Declared none.

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