

Public Attitudes Toward Chairside Screening for Medical Conditions in Dental Settings

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Objective: The aim of this study is to investigate the public's attitudes and knowledge toward chairside dental screening and laboratory investigations based on demographic data.

Methods: A self-administered structured questionnaire regarding chairside screening was designed employing a 5-point Likert-type scale. The questionnaire was distributed to among sample of adults. Data were collected and statistically analyzed using descriptive statistics, *t*-tests, ANOVA, and *P* values.

Results: A total of 573 questionnaires were completed. Most respondents were willing to have a dentist conduct screening for diseases, in particular blood measurement (89%), hypertension (85.7%) and lab result discussion (83.1%), having medical condition did not affect the willingness. The lowest reported willingness was to undergo biopsy (54%) and hepatitis screening (67.6%) Age, education, hospital, and prior chairside screening were found to be significant factors for willingness.

Conclusion: The population's willingness to undergo chairside medical screenings in the dental office is crucial for the implementation of this strategy and to deliver a holistic approach to treating patients' medical conditions.

Keywords: chairside screening, dental, medical conditions, public

Introduction

Monitoring patients closely while in the dental chair is an essential task for the identification of both oral and general risks as well as for the early detection of systemic diseases. It also assists in identifying individuals with an increased risk for a disease or complication, early detection, and prompt intervention.¹⁻⁶ A considerable proportion of the population has reported visiting the dentist but not seeing their physicians.^{7,8} Improved patient health is associated with dental involvement, including improved quality of life.⁹ In addition, a holistic patient approach is recommended for optimal health.¹⁰ Several studies have investigated the benefits of medical screening at the dental chairside as well as the beliefs and attitudes among dentists, authorities, and patients on this topic, with a favorable response reported.¹¹⁻¹⁷ Most of the emphasis in the literature on chronic noncommunicable diseases has focused on efforts to decrease the morbidity and mortality of those diseases. For example, heart diseases are considered to be one of the leading causes of death.¹⁸ Studies have demonstrated that dental screening identified the risk of developing cardiac diseases and serious complications and that they played a role in instituting early intervention.^{5,19} Similarly, reports on diabetes mellitus, a common disease with a considerable associated morbidity, complications, and mortality have revealed promising results. Indeed, research has indicated that screening within dental clinics is an

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effective means of early detection of prediabetes and diabetes.²⁰ Researchers have found positive patient attitudes and willingness toward chairside dental screening.^{13,15,21–23} In a qualitative study, patients who underwent chairside screening requested regular screening in the dental clinic.²³ However, most of these studies investigated chronic diseases such as diabetes and cardiovascular disease. There have been few studies in the reviewed English literature that has examined attitudes toward screening for other common diseases, and none were conducted in Saudi, this is the first such study in Saudi Arabia assessing public attitudes. The aim of this study is to explore the public's attitudes and knowledge toward chairside dental screening and laboratory investigations against demographic data.

Materials and Methods

A cross-sectional survey was designed and conducted to explore the public's attitudes and knowledge toward chairside dental screening and laboratory investigations. After we reviewed the current literature on this topic, we designed and constructed a structured self-administered questionnaire to fulfill the study objectives. The questionnaire was developed in Arabic in different questioning types. The questionnaire was divided into the following three parts. Part 1 contained questions about demographic data, namely, age, sex, education level, occupation, marital status, medical conditions, last visit, and whether medical consultation by the dentist was received. Part 2 included questions related to the willingness to undergo screening. This part employed a 5-point Likert-type scale, with points on the scale indicating measures ranging from very willing, willing, neutral, unwilling, and totally not willing. The participants were anonymous and contained no identifiable information about the participants. Participation in this study was completely voluntary, and the questionnaires took approximately 5 minutes to complete.

A questionnaire created using Google survey forms was distributed thereafter through social media outlets such as Twitter and the WhatsApp application.

Statistical Analysis

Data were collected and analyzed and then summarized and presented in tables. All statistical analyses were performed using the Statistical Package for Social Sciences program (version 22). Descriptive statistics such as frequency distributions were performed. We used *t*-tests, one-way analysis of variance (ANOVA), and post hoc analysis to measure the relationship between variables. *P* values $\leq .05$ were considered statistically significant.

Results

A total of 573 completed questionnaires. Table 1 presents the participants' sociodemographic data and sample characteristics. The majority of the respondents were in the age range 20–30 years 41.4%, followed by 31–40, 29%. More than two third of the sample were (71.6%) bachelor holders.

Table 1 Sociodemographic and Characteristics of the Sample

Variables	Gender	
	Male	Female
Age (years)		
18–20	1(0.2)	47(8.2)
21–30	54(9.4)	183(31.9)
31–40	59(10.3)	107(18.7)
41–50	25(4.4)	61(10.6)
51 and older	10(1.7)	26(4.5)
Marital status		
Single	68(11.9)	204(35.6)
Married	80(14)	198(34.6)
Widow/divorced	1(0.2)	22(3.8)
Education		
Primary/middle school	2(0.3)	14(2.4)
High school	21(3.7)	60(10.5)
Bachelor's degree	101(17.6)	309(53.9)
Postgraduate degree	25(4.4)	41(7.2)
Occupation		
Does not work	8(1.4)	121(21.1)
Student	24(4.2)	136(23.7)
Health care worker	13(2.3)	9(1.6)
Governmental employee/private/other	104(18.2)	158(27.6)
Have you received dental treatment before?		
Yes	147(25.7)	408(71.2)
No	2(0.3)	16(2.8)
Last dental visit		
For emergency	16(9.1)	52(9.1)
Had dental appointment		
Less than 6 months	57(9.9)	186(32.5)
6 to 12 months	20(3.5)	72(12.6)
More than 1 year	55(9.6)	111(19.4)
Other	1(0.2)	3(0.5)
Where do you receive your dental treatment?		
Governmental hospitals	25(4.4)	64(11.2)
Private clinics	111(19.4)	334(58.3)
Teaching hospital	7(1.2)	11(1.9)
Governmental polyclinics	6(1)	15(2.6)
Have you received any consultation or clinical examination from a dentist regarding medical condition?		
Yes	31(5.4)	62 (10.8)
No	118(20.6)	362(63.2)

Almost one third (30%) were does not in health facilities and 27% were students. Five hundred fifty-five (96.9%) had a previous dental visit, while 18 (3.1%) individuals had never visited a dentist. Two hundred forty-three (42.4%) had a dental appointment within the last 6 months. Most participants (83.8%) did not receive any medical consultation in the dental office. The medical conditions among the participants are summarized in Figure 1.

Table 2 and Figure 2 show the willingness and attitudes of the study participants toward different aspects of chairside screening by their dentist. Participants who received a previous medical examination in the dental clinic were more accepting of obtaining a biopsy and undergoing medical consultations than others were (Table 3). Most participants were willing to let the dentist take their blood pressure (89%). This was followed by an assessment of hypertension and diabetes mellitus (85.7% and 83.1%, respectively). Participants were also willing to undergo laboratory investigations requested by the dentist for medical conditions (82.9%) and discussion of the result (82.7%) as well as a general assessment of the health using questionnaires or preliminary evaluation (80.5%) in the dental office. On the other hand, the lowest proportion reported a willingness to undergo simple biopsies such as swabs or surface scraping smear.

Most of the study population (85.7%) stated that they were willing to receive a hypertension evaluation, which was significantly associated with age ($p = 0.005$). The Scheffe test indicated the most significant difference was between participants aged 20–30 years and those greater than 31 years. Participants in the 31–40 years and older age group were more willing to accept hypertension screening in the dental clinic setting. Willingness to undergo diabetes mellitus screening in the dental office was significant at $p = 0.007$. Similarly, 83.1% of the sample were inclined to undergo diabetes screening in the dental office at $p = 0.007$. The Scheffe post hoc test revealed a greater inclination for screening among participants aged 41–50 years than among those of younger age (20–30 years). As revealed by the ANOVA, willingness to undergo hepatic disease and cardiovascular screening was significant at $p = 0.000005$, AIDS screening at $p = 0.001$, and biopsy at $p = 0.011$. The Scheffe post hoc test revealed that individuals aged 41–50 years had a tendency toward a willingness to undergo screening for both hepatic and cardiovascular diseases in the dental office. The ANOVA test indicated significant differences with regard to education levels and the willingness to receive chairside screening. The Scheffe post hoc test indicated that the willingness to undergo screening was lower among

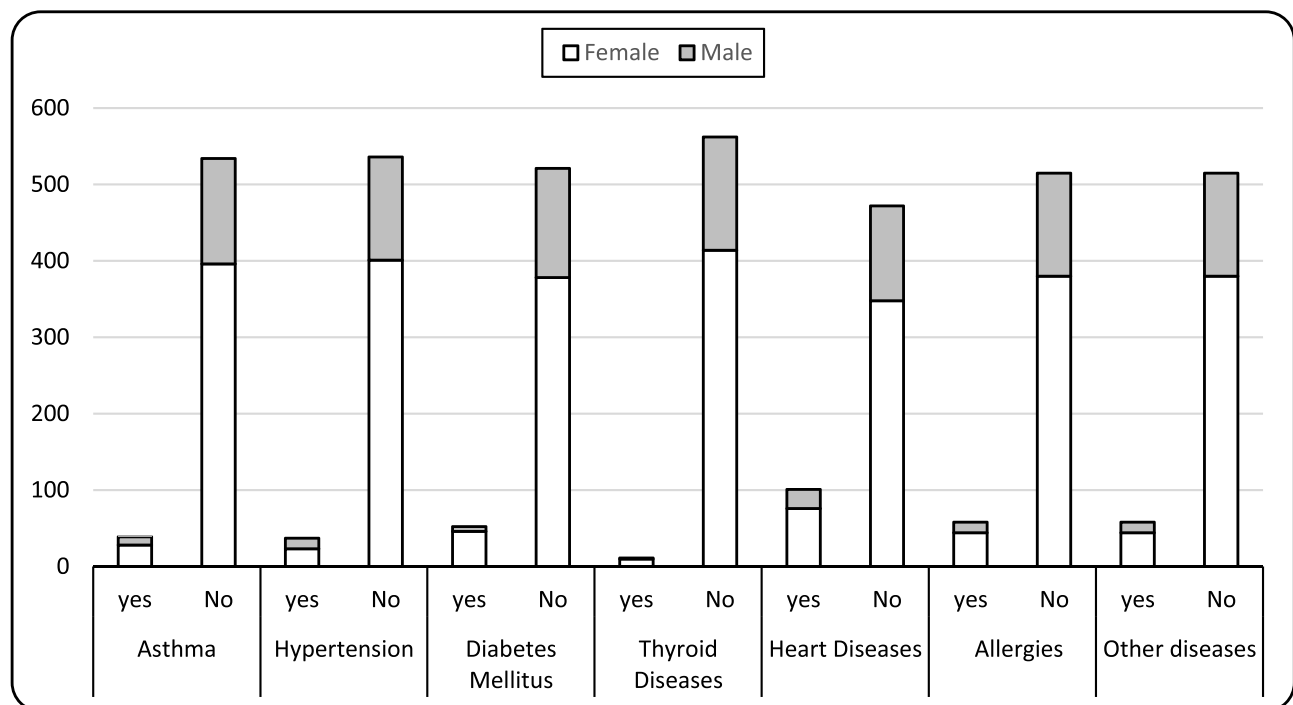


Figure 1 Graphical representation of the medical conditions of the sample.

Table 2 How Willing Would You Be to Have Your Dentist Perform Screening for the Following Conditions in the Dental Office?

Variables	Very Willing	Willing	Neutral	Not Willing	Totally Unwilling	Score Average	Std. Deviation	Order
Hypertension screening	361 (63)	130 (22.7)	56 (9.8)	20 (3.5)	6 (1)	4.4311	0.88156	2
Diabetes mellitus screening	333 (58.1)	143 (25)	63 (11)	26 (4.5)	8 (1.4)	4.3386	0.94084	5
Hepatitis screening	272 (47.5)	115 (20.1)	108 (18.8)	60 (10.5)	18 (3.1)	3.9825	1.16911	13
Cardiovascular disease screening	265 (46.2)	134 (23.4)	93 (16.2)	62 (10.8)	19 (3.3)	3.9843	1.16539	12
AIDS screening	293 (51.1)	102 (17.8)	94 (16.4)	65 (11.3)	19 (3.3)	4.0209	1.19567	11
Physical examination (wellness check)	308(53.8)	153 (26.7)	69 (12.0)	32 (5.6)	11 (1.9)	4.2478	0.99721	7
Laboratory test	331(57.8)	144 (25.1)	67 (11.7)	25 (4.4)	6 (1.0)	4.3421	0.92077	4
Biopsy	210 (36.6)	103 (18.0)	127 (22.2)	91 (15.9)	42 (7.3)	3.6073	1.31602	14
Measuring blood pressure	376 (65.6)	134 (23.4)	42 (7.3)	19 (3.3)	2 (0.3)	4.5061	0.79907	1
Measuring height	321 (56)	100 (17.5)	87 (15.2)	43 (7.5)	22 (3.8)	4.1431	1.15742	8
Obtaining a blood sample	300 (52.4)	126 (22.0)	83 (14.5)	46 (8.0)	18 (3.1)	4.1239	1.12209	9
Collecting a saliva sample	279(48.7)	155 (27.1)	80 (14)	43 (7.5)	16 (2.8)	4.1134	1.08036	10
Having a discussion about the results	343(59.9)	131 (22.9)	68 (11.9)	22 (3.8)	9 (1.6)	4.3560	0.94181	3
Making medical consultations and referrals	309(53.9)	161 (28.1)	70 (12.2)	23 (4)	10 (1.7)	4.2845	0.94853	6
Average						4.169016	0.806498	

postgraduates and highest among those with a high school diploma. The willingness to undergo blood sampling was variable among the populations, but those who received their dental treatment in a governmental facility and those treated in the private sector were more reluctant than others ($p = 0.016$), as revealed by ANOVA and post hoc test. Table 4 presents the results.

Discussion

The current study was designed to assess the attitudes and knowledge of the public toward chairside dental screening and laboratory investigations and the effect of demographic data on their willingness. Medical screening by dentists for diagnosing high-risk patients and preventing complications is widely accepted as an effective

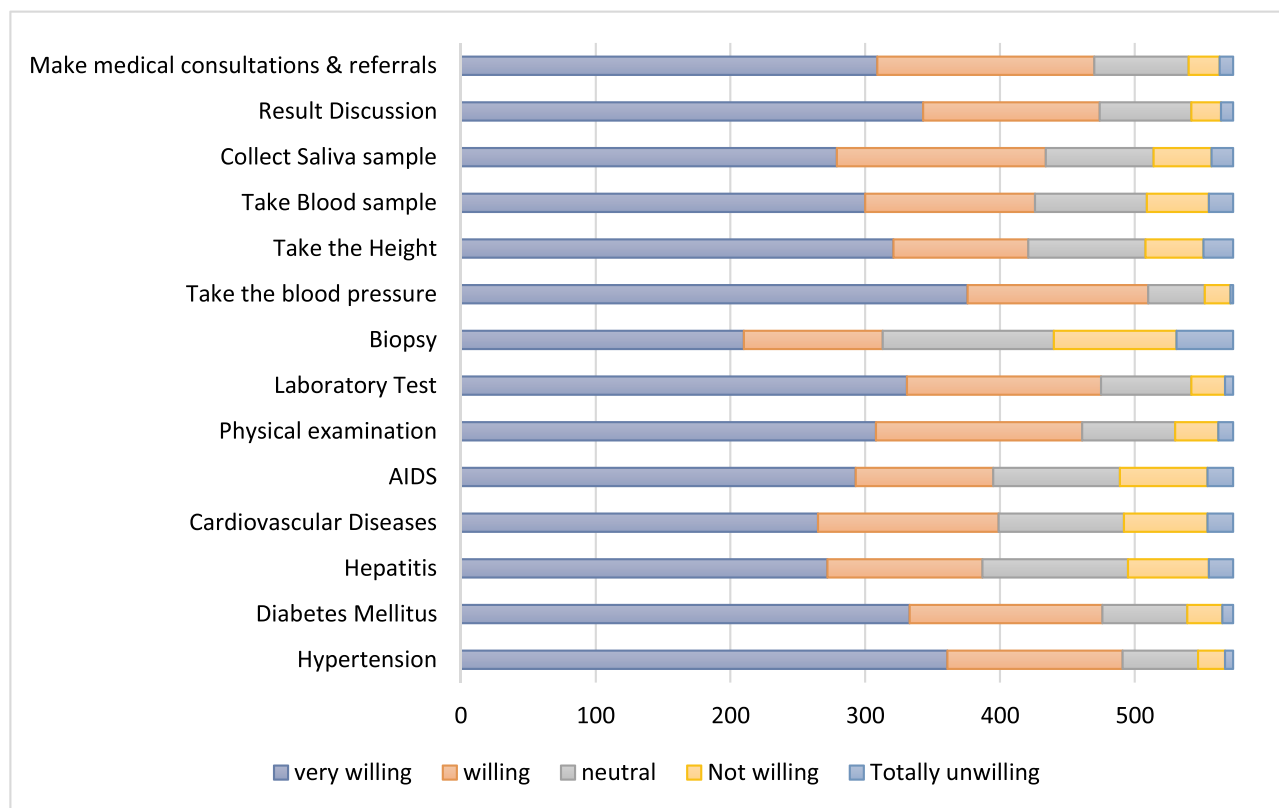


Figure 2 Willingness of the sample to have the dentist perform chairside screening for the selected conditions.

Table 3 t-Test of Analysis of Association Between Those Who Received a Medical Consultation or Examination from a Dentist Regarding Medical Condition in the Dental Office and Chairside Screening

Have You Received Any Consultation or Clinical Examination from a Dentist Regarding Medical Condition?		n	Mean	SD	t	Significance
Perform simple biopsies (such as swabs)	No	480	3.5542	1.32472	-2.304	0.023
	Yes	93	3.8817	1.24105		
Make medical consultation and referral	No	480	4.2500	0.98845	-2.525	0.012
	Yes	93	4.4624	0.68460		

measure.^{4,12,24} Indeed, one of the most recent objectives of the dental profession, as defined by the World Health Organization, is that dentists play a role in controlling diseases through medical visits, which will increase the population of subjects who receive preventive measures.²⁵

In general, most of the participants showed a willingness toward several aspects of chairside dental screening and agreed that screening for medical conditions should be implemented in the dental clinic. Several studies reported that most patients attending dental clinics thought that it is essential for dentists to screen patients for medical

Table 4 Association of Sample Characteristics with Perception and Attitudes Using ANOVA Test

Variables			Sum of Squares	df	Mean Square	F	Significance
Age	Hypertension	Between groups	11.410	4	2.852	3.741	0.005
		Within groups	433.117	568	0.763		
		Total	444.527	572			
	Diabetes mellitus	Between groups	12.317	4	3.079	3.541	0.007
		Within groups	494.001	568	0.870		
		Total	506.318	572			
Hepatitis	Between groups	40.199	4	10.050	7.697	0.000	
	Within groups	741.626	568	1.306			
	Total	781.825	572				
Cardiovascular diseases	Between groups	34.263	4	8.566	6.552	0.000	
	Within groups	742.595	568	1.307			
	Total	776.859	572				
AIDS	Between groups	25.958	4	6.490	4.655	0.001	
	Within groups	791.791	568	1.394			
	Total	817.749	572				
Biopsy	Between groups	22.316	4	5.579	3.272	0.011	
	Within groups	968.334	568	1.705			
	Total	990.649	572				
Education	AIDS	Between groups	14.529	3	4.843	3.431	0.017
		Within groups	803.219	569	1.412		
		Total	817.749	572			
	Biopsy	Between groups	16.194	3	5.398	3.152	0.025
Within groups		974.455	569	1.713			
Total		990.649	572				
Obtaining blood sample	Between groups	18.516	3	6.172	5.005	0.002	
	Within groups	701.686	569	1.233			
	Total	720.202	572				
Collecting saliva sample	Between groups	11.505	3	3.835	3.326	0.019	
	Within groups	656.121	569	1.153			
	Total	667.627	572				

conditions and were very willing to be screened by a member of the dental team.^{13,15,17,21,22,26} Patients' willingness is essential for adopting such an approach. Implementing this strategy can assist in the early diagnosis and prevention of diseases and complications or delaying their occurrence. However, patients should receive adequate medical education about these conditions and dental clinic screening.

Our results demonstrated that the receipt of a previous consultation, referral, or biopsy in dental clinics affected the participant's willingness of undergoing this screening again. Similarly, Lawal and Oladayo reported that those with previous dental visits were better recipients for dental education.²⁷ This may indicate that patient education and involvement are necessary to appreciate the advantages of this strategy. Studies have demonstrated that patient education increases compliance and improves oral health.^{28–30}

In line with findings of previous studies by Lawal and Oladayo and Navabi et al, our results demonstrated a significant association between education level and willingness to undergo chairside screening.^{22,27} However, our results also indicated that participants holding a postgraduate degree were significantly less willing to undergo biopsy and AIDS screening in the dental office. Education level has been reported to be related to low oral health knowledge. Indeed, the level of education is one of the predictors of oral health status.^{4,30–32}

Despite the fact that our sample included participants with chronic diseases, the medical condition did not play a role in their willingness to undergo screening. Our results demonstrated that a higher percentage of participants agreed to be screened for measuring blood pressure and hypertension assessment followed by a discussion of the results and requesting laboratory testing. Higher responses were also observed among patients in the literature.^{13,15,17} Trogon et al reported that there is a large cost burden for hypertension because of its high prevalence.³³ Interestingly, medical screening for hypertension in the dental office has been reported to reduce health care costs.^{12,33} Furthermore, studies have found that most patients who were willing to be screened in the dental clinic perceived the importance of the screening and had awareness of medical conditions.^{21,27} In addition, chronic diseases, although preventable, have an effect and a burden on the economy and quality of life.³⁴ Moreover, previous research has demonstrated that chairside screening can identify patients who are at increased risk of chronic disease yet are unaware of that increased risk.^{7,21}

In accordance with the findings of other studies,^{17,22} we found that a large percentage of the participants were willing to undergo blood pressure examination, laboratory tests, saliva sample collection, and discussion of the results with the dentist. Laboratory test findings and physician referrals were found to be of significance and fulfill the responsibilities of dentists toward their patients.^{35,36} This is important for improving the overall health care delivered for the patients. The dentist may discover many incidental findings during clinical or radiographic examination for dental patients.³⁷ Many studies have reported incidental findings found in dental radiographs. Some of these findings may require further investigations to rule out life threatening conditions such as carotid artery calcifications seen on panoramic radiographs or signs of bone destructions or malignancy within the Maxillary sinuses.^{38,39} Such cases require medical referrals and further investigations. Furthermore, some medical conditions and syndromes might be diagnosed in some cases by radiographic features on dental radiographs such as Gardner's syndrome, osteoporosis or other systematic conditions as well.^{40,41} Therefore, the willingness of patient and understanding of the dentist's role in making medical consultations and referrals is important in providing holistic health care and improving the quality of patients' lives.

Alternatively, some of the participants reported an unwillingness to perform a biopsy and AIDS test. A similar result was reported by Brondani et al, but their findings were in contrast to others who reported wide acceptance of AIDS testing in the dental clinics.^{42–45} Different sample characteristics and communities may play a role in the disparities in acceptance. In 2019, Kassim et al explained that HIV testing is not accessible and carries a huge stigma among the studied population.¹⁴ Siegel et al reported that, among dentists, one of the barriers to offering HIV testing was to avoid offending patients, as this test is less likely to be accepted by patients as well as to prevent the negative impact on the practice.⁴⁶

This investigation documented the wide acceptance of medical screening in the dental setting. As reported in the literature, medical screening could aid in the prevention of diseases among high-risk individuals.^{19,20,47,48,49} It may also assist in controlling disease and preventing complications, thus reducing morbidity and mortality, as well as ease the economic and social burden of chronic diseases.^{19,20,47,48,49}

Conclusions

The current study intended to evaluate the attitudes and knowledge of the public toward chairside dental screening and laboratory investigations and to analyze the results based on demographic data. In general, most of the participants were willing to undergo chairside screening performed by the dentist. Several factors significantly affected participants' responses, including age group, sex, marital status, occupation, level of education, previous dental experience, and medical conditions. Adequate training for medical screening should be implemented in the dental curriculum as well as in continuing medical education. There is a strong need to emphasize the benefits of increased cooperation between dentistry and other health care professions. To obtain more acceptance of chairside screening, community education programs should be implemented.

Data Sharing Statement

Data are available and can be provided upon request.

Ethics Approval and Informed Consent

Ethical approval was obtained from Research Ethics Committee, Deanship of Scientific Research, King Saud University, Riyadh, Saudi Arabia (KSU-IRB 017E). Participation was voluntary, and consent was obtained prior to contribution. All participations were informed about the purpose of the study before contribution. This study was conducted in accordance with the Declaration of Helsinki.

Consent for Publication

The authors have given their consent that the details of any images, videos, recordings, etc., can be published, and that the persons providing consent have been shown the article contents to be published.

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Disclosure

The authors report no conflicts of interest in this work.

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