Validity, attitude, perception and challenges of using teledentistry among dental patients in Saudi Arabia during covid19 pandemic: Randomized control trial

Introduction

In December 2019, COVID19 was declared as pandemic, caused by a severe acute respiratory syndrome coronavirus SARS-CoV-2, that spread from Wuhan, china to the world (Kwok et al., 2020). Many research suggest that covid-19 could be consider as a sever public health threat of the decade (Kannan et al., 2020; Pereira et al., 2020; Zhou et al., 2020). Currently, the spread of COVID19 was countered with strict quarantine protocols, social isolation, social distancing, and shops restrictions in many countries around the world (Kannan et al., 2020; Pereira et al., 2020; Zhou et al., 2020). Since dental care is considered to be a high-risk cross-infection environment for both dental practitioners and patients, this is because SARS-CoV-2 virus is transmitted by saliva aerosol and the availability of the virus in the air for at least three hours and up to 72 hours on plastic and stainless-steel surfaces (Harrel & Molinari, 2004; Pereira et al., 2020; Sabino-Silva et al., 2020; Xu et al., 2020). Thus, special managements have to be taken to provide an effective infection control (Harrel & Molinari, 2004; Pereira et al., 2020; Sabino-Silva et al., 2020; Xu et al., 2020).

Previous studies suggest that the dental care has to be maintained during covid-19 outbreak, especially to those in high need for dental follow up like old patient and orthodontic patient (León & Giacaman, 2020; Maspero et al., 2020). One of the suggested modalities to use during the outbreak is telehealth and teledentistry in particular for dental care (Ghai, 2020). The teledentistry is defined as "the remote provision of dental care, advice, or treatment through the medium of information technology, rather than through direct personal contact with any patient(s) involved" (Khan & Omar, 2013). In fact, teledentistry might be a convenient venue to reduce the dental clinic visits and maintain the dental health care as possible (Böhm da Costa et al., 2019). Other researchers suggested that teledentistry can also help to reduce the financial burden on the dental clinic visit due to the increase in the cost of dental treatment for the strict additional personal protective equipment (PPE) (Irving et al., 2018) needed during the covid-19 outbreak (Böhm da Costa et al., 2019; León & Giacaman, 2020). Most of the available literatures found that teledentistry is an effective method to screening, diagnosis, evaluating emergencies, monitoring and long-term follow-up, providing consultations, and propose dental treatment plan (Ghai, 2020; Kohara et al., 2018; T et al., 2017). In fact, three randomize control trail were conducted to assess teledentistry (Mandall et al., 2005; Duka et al., 2009). The first one found teledentistry effective for screening the orthodontic cases and referral (Mandall et al., 2005).,The second one found teledentistry useful to diagnose impacted third molar, they suggest it has equal to real time diagnosis. (Duka et al.,

2009). Also, the third study found teledentistry in detecting dental caries among preschool children to be similar to regular dental clinic diagnosis to childhood caries. However, the previous studies did not involve mixed or permanent dentition and intraoral photographs were taken by trained assistant (Dorota T Kopycka-Kedzierawski & Billings, 2013).

Although, there were some cross sectional studies indicated positive attitude toward teledentistry among dental professionals (Murererehe et al., 2017; Pradhan et al., 2019; Stephens & Cook, 2002), including Saudi Arabia (Aboalshamat, 2020), there were no similar studies to investigate knowledge, perception, and attiude toward teledentistry among dental patients in Saudi Arabia, either studies using experiemental sud design.

Aim

This study aims to assess the validity, knowledge, attitude, perceptions and challenges of using teledentistry for diagnosis among dental patient in compared to regular dental visit in Saudi Arabia during covid19 pandemic using randomized controlled trial study design.

Methodology

Study design and participants

We will use a parallel-grouped single blinded randomized controlled trial (RCT) design. Also, the statistician will be blinded regarding the study and control group. The CONSORT guidelines will be followed in the reporting of this trial. The target population will be adult patients recruited from Umm Al-Qura University (UQU) dental school, Makkah, Saudi Arabia. The inclusion criteria (1) adult more than 18 years of age. (Martinez-Castaldi et al., 2008) (2) Arabic speaker. (3) have smartphone and social media apps to use it for communication during tele-dental consultation. (4) agreed to participate in the trial and signed the consent form. The exclusion criteria (1) patients with hearing problems. (2) participant who didn't attends the tele-dentistry session.

Setting

Patients will be recruited from data file center in UQU dental hospital, who visited UQU dental hospital for opening dental file for the first time (screening patients). Their name and contact number will be taken from the electronic system. Those patients will be contacted by phone to assess their willingness to participant in the study. After signing the study consent, they will be randomized into study group (SG) and control group (CG). Baseline record for dental examination for all patients in both groups will be taken from their files that include DMFT score (based on the clinical and radiographic examination done by dental intern in their previous visit to open the file), oral hygiene status and gingival health.

The intervention

In the SG, the participants will be asked to taken 5 intraoral pictures and send it with WhatsApp social media platform, because of the end-to-end encryption so, its highly secure (Krapa et al., 2019), after giving them a demonstrating video on how to take a proper photograph, Then the research team will make a tele-dentistry session (phone call) with The participant will be asked to participate in the trail and if they accept whey will receive a link to google form contain (1) simple questions will be answered to ensure; that the participant fits the eligibility criteria. (2) consent form. The participants will randomly be allocated to study or control groups. Simple randomization using Excel software will be used to generate a random list and locate each participant to either study or control group. The study group will receive the intervention first and then will be given a self-reported questionnaire to assess their knowledge, attitude, perception and challenges toward teledentistry, while control group will firstly receive the questionnaire and then the intervention. The intervention will be given by third party who authorized to provide the dental teleconsultation. The intervention will be the same to both groups as well as the questionnaire. The third-party examiner is blinded to which group the participant is from, also the participant is blinded. So, the study group will be subjected to teledentistry and then assessed, while the control group their assessment is based on their past experiences in dental clinic during covid-19 and their perception without undergoing to teleconsultation experience. Therefore, we can assess the participant's knowledge, attitude, perception and challenges toward teledentistry with and without experiencing teledentistry. we gave the control group the same intervention to facilitate the examiner blindness and to give them a compensation to their participation. The participants will be evaluated one time. All data that been obtained during the teleconsultation session will be deleted after completing the assessment.

Intervention and control

The study group will receive a teleconsultation session while the control group receive nothing before the assessment. After the participant been allocated, the research team will contact them with WhatsApp, If the participant is control group she\he will receive a link to self-reported questionnaire and after completing the assessment will undergoing the same intervention as the study group. The intervention has two phases, phase one will obtained by the research team. They will contact the participant using WhatsApp and send to them google form. The form contained (1) demonstration to how they can use their smart phone to take the intra-oral photograph. They will be asked to take a clear five shots (frontal, right buccal, left buccal, occlusal maxillary arch and mandibular arch). (2) an Arabic translated version of the Oral Health Questionnaire for Adults by the World Health Organization. This questionnaire will assess the patient oral health status, oral habit, harm behavior, quality of life and social position. After the participant completed filling the form and his\her data been obtained, the research team will schedule a suitable appointment and refer that information to the third party with no clue wither the patient is study or control group. The third-party is responsible for the

teleconsultation session which is the second phase. The session will be a phone call for about 10 minutes long. The first few minutes for confirming the information in the questionnaire. the middle five minutes, the examiner will fill a modified version of Oral Health Assessment Form for Adults, 2013 by the World Health Organization (World Health Organization, 2013). According to the previous studies, the caries detection, preliminary diagnosis of oral pathology and general oral health assessment could be obtained by teledentristry .(Bauer & Brown, 2001; Dorota T Kopycka-Kedzierawski et al., 2008; Dorota T Kopycka-Kedzierawski & Billings, 2006; Rocca et al., 1999). The last three minutes the examiner will give his preliminary diagnosis and his recommendation to improve the patient's oral health and hygiene and to answer any question from the patient. After the completion of the teleconsultation session the study group will receive by the research team a self-reported questionnaire and that is their assessment.

Assessment

The assessment will be obtained by a self-reported questionnaire composed of twenty close-ended questions. Fifteen of them was taken from a previous study in the same area. The questionnaire is divided into five sections. Demographic data section, knowledge assessment, attitude assessment, perception assessment and challenges assessment. The answer is multiple choice.

Incentives and ethical considerations

We will maintain the confidentiality and patient's privacy during the study. all the information that obtained during the teleconsultation session will be destroyed after completing the assessment. the participants have to sign the consent form. Prior to conducting the trial, the ethical approval will be taken from the institutional review board IRB of Umm Al-quraa university, collage of dentistry.

Data analysis

Statistical Package for Social Sciences (SPSS) ver. 23 for Mac software for statistical analysis will be used and visual graphs and diagrams will be used to illustrate the study results. The questionnaire will be divided into identical links, for study and control group, for blindness. The statistician will receive the data of the two groups without knowing which group is study or control.

Research significant

The continuity of dental health serves is mandatory for patient's health and needs and to overcome the financial consequences of covid-19 outbreak. Teledentistry is a good alternative to avoid cross infection in the clinic and avoid cut off the dental clinic's services. This study trying to prove the readiness and acceptance of dental

patients in Saudi Arabia to the intrusion of teledentistry in some dental health services.

Timeline

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Research Question																		
Literature review																		
Method																		
Proposal submission																		
IRB approval																		
Data collection																		
Data analysis																		
Manuscript writing																		
Journal selection																		
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