The Effect of Social Media (Snapchat) Intervention on the Awareness of Pregnancy Oral Health Among Pregnants In Saudi Arabia: Randomized Controlled Trial

Background

Social media is defined as a collection of applications that use the internet to create technical and ideological foundations that permit generating and sharing contents (Kaplan and Haenlein, 2010, p. 61). Public and patients tend to seek different health information from social media based on their interest in addition to gain emotional support from users' interaction (Zhao et al., 2017). However, low reliability and spreading of fake health information on social media was cited as a major concern in literature (Zhao et al., 2017. Zhou, et al., 2018) as reported in a recent systematic review (Melchior et al., 2021). This became more serious and noticeable during COVID19 era (Cinelli et al., 2020).

On the other hand, pregnancy is a unique health phase in a woman's life as it is influenced by complicated physiologic changes that might have a negative impact on mothers' oral health (Steinberg BJ., et al., 2013). Pregnant women found to seek health information during the perinatal period, pregnancy and after delivery (Baker B et al,2018). However, in terms of dental health, many pregnant women tend to avoid attending dental clinics because they believe they would be harmed (Jeihooni, A. K., et al., 2017) .This illustrates the need to boost pregnant women with information regarding oral health and dental treatment's considerations for pregnant women.

There is a growing interest to use of social media and mobile health applications to improve pregnants' well-being (Chan, K. L., et al., 2019). A systematic review and a meta analysis showed several randomized controlled trial (RCT) and intervention studies aimed to improve different health aspects of pregnants using social media and mobile applications (Overdijkink SB., et al., 2018;Chan, K. L., et al.,2019). Another

systematic review showed that there are many interventional studies that were used to improve oral health during pregnancy (Vamos, C. A., et al., 2015), however, using social media as intervention were lacking. Searching the literature databases showed a single study that aimed to improve oral health during pregnancy using social media (video sharing platform) (Bates, S. B., et al., 2012). This pre and post interventional study resulted in an improve in pregnant awareness with dental visits, prevention of caries and bacteria transmission during pregnancy (Bates, S. B., et al., 2012). However, this study did not have a comparison group to validate the improvement.

One of the most famous social media platform is Snapchat. Snapchat is usually used to make 'selfies' photo and videos between friend and family in relax manner as a substitute to messaging (Piwek et al., 2016). In fact, Snapchat was reported to be associated with bonding between users instead of merely socializing (Piwek et al., 2016). One important feature of SnapChat is that videos are available for a short time before disappearing (Cortis Mack C, 2018). Despite the popularity of Snapchat, there is a scarcity in using such platforms in health promotional activities.

Aim

The aim of this study is to evaluate the effect of social media (snapchat) health promotional intervention on oral health pregnancy awareness among pregnant women in Saudi Arabia.

Methods

Study design and participants

This study will use a single-blinded parallel group RCT design, where the participants in the study group (SG) will receive information about oral health in pregnancy using Snapchat mobile application. The participants in the control group (CG) will receive the same information as written flayer, as shown in Figure 1.

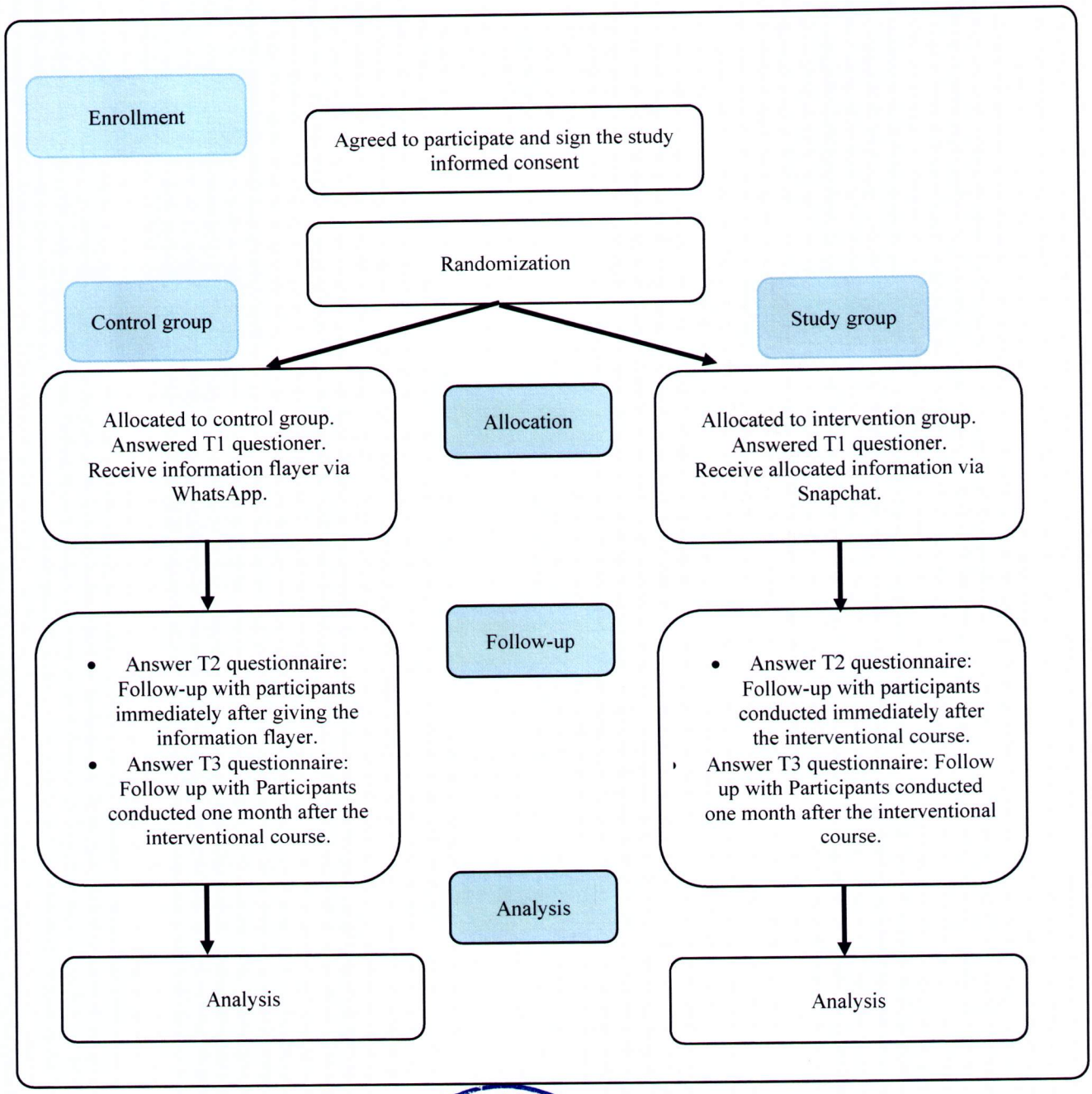

Figure 1. Participant's flowchart.

This study will be documented using CONSORT guidelines. The participants will be pregnant women in Saudi Arabia, and they will be recruited using convenience sampling from Umm Al-Qura University dental hospital and through invitations to social media groups interest in pregnancy in Saudi Arabia. Inclusion criteria will be (a) Arabic speakers, (b) pregnant women in Saudi Arabia, and (c) able to use Snapchat and WhatsApp social media platforms. Potential participants who will not agree to sign the consent form will be excluded from the study. The WhatsApp mobile application will be the method to communicate because it is one of the most common messaging methods used to communicate in Saudi Arabia and widely accepted. Also, WhatsApp has end to end encryption to maintain participants' confidentiality (Endeley, 2018). The sample size will be calculated using RCT with two independent samples, continuous outcomes and two tailed hypothesis formula (Sullivan, 2011, p.181):

$$n(per\ group) = 2\left(\frac{Z_{1-\alpha/2} + Z_{\beta-1}}{ES}\right)^2$$

$$ES = \left(\frac{\text{minimal clinical difference}}{standard\ devation}\right)$$

The ES stands for effect size. As the study power of 90% is used, and a = 0.05, B= 0.1, constant Z(β-1) = 1.282, and constant Z (1-a/2)=1.96. The standard deviation (SD) of a previous study in a related topic is 3.06 (Aboalshamat, K. et al, 2020). Three points were used as minimal clinical differences. According to the previous numbers, 21 participants will be needed in each group, as 42 participants for both SG and CG. The later number was multiplied by 1.5 twice for expected non-response rate and the design effect. This resulted in 90 invitations will be needed for this study.

Setting

After an initial agreement to participate in the study, an invitation will be sent as a message to their mobile using WhatsApp platform that allows communication between

the participants and the research team to receive the consent, intervention/ control group's flyer and the online questionnaires.

The participants will be randomly assigned to either the SG or the CG by the research team. A simple randomization process will be used, using previously shuffled sealed envelopes with an equal allocation ratio placed in a bowl. Each participant will randomly choose an envelope, so that will give them an equal chance of being placed in one of the two groups. The sealed envelope will be opaque and sequentially numbered to ensure allocation concealment. To ensure blindness, the participants will be informed that the study aimed to compare two methods of information delivery meant to improve oral health knowledge among pregnants. None of the participants will be aware that Snapchat intervention will be the main point of interest in the study. The research team will use WhatsApp to give the participants a link that contains the study consent form and the baseline questionnaire (T1). Then the participants in the SG will have another link to be the intervention's Snapchat account. The participants will be evaluated three times: (T1) before the intervention, (T2) immediately after the intervention, and (T3) one month after the intervention for follow-up to evaluate their retention of the information.

Intervention and Control

Participants in the SG will receive information regarding oral health during pregnancy using Snapchat mobile application. The oral health information were retrieved from previous studies (Aboalshamat, K. et al, 2020 ; American Pregnancy Association,2021; American Dental Association, 2021). The content were validated by oral pathology and oral medicine consultants. The information includes general information about dental treatement among pregnant, most recommended time for dental treatment and emergencies, dental setting position, recommendation for elective dental treatement, dental appointment, Root Canal Treatment (RCT) safety issues for pregnant, radiographic precuations, local anasthesia, antibiotic usage, analgesics, pregnancy gingivitis and how to reduce periodontal problems. The intervention will be delivered through two weeks; each week will have two Snapchat stories (story is a series of short videos, each 10 seconds, as permitted by Snapchat application). Each story will be

about 5 to 10 minutes. Participants can send their questions regarding the given material and a short recap of the questions will be in the following story.

The stories will be presented as a diary of one of the research team members as most of the stories in Snapchat. The research team will perform roles within the clinic of the dental teaching hospital in Umm Al-Qura University, as dental chair setting, precaution during taking radiographs, showing the materials which are likely to be used during the dental treatment, and demonstration of dental flossing and toothbrushing. Through interventions days the participants will receive the contents spontaneously. At the same time the control group will receive the same information in a written flyer sent via WhatsApp.

Assessment

Questionnaires are in a self-reported soft copy format will be administered at T1, T2, and T3. All identifiable data used to match participants data in T1, T2, and T3 will be destroyed after completing T3 data collection. The questionnaires will be distributed as soft copies to test participants' knowledge at the three time points previously mentioned, T1, T2, and T3 for both groups. The questionnaires will be identical in T1 and T2 for both groups. In T3 the questionnaires will be also similar, but participants in SG will have an additional section to assess the experience of using Snapchat as a method of information delivery, while CG will receive the same questions to assess WhatsApp as a method of information delivery. The questionnaires sections are demographic information, using social media, oral health knowledge among pregnant women and experiences and perceptions of the social media intervention, as shown in Table 1.

Table 1. Contents of questionnaire in T1, T2 and T3.

Questionnaire time	Study group	Control group
T1 (before the intervention)	• Demographic information • Using social media	• Demographic information • Using social media

	• Oral health knowledge among pregnant women	• Oral health knowledge among pregnant women
T2 (immediately after the intervention)	• Oral health knowledge among pregnant women. • Experiences and perceptions of the social media (Snapchat) intervention	• Oral health knowledge among pregnant women. • Experiences and perceptions of using (WhatsApp) as a comparison.
T3 (after a month of the intervention)	• Oral health knowledge among pregnant women	• Oral health knowledge among pregnant women.

The first section demographic questions included age, marital status, educational level, family monthly income, regular visit for dentist, number of children, pregnancy month, sources of dental information. Using social media section included questions about using of social media, average hours spent on social media per day, the most use social media platform, and average hours spent on snapchat and WhatsApp per day. The third section will ask about knowledge about oral health and dental setting treatment among pregnant women, this section will contain 20 questions in the form of (Yes/ No and I do not know) questions. Each question has only one correct answer, and the total score of correct answers will be summed into the total knowledge score with highest score of 20 points (highest level of knowledge) and zero (no knowledge at all). The last section will assess the participants' experiences and perceptions of the social media "SnapChat" usability and engagement. This section containe 10 statements, with answers ranging from 1 to 5, where 1 = strongly disagree and 5 = strongly agree. Some of the questions in section four were derived from a previous article, with modifications (Aboalshamat, K. 2020). All sections of the questionnaire will be administered in Arabic.

The intervention videos and questionnaire went into a pilot of 12 participants to validate the content, spelling, syntax, organization, clarity, grammar of the questions and audience understanding. The participants in the pilot round will not be included in the main study analysis.

Incentives and ethical considerations

After data collection at T3 all identifiable data will be destroyed completely. Participation will be voluntary. As incentive, the participants will also be entered into six separate random prize drawings for 50 Saudi Riyal (USD 13.33) in the form of local bookstore gift cards. Before participating in the intervention, all participants will sign the study informed consent form.

Data analysis

Significance level will be set on 0.05. The data will be gathered, tabulated and analyzed statistically using SPSS software package version 27. Chi-square, t-test Fisher's exact test, repeated measure ANOVA and parried t-test will be used to analyze the data of this research.

Funding

This project will be self-funded.

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