Community Dental Health (2022) **39,** 187–190
Received 11 February 2022; Accepted 2 March 2022

doi:10.1922/CDH_00034Sobol04

Dental Anxiety as a Risk Factor for Facebook Intrusion

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Objective: To investigate the relationships between dental anxiety, Facebook intrusion, and shame. ***Methods***: A sample of 498 adults aged 16–69 years completed an online questionnaire comprising the Modified Dental Anxiety Scale, the Facebook Intrusion Scale, and the Shame scale from the Test of Self-Conscious Affect. ***Results***: Dental anxiety was positively associated with Facebook intrusion. There were also indirect effects of dental anxiety on Facebook intrusion through shame. ***Conclusions***: The results highlight the problem of dental anxiety in the context of Facebook intrusion risk. The findings may be applicable in Internet dependency prevention and treatment, focused on help in coping with the anxiety related to doctors' appointments.

Keywords*: dental anxiety, shame, Facebook intrusion*

Introduction

It is estimated that nearly 80% of all adults in industrialized countries feel discomfort before a dental appointment, 20% experience anxiety, and 5% avoid treatment due to very strong anxiety (Zinke *et al*., 2018). Dental anxiety (DA) is understood as the emotional response and cognitive evaluation to stimuli or experiences associated with dental procedures (Lin *et al*., 2017). This anxiety is a complex phenomenon, comprising somatic, psychological, and social dimensions. The consequences of DA include avoiding dental appointments, oral neglect, and a decrease in general quality of life. This type of anxiety is also often linked with pain, the experience of which it takes to induce a person to seek dental help (Armfield and Ketting, 2015). Moore et al. (2004) found that DA was significantly positively associated with embarrassment.

Berggren et al. (2000) found that the most frequent response to DA was avoidance. They proposed the vicious circle model of DA (Figure 1) with circular relations between DA, avoidance of dental care, deterioration of oral health, and feelings of shame and inferiority, which in turn increase DA. Berggren et al. (2000) stressed that interpersonal relations are an important aspect of human life. External appearance is very important in interpersonal relations and a poor oral condition can worsen the external appearance.

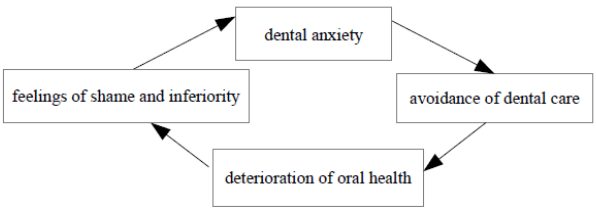

Figure 1. Berggren's model of dental anxiety

Avoiding confrontation with daily life problems often leads to behaviors that give a temporary sense of distraction from the difficult reality. Such behaviors include substance use and Facebook intrusion. Although problematic internet use is not listed in DSM-V (American Psychiatric Association, 2013), it has been discussed in the literature for many years due to the commonness of the problem. It is not so much internet use that is addictive as engagement in specific online activities, such as gaming, messaging, or using social media. One of the most popular social media is Facebook. With the growing interest in this communication platform, there appeared the phenomenon of excessive Facebook use, which has several negative consequences (Błachnio *et al*., 2016). This phenomenon (referred to as Facebook intrusion) is a disorder that encompasses constantly thinking about Facebook, improving one's mood by means of Facebook, unsuccessful attempts to reduce the time spent using it, experiencing negative emotions when it is impossible to use it, and interpersonal problems caused by excessive use (Elphinston and Noller, 2011).

The aim of the study was to analyze the relations between DA (Humphris *et al.*, 2009), Facebook intrusion (Elphinston and Noller, 2011) and shame (Tangney *et al.*, 1989). We formulated the following general hypothesis: Levels of DA and shame are positively related to Facebook intrusion. The proposed model of relations is based on Berggren et al.'s (2000) circular model of DA and on the view of addiction as a way of escaping from reality (Benschop *et al.*, 2020). The understanding of addiction as avoidance of and escape from reality is based on the concept of experiential avoidance. Experiential avoidance consists in excessively negative evaluations of unwanted thoughts, feelings, and sensations, reluctance to experience them, and intentionally controlling them or escaping from them (Kashdan and Rottenberg, 2010).

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Dental anxiety results in avoiding dental appointments and, in consequence, leads to the neglect and poor condition of the oral cavity and the teeth (Berggren *et al.*, 2000). This may contribute to the deterioration of outward appearance and self-perceived physical attractiveness, which in turn results in avoiding direct contact with people. A person may then compensate themselves online for the lack of real-life interpersonal contacts. Additionally, Facebook intrusion gives them momentary oblivion from oral health problems and the lack of real-life interactions with people. Replacing real-life contacts with virtual ones due to a fear of social interactions may lead to problematic Facebook use (Błachnio *et al.*, 2016). Shame, in turn, leads to avoiding direct contact with people, who might notice the deficiencies in the appearance of a person with dental problems. A substitute for real-life interpersonal relations are interactions with other people in the virtual world. Researchers point out that shame is a very important element of addiction (Dearing *et al.*, 2005). Based on these theoretical reflections and previous studies, we formulated the following specific hypotheses (see Figure 2):

Hypothesis 1. The higher the level of DA, the higher the level of Facebook intrusion.

Hypothesis 3. There is an indirect effect of DA on Facebook intrusion through shame.

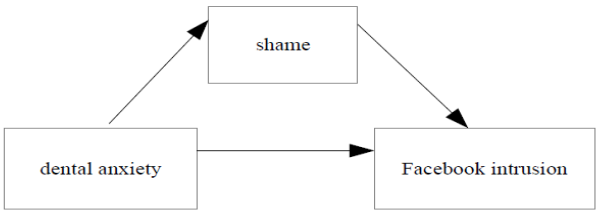

Figure 2. Hypothetical relationships between dental anxiety, shame, and Facebook intrusion

Method

The study was conducted online, in Poland among participants registered with the national online panel *Ariadna*. Each participant received the set of measures along with instructions via the Internet. Participation was voluntary and anonymous. Participants gave their consent to take part in a written form. Data are available at osf.io/xmyue/files/. The procedure and the study protocol were approved by the Ethics Committee of the Institute of Psychology of the University of Wrocław. The research was conducted from October 2019 to November 2020. The necessary sample sizes were determined using G*Power (Erdfelder, 2007), based on the average effect size in individual differences research $r \approx 0.20$.

The Modified Dental Anxiety Scale (MDAS; Humphris *et al.*, 2009) was used to measure the level of anxiety associated with dental appointments. It contains five questions concerning dental procedure and anesthesia, e.g., "How do you usually feel before a dental procedure performed under LOCAL ANESTHESIA?" The participant responded to each question on a 5-point Likert scale. The Facebook Intrusion Scale (FIS; Elphinston and Noller, 2011) consists of eight items (e.g., "I have been unable to reduce my Facebook use"), each rated on a 7-point Likert scale. The Shame scale from the Test of Self-Conscious Affect (TOSCA; Tangney *et al.*, 1989) was used to measure sense of shame, understood as an unpleasant experience of "shrinking," a sense of being small, worthless, and helpless. TOSCA consists of short descriptions of situations with specific moral meaning. Each scenario is accompanied by several statements (items), e.g., "While playing around, you throw a ball, and it hits your friend in the face. You would feel inadequate that you can't even throw a ball." Each of the 16 items is rated on a 5-point Likert scale.

SPSS Statistics 26 was used to analyze data. Facebook intrusion was the primary outcome, DA and shame were the predictor variables. Descriptive statistics (M, SD) were estimated on sample characteristics. Correlation coefficients were computed to establish relationships between the variables. Mediation analyses were used to investigate the indirect effects of DA on Facebook intrusion through shame. The indirect effect was operationalized as the product of the regression coefficient between DA and shame and the regression coefficient between DA and Facebook intrusion. We tested the direct and indirect effects by performing bootstrap mediation analyses in the PROCESS 3.4.1 software (Hayes, 2017) with 5,000 bootstrap samples. A 95% bootstrap confidence interval for the indirect effect of DA was generated.

Results

The participants were 498 Polish adults (254 female, 244 male) aged 16 to 69 years (mean 34.9 yrs ±14.26) (Table 1). The sample was broadly comparable with Polish Internet user population characteristics, and included participants with higher (29.5%), secondary (45.6%), and elementary education (24.9%). They lived in big cities (18.5%), large towns (20.3%), medium-sized towns (25.7%), small towns (13.3%), and villages (22.3%).

Scores on MSDAS, FIS, and TOSCA Shame were normally distributed (Table 2). Using the threshold of 19 and above (Gremigni *et al.*, 2014; Humphris *et al.*, 2009) for identifying patients with a high level of DA, 18.5% of the sample had high DA. Pearson's correlations (Table 3) showed that DA correlated positively with Facebook intrusion and shame. There were also negative associations of Facebook intrusion with age and education and a positive association between Facebook intrusion and shame. Shame correlated negatively with age.

Table 1. Professions of the 498 participants.

	%
Clerk	17
Teacher	15
Student	11
Homemaker	11
Driver	9
Company owner	9
Nurse	8
Doctor	7
Lawyer	7
Other	6

Table 2. Distributions and reliability coefficients of variables.

	Mean	*SD*	*median*	*min.*	*max.*	*Cronbach's alpha*
Modified Dental Anxiety Scale	12.38	5.62	11	5	25	0.92
Facebook Intrusion Scale	24.57	13.29	22	8	56	0.93
Shame	50.52	10.87	50	16	80	0.82

Table 3. Correlations between Demographic Variables, Dental Anxiety, Facebook Intrusion, and Shame

	1	*2*	*3*	*4*	*5*	*6*
1. gender	-					
2. age	0.04	-				
3. place of residence	-0.05	0.12**	-			
4. education	0.01	0.38***	0.21***	-		
5. Modified Dental Anxiety Scale	-0.04	-0.09*	-0.04	-0.11*	-	
6. Facebook Intrusion Scale	-0.04	-0.32***	-0.02	-0.15***	0.10*	-
7. Shame	-0.18***	-0.18***	-0.02	-0.07	0.12**	0.31***

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$.

The mediation analyses indicated that DA was positively associated with shame, $b = 0.22$, $SE = 0.09$, (95% CI 0.05, 0.39), $\beta = .11$. Shame was positively associated with Facebook intrusion, $b = .37$, $SE = .05$, (95% CI 0.27, 0.48), $\beta = .31$. When shame was entered into the model, the direct effect of DA was no longer significant, (CI = −0.046, 0.352). The indirect effect was significant, however, as the bootstrap-estimated confidence interval did not include zero, CI (0.017, −0.156). Thus, as hypothesized (H2), people with a higher level of DA were more likely to feel shame and, consequently, showed higher Facebook intrusion.

Discussion

This study explored the relations between DA, Facebook intrusion, and shame. The need to investigate this issue stems from the importance of the problem of internet dependency and its high prevalence, and from the commonness of the fear of dental appointments. What the seemingly unrelated variables of DA and addictive behavior have in common is, among other things, a sense of shame.

The hypotheses were supported. As predicted (H1), DA positively correlated with Facebook intrusion. The present study is the first to show that the stronger the fear of dental appointments a person feels, the more intense is their online activity in the world of virtual acquaintances. As predicted (H2), DA had an indirect effect on Facebook intrusion through shame. These results are consistent with those of research showing a positive relationship between addictions and shame (Berggren *et al.,* 2000), Facebook dependency and body shame (Manago *et al.*, 2015; Hanna *et al.*, 2017) and between DA and shame (Moore *et al.*, 2004).

These results can be interpreted within the circular model of DA (Berggren *et al.*, 2000), whereby DA results in the avoidance of dental care, leading to a deterioration of oral health, a consequence of which is a sense of inferiority and shame caused by bad oral health, which in turn increases DA. The person feels shame and avoids contacts with others in the real world. Instead of confronting people and everyday issues in the real world, he or she engages in virtual social activity in social media. This kind of behavior induced by a fear of social contacts may lead to problematic Facebook use (Błachnio *et al.*, 2016).

Regarding study limitations, the model of DA cannot be fully confirmed with cross-sectional data. It is possible that Facebook intrusion is an antecedent to shame and DA. Moreover, there may be other confounding variables that have not been included. Future studies could benefit from using an experimental design or longitudinal data.

These results suggest that one risk factor for Facebook intrusion may be DA combined with a sense of shame. This may initiate debate on the possibility of limiting the use of dental stimuli as signals that are meant to induce fear and a sense of threat in the addressee, at any rate in movies, games, books, and commercials aimed at children. The model used in this study could be used to design prevention and treatment interventions aimed at reducing anxiety and shame. The results can also be used to develop screening tools aimed at identifying people at risk of becoming addicted to social media.

In summary, these data suggest that DA is associated with Facebook dependency and that these associations are explained by shame.

Funding information

Ministry of Health grant "Dental anxiety as a risk factor for problematic Facebook use and drug use"; National Science Centre, Poland, Grant Number: 2016/23/B/HS6/03888

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