



CAUSAL PSYCHOLOGICAL FACTORS INVOLVED IN DENTAL PHOBIA

Ioana Mărginean *
University of Oradea, Romania

Abstract

The study was designed in order to allow the investigation of theoretical predictions regarding the determinants of dental phobia. By way analysis we test under which conditions self-cognitions have a direct action or not on the semeiology of dentist oriented anxiety. We also study the role of the pain and of pre-existent anxiogenic fond. The sample was made of 198 participants (teenagers and adults aged between 15 and 35 years old) who were assessed with a scale package during one session before the stomatological intervention phase. The study indicates that the anxiogenic fond is the one residing at the basis of developing specific phobia for dentist and for administered treatment. Previous pain experience in association with basal anxiety creates the set of mediators between irrational beliefs and self-esteem oscillations.

Keywords: dental phobia, anxiety, pain, self-esteem

Introduction

During the last decades, the researches in the field of dental treatments were extended and diversified, as well as modern intervention techniques and equipments, the anaesthesia or sedation. However, dental anxiety, fear and dental phobia continue to generate many problems for a large number of children and adults. Consequently, delaying or the extension of the interval between the visits, or even avoiding the visit to the dentist is often associated to the deterioration of oral health, with negative effects on self-trust, with diminish

Correspondence concerning this paper should be addressed to:

* M.D. student, University of Oradea, Teacher Training Department, Universitatii street, no. 1, Oradea, 410087, Romania. E-mail: ioanafilimon81@yahoo.com

of social interactions, with feelings of loneliness and isolation, with the decrease of life quality.

The maintenance of anxiety, fear and dental phobia level at high quota, requires the accentuation and diversification of interdisciplinary and multidisciplinary efforts for identifying and intervening on trigger factors which predispose and maintain anxious semeiology. On the other side, the perfecting of treatment methods and techniques, of professional and communication competences of dentists, can lead to the improvement of the results in the field of oral health, of patients` satisfaction and trust in the professionalism of dental services.

Behavioural assessment at the beginning at the end of the treatment used in research is considered to be the measurement having the best ecological validity as it indicates what the patient is able to do reported to dental treatment (Haukebo & Vika, 2013, pp. 33-44). This assessment is made not by the dentist who treats the patient, but by another person, starting with the moment when the patient enters the dentist room until the end of the intervention (Haukebo, Skaret, Ost, Raadal, Berg, Sundberg, & Kvale, 2008).

Structured assessment of the patient`s behaviour during the treatment can also be realised by the dentist who does the therapeutic actions. There is the possibility of quantifying the patient`s activity – general activity and the specific one, arms movements, heads movements, posture; this kind of assessment on controlled groups are rare (Haukebo & Vika, 2013). The assessment of psycho-physiological answers aim the modification of skin conductance, heart beats, electromyographic answer, as indicators of anxiety level modifications (Lundgren, Carlson, & Berggeren, 2006).

With regards to self-assessment scales for anxiety and dental fear, they are used both in clinical contexts and in research. Although the diagnosis interviews cannot be substituted, they are important for determining the clinical or subclinical level of anxiety or dental fear. In this causal study of anxiety for dentist, there are included instruments with adequate to excellent psychometric properties.

Study objectives

Experimental endeavour will investigate the relation between self-esteem, pain, anxiety and phobia for dentist manifested by fear, avoidance and at somatic level. The experimental endeavour will observe under which

conditions the cognitions about self have a direct action or on the contrary, indirect on anxiety semeiology for dentist by the means of pain and pre-existent anxiogenic fond.

The study is designed in order to allow the investigation of explicative models predictions regarding the determinants of dentist anxiety, self-esteem and patient distress.

Methods

Participants

The study included the same participants sample (N=198), teenagers and adults aged between 15 and 35 years old (m=19,75; SD=4,43). The results of the participants to the study were used for building some comprehensive explicative models of dentist anxiety and specific medical intervention.

Research instruments

Current Thoughts Scale (The State Self-Esteem Scale; SSES) devised by Heatherton and Polivy (1991); it consists of 20 items loaded on three factors: a. performance self-esteem, b. social self-esteem, and c. appearance self-esteem. This instrument was designed to asses one's thoughts at certain times. Marian (2008; 2009) reported a .84 alpha coefficient for this scale. The SSES aims to uncover the real effect of the variance of self evaluations on thoughts, emotions and behaviour.

Dental Fear Survey (DFS; Kleinknecht, Klepac, & Alexander, 1973; Kleinknecht & Bernstein, 1978) is a psychometrical instrument frequently used for measurement of fear associated with specific situations and stimuli of dental treatment. The respondents receive information about the content of the questionnaire (different situations, emotional states and reactions associated with the dental activity). To calculate the score for each subscale means adding the values for each corresponding item. The total score can be determined either by adding the scores for three subscales or by adding the values for each item of the DFS. Also, according to the analysis of the psychometric characteristics of the most widely used instruments for the measurement of the anxiety and of the pain, the DFS is recommended for use in research (Newton

& Buck, 2000). Alpha Cronbach has a value of .95 for the total score, of .92 for the dental avoidance and anticipatory anxiety subscale, of .93 for the fear associated with particular procedures and stimuli subscale of .85 for the physical arousal symptoms during dental treatments subscale. The results are similar to other results in similar previous studies, of which we would like to present a few (Mărginean & Filimon, 2011, p. 131).

Trimodal Anxiety Questionnaire (TAQ; Lehrer & Woolfolk, 1982) measures three key anxiety components: somatic, cognitive and behavioural. The questionnaire's 36 items were derived from previous research, from different widely utilized measurement instruments known for their psychometric properties. A score for each dimension is calculated: somatic, cognitive, and behavioural and also a global score may be calculated for anxiety by summing the scores of the three subscales. The global score sums the 36 items' scores and can range between 0 and 288 points; the average score ranges between 110 and 135 points; a score over 136 points is considered a high global score. The results regarding the TAQ's internal consistency sustain an excellent internal consistency; the quotients are .93 for the somatic factor, .92 for the behavioural factor and .92 for the cognitive factor (Mărginean & Filimon, 2012, p. 87).

McGill Pain Questionnaire (SF-MPQ; Melzack, 1975, 1983) consists primarily of 3 major classes of word descriptors - sensory, affective and evaluative - that are used by patients to specify subjective pain experience. The main component of the SF-MPQ consists of 15 descriptors which are rated on an intensity scale as 0 - none, 1 - mild, 2 - moderate or 3 - severe. The SF-MPQ was designed to provide quantitative measures of clinical pain that can be treated statistically. The results regarding the SF-MPQ's internal consistency sustain an excellent internal consistency; the quotients are .93 for the sensory factor .87 and .80 for the affective factor. The SF-MPQ shows promise as a useful tool in situations in which the standard MPQ takes too long to administer, yet qualitative information is desired and the PPI and VAS are inadequate to relieve pain.

Procedure

We engaged in this study the appliance of participants assessment criteria according to the level of their anxiety problems (anxiety problems were measured with TAQ). The participants received the necessary instructions so

that the scales be adequately filled-in. Considering the wish of the participants to assure their anonymity, there was not possible a second assessment, although it would have brought important data in the case of each patient with dental anxiety problems reported to dental treatment, to actual intervention techniques and equipment, to anaesthesia or sedation.

Experimental design

In order to verify *the objective*, the experimental design is a multi-factorial one, where predictors (or exogenous variables) are current thoughts about self - global score (SSES; Heatherton & Polivy, 1991; Marian, 2009), pain (SF-MPQ; Melzack, 1975, 1983) and anxiety (TAQ - global score; Lehrer & Woolfolk, 1982; Mărginean & Filimon, 2012), and the criterion is anxiety for dentist (DFS - global score; Kleinknecht, Klepac, & Alexander, 1973; Kleinknecht & Bernstein, 1978).

SSES represents an exogenous variable because it represents the start point of way analysis, while the pain (SF-MPQ) and anxiety (TAQ) play the role of exogenous variables (in report to anxiety for dentist - DFS) and endogenous (in report to SSES). In the *way analysis*, anxiety for dentist plays the role of exclusively endogenous variable because we consider it as being caused by the mutual action of the variables previously presented.

The way analysis allows the preliminary testing of the causal model (which shall be presented below) and of the relationship between SSES variable and also the identification of mediators (pain - SF-MPQ and anxiety - TAQ).

Results and interpretation

In our study, we proposed ourselves to increase the explicative power of the analysed variables as compared to the studies published in bio-medical speciality journals committed in this domain.

The statistical method (*the way analysis*) allows the examination of the extent to which the relationship between SSES is mediated by pain (SF-MPQ) and anxiety by the means of the three dimensions (TAQ) in relation to phobia and/or anxiety manifested during the dentist intervention.

The exogenous variable in the case of our model is represented by current thoughts about self (cause variables), while total score for pain (SF-MPQ) plays the role of exogenous variable (cause variable) in relation to dentist anxiety and endogenous variable in report to SSES.

Trimodal anxiety measured with TAQ also play the role of endogenous variable (effect variable) considering the fact that we see it as being cause by the action of the way in which the patient appreciates himself (current thoughts about himself).

In Figure 1, specific dentist anxiety is an exclusively endogenous variable considering that it is directly influenced by the variables pain (SF-MPQ) and anxiety (TAQ), but with a mediatory role in the relation between SSES and dentist anxiety (DFS).

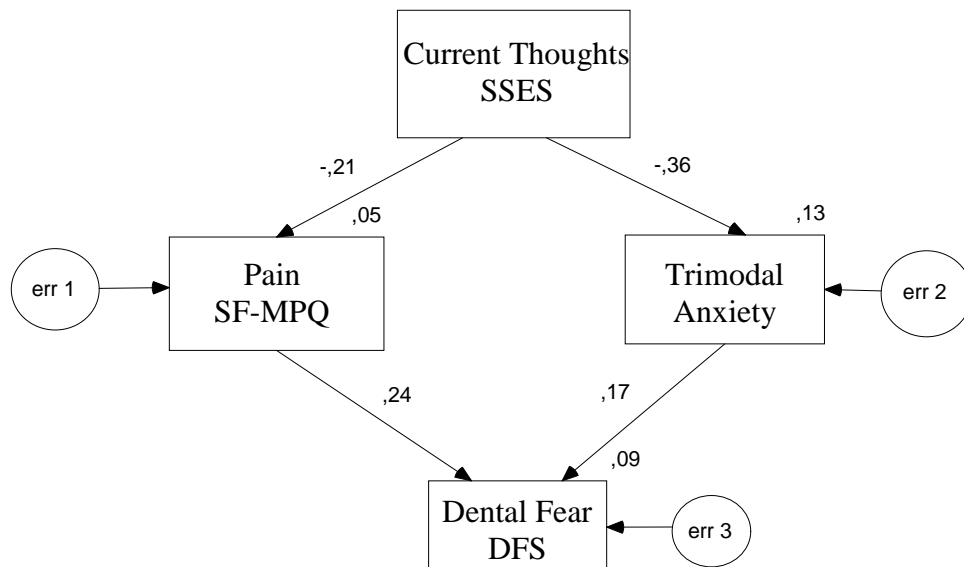


Figure 1. Way analysis – estimated parameters (standardised) of current thoughts about self, of pain and anxiety in relation with dentist anxiety

The data obtained are consequent to the theoretical models presented in the first part of the study where, in order, the correlation between pain (SF-MPQ) and anxiety (TAQ) and dentist anxiety (DFS) is a product of articulation with current thoughts about self (SSES).

Explicitly, in order to increase the accuracy of presenting statistic data registered by the means of advanced statistics (way analysis) we present the errors measured, noted in Figure 1 with e1, e2 and e3 because they are not directly observed and they represent the fluctuations of the way in which the participants answered to the administered scales and presented in the section instruments used.

In other words, the measurement error indicates in the study any variable or factor which was not directly measured but it might distort the data registered. In Figure 1 the measurement errors is not statistically significant, consequently we can give credit to the results obtained.

The causal model of dentist anxiety, tested by the way analysis and also by AMOS program (Table 1) indicates the presence of some differences between the matrix the data of the participants and the matrix obtained based on the connections specified in the model ($\chi^2=30,211$; $p<.001$).

Table 1. the values of absolute indicators for the tested model

Model	χ^2	df	p	RMR	RMSEA	GFI	AGFI
The causal model of dentist anxiety	30,211	2	.001	.04	.07	.98	.97

RMR indicator (*root mean squared*) indicates an efficient model of dentist anxiety (DFS) considering that the value obtained by us is situated under the critical threshold of .10 which means that we explain in an adequate way the data observed (Tia, 2008). Also, RMSEA indicator (*root mean squared error of approximation*) does not pass over threshold .08 which means that the model is appropriate in proportion of 90%. GFI (*index of goodness of fit*) is an indicator (Kline, 2005; Barrett, 2006; Tia, 2008) dependent on the data collected, in the case of the model proposed of dentist anxiety it supports the data previously presented and the adjusted form of AGFI indicator has a very close value and it confirms and supports the data presented in Table 1.

Table 2. The values of comparison indicators for the tested model

Model	NFI	RFI	IFI	CFI
The causal model of dentist anxiety	.97	.94	.96	.92

In Table 2 we present the testing of differences between our model and a null model, consequently NFI, RFI IFI and CFI (with values between 0 and 1) indicates the desirability of the model. Considering the fact that in social sciences are accredited simple models and not the redundant ones, consequently we give more credit to the model implemented by us in the case of which there are no parameters t indicate discordances.

In Table 3 and 4 we present the weight of regression in the model proposed and namely the influences of causal variables (exogenous) on endogenous variable.

Table 3. The weight of regression in the tested model

	Estimate	S.E.	C.R.	P
Pain (SF-MPQ) \leftarrow Current Thoughts (SSES)	-,21	,06	-3,06	,002
Trimodal Anxiety (TAQ) \leftarrow Current Thoughts (SSES)	-1,65	,30	-5,46	***
Dental Fear (DFS) \leftarrow Pain (SF-MPQ)	,49	,13	3,58	***
Dental Fear (DFS) \leftarrow Trimodal Anxiety (TAQ)	,07	,03	2,43	,015

Table 4. Standardised estimation of regression weight

	Estimate
Pain (SF-MPQ) \leftarrow Current Thoughts (SSES)	-,213
Trimodal Anxiety (TAQ) \leftarrow Current Thoughts (SSES)	-,363
Dental Fear (DFS) \leftarrow Pain (SF-MPQ)	,244
Dental Fear (DFS) \leftarrow Trimodal Anxiety (TAQ)	,166

Based on the indicators presented in Table 3 we can conclude that the structural model (Figure 1) is adequate in order to support that patient's self-esteem or self-cognitions in the context of dental intervention (SSES) is a distal cause for perceiving the pain (SF-MPQ) and anxiety (TAQ) dentist anxiety. On the other hand, the increase of dentist anxiety (DFS) up to the level of phobia manifestations are associated to the increase of anxiety (TAQ) in the three fundamental areas (physiologically, cognitive and behavioural) and in pain receptivity (SF-MPQ) as we can observe in Figure 1, but also a significant decrease of personal control, meaning the cognitions with protective role (SSES).

Conclusions

Starting from theoretical models we proposed ourselves to implement a causal model of dentist anxiety and dentist treatment that we test from experimental point of view.

The study was designed in order to allow the investigation of theoretical predictions regarding the determinants of dental phobia and of specific intervention procedures.

In this study we proposed ourselves to explain by the means of way analysis, the way in which psycho-physiological distal and proximal predictors are involved in dental phobia associated to dental treatment.

We examined the action of current self-thoughts on phobia and/ or anxiety manifested during dental intervention, mediated by pain and adaptation of stimuli at somatic, cognitive and behavioural level, as being anxiety generators.

Consequently, distal factor was represented by current cognitions about self, while the perception of pain played the cause role in relation to dental anxiety and proximal factor in report to current cognitions of the patient/dentist.

Anxiogenic manifestations at somatic and behavioural level interpreted as being a trimodal construct play the effect role as we consider it as being caused by the action of the way in which the patient appreciated himself in a given situation.

Specific dental anxiety is an exclusively endogenous factor considering the fact that it is directly influenced by the perception of pain and anxiety, but it has a mediatory role in the relation between current self-thoughts and dental anxiety.

Logically, anxiogenic fond is the one laying at the basis of dental phobia and administered treatment phobia formation. Previous experience of sensorial and affective pain in association with basal anxiety creates the dysfunctional emotional set meaning the set of mediators between irrational believes and self-esteem oscillations.

The data presented in our model represent a synthesis of relevant speciality literature destined to dentistry and tested by causal modelling. Besides that, the data obtained are relevant for dentists who will treat this category of patients. Understanding the causal mechanism of patient`s anxiety

will make more efficient the interaction between doctor and patient, the satisfaction with life and wellbeing of those involved.

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