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Qualitative research paradigm in dental education: An innovative qualitative approach of dental anxiety management

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Abstract:

Objectives: Although qualitative research is becoming more prominent in health care, qualitative data are not widely implemented in medical/dental clinical practice, since clinical teachers are usually unfamiliar with qualitative research and feel unconfident about its reliability. However, this kind of methodology may produce valuable data to a depth that standardized quantitative methods cannot reach and therefore qualitative reports may be useful in order to assess the impact of several medical/dental disorders on psychophysical health of the individuals. Thus, the purpose of the present study was to describe a qualitative research paradigm in dental education, demonstrating how the use of qualitative dental anxiety data may enable general dentists to manage dental anxiety of their patients with greater success.

Methods: A two-day pilot curriculum on dental anxiety management for general dentists has been developed enabling participants to prevent, handle or alleviate patients' dental anxiety, implementing the findings of a qualitative analysis (instrumental and conceptual use) of individual fears and experiences in dental care of adults with dental anxiety disorders.

Results: The patients described strong fears, mostly

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related to perceived dentist's behavior, to the invasive nature of specific treatments/instruments and to the development of unpredictable and unbearable orofacial pain. This qualitative analysis also provided some newer data; dentists' lack of specific knowledge and skills for preventing and controlling dental anxiety or pain; willingness of phobic parents not to convey anxiety to their children; impact of traumatic dental experiences on anxiety onset, regardless the age of the patient. According to the responses of both patients and dentists, short course evaluation indicated that the precise role of a variety of dental anxiety factors has been better elucidated by means of a qualitative analysis and there was a significant comprehension of specific dental anxiety management guidelines, especially as far as the perceived dentists' behavior is concerned. Some dentists reported that they began to feel more confident about treating a person with dental anxiety and almost all the clinicians intended to develop certain needed personal skills, in order to treat a dental anxious person more properly.

Conclusions: An innovative short course on dental anxiety which explores the topic qualitatively in greater depth appeared to help clinicians to better understand the anxiety of their patients and to increase dentists' preparedness to manage dental fear.

Key words: Dental anxiety disorders, dental fear management, health education, qualitative study.

Introduction:

Although qualitative research is becoming more prominent in health care[1], qualitative data are not widely implemented in medical/dental education; clinical teachers are usually unfamiliar with qualitative research and feel unconfident about its reliability having a strong positivist background.[1,2] Several researchers also argue about what kind of research questions are addressed using qualitative analysis and there is a controversy about whether there are adequate methodological standards in order to achieve the best possible validity and reliability of qualitative data.[1] Nevertheless, this kind of methodology may produce valuable data to a depth that standardized questionnaires cannot reach[3] as well as unexpected findings that are hidden by the numerical analysis of quantitative research.[2] Since the nature of most public health matters is complex, qualitative research findings may also provide insights about ''why'' individuals and populations engage in specific behaviors and facilitate identification of contextual influences, that determine the success of an intervention, program, or policy.[4] Therefore, as far as especially dental education is concerned, there is adequate need for a greater engagement with the qualitative research paradigm, in order to handle several psychological or behavioral multifactorial conditions with greater success, such as dental anxiety.

Despite modern oral health treatment techniques, dental anxiety disorders appear to remain one of the most widespread health related problems. Several epidemiological studies have shown that approximately 7-25% of the adult population is significantly anxious or afraid of dental care.[5-7] Dental anxiety disorders, especially when they are combined with general fearfulness, have significant impact on socio-emotional health of both patients and dentists, such as difficulties in keeping dental appointments and planning everyday life after dental treatment, avoidance of dental treatment, occupational stress among dental staff, constant fear of losing teeth, hiding feelings about dental treatment from other people and hiding teeth when laughing or smiling.[5,8-10] In addition, people with dental anxiety or fear are more prone to have poor oral health-related quality of life.[11,12]

Dental anxiety disorders have been already investigated by many researchers from different countries, mainly using quantitative instruments such as the Modified Dental Anxiety Scale.[13] Yet, we are still far from final understanding of the way in which patients' emotions, cognitions and expectations are powerful in creating dental anxiety. In addition, to the best of our knowledge, only a few studies have focused on analyzing the perspective of people with dental anxiety and fear, with the use of a qualitative research process.[8,10,14] Further, the precise role of dental anxiety exogenous and endogenous factors may be elucidated only by means of longitudinal

studies and qualitative research.[15] Thus, qualitative reports are very useful in order to assess the impact of dental anxiety disorders on oral as well as psychological health of these individuals and to develop strategies for managing dental anxiety. Additionally, thus far there are no published studies investigating qualitatively dental anxiety, fear or phobia in Greek adults. These studies could significantly contribute to the development of specific dental anxiety management under/graduate courses, since such courses are not integrated in the educational curriculums of the Greek Dental Schools (of Athens and Thessaloniki) at this time.

The present study investigated qualitatively individual pain fears and experiences in dental care of Greek adults with dental anxiety disorders, analyzing patients' own words and perspectives, in order to elucidate previous international research findings and possibly produce newer data. However, the main purpose of this paper was to develop and evaluate an innovative educational approach to capacity managing dental anxiety, based on the implementation of the aforementioned qualitative research findings and also with respect to previous results.

Material and methods:

Hypothesis

Since the great majority of clinical medical and dental tutors come from strong positivist backgrounds and are used to rely on quantitative research methods, they are seldom interested in a qualitative investigation of clinical issues. In most cases, quantitative approaches are adequate in order to manage specific practical problems, such as scattering and absorption properties of esthetic filling materials, role of periodontopathic bacteria etc. However, medical and dental multifactorial conditions, such as dental anxiety, involving psychological, socio-emotional as well as behavioral factors, are very difficult to be handled, with the use of quantitative analyses only. For example dentists may have occupational stress and difficulties in providing care to a person with dental or general fearfulness, regardless the fact that they acquaint the needed skills for diagnosing and treating oral diseases. The role of implementation of the findings of a qualitative analysis of individual fears and experiences in dental care of adults with dental anxiety disorders has not been investigated and evaluated yet. We propose that the instrumental and conceptual use of qualitative dental anxiety data may enable general dentists to prevent, handle or alleviate patients' dental anxiety with greater success.

1st step: Conduction of the qualitative study.

Since thus far there are no published studies investigating qualitatively dental anxiety in Greek adults, a qualitative study was conducted aimed at investigating dental fears and experiences in dental care of Greek adults with dental anxiety disorders. In brief, after obtaining ethics committee approval and written consent of each potential participant, persons aged $\geq$ 18 years-olds with self-reported dental anxiety disorders were invited to participate in the study, recruited through ten private practice dentists from different districts of Athens, Greece. In order to form a heterogeneous group of individuals with high dental fear, the authors with the cooperation of the dentists, contacted several potential subjects who were empirically considered (by their dentists) as considerably dental anxious or had avoided dental treatment for a long time due to anxiety. In addition, specific information was given to the patients about the aforementioned purposes of the study and about the fact that their narrations will be available to their dentists. The principles of purposeful sampling strategy and saturation were chosen in order to determine the sample size.[3,16] In order to assess the level of dental anxiety of the participants, they completed a standardized Greek version of the Modified Dental Anxiety Scale (MDAS)[13], which is the most frequently used dental anxiety questionnaire[17]. The final sample (table 1) consisted of patients who had MDAS score 16 or higher indicating dental fear[18]. Thirty one semi-structured one-to-one interviews were conducted by the first author (V.M.) between May and December of 2010. An interview guide with questions with a wide coverage of interest was used (e.g. debut of dental fear, previous dental pain experiences,

behavior of the dentist, observational learning and treatment solutions for avoiding dental anxiety). Furthermore, the follow-up questions were constructed during the interview in response to the answers and gestures of the participants by adapting to different response patterns.[3] All interviews were audiotaped and transcribed verbatim.

Data were coded systematically using QSR NVivo 2.0 and analyzed thematically. Thematic analysis is a widely used method for identifying, analyzing and reporting patterns (themes) within data.[19] In order to analyze our data as successfully as possible, specific steps were followed, trying not to limit the flexibility of thematic analysis. The six phases of the used analysis were the following[19]: familiarizing with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes and finally producing a scholarly report of the analysis. In order to achieve the maximum validity and reliability of the analysed themes, all coding reports were read independently by two of the authors (V.M. and H.K.) and similarities as well as differences in interpretation of the data were discussed. Furthermore, identified concepts and themes emerged repeatedly and were verified in additional interviews.The main results of the study are shown in table 2.

2nd step: Curriculum development

The curriculum development process began with a broad review of existing literature on dental anxiety. With respect to the findings of the aforementioned study (1st step) and previous reports, a pilot two-day short course was developed (June 2011) and was addressed to the 10 private practice general dentists, who were the practitioners of the 31 dental anxious persons. The principal learning objective for the course was to present the qualitative results (i.e. the thematic analysis findings-please check the 'results of the qualitative study section') as detailed and compelling narratives[4], to point out the most powerful and illustrative anxiety experiences and to help clinicians to connect with the problem of dental anxiety. In addition, clinical oriented scenarios were included in the course in order for practitioners to acquaint some communicative and behavioral skills for managing dental anxiety. The detailed course outline is presented in table 3.

Results:

Results of the qualitative study

All the subjects of the study were assigned to a diagnostic category of the Seattle system of Milgrom et al.[20] according to their main reason for being dentally anxious (table 1); this system consists of four diagnostic types: (I) simple conditioned fear of specific dental stimuli; (II) anxiety about somatic reactions during dental treatment; (III) patients with generalized anxiety states and multiphobic symptoms; (IV) distrust of dental personnel. In the analysis four main themes were developed and were labelled as following (table 2): traumatic dental experiences, influence of family and friends, feelings before and during the dental treatment and personality with general fearfulness.

Traumatic dental experiences:

Many of the interviewees described several traumatic dental experiences and they believed that these experiences played a significant role in dental fear development. Dental anxiety was almost equally thought to originate in childhood as well as in early adulthood. These negative experiences were mostly related to the

Table 1. Characteristics of 31 individuals interviewed about their dental anxiety

Characteristics	No of individuals
Sex	
Male	11
Female	20
Age (years)	
29-35	15
36-45	5
46-54	6
55-68	5
Education level	
Compulsory education	5
Upper secondary school	10
Higher education	16
MDAS score	
16-18	14
19-25	17
Diagnostic type of Seattle system	
(I) simple conditioned fear of specific dental stimuli	13
(II) anxiety about somatic reactions during dental treatment	7
(III) patients with generalized anxiety states and multiphobic symptoms	4
(IV) distrust of dental personnel	7

Table 3. Pilot short course on dental anxiety management, using a qualitative research paradigm

Schedule	Topic
Day One	Introduction in anxiety and pain management
	Anxiety assessment using qualitative and quantitative methods
	Understanding individual dental anxiety experiences
Day Two	Clinical oriented scenarios
	Clinical and practical suggestions
	Participants presentations
	Course evaluation

Table 2. Main categories/subcategories of thematic analysis and selected coded extracts on dental anxiety disorders according to 31 adults

Theme/category	Subcategory	Selected extract
Traumatic dental experiences	*Dentist's behavior*	"My fist dentist was a torturer! Whatever he did to me was very painful and I remember that when he gave me injections, he nailed the needle to my bone so much, that I was hurting for at least two days" (IP 2)
		"Several dentists were tough and aggressive. Most of them told me that it will hurt only for a while but that was not true. They continued their work without listening to me and some of them did not care even though I was crying" (IP 5)
		"Many dentists were very unprofessional. In order to fix my teeth I was obligated to visit them for lots of times and our appointments lasted only few minutes. Especially the last two dentists were very cold persons and they seemed not willing to listen to my dental problems or opinions" (IP 6)
	Stressful dental treatments and objects	"I detest extraction and root canal treatment because of the use of sharp and painful tools, such as the needles used in root canal treatment. During these treatments I feel that I am suffering so much that I think I am going to die" (IP 5)
		"When the dentist is going to give me an injection I am terrified! I do not mind so the sting of the needle as the idea that something is going to pierce me. I also hate the sound of the needle when it reaches the bone" (IP 29).
		"The tools that the dentists use to pull out a tooth are horrible! Especially when I see these screwdrivers or gigantic forceps! …And how awful is the feeling of the pressure when the dentist performs an extraction!" (IP 19)
		"When a dentist works I do not want to see anything of the used tools. They are so terrifying that I cannot stand to watch them. That is the reason when I receive a dental treatment I close my eyes" (IP 30)
		"During a dental treatment I worry about seeing blood. Even though I have a tooth cleaning, the sight of blood makes me feel like I am going to faint. I always break out in a cold sweat and feel woozy and this is very embarrassing" (IP 7)
Influence of family and others	*Observational learning*	"When I was a little girl I remember that one day my father was returning from the dentist saying: 'he was trying to remove the nerve of my tooth with a very big needle! The pain was unbearable!' Since then I am afraid of root canal treatments and injections" (IP 6)
	Psychological pressure	"When I was a child I remember that I was forced by other children to pull out a tooth which it was moving. They laughed at me and they threatened me that if I did not remove the tooth, they would do it!" (IP 3)
	Relationship with parents	"My father was always indifferent to me, even though I love him and I think that he loves me too. Since I was a child he never hugged me and when he had a problem with me he always talked about it with my mother and never with me. This situation is still continuing" (IP 5)
		"I left home years ago. I have a good relationship with my mother; however she is sad because I left home. I had a lot of

	disagreements with my father and I believe that in general he does not care about what I want" (IP 2)
Feelings before and during the dental treatment	"A dental treatment means pain to me! When I have an appointment with my dentist I am thinking about it all the time and sometimes I have nightmares. I hope that something will come up and my dentist will cancel the appointment" (IP 30)
	"I often have the feeling that my teeth are going to be broken or lost. Sometimes I am so anxious that I am dreaming in my sleep that I am going to lose my teeth and I panic" (IP 3)
	"When I am sitting in the dental chair I think that my heart will stop" (IP 5)
	"I feel pain, stress and I feel that the dentist tortures me and I cannot stand it anymore" (IP 2)
Personality with general fearfulness	"Since the unexpected death of my mother, I am afraid of something awful will happen to my children or husband. That is why I am not going to a doctor frequently, because I am afraid of he will tell me that I have a severe disease, such as cancer" (IP 20)
	"I am not using elevators, although my office is in 7th floor. I also never stay in a room with closed doors because I am afraid of being trapped inside the room" (IP 30)

behaviour of the dentist. More specifically, the participants reported that they have received treatment from unsupportive or unprofessional dentists, who generally did not respond to the patients' signals or did not care about whether the patients were in pain. Moreover, they felt that dentists did not take their fear or thoughts seriously. Several patients also mentioned that they avoided dental treatment for a long time due to the fact that their dentists seemed unaware of how to prevent, handle or alleviate dental anxiety or pain. In addition, the importance of the type of the given dental treatment in the dental fear onset emerged several times during the interviews. The most stressful dental treatments were tooth extraction and endodontic treatment. Further, the use of injection (local anesthesia) or needles in general caused significant dental anxiety to many patients. In many cases the fear of specific dental treatment was so powerful that the patients preferred to receive dental care under general anesthesia. Most of the patients also reported that their anxiety was caused by the sight or the sound of specific dental tools, even though they did not feel any pain. Dental drills, needles as well as sharp tools such as dental elevators and scalpels were the instruments with the most terrific sight and sound. Many participants mentioned that bleeding in self and others, as well as the sight of blood were also terrifying experiences.

Influence of family or other persons:

Dental anxiety of several patients appeared to be the result of observational learning or psychological pressure by their social group. They reported that if a member of their families or a close friend was afraid of dentists, they learn to be scared as well, even in the absence of dental traumatic experiences. Nevertheless, many participants wished to learn how they could overcome their dental fear in order to not convey it especially in their children Also, hearing other people's terrifying stories about visits to the dentist or dental treatments had a similar effect. In addition, some participants said that during their childhood they had faced some kind of psychological pressure by their families or others in order to receive dental treatment. Finally, few interviewees mentioned that they had bad previous or current relationships with their parents (especially with their fathers), who mostly were unconcerned about their fears and feelings in general.

Feelings before and during the dental treatment: Most of the subjects described strong fears of unpredictable events where pain was the main problem and also expressed feelings of powerlessness during the dental treatment. Many participants reported that they became very anxious as the day for the appointment approached or while they were sitting on the waiting room. Only some patients expressed sleeping problems or nightmares regarding their oral health status. Finally, during a dental procedure many patients described feelings of panic and inexplicable thoughts of dying or serious physical damage.

Personality with general fearfulness:
Many of the participants appeared to have general fearfulness, such as fear of death and illness, claustrophobia and worries about something bad will happen to them or their families. However, they were not sure if these fears were related to the development of their dental anxiety.

Results of the course evaluation-Dentists
A questionnaire prior to administration of the course was given to the participants to assess feedback following course delivery. According to the results of this questionnaire, the majority of the general dentists expected to use specific dental anxiety management suggestions upon return to their clinics. In addition, they felt very unconfident about their ability to provide specific dental care to people with dental or general fearfulness, since most undergraduate dental programs in developed countries do not include clinical exercises on treating individuals with dental anxiety disorders.

By short course end each participant produced a dental anxiety management plan, which was addressed to a specific clinical scenario, concerning the same dental anxious patient, in order to have more comparable results. These reports indicated a significant comprehension of specific dental anxiety management guidelines, especially as far as the perceived dentists' behavior is concerned (e.g. acknowledgement of dentist's friendly, calm and supporting behavior as well as communicativeness as important factors for patient satisfaction).

Post-course evaluation was very encouraging. More specifically, from the participants' viewpoint, the course was well organized (80%), relevant to their dental daily practice (90%) and adequate interesting (90%). They especially appreciated the detailed and in depth description of experiences of dental anxious patients (qualitative approach) (90%), the clinical oriented scenarios (100%) and familiarization with modern painless techniques and psychological non-pharmaceutical methods (80%). Some participants reported that they began to feel more confident about treating a person with dental anxiety and all of them requested that this short course must be extended and integrated in Greek Dental School curriculums. The participants had some difficulties only in perceiving psychological theories due to the lack of specific previous knowledge of basic principles of psychology. Since the principal learning objective for the course is to acquire practical skills in dental anxiety management, the impact of the course may be further assessed in daily practice, upon dentists' return to their practices.

Results of the course evaluation-Dental anxious patients
Four months (October 2011) after the realization of the pilot short-course, a questionnaire concerning the potential improved individual experiences in dental care was given to the thirty-one dental anxious patients who initially participated in the qualitative study, in order to evaluate the impact of the course. Twenty-four patients returned the questionnaires completed (response rate 75%). The responses of the patients were encouraging; 79% reported that the behavior of the dentists was significantly improved, since they dedicated more time in order to discuss and understand patients' opinions and fears related to dental treatment. Also, most patients (67%) mentioned that their dentists attempted to relax them during the dental procedure, by not having visual or audio contact with tools with increased anxiety-provoking capacity (e.g. needles) or by using

less painful techniques such as laser technology. Further, many participants (42%) responded that they felt more confident about visiting their dentists, mostly due to the fact that the dentists appeared more supportive, although most patients (88%) reported that they still feel anxious about receiving specific dental treatment, e.g. extraction.

Discussion:

The subjects of the present qualitative study represented a selected group of dental anxious individuals recruited mainly through private practice dentists. Although this study reflects the views and perceptions of a small number of participants, the sample size is appropriate considering the principle of purposeful sampling methodological approach.[16,21] In addition, generalizations from the present data need to be drawn very carefully, as is the case for most qualitative studies, since they are not based on randomly selected samples.[3] Further, the possibility that some of the participants have forgotten certain events regarding their dental anxiety should not be underestimated.

According to our results, women are more likely to report dental fear than men and this is also supported by other studies.[8,22] This finding may be due to the fact that it is generally considered more socially acceptable for women to express their fears and they usually give more honest responses regarding fears compared to men.[8,22] On the other hand, since both women and men described dental anxiety with the same intensity, it could be concluded that gender does not significantly determine the dental anxiety feelings and experiences of individuals with dental anxiety.

The present study indicated that perceived dentist behavior was a major factor in dental anxiety development for many patients. More specifically, rough dentists who were described as unsupportive, with lack of respect, without the will to dedicate sufficient time to their patients and to listen to their fears, were the main cause of having a traumatic dental care experience and this is in accordance with other qualitative studies.[8,10] In addition, Corah et al.[23] reported that patients rank the dentist's friendly, calm and supporting behavior as well as communicativeness as important factors for patient satisfaction. The present report also pointed out that traumatic dental experiences at any age are equally significant for the patients. Thus, although previous studies have already reported that dental fear starts mostly in childhood[8,15] uncaring dentist's behavior has almost the same effect in dental anxiety onset, regardless the age of the patient.

The participants also reported that they had at least one traumatic dental experience because of the nature of specific dental treatment or/and instrument (e.g. extraction, root canal treatment, scalpels, forceps and needles), even though the dentist was supportive enough. The increased anxiety-provoking capacity of the aforementioned situations and objects has been already documented and it could be mostly attributed to their invasive characteristics, possibly resulting in tissue damage and pain.[24] Also, the etiology of needle phobia is rooted in an inherited vasovagal reflex that causes shock with repeated needle puncture.[25] Furthermore, many interviewees mentioned that when they did not have visual or audio contact with the used tools, they felt more relaxed during the dental procedure. Thus, dentists could be encouraged to use modern and less painful methods of dental treatment, such as laser technology and anesthesia without injections, in order to avoid the use of anxiety-provoking instruments. Sometimes the utilization of distraction techniques, such as movie glasses and headphones, could be also sufficient for minimizing the patients' anxiety.

As other researchers have already reported[8,26] the participants of this study underlined the major impact of dental fear and oral health attitudes of family and close friends on their dental anxiety onset. Nevertheless, our study gave a new perspective on this matter, since several interviewees reported that they wish to learn how they can overcome and not convey their dental fear especially in their children. Therefore, dentists could help their patients not only to control their anxiety, but also to realize

the importance of observational learning in dental fear development. At this point it should be mentioned that mother's behavior could be a major influential example, since maternal dental anxiety is one of the most significant predictors of dental fear in children.[26]

The results of the present study revealed that almost all of the dentists who treated the examined subjects seemed unaware of how to prevent, handle or alleviate the dental anxiety of their patients or the development of pain (table 2- Traumatic dental experiences). This finding may be attributed to the fact that many dentists are unconfident about their ability to provide specific dental care to people with dental or general fearfulness, since most undergraduate dental programs in developed countries do not include clinical exercises on treating individuals with dental anxiety disorders. Additionally, dentists seemed to be reluctant to provide dental treatments to anxious patients, since these treatments are often very stressful as well as difficult to be accomplished.[5] Therefore, they lack certain needed personal skills[27], in order to treat a person with dental anxiety properly, such as to be familiar to modern painless techniques, to be trained in psychological non-pharmaceutical methods and being willing to give enough time to dental anxious people to express their feelings and fears. Accordingly, it is considered necessary for Dental Schools to develop more specific strategies and programs/courses in order to increase the preparedness of dentists to provide dental care for people with dental anxiety disorders and to prevent the development of dental fear, whenever is possible. With respect to the findings of the present and previous reports, Greek Dental Schools may benefit from the evaluation of the aforementioned innovative short course, since at the present time dental anxiety management is only included as a session in some courses, such as "Introduction to Dentistry and Behavior Sciences", and does not consist a separate course. Such a course could integrate basic and clinical sciences, interdisciplinary learning and clinically orientated scenarios[28,29], in order for Greek dental students to acquaint the needed skills for managing dental anxiety.

Conclusion:

Since dental anxiety disorders have significant impact on socio-emotional health of both patients and clinicians, dental anxiety management is a significant dental public health issue. Although qualitative research, in comparison with quantitative, has been perceived as a process with less rigor and legitimacy[4], it could significantly contribute to a more in depth investigation of multifactorial conditions such as dental anxiety. Our Department developed an innovative pilot short course on dental anxiety management, which appeared to increase dentists' preparedness to prevent and control dental fear development, mostly concerning a detailed description of individual experiences of dental anxious patients (qualitative approach).

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