The Significance of Person-Centered Information on Dental Anxiety – a mixed method study

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ABSTRACT

Dental anxieties are one of the most common forms of anxieties today and represent an obstacle for both the patients and the therapists. The aim of this study was twofold; first, to describe experiences of and assess dental anxiety among patients, and second, based on this develop, implement and evaluate a person-centered information program to decrease experiences of dental anxiety. Our hypothesis was that person-centered information reduces dental anxiety estimated by the Dental Anxiety Scale (DAS). The higher initially measured anxiety the greater reduction of anxiety at the final measurement. This is a descriptive intervention study with a mixed method design based on individual interviews and questionnaires about dental anxiety. Eight patients, median age 51.50 + Q_1=35.00, Q_3=67.00 completed the program. Dental Anxiety Scale was used to measure the level of dental anxiety and to evaluate the effect of person-centered information. The analysis of the interviews resulted in three content areas: causes of dental anxiety, expressions of dental anxiety and preference of information. Pre-intervention median DAS was 13.50 + Q_1=12.25, Q_3=16.50. In seven of the participants the score of the dental anxiety decreased and one did not change in scores on DAS. The post-intervention median DAS was 9.50 + Q_1=8.25, Q_3=12.75, with a statistically significant change ($p<0.05$). In conclusion, the hypothesis was supported. Person-centered information based on the history of dental anxiety and the participants' preferences, may be helpful in reducing dental anxiety.

INTRODUCTION

Anxieties of various kinds are common. One of the most frequent and common anxieties is dental anxiety. Approximately 20% of the Swedish population are anxious of dental care (Wide Boman *et al.*, 2013; Hägglin *et al.*, 1996). The development of dental anxiety is multi-factorial. The most common factor is previous negative experiences of dentistry and fear of pain (Abrahamsson *et al.*, 2002; Klingberg, 1995).

Fear, anxiety and phobia are in common language used interchangeably. Although the similarities are various a distinction between these three concepts should be made. Fear is a normal emotional response to situations that are perceived as threatening and dangerous. Anxiety is a condition of weariness and inner turmoil as an overreaction to a situation that is subjectively seen as threatening. Phobia is an intensive fear that does not stand in reasonable proportion to the actual threat (Öhman, 1994). In accordance with above, what we call dental anxiety can also be classified in the three categories: fear, anxiety and phobia. When talking about physiological reactions and experiences, dental anxiety and dental fear are the same (Wide Boman *et al.*, 2013).

Severe dental anxiety or fear can be defined as a specific phobia according to the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013). It is described as a clinically significant anxiety and a reaction to specific threatening objects or situations, resulting in actively avoiding direct contact with the objects or the situations (Abrahamsson *et al.*, 2002). Subsequently, patients with severe dental anxiety avoid dental care and therefore often have poor oral health (Leung *et al.*, 2008). Dental fear and anxiety can further be defined by the use of validated self-report scales to measure the degree of the anxiety for example Norman L. Corah's Dental Anxiety Scale (DAS) (Wide Boman *et al.*, 2013).

Anxious patients often fail to attend their appointments. This leads to complications for the therapist due to longer treatment periods and poorer oral health (Skaret *et al.*, 2000). Patients with dental anxiety often land in a vicious cycle. They avoid dental care, which results in poorer oral health that requires more intensive and complicated treatments that in turn can be traumatic and aggravate their anxiety. This causes even more avoidance of dental care (Armfield *et al.*, 2007).

Many methods have been described to "treat" dental anxiety, for example cognitive behavioural therapy and sedation. Many of them may require specific education or the involvement of a psychologist who specializes in treatment of dental anxiety (Irish *et al.,* 1994). Sedation, for example is not a permanent solution to the patients' problem as well as not cost-effective (Davies *et al.,* 2011).

It is fairly common that information is given to patients through videotapes, leaflets, films and booklets in order to increase knowledge and reduce dental anxiety (Sorell *et al.,* 2009). One study has described information as a method to address specific anxieties such as injection fears, were patients' underwent a computerized, exposure-based therapy program. This resulted in a reduction in dental injection fear (Heaton *et al.,* 2013). However, it is in general not common that studies report the effects of given information. It is also unusual that validated scales are used. Therefore the results can not be generalized (Sorell *et al.,* 2009; Johansson *et al.,* 2005). Nevertheless, one should take in account that videotaped or written information to patients is not always understood as knowledge (Sorell *et al.,* 2009). One study implies that some patients require less or no information, others require more than the routinely given information. Therefore person-centered information is preferred. There is also a lack of material where the patients themselves describe their own preference of information (Wijka *et al.,* 2010).

Thus, the aim of this study was twofold: first, to describe experiences of and assess dental anxiety among patients, and second, based on this, develop, implement and evaluate a person-centered information program to decrease experiences of dental anxiety.

Our hypothesis was that person-centered information reduces dental anxiety estimated by the Dental Anxiety Scale (DAS). The higher initially measured anxiety the greater reduction of anxiety at the final measurement.

MATERIAL AND METHODS

Design

This is a descriptive intervention study with a mixed method design; the study is based on individual interviews subjected to qualitative content analysis and questionnaires about dental anxiety.

Participants

Ten experienced dentists from Department of Odontology at Umeå University asked patients with dental anxiety that visited them for regular appointments during the period of June 2013 to January 2014 to participate. In order to be able to manage the target group the inclusion criterion was that the patients showed manageable and not advanced dental anxiety. The intention was to include adult participants from all ages, both men and women to obtain a variety of experiences. The total number of invited participants was 16 (nine women and seven men). Of the 16 patients, nine of them proceeded and participated in the interview session. The reason for the seven dropouts were small children, work or they simply did not show up. One of the nine interviewees was considered not eligible since he believed that he was fully treated for his dental anxiety and did not require any help. Thus, eight patients completed the person-centered intervention – three men and five women between 22-72 years, median age 51.50 + Q_1=35.00, Q_3=67.00. The characteristics of the participants are shown in Table 1.

Data collection

Questionnaires

The data collection included the Dental Anxiety Scale (DAS). The scale was developed by Norman L. Corah and consisted of four multiple-choice questions that are all phrased to reflect the patients' emotions in a dental environment. Each response is scored with a numerical value from 1-5 (where 1 equals no anxiety and reaches up to 5 which equals extreme anxiety) with the maximum score of twenty (Appendix 1). A score of 9-12 represents moderate anxiety, 13-14 high anxiety and 15-20 severe anxiety (Norman *et al.*, 1978). The scale has been found to be reliable with a Kuder-Richardsson (K-R) formula coefficient of 0.86 and was also test-retested obtaining a correlation coefficient value of 0.82, which is high. The validity of the test was addressed via two different

experienced dentists' evaluation (Norman *et al.*, 1978; Johansson and Berggren 1992). The participants completed the scale (in Swedish) during the interview session before the intervention and after the intervention.

To identify the specific factors that induced anxiety in a dental environment, the Dental Concerns Assessment (Clarke *et al.*, 1998) was completed by each participant in connection with the interviews. Each of the 25 procedures described in the questionnaire is rated from 1 (low anxiety) to 3 (high anxiety) (Appendix 2). This assessment was used as an orientation for the development of the person-centered information program.

Interviews

Further, data on causes, expressions and preference of dental anxiety were gathered through semi-structured interviews. The central questions were: "Can you describe the history behind your dental anxiety?", "What is the expression of you dental anxiety? (Emotions, actions)" and "How can we help you?"

Follow-up questions such as "Can you give an example of a situation that caused discomfort" were asked to collect more information. The interviews were performed prior to the intervention by the researchers at a non-dental related environment (group activity room) at the Department of Odontology. One of the authors interviewed, the other observed and took notes of the interview content, this was alternated evenly. Each interview was documented with a tape recorder and penned notes with the consent of each participant. The interviews ranged from ten to 40 min (median 15 min). The interviews were transcribed verbatim.

Intervention

To offer a relevant environment with all required equipment, the interventions took place in a treatment room at the Department of Odontology. The same researcher who interviewed the participant presented the intervention while the other observed and documented the content and the implementation process. The interventions took approximately 20 – 35 min (median 26 min) depending on the amount of information that was discussed or given. The content of the intervention is described in the result section.

Data analysis

Qualitative content analysis

The transcribed interview text was subjected to qualitative content analysis, which is a systematic method to analyse verbal communication, focusing on differences between and similarities within parts of the text (Graneheim and Lundman, 2004).

The analysis was performed in several steps. First, to get a sense of the whole, the text was read through several times and sorted into three content areas each based on the central interview questions: the causes of dental anxiety; expression of dental anxiety; preference of information. The text was then divided into meaning units, which is words, sentences or phrases that relate to each other through their content and context. Next step was to condense the meaning units without losing the core of the content. Then each condensed meaning unit was labelled with a code. All codes from each content area were sorted into different categories depending on their similar features and differences.

For trustworthiness purpose, each step in the analysis process was discussed and audited by two external researchers.

Statistics

Statistical analysis was performed using The Statistical Package for Social Science (SPSS) version 20.0. The DAS scores measured before and after the interventions were compared by means of a non-parametric test (Wilcoxon signed rank test) since our data does not have a normal distribution. The level of significance was set at $p<0.05$.

Also the effect size of the intervention was calculated, which describes the size of the observed effect. Cohen´s r was used for calculation of effect size for Wilcoxon signed rank test. The calculation of r was obtained by this formula ($Z/\sqrt{n}$), n = number of observations (Fritz et al., 2012), in this case n was 16. A large effect size indicates a great influence among the experimental variable and also how strong the findings are (Fritz et al., 2012). A small r-value is 0.10, medium is 0.30 and large is 0.50.

Ethical analysis

Prior to the start of this study, an ethical reflection was made which was evaluated by The Ethics Forum at the Department of Odontology. Eventually an informed consent was granted.

The participants might develop an increased dental anxiety when giving a great amount of information. Therefore we tried to adjust the information to each participant. During the interview session, we were very perceptive and considerate to the participants' reactions when telling their stories since the subject is very sensitive to them.

Each participant has signed an informed consent before the start of his or her interview also approving to be tape-recorded. They were informed that their participation was voluntary and they could withdraw their participation at any point. Information was also given about the fact that the content of their interview might be cited in an article but that they always remained confidential.

Literature search

The database PubMed was used for an electronic literature search. Publications in English from January 1990 to May 2014 were included. Initially chosen MeSH terms were "Dental anxiety" and "Adults", which resulted in a total of 905 articles. By adding the MeSH term "Patient education as topic" the search identified 26 relevant articles.

After screening the titles, ten articles were excluded due to irrelevance to the subject, for example preoperative information and other target groups (for example children). Further reading of the abstracts of the remaining 16 articles, eight were excluded due to their content. Many of these articles had a different objective for example evaluating the purpose of information or to measure the patients' ability to perceive information. Some studies did not have a focus on dental anxiety. This resulted in eight articles and their reference lists were used to identify 14 additional articles.

RESULTS

The results of the interviews are described under three central content areas: *Causes of dental anxiety; Expressions of dental anxiety; Preference of information*. Quotations from the interviews are given as examples for validation purposes. An overview of

content areas, categories and examples of codes from the interviews are presented in Appendix 3.

Causes of dental anxiety

The causes of the participants' dental anxiety are based on four categories: *The dentists' approach, the dental apparatuses, the treatment execution and the environment.*

The participants described their first childhood dentist as the cause to their anxiety. The *dentists' approach* has been described as indifferent, authoritarian, intimidating, harsh (i.e. violent and heavy-handed) and routine-ruled (meaning that he/she did not listen and gave no information). "Sit down, shut up and open your mouth" (interview 2) was a classical describing sentence that was expressed by a participant and also confirmed by the majority of the participants.

The *dental apparatuses* of most concern were the dental drill and the syringe. Here most of the elderly participants perceived the drills from past as very frightening. "The burr sounds from past were like bike chains, they would frighten anyone" (interview 7). They were remembered as being very big, had a horrid sound and a terrifying exterior.

The *treatment executions* are mostly based on painful experiences. Many of the participants described dental situations in which they were treated without anesthesia. "The dentist did a root canal treatment without anesthesia, it was very painful" (interview 8). Also many were traumatized by the fact that they had experienced complications and mistakes during their treatment. "Everyone in our class had problems with bleeding from their cheeks when the dentist used the burr" (interview 3).

The sound and smell of the *dental environment* is described as very unpleasant. One participant mentioned. "The sound and the smell are more excruciating than the pain itself" (interview 6). They were scared by the screaming sounds they could hear from the other rooms. Also the stressfulness of the environment, meaning that everything had to go really fast and without discussion, was of big concern for some. A few also expressed that they felt they did not have any options presented.

Expressions of dental anxiety

Expressions of dental anxiety were narrated in different forms, and were presented in six categories: *Anxiety, avoidance, feelings of exposure, physical reactions, injection fear and self-distraction.*

For most of the participants, *anxiety* was experienced a day before an appointment but for some while standing in the waiting hall. It was fear, dread but for some it caused nightmares and insomnia. "The night before my appointment I couldn't sleep, felt restless and sick" (interview 8).

The need of *avoidance* was carried out by fleeing, wishing the dentist wouldn't show up, avoiding dental care or only seeking help in a state of emergency. "I would only seek help for teeth that are visible" (interview 6). The same participant avoided the dental environment entirely, even if it meant they had to send a relative as company with its child.

Feelings of exposure was repeatedly stated by the participants. "A lot happens while you are sitting there, you get the feeling of being surrounded and without getting any explanation it gets worse" (interview 3). This feeling along with the feeling of being defenseless, uninformed, locked in, downcasted and having no control of the situation was central in this category. A common word for describing a visit at the dental office was discomfort and horror. One participant explains, "it's unpleasant especially when you have a lot of equipment in your mouth and you get asked if you are in pain or if it's going well" (Interview 8).

Physical reactions such as tension during the injection of anesthesia, pain, feeling of sickness, vomiting, crying and fainting were revealed. One participant said, "I passed out in the chair when they tried to extract my wisdom tooth" (interview 5). It also felt strenuous, meaning tiresome and time-consuming, when for example having procedures such as root canal treatments and complicated tooth extractions.

Fear of injection is relatively common, which causes strain and tiredness. It could be the needle insertion itself but also the thought of having an injection. “I am very afraid of being injected multiple times” (Interview 9).

Self-distraction by breathing, tweaking and mind distraction were methods used by the participants themselves to alleviate their anxiety. “I pinch my hand and it’s sort of making my brain think about something else. Then I will have pain somewhere else than my mouth” (Interview 4).

Preferences of information

The following categories were obtained in reply to the question “How can we help you?”: *Person-centered information, peaceful environment, being seen as a person, skilled therapist and control regain*.

Person-centered information was generally requested, such as information about current treatments, for example differences between a regular filling and root filling. One participant stated, “Is there any difference? If so I would like to know, the dentists never have time to tell” (Interview 2). Patient education and involving the patient during the treatment were also highlighted. Based on the interventions a lot of participants showed positive response and interaction, also curiosity to test several methods for example drilling or pocket probing on plastic teeth.

Peaceful environment that is free from stress and includes a calm dentist and the ability to take pauses during a treatment. Some patients described it as “a breathing space”. If a dentist had routines like “listening to calm music and humming to it” (Interview 2) it could calm a patient with dental fear.

The participants reported the lack of *being seen as a person* of big concern. This comes from involvement with dentists that did not indicate enough compassion and respect for them. However, a dentist with good reception and whom they could disperse concerns to, is favored. When a dentist spoke about other subjects and was not urgent at their first meeting gave a positive impression and indicated that the patient was not just for “sit down, pay and next” (Interview 1).

A skilled therapist was also desired. That means for example that he/she uses an anesthetic ointment and has a good anesthetic technique. Even more important was therapists who knew their limitations. "Refer to another dentist when you don't feel capable enough for a special procedure, it feels safer for me". This person also stated that "a lot of dentists treat patients with dental fear according to a scheme and apply it on every patient, but it doesn't work on everyone since we're all different" (Interview 9).

Control regain was required since the feeling of not knowing and loss of control is uncomfortable. The need of autonomy and "free straps" were of importance. "You are free to leave any time, you decide", said the dentist (Interview 3). That resulted in relaxation and less dental fear for the participant.

Intervention

The intervention had a person-centered design based on each participant's problems and preferences. The interviews and the questionnaires provided the content of the intervention. The intervention was conducted in a peaceful dental environment and was based on a demonstration on a phantom with plastic jaws. A dental tray with regular instruments such as mirror, probe and pocket probe was shown. Also different types of drills were exhibited in the start of the demonstration. In order to regain control all participants were told to ask questions in the meantime and also feel free to touch and utilize the instruments. Based on the Dental Concerns Assessment questionnaire the individually requested information was presented, most commonly of them being endodontic treatment (six participants), extraction (three participants) or probing/scaling (three participants). Two participants requested information about different types of burrs. One asked about difference between root filling and regular filling. During the entire intervention process, we strove to show compassion and respect in order to see the patient as a person. The intervention ended with the completion of the DAS scale for the last time to evaluate the effect of the intervention on dental anxiety.

Outcome of intervention

As shown in Table 1 no significant change could be seen between men and women. Pre-intervention median DAS was 13.50 + Q_1=12.25, Q_1=16.50 as opposed to post-

intervention median DAS which was 9.50 + Q_1=8.25, Q_3=12.75. As a result of the intervention, reduction of dental anxiety was found in seven patients at the post-intervention assessment. After the intervention valuation, one participant can be considered to have severe anxiety (DAS = 15). One participant did not change in scores of DAS. All the other participants had low to moderate levels of anxiety according to DAS scores (Figure 1).

The statistical tests show that the intervention had a statistically significant change in dental anxiety ($p<0.05$), see Table 2. Effect size, Cohen´s r is 0.59, which is a large value and shows that the size of the observed effect is large.

DISCUSSION

Result discussion

One of the aims in this study was to develop, implement and evaluate a person-centered information program for patients with dental anxiety. The results of our interviews are described under three content areas: causes of dental anxiety, expressions of dental anxiety and preference of information. Other qualitative studies have been made to gather an in-depth understanding of dental anxiety. An example of such study is Hultvall *et al.*, (2010). This study identified four content areas: experience of dental care, content of the behavioral therapy program, perception of therapy and impact on quality of life. Similar to our findings regarding the causes of dental anxiety the following categories were concluded: abusive situations, mistakes by dentists, smells, sounds, drill and pain (Hultvall *et al.*, 2010).

Expressions of anxiety were also discussed in a study as consequences of dental anxiety such as shame, poor self-esteem, loss of control, not knowing and having no possibility of influencing the situation, avoidance and only seeking help in emergency situations (Hultvall *et al.*, 2010). Those expressions are in line with the expressions of dental anxiety in our results.

Preferences of information emphasized in our results, points to the importance of communication and the need to receive person-centered information. This was also mentioned by Freeman, who found that, to assist a patient in coping with dental anxiety,

a deeper understanding of the etiology to each patient's anxiety is needed (Freeman, 1998).

Statistically significant decrease of anxiety in our results was achieved despite few participants (median difference 4.00 in DAS pre and post intervention). According to some studies, women are more likely to report high dental anxiety as opposed to men (Moore *et al.,* 1993; Hakeberg *et al.,* 1992). Our study showed no differences between men and women. This may be due to the fact that the number of male participants was limited in our study.

An assumption we had in the beginning of this study was that some of the participants might get a negative effect of the intervention. Nevertheless, the person-centered information that was given considered the participants' preferences of information. One participant did not express any need of information. The participants' preferences were followed accordingly and therefore we believe that no negative results could be seen in this study. However, the environment that the participants were exposed to was not the authentic, stressful environment that they usually visit. This can affect our results and be seen as a bias.

Today there is a broad range of techniques to use in coping with dental anxiety. Those can be pharmacological, such as sedation, but also non-pharmacological, for instance cognitive behavioral therapy. Although sedation may manage fear it does not solve the problem, only functions in the short terms. Many studies have shown the effectiveness of managing dental anxiety with cognitive behavioral therapy in the long term for the more fearful individuals. This takes a lot of time, effort and the involvement of many specialized therapists. Ultimately the choice of anxiety management is up to the dental practitioner (Hultvall *et al.,* 2010). When dealing with low or moderate fearful patients we believe that person-centered information may be effective (Armfield *et al.,* 2013). Person-centered information means a tailored management and treatment approach taking into consideration each patient's unique background, concerns and their particular capacity for change. We believe that our method can be an alternative approach when dealing with some dentally anxious patients since it requires only basic skills and routines. With a good communicating skill, a dentist can explore the bases of

each patient's anxiety and work with them towards creating a treatment and management plan according to their fears.

Of course, in a dental setting, there is a need for flexibility. What will work for one patient, might not work for another. When dealing with patients with severe anxiety and phobia our management plan might not work. In those cases perhaps cognitive behavioral therapy for example would be a preferred method.

Method discussion

It was hard to achieve an equal selection of participants due to the fact that they were recruited with the help of ten different dentists. A consequence of this may be a great variation of anxiety levels among the participants, which can be seen as a limitation. However, this could also be a strength since the results will also be applicable to individuals with varying levels of dental anxiety.

Another noteworthy factor is the number of the participants. The intention was to get a larger group for a stronger statistical significance. That would also have enriched our findings in the qualitative analysis and added even more diversity. Having a larger group would have also allowed us to add a control group to our study.

No tests on reliability or validity could be found on the used questionnaire: Dental Concerns Assessment. However, this has not affected our results as the questionnaire only was used to identify the participants' preference of information preceding the intervention. It was not used to evaluate the effects of the person-centered intervention program.

Regardless of difficulties to do statistical tests on few individuals to measure effect of treatments we wanted to visualize our results. But whether or not the results can be applicable on all individuals is difficult to know. More studies and larger study groups are needed to answer such question. In such studies it would be of interest to include other factors such as general health, psychological conditions, medical problems and education. This can add another perspective to dental anxiety (Hultvall *et al.,* 2010).

Optimally the interventions need a follow-up to determine the long-term effects. This was initially our intention, but could not be achieved due to the fact that the participants

finished their treatments and had no need for further consultation or due to lack of interest.

Conclusion

Causes of dental anxiety, expressions of dental anxiety and preference of information are the three central content areas withdrawn from the interview analysis. This has helped us to get familiar with the patients history but also in planning the intervention sessions. Our results showed that our hypothesis was confirmed; person-centered intervention can decrease dental anxiety measured by DAS. To generalize the results, there is a need for a large-scale study.

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Table 1. Characteristics of participants

Participant	Gender	Age	DAS Before	DAS After	DAS Diff[a]
1	F	35	17	15	2
2	F	57	14	12	2
3	M	67	12	9	3
4	M	50	11	8	3
5	M	72	15	7	8
6	F	53	17	9	8
7	F	22	13	13	0
8	F	35	13	10	3

Results before and after intervention in DAS score. F=Female, M=Male.

Median age 51.50 + Q_1=35.00, Q_3=67.00. (a) Difference of DAS before and after.

Table 2. Median effect of intervention

	Preintervention	**Postintevention**	**Test for overall effect[a]**
Median	13.50	9.50	Z=-2.39
Interquartile range	4.25	4.50	
Q_1	12.25	8.25	p=0.02
Q_3	16.50	12.75	

The results are presented as median sum scores of DAS before and after intervention.

(a) Wilcoxon Range sum test.

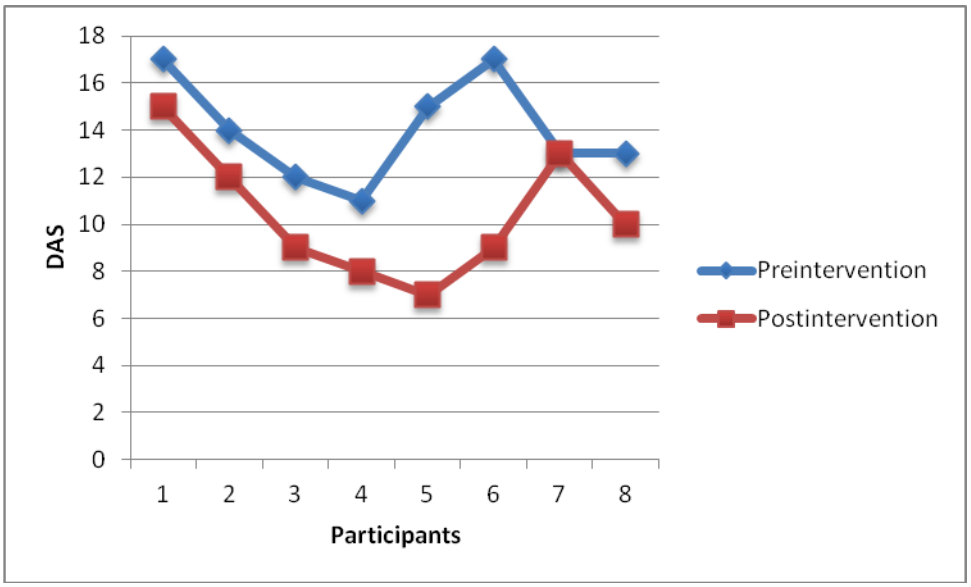

Figure 1. The chart illustrates each participants DAS scores before and after intervention.

Appendix 1.

Norman L. Corah's Dental Questionnaire

1. If you had to go to the dentist tomorrow for a check-up, how would you feel about it?

a. I would look forward to it as a reasonably enjoyable experience.

b. I wouldn't care one way or the other.

c. I would be a little uneasy about it.

d. I would be afraid that it would be unpleasant and painful.

e. I would be very frightened of what the dentist would do.

2. When you are waiting in the dentist's office for your turn in the chair, how do you feel?

a. Relaxed.

b. A little uneasy.

c. Tense.

d. Anxious.

e. So anxious that I sometimes break out in a sweat or almost feel physically sick.

3. When you are in the dentist's chair waiting while the dentist gets the drill ready to begin
working on your teeth, how do you feel?

a. Relaxed.

b. A little uneasy.

c. Tense.

d. Anxious.

e. So anxious that I sometimes break out in a sweat or almost feel physically sick.

4. Imagine you are in the dentist's chair to have your teeth cleaned. While you are waiting
and the dentist or hygienist is getting out the instruments which will be used to scrape your teeth around the gums, how do you feel?

a. Relaxed.

b. A little uneasy.

c. Tense.

d. Anxious.

e. So anxious that I sometimes break out in a sweat or almost feel physically sick.

Appendix 2.

DENTAL CONCERNS ASSESSMENT

Please rank your concerns or anxiety over the dental procedures listed below by ranking them on the accompanying scale. Please fill in any additional concerns.

	Level of Concern or Anxiety			
	Low	**Moderate**	**High**	**Don't know**
1. Sound or vibration of the drill	1	2	3	4
2. Not being numb enough	1	2	3	4
3. Dislike the numb feeling	1	2	3	4
4. Injection ("novocaine")	1	2	3	4
5. Probing to assess gum disease	1	2	3	4
6. The sound or feel of scraping during teeth cleaning	1	2	3	4
7. Gagging, for example during impressions of the mouth	1	2	3	4
8. X-rays	1	2	3	4
9. Rubber dam	1	2	3	4
10. Jaw gets tired	1	2	3	4
11. Cold air hurts teeth	1	2	3	4
12. Not enough information about procedures	1	2	3	4
13. Root canal treatment	1	2	3	4
14. Extraction	1	2	3	4
15. Fear of being injured	1	2	3	4
16. Panic attacks	1	2	3	4
17. Not being able to stop the dentist	1	2	3	4
18. Not feeling free to ask questions	1	2	3	4
19. Not being listened to or taken seriously	1	2	3	4
20. Being criticized, put down, or lectured to	1	2	3	4
21. Smells in the dental office	1	2	3	4
22. I am worried that I may need a lot of dental treatment	1	2	3	4

23. I am worried about the cost of the dental treatment I may need	1	2	3	4
24. I am worried about the number of appointments and the time that will be required for necessary appointments and treatment; time away from work, or the need for childcare or transportation	1	2	3	4
25. I am embarrassed about the condition of my mouth	1	2	3	4
26. I don't like feeling confined or not in control	1	2	3	4

Overview of content areas, categories and examples of codes Appendix 3.

Content areas	Categories	Example of codes
Causes of dental anxiety	The dentist's approach	Indifferent Authoritarian Intimidating Harsh Routine-ruled
	The dental apparatuses	Drill Syringe
	The treatment execution	Pain Complications Mistakes
	The environment	Sound and smell No options Change of dentist
Expressions of dental anxiety	Anxiety	Dread Fear Nightmares and insomnia
	Avoidance	Flee Seeking help only in emergency cases
	Feelings of exposure	Defenseless Uninformed Down casted Losing control
	Physical reactions	Tense Pain Feeling of sickness Crying Fainting Strenuous
	Injection fear	Strain due to anesthesia Tiredness
	Self-distraction	Breathing Tweaking Mind distraction
Preferences of information	Person-centered information	Information about treatment Involving the patient
	Peaceful environment	Calm dentist Environment free from stress Pauses
	Being seen as a person	Compassion Respect Good reception Disperse concerns to
	Skilled therapist	Good anesthetic technique Knowing their limitations
	Control regain	The need of autonomy Free "straps"