

Anxiety and quality of life in phobic dental patients

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ABSTRACT

Little is known about the anxiety patients experience before attending for dental treatment. The aim of this study was to determine, in dentally phobic patients, the temporal relationship of pre-operative anxiety levels, and the disruption to daily life activities caused by this. Twenty-four phobic and nineteen control (non-phobic) dental patients were recruited. Four validated questionnaires were used to assess anxiety and quality of life, which each patient completed for 5 days prior to, and on the day of treatment. The experimental group were found to have significantly greater levels of dental and general anxiety, and a significantly lower quality of life compared to the control. Significant temporal relationships were found with all of the questionnaires. Dental and general anxiety scores were significantly correlated with quality of life measures. This study suggests that phobic dental patients are experiencing significant increased anxiety, and significant negative quality of life effects, in this period.

INTRODUCTION

Many people feel anxious about visiting the dentist. Forty-five percent of respondents in the 1988 Adult Dental Health Survey (Todd and Lader, 1991) said that fear was a major barrier to the receipt of routine dental care. The 1998 Adult Dental Health Survey (Kelly *et al.*, 1998) found that 64% of respondents were nervous of some form of dental treatment, and 49% were anxious of simply going to the dentist. This fear can then lead to avoidance of dental treatment (Mellor, 1992), dental neglect (Hakeberg *et al.*, 1993) and a reduced general quality of life (Locker, 2003; Mehrstedt *et al.*, 2004; McGrath and Bedi, 2004). Eventually dental neglect can lead to pain, when many patients seek treatment. This is often undertaken at a referral hospital under conscious sedation.

Conscious sedation is a safe, valuable and effective technique (Department of Health, Standing Dental Advisory Committee, 2003), which is used to reduce patient anxiety whilst undertaking dental treatment. However, little is known about the patient's anxiety and quality of life in the period before attending for treatment under sedation. Many of the papers in relation to pre-operative dental anxiety are focussed on treatment modalities aimed at reducing dental anxiety, and none have included a non-anxious control group (Luyk *et al.*, 1988; Fox *et al.*, 1989; Litt *et al.*, 1993). Hence, although the studies show that pre-operative dental anxiety is present, the severity of that anxiety is not quantified. Numerous studies show that dental anxiety does have an effect on quality of life (Berggren, 1993; Abrahamsson *et al.*, 2000; Locker, 2003; Mehrstedt *et al.*, 2004; McGrath and Bedi, 2004). However these are retrospective studies, and are remote from the pre-operative period, so may not be truly representative of the effects of acute dental anxiety. One study discusses the impact of dental anxiety on quality of life in the days leading up to treatment (Cohen *et al.*, 2000). This retrospective study showed how far reaching and dynamic the effect of dental anxiety can be, however due to the fact that the data is qualitative the frequency or severity of these quality of life effects is not reported. More objective research is required to assess anxiety and quality of life in anxious dental patients. Many patients are anxious of the dentist. However, when fears arise that are considered out of proportion to the demands of the situation, they cannot be explained or reasoned away, are beyond voluntary control, and lead to avoidance of the feared situation, then a phobia is said to exist (Marks, 1969).

The study presented uses validated questionnaires to assess anxiety and quality of life in phobic dental patients in the period before attending for dental treatment under conscious sedation. It is

a prospective, controlled study, aimed at providing a quantitative picture of the anxiety patients experience in the period before dental treatment. It is important to investigate the extent of pre-operative anxiety and its effects on quality of life as this will increase our scientific knowledge of dental anxiety. If found to be appropriate, this study may facilitate further investigation into methods of alleviating dental anxiety in the pre-operative period, thereby improving quality of life. The aims of this study were to determine, in phobic dental patients scheduled to undergo dental treatment under conscious sedation a) the temporal relationship of experienced anxiety levels in the days prior to the dental procedure b) the level of disruption to daily life activities caused by the anxiety experienced in the days prior to the dental procedure. The null hypothesis is: 'Dental anxiety does not increase in the days leading up to dental treatment, and does not cause any disruption to normal daily life'

MATERIALS AND METHODS

Approval for the study was obtained from Sunderland Local Research Ethics Committee, and both Newcastle-upon-Tyne Hospitals Trust and Newcastle Primary Care Trust Research and Development Departments.

Study Design

The study was designed as a prospective, controlled, quantitative survey of patient anxiety and quality of life.

Sample Size

A power calculation using Power and Precision Software, based on the Corah Dental Anxiety Scale, revealed that a sample size of 22 for each group would detect a significant difference between the two groups of one standard deviation, with 95% confidence and 90% power.

Study Groups

An experimental and control group were included in the study.

i) Experimental Group

The experimental group was recruited from patients presenting to the Sedation Department at Newcastle Dental Hospital. These patients had been referred to the department because they had a disproportionate level of dental anxiety and, as a result, were considered unable to undergo routine dental treatment without some form of pharmacological anxiolysis. The inclusion criteria were: clinically assessed to be phobic of dental treatment, willing to participate, aged between 18 and 50 years, and ASA I or II.

ii) Control Group

The control group were recruited at Grainger Park Dental Practice, Newcastle, and consisted of non-phobic patients not requiring additional anxiety management to complete their dental treatment. Inclusion criteria were: clinically assessed as being non-phobic of dental treatment, willing to participate, aged between 18-50 years and ASA I or II.

Exclusion criteria for both groups were refusal to participate, inability to attend for the treatment appointment within the time restraints of the study, and inability to understand the consent process or the questionnaires.

Recruitment

All patients underwent an assessment visit and if they met the inclusion criteria they were invited to take part. A patient information leaflet was provided, and the patient was given time to read it and ask any questions. If they were happy to participate, an informed consent form was signed and witnessed.

Assessment Tools

i) Measurement of Anxiety

Two validated anxiety questionnaires were used to assess general and dental anxiety, in the pre-operative period: Corah Dental Anxiety Scale (Corah DAS) (Corah, 1969), and the Spielberger State-Trait Anxiety Inventory (STAI) (Spielberger, 1983).

The STAI provides two self-report scales, each of twenty statements. The State Anxiety scale evaluates how the respondent feels *right now*, at this moment; the Trait Anxiety scale evaluates how the respondents *generally* feel. The patient evaluates each of the twenty items on a four-point scale. Scores range from 20 to 80, with higher scores indicating higher anxiety. All of the components of the STAI scale have been widely used and extensively tested for validity and reliability (Spielberger, 1983).

The Corah DAS evaluates how the patient feels about dentistry in particular. The patient is asked to imagine themselves in the four different dental situations, and rate how they feel on a 5-point scale from 'calm' to 'terrified'. The scores range from 4 to 20, with higher scores indicating

higher dental anxiety. The scale has been used in a large number of studies. Reliability has been tested and validity has also been proven (Corah, 1969).

ii) Measurement of Quality of Life

Two validated quality of life questionnaires were used to assess the level of disruption to daily activities in the pre-operative period: Minor Symptom Evaluation Profile (MSEP) (Dahlof *et al.*, 1989; Dahlof, 1990), and the Psychological General Well-Being scale (PGWB) (Dupuy, 1984).

The MSEP provides a general measure of subjective Central Nervous System-related symptoms that affect well-being. The measure is a 15-item questionnaire consisting of 3 components *contentment, vitality and sleep*. Subjects mark the intensity of each symptom on a 100mm linear scale, and the total score in millimetres is evaluated for each group of symptoms. The lower the score, the better the subjects feel. All items of the MSEP, with the exception of the sleep variables, refer to the patient's feelings at the time of completing the questionnaire. Sleep items, however, reflect the patient's recollection of the previous night. It has been extensively validated, the internal consistency for each dimension is high and test-retest reliability has also been proven (Dahlof *et al.*, 1989; Dahlof, 1990).

The PGWB also provides a measure of well-being and has six subscales. There are 22 items. For each item there are five response options scaled 1 to 5, the most negative option is scored 1, and the most positive option is scored 5. Thus the total score of the PGWB gives a minimum value

of 22, and a maximum of 110. The higher the score the better the subjects feel. The literature has shown high validity and reliability of the instrument (Dupuy, 1984).

Administration of Questionnaires

Each patient was given 6 envelopes, containing the 4 questionnaires. The envelopes were dated to correspond to the day the patient was to complete the questionnaires. The patients completed the four anxiety questionnaires in the morning of each day, for 5 days prior to their scheduled dental treatment appointment, and on the day of treatment. On completion the patient dated the questionnaires and put them back in the appropriate envelope. All 6 envelopes were returned to the investigator on the day of the patient's initial treatment appointment.

The questionnaires were coded with the patients identification number and A or B. The code A or B identified which group the patient was in, control or experimental, which the investigators were blind to.

To help improve compliance, the patient was given a patient instruction leaflet with reminders of how to fill in the questionnaires, and a tick box to enable them to record that they had completed the questionnaires on that day.

Data Analysis

The data was entered into SPSS for Windows 11.0. In order to answer the research questions and test the null hypothesis, a number of investigations were carried out. To quantify the level of anxiety and disruption to daily life activities it was necessary to compare the experimental group

to the control group, looking at each questionnaire individually. To investigate the temporal relationship it was necessary to determine whether there were any changes from day to day in the anxiety and quality of life scores, considering each questionnaire individually. To determine whether the anxiety experienced in the days leading up to dental treatment had an effect on quality of life in the phobic experimental group, it was necessary to look at the relationship between the anxiety and quality of life scores.

To test the significance of the results two different types of tests were carried out. For analysis of significance between groups and days, repeated measures analysis of variance was used. This involved three tests being undertaken simultaneously: a test of whether there is an overall difference between the experimental and control group over the six days; a test of whether anxiety and quality of life varies between days; and a test of whether the difference between the experimental and control group varies between days. The correlation between anxiety and quality of life scores was tested using Pearson's correlation coefficient, which measures the strength of the linear relationship between the 2 variables. The statistical significance of this result was then tested using a t-test.

RESULTS

Forty-three patients were initially recruited to the study, twenty-four in the experimental group and nineteen in the control group. Three patients were completely excluded as they failed to fill in the questionnaires on one of the days, leading to incomplete data. One of the patients from the experimental group withdrew from the study as they felt that completing the questionnaires was increasing their anxiety to such a level that they felt unable to continue. This left twenty-one

patients in the experimental group and eighteen in the control group. Four patients failed to complete a full set of a particular questionnaire. These patients were not excluded, however the data for that particular questionnaire was discounted. This resulted in different numbers of subjects for each questionnaire, to ensure analysis was only carried out on full data sets (see table 1 for details).

Descriptive statistics showed the average age of the experimental group to be thirty-six years (range nineteen to fifty), and thirty-eight years for the control group (range twenty-one to fifty). There were fifteen females and six males in the experimental group, and ten females and eight males in the control group.

1. Comparisons to the Control

Table 1 shows the total means (95% confidence interval), standard deviations, and standard errors for the 6 days for each questionnaire, in both the experimental and control groups.

Considering the data, the experimental group had higher total mean anxiety scores over the 6 days, compared to the control group, for the Corah DAS, and the State and Trait Anxiety Inventories. The difference between the two groups was significant for the Corah DAS ($p=0.000$), State ($p=0.001$) and Trait Anxiety scores ($p=0.038$).

The mean score in all three dimensions of the MSEP (*contentment, vitality and sleep*) was higher for the experimental group, indicating a poorer quality of life. This result for each dimension was significant ($p=0.000$ for all dimensions). The PGWB score was lower for the experimental

group, indicating a poorer quality of life, and this difference was significant ($p=0.022$).

2. The Temporal Relationship

A temporal relationship was found with the Corah DAS, State and Trait Anxiety scores, PGWB scores and all of the dimensions of the MSEP scale. The control group scores for all of the questionnaires (apart from the Corah DAS) remained fairly stable over the 6 days. The experimental group showed a steady increase (MSEP, State and Trait Anxiety) or decrease (PGWB) in scores from day 4 to 0. This change indicated an increase in anxiety and decrease in quality of life. These observations are illustrated for the State Anxiety scores in figure 1.

Both the experimental and control group Corah DAS scores remained fairly stable until day 0, when they both showed an increase, by 0.66 and 0.50 respectively.

This effect of days was shown to be significant for the Corah DAS ($p=0.017$), State ($p=0.000$), Trait ($p=0.047$), MSEP ($p=0.000$ for all three dimensions) and PGWB ($p=0.000$) scores.

Table 2 further illustrates the difference in the means between the two groups on each day. This illustrates that, in all of the measures apart from the Corah DAS and the Spielberger Trait Anxiety Inventory, there is a steady increase in the difference in mean scores between the experimental and control groups on each day, up to the day of treatment. The MSEP scores all show a small decrease in the difference from day 5 to 4 then a steady increase in the difference to day 0. The difference in scores between the experimental and control groups was shown to significantly vary from day to day for the State Anxiety ($p=0.000$), Trait Anxiety ($p=0.010$),

PGWB ($p=0.000$), MSEP *contentment* ($p=0.000$), *vitality* ($p=0.000$) and *sleep* ($p=0.000$) scores, but not the Corah DAS ($p = 0.307$).

3. Correlation between Anxiety and Quality of Life Scores

Table 3 shows the results of the correlations.

There are significant positive correlations between the Corah DAS and the MSEP *contentment* and *sleep* scores. There is a negative correlation with the PGWB scores, and a positive correlation with the MSEP *vitality* scores, although these results are not significant.

There are stronger significant negative and positive correlations between the Spielberger State Anxiety Inventory and the PGWB, MSEP *contentment* and *vitality* scales. There is a weaker non-significant correlation with the MSEP *sleep* scores.

DISCUSSION

The results of the study show the extent of pre-operative anxiety that phobic patients experience in the days leading up to dental treatment. This is especially marked with regard to dental anxiety as there is a difference in scores of nearly 3 standard deviations, which is consistent with the scores from anxious and non-anxious populations in other studies (Corah, 1969; Berggren and Meynert, 1984; Cohen, 1985; Locker *et al.*, 1997). Elevated state anxiety (the response to situational stress) is also shown in the experimental group, compared to the control group.

Previous studies have linked high levels of dental anxiety with high levels of general anxiety

(Hall and Edmondson, 1983; Kaakko *et al.*, 1988), and general fears (Abrahamsson *et al.*, 2000; Locker, 2003). Interestingly, this study has shown that there may also be a difference in phobic dental patients' proneness to anxiety, as shown by a higher mean trait score in the experimental group.

The difference over the six days, between groups, was significant for psychological general well-being, *contentment*, *vitality* and *sleep*. This result indicates that patients with an elevated dental and general anxiety do have a reduced quality of life in regard to these dimensions, compared to normal dental patients.

The study also found temporal relationships with pre-operative dental anxiety, state anxiety, trait anxiety, psychological general well-being, contentment, vitality, and sleep in the experimental group. This is the first time these relationships have been identified, and shows that pre-operative quality of life and anxiety levels in the phobic dental patient are dynamic. It has also identified a possible start to these negative temporal effects, which could facilitate further research.

An unexpected result is the temporal relationship with trait anxiety, which increases in the experimental group as the appointment approaches. As this is an underlying personality trait, we would expect it to be relatively stable. This may be an error due to the sample size, and further work is warranted.

A temporal relationship was also demonstrated in regard to the difference in means between the two groups from day to day, for the State and Trait Anxiety Inventory, PGWB scale and MSEP

scores. For all but the Trait Anxiety Inventory and the Corah DAS, as the days progressed, the difference in means between the experimental and control groups increased. This shows that the experimental group were getting relatively more anxious, and experiencing a relatively greater effect on their quality of life, compared to the control group. This effect was seen at day 0 for the Trait Anxiety Inventory. Interestingly the difference between the Corah DAS scores was not significant over the 6 days, including the increase in scores in both groups on the day of treatment. This shows that the control group had a comparable increase in anxiety to the experimental group on that day. These temporal effects are unique findings, which have not previously been researched.

The observations seen in this study further confirm the link between dental anxiety, general anxiety, and quality of life. The literature has suggested that quality of life is often measured as physical, psychological and social well-being (Arnold *et al.*, 2004). Previous studies have shown a relationship between dental anxiety and emotional consequences (Abrahamsson *et al.*, 2000; Locker, 2003; Mehrstedt *et al.*, 2004), mood (Berggren, 1993), vitality (Mehrstedt *et al.*, 2004), psychological well-being (Mehrstedt *et al.*, 2004) and social functioning (Locker, 2003; Mehrstedt *et al.*, 2004). By demonstrating positive and negative correlations, this study confirms the findings of the above papers in regard to psychological well-being, contentment and vitality, although not all of these findings were significant. However, neither scale used in this study has any assessment of social well-being, therefore quality of life has not been fully assessed in this current study, and is one of the limitations of this work. However, another unique finding of the study was the significant relationship between dental anxiety and sleep, which has not previously been researched.

A stronger relationship was shown between general anxiety and quality of life, which was particularly marked with psychological general well-being, contentment and vitality, but sleep was also affected (although this finding was not significant). These observations are consistent with a quality of life study in regard to general anxiety (Strine *et al.*, 2005) and with the symptoms you would expect from generalised anxiety.

Conclusion

The results of this study suggest that dentally phobic patients, in the pre-operative period, have greater dental and general anxiety and a poorer quality of life, compared to normal dental patients.

The presence of dental and general anxiety show a relationship to quality of life. Although there is insufficient evidence to conclude that dental anxiety specifically has an effect on all aspects of quality of life, the study does suggest a relationship.

With regard to the studies null hypothesis 'Dental anxiety does not increase in the days leading up to dental treatment, and does not cause any disruption to normal daily life', the first and the second part were disproved.

Although the sample size in this study is small and therefore the conclusions must be interpreted with some caution, the results have highlighted important differences between the phobic and normal dental patient, in the pre-operative period. It has also further confirmed the link between

dental anxiety and quality of life. The study is unique with regard to the time period considered, the temporal relationships found, and the quality of life measures used.

At the present time, the majority of the treatment modalities employed to assist anxious patients are on the day of treatment. This study has shown that the patients are experiencing significant effects in the period leading up to this day. Dental anxiety should, therefore, be looked at in a wider perspective, and management regimes for anxiety may need to include the pre-operative, as well as the peri-operative period.

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REFERENCES

Abrahamsson KH, Berggren U, Carlsson SG (2000). Psychosocial aspects of dental and general fears in dental phobic patients. *Acta Odontologica Scandinavica* 58(1): 37-43

Arnold R, Ranchor A.V, Sanderman R, Kempen GI, Ormel J, Suurmeijer TP (2004). The relative contribution of domains of quality of life to overall quality of life for different chronic diseases. *Quality of Life Research* 13: 883-896

Berggren U, Meynert G (1984). Dental fear and avoidance: causes, symptoms, and consequences. *Journal of the American Dental Association* 109(2): 247-51

Berggren U (1993). Psychosocial effects associated with dental fear in adult dental patients with avoidance behaviours. *Psychology and Health* 8: 185-196

Cohen M.E (1985). Dental anxiety and DMFS status: association within a US naval population versus differences between groups. *Community Dentistry and Oral Epidemiology* 13: 75-8

Cohen SM, Fiske J, Newton JT (2000). The impact of dental anxiety on daily living. *British Dental Journal* 187: 385-390

Corah N (1969). Development of a dental anxiety scale. *Journal of Dental Research* 48(4): 596

Dahlof C, Dimenas E, Olofsson B (1989). Documentation of an instrument for assessment of subjective CNS-related symptoms during cardiovascular pharmacotherapy. *Cardiovascular Drugs and Therapy* 3: 919-27

Dahlof C (1990). Minor Symptoms Evaluation (MSE) Profile – a Questionnaire for Assessment of Subjective CNS-related Symptoms. *Scandinavian Journal of Primary Health Care* Supplement 1: 19-25

Dupuy HJ (1984). The Psychological General Well-Being (PGWB) index. In: Assessment of Quality of Life in Clinical Trials of Cardiovascular Therapies. Wenger NK, Mattson ME, Furberg CF, Elinson J.,eds. New York: Le Jacq Publishing, pp.170-83.

Department of Health, Standing Dental Advisory Committee (2003). Conscious sedation in the provision of dental care. Report of an expert group on sedation for dentistry.

Fox E, O'Boyle C, Barry H, McCreary C (1989). Repressive coping style and anxiety in stressful dental surgery. *British Journal of Medical Psychology* 62(Pt4): 371-80

Hakeberg M, Berggren U, Grondahl HG (1993). A radiographic study of dental health in adult patients with dental anxiety. *Community Dentistry and Oral Epidemiology* 21(1): 27-30

Hall N, Edmondson HD (1983). The aetiology and psychology and dental fear. *British Dental Journal* 154: 247-252

Kaakko T, Milgrom P, Coldwell SE, Getz T, Weinstein P, Ramsay DS (1988). Dental fear among university employees: implications for dental education. *Journal of Dental Education* 62(6): 415-20.

Kelly M, Steele J, Nuttall N, Bradnock G, Morris J, Nunn J *et al.* (1998). The Adult Dental Health Survey 1998. United Kingdom. London; HMSO.

Litt MD, Nye C, Shafer D (1993). Coping with oral surgery by self-efficacy enhancement and perceptions of control. *Journal of Dental Research* 72(8): 1237-43

Locker D, Shapiro D, Liddell A (1997). Overlap between dental anxiety and blood-injury fears: psychological characteristics and response to dental treatment. *Behaviour Research and Therapy* 35(7): 583-590

Locker D (2003). Psychosocial consequences of dental fear and anxiety. *Community Dentistry and Oral Epidemiology* 31: 144-51

Luyk NH, Weaver JM, Beck FM, Loetscher CA, Sacks J (1988). The effectiveness of flurazepam as night sedation prior to the removal of third molars. *International Journal of Oral and Maxillofacial Surgery* 17(6): 347-51

Marks IM (1969). *Fears and Phobias*. London: Heinemann Medical Books

McGrath C, Bedi R (2004). The association between dental anxiety and oral health-related quality of life in Britain. *Community Dentistry and Oral Epidemiology* 31(1): 67-72

Mehrstedt M, Tonnies S, Eisentraut I (2004). Dental fears, health status and quality of life. *Anesthesia Progress* 51(3): 90-4

Mellor AC (1992). Dental anxiety and attendance in the North-West of England. *Journal of Dentistry* 20(4): 207-10

Spielberger DC (1983). Manual for the State-Trait Anxiety Inventory. California: Mind Garden Inc. Publishing.

Strine TW, Chapman DP, Kobau R, Balluz L (2005). Associations of self-reported anxiety symptoms with health-related quality of life and health behaviours. *Social Psychiatry and Psychiatric Epidemiology* 40(6): 432-8

Todd J, Lader D (1991). Adult Dental Health In United Kingdom in 1988. London: HMSO.

Table 1: Totals of the 6 days for the experimental and control groups

Measure	Experimental				Control			
	n	Mean (95% confidence interval)	Std. Deviation	Std Error	n	Mean (95% confidence interval)	Std Deviation	Std Error
Corah DAS	21	16.19 (14.63, 17.75)	3.43	0.75	18	8.31 (6.92, 9.71)	2.81	0.66
STAI S-Anxiety	21	43.9 (38.4, 49.41)	12.1	2.64	17	30.85 (26.48, 35.23)	8.51	2.06
STAI T-Anxiety	21	42.13 (37.11, 47.15)	11.03	2.41	16	34.18 (28.18, 40.18)	11.26	2.82
PGWB	21	75.92 (68.48, 83.36)	16.34	3.57	18	87.61 (80.81, 94.42)	13.68	3.23
MSEP Contentment	19	290.06 (239.47, 340.66)	104.98	24.08	18	136.92 (89.97, 183.86)	94.41	22.25
MSEP Vitality	19	214.32 (177.94, 250.69)	75.47	17.31	18	95.17 (63.03, 127.3)	64.62	15.23
MSEP Sleep	19	155.35 (128.2, 182.5)	56.34	12.93	18	72.7 (47.16, 98.25)	51.37	12.11

n = number of subjects

Table 2: Parameter estimates: difference between groups (95% confidence interval) on each day

	Day 5	Day 4	Day 3	Day 2	Day 1	Day 0
Corah DAS	7.09 (4.68, 9.50)	8.07 (5.92, 10.23)	8.07 (6.06, 10.09)	7.83 (5.64, 10.01)	8.02 (5.90, 10.13)	8.18 (6.09, 10.28)
STAI S-Anxiety	7.26 (-0.26, 14.78)	7.36 (0.84, 13.88)	11.86 (4.50, 19.03)	12.40 (4.37, 20.44)	15.74 (6.67, 24.81)	23.68 (14.82, 32.55)
STAI T-Anxiety	7.69 (-0.01, 15.40)	6.36 (-0.76, 13.49)	6.26 (-1.43, 13.96)	7.97 (-0.05, 15.98)	7.72 (-0.47, 15.91)	11.69 (3.81, 19.58)
PGWB	-6.82 (-15.88, 2.25)	-7.01 (-16.18, 2.17)	-10.45 (-20.93, 0.02)	-11.94 (-23.49, - 0.40)	-15.21 (-25.94, - 4.49)	-18.71 (-30.21, - 7.20)
MSEP Vitality	73.97 (25.10, 122.84)	73.87 (26.52, 121.22)	94.94 (49.41, 140.47)	126.73 (64.99, 188.47)	158.11 (98.83, 217.38)	187.28 (124.69, 249.86)
MSEP Contentment	85.55 (15.94, 155.16)	85.10 (21.76, 148.44)	122.27 (53.47, 191.07)	159.87 (70.86, 248.89)	199.53 (119.18, 279.88)	266.55 (181.62, 351.48)
MSEP Sleep	57.76 (14.62, 100.91)	39.62 (-2.37, 81.61)	67.49 (29.56, 105.43)	86.88 (45.59, 128.17)	116.70 (69.99, 163.41)	127.42 (82.77, 172.08)

Day = Number of days before treatment

Day 0 = Day of treatment

Table 3: Correlations of anxiety measures with quality of life measures in the experimental group

Anxiety Measures	Quality of Life Measures	Pearson Correlation	Significance (2-tailed)
Corah DAS (n=21)	+ PGWB (n=21)	-0.425	p=0.055
	+ MSEP Contentment (n=19)	0.461	p=0.047
	+ MSEP Vitality (n=19)	0.271	p=0.263
	+ MSEP Sleep (n=19)	0.533	p=0.019
STAI S-Anxiety (n=21)	+ PGWB (n=21)	-0.841	p=0.000
	+ MSEP Contentment (n=19)	0.846	p=0.000
	+ MSEP Vitality (n=19)	0.676	p=0.001
	+ MSEP Sleep (n=19)	0.420	p=0.074

n = number of subjects

Figure 1 ▲NCB, NG, EB, KW, AB - Test scores for the experimental and control groups over the six days for the Spielberger State-Anxiety questionnaire

