

# Evaluation of the effect of cognitive therapy on perioperative anxiety and depression among Nigerian surgical patients

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## Summary

### Study Objective

Surgical patients have been known to benefit immensely from psychological interventions. This study set out to assess the pre and postoperative anxiety levels and depression and the effect of cognitive therapy among Nigerian surgical patients. The effects of gender and educational status on perioperative anxiety and depression were also evaluated.

### Study design

The study utilized a controlled outcome design to evaluate the efficacy of self-instructional training (SIT) and rational emotive therapy (RET) in surgical patients. Preoperative anxiety and depression scores were used as co-variants.

### Patients

Thirty-three (33) elective surgical patients were sampled randomly, divided into 3 groups of eleven (11) patients each. Eight (8) subjects underwent gynaecological procedures while the remaining 25 subjects had general surgical procedures. The mean age was 32.72 ± 15.83 years (range = 17-16 years.)

### Measurements

The major instruments used in the study were the State Anxiety Subscale of the Spielberger State Trait Anxiety Inventory (STAI) and Hospital Anxiety and Depression Inventory.

### Main results

SIT had the potential to reduce anxiety level among subjects postoperatively ( $t = 2.06; df = 10; p < 0.05$ ). The use of RET reduced depression among surgical patients ( $t = 1.23; df = 10; p < 0.05$ ).

### Conclusions

It was concluded that surgical patients manifest varying degrees of anxiety preoperatively and postoperatively. Patient's pre and postoperative anxiety and depression can be reduced by the introduction of SIT and RET.

**Key words.** Cognitive therapy, Self-instructional therapy, Rational emotive therapy, Anxiety, Surgical patient, Perioperative

## Résumé

### Objectif

C'est déjà noté que les opérés bénéficient énormément de l'intervention psychologique. Cet étude est pour but d'évaluer les niveaux de l'inquiétude pré et postopératoire et l'état dépressif et l'effet de la thérapie cognitive chez les opérés nigériens.

L'effet de sexe et du diplôme sur l'inquiétude périopératoire et état dépressif sont été également évalués.

### Méthodes

On a utilisé un plan du résultat bien dirigé pour évaluer l'efficacité de la formation autodidacte (SIT) et la thérapie rationnelle sensationnaliste (RET) chez des patients opérés. On avait utilisé des Scores de l'inquiétude préopératoire et de l'état dépressif comme co-variants.

### Patients

Trente trois (33) patients opérés de confort ont été passés par échantillonnage au hasard divisé en trois groupes composé de 11 patients dans chaque groupe. Huit (8) sujets avaient passé par des procédures gynécologiques tandis que les autres 25 sujets avaient subi des procédures chirurgicales générales. L'âge moyen était 32, 72 ± 15, 83 ans (de 17 à 61 ans).

## Mesurage

Des instruments les plus importants utilisés dans cet étude étaient sous balance d'état de l'inquiétude de Spielberger state-Trait Inquiétude d'inventaire (STAI) et inquiétude de l'hôpital et l'inventaire de l'état dépressif.

## Résultats principaux

Le SIT avait le potentiel d'abaisser le niveau de l'inquiétude chez des sujets postopératoires ( $t = 2.06, df = 10, p < 0.05$ ). L'utilisation de RET a abaissé l'état dépressif chez des patients opérés ( $t = -1, 23; df = 10; p < 0.05$ ).

## Conclusion

Dans l'ensemble, on dirait que des patients opérés témoignent les degrés diverses de l'inquiétude pré-opératoire et postopératoire. On peut abaisser l'inquiétude et l'état dépressif des patients à travers le traitement avec le SIT et RET pré et postopérativement.

## Introduction

To a varying extent, surgical patients are faced with a variety of stressors which have a direct, adverse effect on the outcome of surgery.<sup>1,2</sup> The recognition of this factor has culminated in an increased research in this area.<sup>3,4</sup> Preoperatively, many surgical patients manifest a heightened level of anxiety.<sup>3,6</sup> They are often threatened by possible loss of life, separation from spouse or family members, unfamiliar environment and new social relationships. The strangeness of the operating room itself, its noise and equipment, represents a potential hazard and psychological stressor.<sup>7</sup> Individual responses toward a proposed surgery differ according to one's personality, trait and characteristics, personal and societal values, existing family support and the effectiveness of the coping mechanisms in use.<sup>8</sup>

Many may deny that their hospitalisation or schedule for surgery affects them in any way. This may be a means of escaping from the reality of facing the challenges of initiating and putting up a sustainable resistance to the possible stressors attendant to the overall effect of the indications for, the preparation, the operative procedure as well as the possible outcome of surgery. In relation to the above coping style, patients often tend to deny protecting their ego.<sup>7</sup> Similarly, patients may reject reality and danger, thereby reducing anxiety, maintaining stability, and deterring panic. By denying their concern or joking inappropriately, they repel overwhelming threats and make their difficulties more bearable. Such patients are super optimistic and are high-risk surgical patients because they are not prepared to cope postoperatively. Other surgical patients may react to the stress and anxiety of surgery by feeling depressed, withdrawn, dependent, regressed, grieved, suspicious, angry or hostile, or feeling guilty or punished for one's sins.

All patients experience anxiety pre-operatively whether they verbalise them or not.<sup>7</sup> Pre-operative anxiety may manifest physiologically in the form of changes in the vital signs and may also produce a psycho-physiological reaction. Varying degrees of anxiety are to be expected based on the intensity and persistence of stressors.

The mere scheduling of an individual for surgery in any operating theatre is in itself a possible source of worry, anxiety or depression.<sup>10</sup> The thought of an unfamiliar operating theatre environment, strange electro-medical equipment, differently attired (masked) personnel, technique of anaesthesia, post-operative pain and uncertain outcome of surgery among others produce apprehension and dread. In illness, anxiety causes repressed fears

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to resurface from the subconscious and become magnified. The patient recognises his vulnerability and his body prepares to cope physiologically with the crisis. Of course, the patient may imagine and dread something more frightening than the actual experience. Anticipatory fear can be an emotion marked by dread, apprehension, and alarm due to the anticipation or awareness of danger. Some of these may include fear of the unknown (for instance, what might be discovered in an exploratory operation), the fear of death and fear of anaesthesia are often related in which case the patient asks himself - "Will I survive the operation? Will I wake up?" "Who will care for my family if I die?" The fear of a resultant change in body integrity or fear of disfigurement, mutilation, loss of a valued body part e.g. the breast, eye or limb, evokes a lot of anxiety. Many patients abhor the thought of an incomplete body.

All patients experience anxiety preoperatively whether they verbalize it or not.<sup>7</sup> Efforts directed at reducing preoperative anxiety in surgical patients have been reported in various studies.<sup>3-6,9,11-15</sup>. Therapeutic modalities that have been successfully employed to reduce preoperative anxiety in surgical patients include structural preoperative teaching,<sup>3</sup> aromatherapy,<sup>4</sup> relaxation technique,<sup>3</sup> administration of midazolam,<sup>6</sup> peer support,<sup>12</sup> aerobic training,<sup>13</sup> music.<sup>14</sup> Several workers have reported negative effects of preoperative anxiety on the outcome of surgery. These include depression and increased mortality,<sup>1</sup> increased post-operative analgesic consumption,<sup>16</sup> increased mortality in recurrent breast cancer,<sup>17</sup> poor outcome in lumbar surgery,<sup>18</sup> neuro-psychological deficits following cardiac surgery,<sup>19</sup> alterations in immune response,<sup>20</sup> chronic fear of recurrence, sexual dysfunction, and identity disturbance in ovarian cancer patients.<sup>21</sup>

Where a patient perceives incompetence of medical personnel, he may ask questions such as, "Do they know what they are doing?" "Am I being experimented on? This may erode his trust, creating anxiety especially where he feels inadequate to confront the health team.

The aims of the study were as follows:

1. To assess the effect of gender on pre-operative anxiety.
2. To find out whether educational status has any influence on pre-operative anxiety score of surgical patients.
3. To discover whether exposure of subjects to cognitive behaviour therapy will have an effect on the post-operative anxiety score of subjects.
4. To investigate whether the exposure of surgical patients to rational emotive therapy will have any effect on patients' post-operative anxiety score compared to no-treatment subjects.
5. To compare the postoperative anxiety score among self-instructional training subjects and the control group.

The development of preoperative anxiety in the surgical patient can be explained using existing psychological theories such as the crisis theory<sup>22-24</sup>, Hans Selye's theory of stress<sup>25</sup> (General adaptation syndrome - GAS), and the stimulus-response theory.<sup>26,27</sup>

## Materials and methods

### Stage 1

The objectives for this stage was to assess the influence of education and sex on pre and postoperative anxiety level of surgical patients. A series of independent test were adopted to assess these effects.

**Setting:** Patients for his study were recruited from the surgical wards of the University College Hospital (UCH), Ibadan and the gynaecological wards of the Oluyoro Catholic Hospital, Ring Road State Hospital, Adeoyo Hospital and Adeoyo Maternity Hospital, all in Ibadan as well as the Baptist Hospital and State Hospital, Ogbomosho. All these hospitals are situated in the south western part of Nigeria.

### Participants

Thirty three(33) patients awaiting surgery were randomly selected for the study. Eleven (11) patients each were distributed into self-instructional training, control and Rational Emotive Therapy groups with each subject having equal chances of being selected into any of the three groups. There were 18 males (54.5%) and 15 females (45.5%). The mean age was  $32.72 \pm 15.83$  years (range = 5 - 61 years). Eighteen (18) subjects (54.5%) were married while 15 (45.5%) were single. Twenty-two (66.66%) of the subjects were of high educational status while eleven (33.33%) were of low educational status.

### Instruments and measures

Part A of the questionnaire tapped socio-demographic data of the respondents such as age, gender, tribe, religion and educational status. The State-Trait Anxiety Inventory (STAI) by Spielberger, Gorsuch and Lushene<sup>28</sup> is a 40-item self-report questionnaire, which measures symptoms of state and trait anxiety among individuals. Only the 20-item State Anxiety Subscale was used in this study. The subscale response format is the 4-point Likert type ranging between "Not so", "At all" to "Very much so." The scale had been revalidated for use in Nigeria by Oyefeso.<sup>30</sup> The scale was re-standardized for the benefit of this study. The Cronbach coefficient Alpha yielded 0.89. Of the 20 items, only one item was not found significant at 0.5 level of confidence using item analysis - (item-total method) hence it was dropped. The remaining 19 items were included in the scale used for this study. The mean obtained postoperatively in this study was  $42.64 \pm 11.63$ . Hence any score  $>54.27$  was classified as high anxiety while any score  $<31.03$  was classified as low anxiety. The other subscale of the inventory is the 19-item trait subscale. The mean obtained preoperatively in this study was  $34.06 \pm 6.35$ .

The Hospital Anxiety and Depression Scale (HADS)<sup>31</sup> is a self reported 14-item scale that provides information on anxiety and depression in hospitalized patients. It has a 4-point Likert type format.

### Procedure

Permission to collect data was obtained from the Hospital Directors of each hospital. For ease of understanding, The Yoruba language translation of the questionnaire was administered to those who were Yoruba-speaking. The questionnaire was administered to all the 33 subjects in order to make a preoperative assessment of the patients' anxiety level, depression level and also to have a comprehensive review of their personality, sources and causes of anxiety, as well as their modes of coping.

The first session was used for preliminary assessment to collect base line data and establish rapport, while the second session involved exposure to treatment in the experimental group, carried out in the patients' day room. This session involved a didactic education session with the surgical patients. Each module had various rationales, which were explained to them and questions were entertained. The treatment package objectives are shown below.

### Stage 2 Cognitive behaviour programme

The treatment package was prepared using the information gathered during the pilot study in Stage 1. Before commencement of the therapy session, the patients were instructed about the rationale for the treatment and that it was a follow up to the assessment phase of the study.

The therapy packages used for each of the two treatment groups were based on the Rational Emotive Therapy (RET) and Self-Instructional Training (SIT). The control group had no treatment. The therapy took place during two sessions prior surgery. The RET Package had the following objectives:

- \* To familiarise the patients with therapy and to seek their cooperation.
- \* To obtain baseline data.
- \* To substantiate the need for therapy.
- \* To reinforce the learning process of the patient.
- \* To determine the extent to which patient has been able to dispute his irrational beliefs.
- \* To inform the patients that they are responsible for the emotional and psychological stress which people experience.
- \* To create opportunity to introduce R. E. T. in managing identified patients' problems.
- \* To abolish illogical reasoning and thought processes.
- \* To monitor the patient's progress.
- \* To review therapy and make patient clarifications.

The self-instructional training package included the following objectives:

- \* To make the patients aware of their thoughts, feelings and consequent physiological reactions.
- \* To know the patient's inner thoughts about the proposed operation (feared event).
- \* To explore the thoughts expressed by the patient.
- \* To reinforce patient's learning experience.
- \* To guarantee that the patient has understood the previous steps and was ready to adopt new behaviour.
- \* To introduce therapy.
- \* To know when to try on the new conceptualization.
- \* To equip the patient with the ability to understand the new coping skill for application under stressful conditions

**Stage 3 Postoperative assessment**

The administration of the State Anxiety Inventory to all the 33 subjects was carried out 24 hours after the operation, at which time there was already full recovery from the effects of the anaesthesia.

**Statistical analyses**

T-test analyses and a 2 x 3 analysis of covariance (ANCOVA) were used to analyse the data. Analyses of covariance was computed for each dependent variable for the three experimental groups in order to test for possible post-experimental differences in the dependent variable with respect to treatments. Pre-test scores were used as covariates so as to cater for initial difference in the dependent variables and other extraneous factors, which could compound the treatment effect.

**Results**

T-test analysis showed that there was no significant effect of patients' sex and educational level on preoperative hospital anxiety (Sex  $t = 0.33$ ;  $df = 31$ ;  $p > 0.05$ . Educational status:  $t = 0.25$ ;  $df = 31$ ;  $p > 0.05$ ) (Table 1).

**Table 1** T-Test table showing the effect of sex and education on preoperative state anxiety levels

Variables	N	X	SD	SE	t	df	p
Male	18	43.28	9.75	2.30			
Female	15	41.87	13.88	2.58	0.33	31	0.74
Low educational status	11	43.36	11.73	3.54			
High educational status	22	42.27	11.84	2.52	0.25	31	0.80

**Table 2** A comparison of Pre and Postoperative anxiety and depression scores by group

Dependent Variables	Experimental Group				Control Group				
	X	SD	t	p	X	SD	t	p	
State Anxiety	Pre SIT	44.55(12.16)*			Pre SIT	11.55(12.16)*			
	Post SIT	30.91(6.61)*	-0.85	10	<0.05	Post SIT	30.90(6.61)*	-2.32	10
State Anxiety	Pre RET	48.18(7.26)*			Pre RET	35.18(11.55)*			
	Post RET	33.82(6.21)*	-1.73	10	>0.05	Post RET	33.45(6.62)*	1.54	10

Note: \* Figures in parentheses represent standard deviation; n.s. Not significant; SIT - Self Instructional Therapy; RET - Rational Emotive Therapy.

The assessment of the anxiety level among elective surgical patients in this study showed that in the preoperative phase, 20(60%) patients had a normal anxiety level, 5(15.2%) had high anxiety level and the remaining 6 (18.2%) had low anxiety level (high anxiety level  $X = \text{or} > 54.27$  and low anxiety level  $X = \text{or} < 31.03$ ). At the post-operative phase, 6(18.2%) patients had high anxiety, 20(60.6%) had normal anxiety level while 7(21.2%) had high anxiety with high anxiety at  $X = 27.71$  limit.

Table 2 shows that a series of repeated-measures t-test for dependent samples for the SIT group yielded a substantially significant decrease in the level of anxiety from pre-intervention to post-intervention as measured by the Hospital Anxiety and Depression Scale ( $t = 2.06$ ,  $p < .05$ ). In comparison to the control group, the treatment group showed a significant decrease in anxiety. For depression, the SIT group did not show a significant decrease in the level of depression from pre-intervention to post-intervention ( $t = -0.33$ ;  $p = \text{n.s.}$ ) and in comparison with control group, the SIT group showed no significant difference in depression as measured by the Hospital Anxiety and Depression Inventory Scale.

The RET group showed a significant decrease in the level of anxiety from pre-intervention to post-intervention period as measured by the Hospital Anxiety and Depression Scale ( $t = 3.62$ ,  $p < .01$ ). When compared with the control group, the RET group showed a significant decrease in anxiety. With regards to depression, there was no significant difference between pre-intervention and post-intervention levels as measured by the Beck Depression Inventory ( $t = 0.08$ ;  $p = \text{n.s.}$ ). However, compared with the control group, the intervention mean values of 12.45 and 14.91 for the RET and the Control groups respectively.

Table 3 shows a series of t-test for repeated measures, which showed that there was no significant difference between the subjects on anxiety in the pre-self instructional and post-self instructional training levels in the experimental groups, ( $t = 0.8514$ ,  $df = 10$ ,  $> .05$ ). It was revealed however that there was a significant difference between subjects under pre-self instructional training and post self instruction training on anxiety level, and the control group, ( $t = 2.32$ ,  $df = 10$ ,  $p > .05$ ).

**Discussion**

In general, anxiety is an aversive emotional experience that motivates individuals to move away from, remove, or control the source of anxiety.<sup>28</sup> Anxiety is a feeling of apprehension manifested by feelings of impending doom, dread and weariness that is evoked by some perceived threat to the individual. Anxious individuals also tend to make negative, inaccurate attributions and interpretations.<sup>29, 30</sup>

In the present study, it was found that there was no significant difference between males and females on anxiety levels before surgical operations. Similar findings had been reported<sup>31</sup> which showed that males were more readily distressed than females thus further buttressing the fact that females were no more anxious before surgical operations than males.

Our results showed that the patient's level of education did not affect the scores on the state anxiety scale in response to cognitive therapy. Similar findings were reported by Atkinson and Kohn,<sup>32</sup> Kendall and Hollon.<sup>9</sup> This follows from the fact that cognitive therapy has the potential of assisting patients to change wrong

**Table 3** A comparison of pre and postoperative Hospital anxiety and depression scores by group

Dependent Variables	Experimental Group			Control Group			t	df	p	
		t	p	t	df	p				
Hospital Anxiety score	Pre SIT	15.29(4.72)*	2.06	10	<.05	Pre SIT	11.53(3.11)*	-1.13	10	n.s.
	Post SIT	11.0(2.16)*				Post SIT	13.7(2.94)*			
Hospital Depression Score	Pre SIT	13.14(4.78)*	-0.33	10	n.s.	Pre SIT	12.63(3.61)*	-1.55	10	n.s.
	Post SIT	14.0(3.42)*				Post SIT	14.91(2.43)*			
Hospital Anxiety score	Pre RET	16.09 (2.88)*	3.62	10	<.01	Pre RET	11.55(3.11)*	-1.13	10	n.s.
	Post RET	12.09 (2.74)*				Post RET	13.7(2.94)*			
Hospital Depression score	Pre RET	13.55(2.66)*	0.80	10	n.s.	Pre RET	12.63(3.61)*	-1.55	10	n.s.
	Post RET	12.45 (2.70)*				Post RET	14.91(2.43)*			

Notes: \* figures in parentheses represent standard deviation; n.s. - Not Significant; SIT = Self Instructional Therapy; RET - Rational Emotive Therapy

perceptions and interpretations of stimuli by modulating the cognitive processes so that appropriate responses can be learnt culminating in desired adaptive behaviours.

Patients who received SIT and RET preoperatively were found to have a significant reduction in their anxiety level post-operatively. The replacement of negative self-statements and thoughts with more goal-directed, positive self-statements has the potential of reducing anxiety among surgical patients.<sup>33</sup> Self-statements are the products of wrong cognitive perceptions of stimuli; hence their correction reduces the level of stress and anxiety.

Depression and anxiety frequently occur in surgical patients and have a significant impact on patient quality of life, health care utilization, and even disease outcome. Depression and anxiety are eminently treatable, and therefore psychological assessment and appropriate intervention should form an integral component of management strategy in surgical patients. Diagnosis of depression and anxiety may be facilitated by using primary screening tools, such as the Hospital Anxiety and Depression Scale questionnaire.<sup>34</sup>

The study conducted by Morrel<sup>5</sup> confirmed that structured preoperative instructions reduce the anxiety levels of patients scheduled for surgery. The reaction of each individual to anxiety cues differs in consonance with the observation by Schlesinger, Mumford and Glass.<sup>8</sup>

In terms of methods of coping with stressors employed by the patients, more of them resorted to prayers and faith in God (religiosity). This can be explained by the fact that all the subjects in this study were either Christians or Muslims.

**Conclusion**

From the results obtained in this study, it has been shown that:

- (i) Female subjects did not score significantly higher on anxiety rating than males.
- (ii) Preoperative anxiety rating does not depend on a patient's educational status.
- (iii) Cognitive behaviour therapy has the potential to reduce anxiety level among subjects post-operatively.
- (iv) The use of self-instructional training has the ability to reduce anxiety among surgical patients.

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