

ORIGINAL RESEARCH

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Is childhood trauma a predictive factor for increased preoperative anxiety levels?**Ayşe Vahapoglu¹, Suna Medin Nacar², Yagmur Suadiye Dalgic³ Hande Gungor¹**¹SBÜ Gaziosmanpaşa Taksim Research and Training Hospital Clinic of Anesthesia and Reanimasyon, Istanbul, Turkey²Istanbul Occupational Diseases Hospital Clinic of Psychiatry, Istanbul, Turkey³SBÜ Gaziosmanpaşa Taksim Research and Training Hospital Clinic of Psychiatry, Istanbul, Turkey

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Abstract

Childhood trauma is a well-known source of lifelong anxiety and various personality disorders. Also preoperative anxiety is related with perioperative physical and physiological responses. The aim of this study was to investigate possible relationship –which has not been studied yet- between having a childhood trauma history and preoperative anxiety levels. A total of 190 patients (aged between 18-65) with a history of childhood trauma presenting for different types of surgery were investigated prospectively using the Childhood Trauma Questionnaire (CTQ). A childhood trauma questionnaire total score of ≥ 35 points was accepted as an indicator of significant childhood trauma history. Preoperative and postoperative anxiety levels of patients were assessed using State Trait Anxiety Inventory (STAI). Also relationship between childhood trauma types (physical, emotional neglect/abuse, sexual abuse) and pre-postoperative State Trait Anxiety Inventory levels were evaluated. Correlations between several factors that might effect preoperative anxiety levels including such as; gender, type of surgery, type of anesthesia, educational and marital levels of patients with or without a childhood trauma history were investigated. We found significant correlations between higher Childhood Trauma Questionnaire scores and increased preoperative State Trait Anxiety Inventory trait and state scores ($p < 0.05$). Female gender, lower educational level, major surgery, general anesthesia were significantly associated with higher preoperative anxiety levels in patients with childhood trauma history. Having a childhood trauma history is closely related with increased preoperative anxiety levels in patients undergoing surgical procedures.

Keywords: Preoperative anxiety, childhood trauma, childhood trauma questionnaire, state trait anxiety inventory**Introduction**

Anxiety can be described as a feeling which is unpleasant, uncomfortable and difficult to deal with that emerges from various types of stress [1]. Independent from the source of anxiety, sympathetic, parasympathetic and endocrine system activation results in several hemodynamical responses such as hypertension, tachycardia, sweating and tachypnea [1]. It is well known that many patients scheduled for surgery manifest different degrees of anxiety during preoperative period [2,3]. Several factors may affect the degree of preoperative anxiety levels. Age and gender of patient, type of surgery, education level of patient, surgical history of patient and patient's personal susceptibility to anxious conditions are important factors that determine level of preoperative anxiety [4,5]. Different studies conducted in various surgical patients reported different preoperative anxiety with incidence ranging

between 60%-92% [6,7]. Female gender, lower education level, being a non-smoker or divorced were found in relation with higher preoperative anxiety levels [8,9]. Undergoing elective surgery, possibility of surgery being postponed, harmful mistakes done by doctor or other caregivers, fear of being unable to awakening from general anesthesia, awareness during surgery and high levels of postoperative pain were reported as important reasons for preoperative anxiety [10,11]. Uncontrolled preoperative anxiety often results in delayed muscle relaxation, coughing during anesthesia induction, increased doses of anesthetics and analgesics include narcotics, rapidly changing hemodynamical responses to anesthetics and surgical stimuli, postoperative increased pain, nausea vomiting and delayed recovery [12,13].

Childhood trauma is a wide description of different types of trauma exposure including emotional and physical neglect, emotional and physical abuse and sexual abuse. Previous studies revealed close relationship between childhood trauma and impaired emotion regulation, behavioral instability and developmental lack of healthy personality [14,15]. Also childhood traumatic events commonly

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lead to psychiatric disorders, increased suicide risk, depressive disorders, obsessions, decreased quality of life, engagement in high risk behaviors and anxious personality [14,16-19]. Data regarding child sexual abuse is a good example for ongoing effects of childhood trauma in adulthood which was shown that 26%-32% of adult onset disorders (depressive disorders, high levels of anxiety, drug addiction) were closely related with childhood sexual abuse [20,21].

We hypothesized that childhood trauma – a triggering factor for anxious personality/ high levels of anxiety- might lead to higher preoperative anxiety levels measured by STAI-state and STAI-trait scores. So we aimed to investigate possible relationship between childhood trauma and preoperative anxiety levels in patients undergoing different types of surgery. Also we measured effects of several factors include age, gender, educational level, working status, type of anesthesia and surgery on preoperative and postoperative anxiety levels in conjunction with having a history of childhood trauma.

Material and Methods

The study was conducted in Gaziosmanpaşa Taksim Education and Research Hospital Anesthesiology and Reanimation Clinic in a period of three month after obtaining ethical committee approval of the hospital, using Childhood Trauma Questionnaire and Spielbergs Situation-Trait Anxiety Inventory tools were filled on the day before operation by 190 patients who filled out the written informed consent before being a participant of study. At postoperative 8th hour, all patients filled STAI forms again. A blinded psychiatrist to patients' personal features and other variables that investigated during study, evaluated CTQ and STAI scores. Inclusion criteria were patients with age 18-65, ASA I-II, having sufficient mental and educational level for adequately filling the questionnaires who underwent surgical interventions under general or regional anesthesia. Exclusion criteria were patients younger than 18 or older than 65 years, unable to speak Turkish language, with known psychiatric diseases or any advanced neurological problem that might limit properly filling of questionnaires, patients underwent emergency surgery, being pregnant, blind and/or deaf patients.

The Childhood Trauma Questionnaire

The 28-item Childhood Trauma Questionnaire (CTQ) is a self-filled questionnaire that assesses abuse and neglect maltreatments quantitatively using 28 different questions. There are five subscores derived from either sexual, physical, emotional abuse, emotional and physical neglect in addition to total score which is the sum of subscores. Validity and reliability of CTQ have been documented [22,23] also Turkish version of the questionnaire was accepted as valid and reliable with a cutoff value ≥ 35 for total CTQ scores which indicates significant history of childhood trauma [24].

State-Trait Anxiety Inventory

Spielberg's State Trait Anxiety Inventory is a commonly used and validated self report instrument that measures anxiety depending on personal features (trait anxiety inventory) and anxiety depending on changing environmental events (state anxiety inventory). State anxiety inventory is used to determine feelings –anxiety- of a person in a special situation and environment. On the other hand trait anxiety inventory is used to determine feelings –anxiety- of

the person independent from the situation and environment that surround the person. Turkish version of STAI is validated and accepted as a reliable tool for patients as its true for original version of instrument [25,26].

Statistical Analysis

The statistical package SPSS 22.0 for Windows (SPSS, Chicago, IL) was used for statistical analyses. Descriptive statistics of numerical variables were expressed as mean $\pm$ standard deviation where categorical variables were expressed as numbers and percentage. Correlations between categorical variables were evaluated using Pearson X² test or Fisher-Freeman-Halton Exact test. Pearson correlation analyses was used in order to evaluate continuous variables. Independent Sample t-test and One Way ANOVA were used in order to compare intergroup mean values of numerical variables. Two-Way Repeated Measures ANOVA test was used to compare preoperative and postoperative STAI values. For all statistical analysis, a p value < 0.05 was accepted as significant.

Results

A total of 190 patients were enrolled in the study whose mean age was 39.8 ± 13.02 years (ranged between 18 to 65). 76 female (40%) and 114 male (60%) patients data was investigated. 141 patients (74.21%) were classified as ASA I where 49 patients (25.79%) patients were classified as ASA II. Majority of patients (63.68%) were primary school graduates while the proportion of university graduates was 13.68%. 58 patients (30.52%) were housewives, 57 patients (30%) were self-employed. Majority of patients (73.68%) were married.

Preoperative and postoperative mean STAI scores, CTQ subscores and total CTQ scores were demonstrated in Table 1.

Table 1. Preoperative and postoperative mean STAI scores, CTQ subscores and total CTQ scores of all patients.

	Mean $\pm$ SS	Min - Max
Preoperative STAI-State	38.38 $\pm$ 10.18	20 - 66
Preoperative STAI-Trait	42.18 $\pm$ 7.61	22 - 64
Postoperative STAI-State	38.00 $\pm$ 11.21	20 - 72
Postoperative STAI-Trait	40.83 $\pm$ 7.47	21 - 59
Physical neglect	10.14 $\pm$ 2.10	6 - 19
Emotional neglect	10.04 $\pm$ 4.27	5 - 25
Physical abuse	5.85 $\pm$ 2.49	5 - 24
Emotional Abuse	6.52 $\pm$ 2.74	5 - 23
Sexual Abuse	5.27 $\pm$ 1.20	5 - 17
Total CTQ Score	37.82 $\pm$ 9.54	29 - 102

Trauma subscores and total CTQ scores for evaluated patients were shown in Table 2.

Table 2. Trauma subscores and total CTQ scores of patients

	n (%)
Physical neglect >7	186 (97.9)
Emotional neglect >12	43 (22.6)
Physical abuse >5	36 (18.9)
Emotional abuse >7	44 (23.2)
Sexual abuse >5	17 (8.9)
Total CTQ Score >35	91 (47.9)

We accepted a CTQ cutoff value of ≥ 35 according to study conducted by Sar et al. [24] The CTQ cut off values were physical neglect ≥ 7 , emotional neglect ≥ 12 , physical abuse ≥ 5 , emotional abuse ≥ 7 and sexual abuse ≥ 5 (Cutoff score for Total score ≥ 35).

We found positive correlation between higher CTQ total score and preoperative STAI-State and STAI-Trait scores and postoperative STAI-Trait scores (Table 3). Also positive correlations were found between CTQ subscores and STAI scores (Table 4).

Table 3. Correlations between CTQ scores and STAI scores

		Preop. STAI-State	Preop. STAI-Trait	Postop STAI-State	Postop STAI-Trait
Physical neglect	R	0.061	0.106	-0.065	0.031
	P	0.405	0.145	0.374	0.669
Emotional neglect	R	0.121	0.196	0.044	0.151
	P	0.096	0.007	0.550	0.038
Physical Abuse	R	0.134	0.167	0.017	0.094
	P	0.065	0.021	0.819	0.199
Emotional Abuse	R	0.173	0.220	0.007	0.182
	P	0.017	0.002	0.927	0.012
Sexual Abuse	R	0.111	0.154	0.006	0.106
	P	0.126	0.034	0.936	0.146
CTQ Total Score	R	0.166	0.237	0.007	0.164
	p	0.022	0.001	0.924	0.024

We found that both of preoperative STAI-trait scores in CTQ <35 and CTQ ≥ 35 groups were significantly higher than postoperative STAI-trait scores ($p=0.002$). On the other hand, preoperative and postoperative STAI-trait scores found in CTQ ≥ 35 group were significantly higher than those found in CTQ <35 group ($p<0.05$).

Table 4. Pre and postoperative STAI scores in groups created using CTQ cutoff value of ≥ 35

	CTQ <35 (n=99)	CTQ ≥ 35 (n=91)	p
Preop. STAI-state	37.03 $\pm$ 9.81	39.85 $\pm$ 10.43	>0.05
Postop. STAI-state	37.60 $\pm$ 10.36	38.44 $\pm$ 12.10	>0.05
Preop. STAI-trait	40.42 $\pm$ 7.63	44.10 $\pm$ 7.14	<0.05
Postop. STAI-trait	39.62 $\pm$ 7.40	42.15 $\pm$ 7.35	<0.05

We analysed correlations between gender and CTQ subscores and total CTQ scores. We found significantly higher preoperative STAI-Trait scores in physically neglected female patients ($p=0.026$). Preoperative STAI-Trait scores were significantly higher in emotionally neglected male patients ($p=0.014$).

Physically abused female patients had higher preoperative and postoperative STAI-Trait scores. Emotionally abused female patients had higher preoperative and postoperative STAI-Trait scores where higher preoperative STAI-State scores were found in emotionally abused male patients ($p<0.05$). Sexually abused male patients had higher preoperative STAI-State and Trait scores ($p=0.030$ and 0.006 respectively). Also postoperative STAI-Trait scores were higher in this group ($p=0.050$). Female patients with a total CTQ score ≥ 35 stated higher preop and postoperative STAI-Trait scores where preoperative STAI-State scores were higher in male patients ($p<0.05$).

Correlations were investigated between type of anesthesia (general versus regional anesthesia) and CTQ scores. We found that emotionally neglected or physically abused patients who were operated under general anesthesia had significantly higher preoperative STAI-Trait scores ($p=0.036$ and 0.038 respectively). Emotionally abused patients who were operated under general anesthesia had higher preoperative and postoperative STAI-State scores ($p=0.012$ and 0.038 respectively). In terms of CTQ total scores, general anesthesia was found to have a positive correlation with increased preoperative and postoperative STAI-Trait scores.

We examined possible correlations between type of surgery (major or minor) and trauma subscores and total CTQ scores. We found that major surgery was strongly correlated with increased STAI scores in patients with a history of physical neglect, emotional neglect, physical abuse and emotional abuse ($p=0.016$, 0.001 , 0.012 and 0.009 respectively). Minor surgery was correlated higher preoperative and postoperative STAI-Trait scores in patients with a history of sexual abuse ($p=0.001$ and 0.006 respectively). Also major surgery was found in correlation with increased preoperative STAI-state and postoperative STAI-trait scores ($p=0.017$ and 0.010 respectively).

We evaluated the correlations between CTQ subscores STAI scores and educational level of patients. We found significantly lower preoperative and postoperative STAI-Trait scores in university graduated patients ($p=0.005$ and 0.002 respectively).

Also trauma scores including physical and emotional neglect, physical and emotional abuse and total CTQ scores of university graduates were significantly lower than those measured in other patients ($p<0.05$).

In another analysis, correlation between CTQ and STAI scores and occupational status of patients were investigated. We found that housewives reported higher scores in all STAI scores ($p<0.05$). On the other hand there was no significant differences of CTQ scores in all occupation types ($p>0.05$).

We compared marital status of patients in terms of CTQ subscores, STAI scores. We couldn't find any significant difference between single patients and married patients in terms of CTQ and STAI scores ($p>0.05$).

Also there was no significant difference between ASA I and ASA II patients in terms of CTQ subscores, STAI scores ($p>0.05$).

Finally, we compared STAI scores of patients with or without

any relatives during perioperative period and found lower preoperative and postoperative STAI-State scores in patients without any relatives during perioperative period ($p=0.026$ and 0.002 respectively).

Discussion

In this study we found significant correlation between higher CTQ scores and preoperative STAI scores –both Trait and State- which indicates close relationship between having a history of childhood trauma and increased preoperative anxiety.

STAI is a very commonly used, validated with high reliability inventory that measures levels of anxiety. It has two categories -trait and state anxiety which trait anxiety is closely related with feature of personality (an anxious personality) where state anxiety indicates the level of the anxiety at the time of assessment [4]. We used this inventory because of advantage of two way measurement regarding trait and state anxiety levels which are good indicators of showing anxious personality and preoperative anxiety [27,28].

There are many environmental and personal factors that influence and trigger preoperative anxiety. Fear of death, being in an unfamiliar condition, feeling vulnerable, feeling of loss of control, extent of surgery (major surgeries like coronary artery bypass surgery etc), fear of awareness during operation, postoperative pain, female gender, low educational level are prominent factors that influence preoperative anxiety [4,11,28]. Also without a previous history of surgery, younger or middle ages, non-smokers, being divorced are other factors might have effects on preoperative anxiety [9,29]. There are large number of studies investigating preoperative anxiety provoking factors however –to the best of our knowledge- there is no study investigating possible correlation between childhood traumas and preoperative anxiety.

Childhood trauma is closely associated with inception, severity and course of anxiety disorders [30-32]. Physical, emotional neglect, abuse, sexual abuse are important types of childhood trauma which can result in adulthood anxiety, depression, personality disorders and other psychopathologic diseases [33,34]. Although exact pathways that provoke anxiety are not clear, cognitive-behavioral approach suggests threat and danger in childhood as triggering factor for anxiety [35]. Impaired hypothalamo pituitary axis (HPA) and corticotropin releasing factor (CRF) stress systems following biological effect of trauma have been shown [30]. As a consequence increased stress sensitivity leads to decreased threshold which provoke anxiety [30]. In this context our findings those indicating positive correlation between an anxious personality with higher STAI scores and having childhood trauma history indicated by higher CTQ scores become more important.

Beyond total CTQ score, we evaluated correlation between each of childhood trauma questionnaire subscores and STAI scores. Preoperative STAI-state scores were higher in only emotionally abused patients where preoperative STAI-trait scores were higher in all childhood trauma types except physical neglect (Table 3). As mentioned above, STAI-trait inventory investigates anxious personality and the correlation between high preoperative STAI-trait scores and childhood trauma types is evidence of prolonged effect of childhood trauma in adulthood. Generally childhood physical and sexual abuse are accepted as primary causative

factors for various psychological disorders include depression, substance dependency, dissociation, anxiety disorders however there is accumulating data indicating important role of emotional abuse on psychological disorders [36-38]. Similarly Huh et al.[30] showed effects of different types of childhood abuse and neglect on depression, state-trait anxiety and anxiety sensitivity. The authors reported significant correlations between emotional abuse, neglect and sexual abuse and interpersonal problems in adulthood [30]. They concluded that co-occurrence of emotional and physical trauma –not only physical trauma- lead more to severe trait anxiety and state anxiety. In line with previous studies we showed that emotional abuse is the only trauma type that correlates with increased preoperative STAI-state scores.

Many previous studies showed that females had higher preoperative STAI-trait and state scores than males [39-41]. In contrast there are several studies unable to show any correlation between gender and preoperative anxiety. In this manner we evaluated correlation between gender and preoperative anxiety in patients with history of childhood trauma. We found significantly higher preoperative STAI-trait scores in emotionally neglected female patients in addition to higher pre and postoperative STAI-trait scores in physically abused females. On the other hand emotionally neglected male patients had higher preoperative STAI-trait scores and sexually abused males had higher preoperative STAI-state scores. Also female patients with a CTQ total score of ≥ 35 had higher preop and postoperative STAI-trait scores where male patients with a CTQ total score of ≥ 35 had higher preoperative STAI-state scores.

Type of anesthesia (either general or regional) is another important factor for preoperative anxiety [42,43]. Also awareness during surgery is a well documented triggering factor for anxiety [4]. In the present study we evaluated correlation between type of anesthesia, STAI scores and childhood trauma questionnaire sub- and total scores. We found significantly higher preoperative STAI-trait scores in patient having history of emotional neglect or physically abuse who underwent surgery under general anesthesia. Also pre- and postoperative STAI-state scores of patients having history of emotional abuse who underwent surgery under general anesthesia were significantly higher than those measured in other group. Finally we showed positive correlation between general anesthesia and increased pre and postoperative STAI-trait scores in patient with a CTQ score ≥ 35 . These findings indicate that general anesthesia has more powerful effect than regional anesthesia in terms of provoking preoperative anxiety in patients with history of childhood trauma.

Major surgery is a well known anxiety increasing factor [39] and we investigated association between type of surgery and STAI scores in patients with history of childhood trauma. We found that major surgery (debulking surgery, hip replacement, whipple surgery etc) was strongly correlated with increased STAI scores in patients with a history of physical or emotional neglect, physical or emotional abuse. Also patients with a CTQ score ≥ 35 had significantly increased preoperative STAI-state and postoperative STAI-trait scores.

Positive correlation between lower educational level and preoperative anxiety was shown in previous studies [44-46]. Low education level is related with insufficient accurate information

about possible risks of interventions, decreased consciousness level which help to cope with anxious situations [44]. In the present study we found lower pre- and postoperative STAI-trait scores in patients graduated from university. Additionally, physical or emotional neglect, physical or emotional abuse and total CTQ scores of university graduated patients were found significantly lower than others. Similarly when we evaluated correlation between occupational status and STAI scores, we found significantly higher STAI scores in patients who were housewives. Although we did not make any additional analysis to determine the relationship between being a housewife and having a low education level, previous studies considered being a housewife as an anxiety triggering factor [44]. In line with previous studies we suggest that this finding of study is in correlation with findings that showed positive correlation between low educational level and increased STAI scores.

When we compared CTQ sub- and total scores, STAI scores and marital status of patients, we couldn't find any significant difference between these two groups. However Nigussie et al. [4] reported – independent from childhood trauma history of patients- that being divorced was significantly related with higher preoperative anxiety, also the authors considered being single as an anxiety promoting factor.

Interestingly when we compared CTQ sub- and total scores, STAI scores of patients with or without any relatives during perioperative period, there was no significant difference in terms of CTQ scores however we found lower pre and postoperative STAI-state scores in patients without any relatives. This finding is in contrast with previous study results that indicate higher preoperative anxiety levels in single patients than with relatives/family/friends [44].

Several studies showed positive correlations between anesthetists' preoperative visit and anxiety reduction [1,47,48]. Fitzgerald et al. [49] reported over 40% reduction of patients anxiety levels following anesthetists visit. An attempt to inform patients about diagnosis, treatment, surgery, anesthesia type, risks of interventions and important features of perioperative care may help reducing preoperative anxiety. Although preoperative anesthetist visit of all patients was performed on the day before surgery during our study, we did not evaluate its effect on patients and this seems a shortcoming of our study.

Limitations

CTQ and STAI are widely used and validated tools however using these tools can sometimes provide inaccurate information because of self-report design of them. Especially patients with a history of childhood trauma which may lead a traumatic memory might have given inaccurate or insufficient responses to questions.

Conclusion

In conclusion we suggest that the present study indicates important relationship between having a childhood trauma history and preoperative (also postoperative) anxiety. Findings of the study have to be supported by future larger scaled studies and after sufficient accumulation of scientific data, any type of childhood trauma may be accepted as a preoperative anxiety promoting factor that will be managed by multidisciplinary attempts.

Competing interests

The authors declare that they have no competing interest

Financial Disclosure

The financial support for this study was provided by the investigators themselves.

Ethical approval

Our study was approved by the local ethics review board.

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