



Research Paper

The relationships between separation anxiety disorder, childhood traumas, and anxiety sensitivity in a sample of medical students

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ABSTRACT

Background: The present article aims to investigate the relationships between Separation Anxiety Disorder (SEPAD), anxiety sensitivity, and childhood traumatic life experiences (CTLE) in a sample of medical students. **Methods:** The sample of this study consisted of 369 young adults. The Structured Clinical Interview for Separation Anxiety Symptoms (SCI-SAS) was applied for all participants by researchers. Participants were asked to fill in the socio-demographic form, Separation Anxiety Symptoms Inventory, Adult Separation Anxiety Questionnaire, Anxiety Sensitivity Index-3, and Childhood Trauma Questionnaire.

Results: The rate of those with significant childhood SEPAD is 14.9% (n: 55), the rate of those with adult SEPAD is 20.1% (n: 74) in the present study. A statistically significant difference was found in emotional abuse, sexual abuse, and physical abuse sub-scores between participants who met childhood or adult SEPAD criteria of SCI-SAS and those who did not. Moreover, all anxiety sensitivity scores were significantly higher in both groups who met childhood or adult SEPAD criteria than those who did not meet the childhood or adult SEPAD criteria.

Limitations: A limitation of our study is that since we investigated participants based on retrospective recall of childhood SEPAD criteria, this lead to being subject to memory and reporting biases. Second, we measure anxiety sensitivity and CTLE on scales by self-report, sometimes it can cause misinformation.

Conclusions: SEPAD may be diagnosed commonly in a medical student sample. Moreover, CTLE and anxiety sensitivity may have a key role in the progress of SEPAD.

Introduction

Separation anxiety is characterized by heightened fears about separations from close attachment figures (Manicavasagar et al., 1997). Separation anxiety is defined as a childhood-period disorder that does not last through adulthood in the past and Separation Anxiety Disorder (SEPAD) was classified in the section “Disorders Usually First Diagnosed in Infancy, Childhood, or Adolescence” criteria for the disorder until the fifth version of Diagnostic and Statistical Manual of Mental Disorders (DSM-5) (APA, 2013). Although several studies in the literature had claimed that SEPAD could present itself in adulthood, or it could start after age 18, it took years to be accepted as a lifetime diagnosis for SEPAD (Manicavasagar et al., 1997; Fagiolini et al., 1998; Wijeratne and Manicavasagar, 2003; Manicavasagar et al., 2010).

In DSM-5 the core features of SEPAD remained the same, however, the wording of the criteria updated to a more suitable form of SEPAD symptoms in adulthood such as a place for avoiding behaviors can be workplace in addition to school or attachment figure could be a child of someone other than a caregiver (APA, 2013). Moreover, DSM-5 indicated that the age for onset of SEPAD must not be under age 18, it could be seen after age (APA, 2013). The diagnosis of SEPAD requires clinically significant impairment in social, academic, or other crucial areas of functioning. Thus, patients with SEPAD suffer from several problems with their anxiety.

After diagnostic criteria have been updated for SEPAD, epidemiologic studies also showed that SEPAD is very common in adulthood. In the United States, National Comorbidity Survey Replication (NCS-R) indicated lifetime prevalence for SEPAD as 6.6% (Shear et al., 2006). On

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the other hand, clinical samples gave varied results between 23% to 65% (Gesi et al., 2016; Manicavasagar et al., 2000; Manicavasagar et al., 2009). Due to similarity in terms of symptom characteristics, SEPAD patients were diagnosed with several anxiety disorders including generalized anxiety disorder, panic disorder, and especially panic disorder with agoraphobia (PD-Ag) before DSM-5 (Pini et al., 2010; Silove et al., 2010). But after DSM-5 well-established core symptoms of SEPAD in adults, most of the clinicians noticed that some of the patients with PD-Ag have different roots for their anxiety symptoms other than being alone outside or seeking help for their panic attacks (Silove et al., 2010). However, both clinical and epidemiologic studies indicated that SEPAD is still very highly comorbid with other mental disorders such as panic disorder, agoraphobia, depression, and bipolar affective disorder (Shear et al., 2006; Gesi et al., 2016; Manicavasagar et al., 2000; Manicavasagar et al., 2009; Pini et al., 2010; Silove et al., 2010; Pini et al., 2005; Toni et al., 2008).

Several anxiety disorders have been linked to childhood traumatic life events (CTLE) in the literature (Ölmez et al., 2018; Stein et al., 1996; Gül et al., 2016; De Venter et al., 2017; Örsel et al., 2011). The most well-known anxiety disorders which are linked with CTLE are panic disorder, post-traumatic stress disorder (PTSD), and phobias (Ölmez et al., 2018; Stein et al., 1996; Gül et al., 2016; De Venter et al., 2017; Örsel et al., 2011).

Anxiety sensitivity is providing cognitive constructs of anxiety symptoms in patients with anxiety disorders, and it was first defined by Reiss et al., as "frightening from fear" (Reiss et al., 1986). Individuals who have higher anxiety sensitivity experience anxiety symptoms more intensely than others and it also affects overall treatment outcomes in patients with many mental disorders (Reiss et al., 1986; Taylor 2014).

SEPAD is a very new diagnosis for adults. Most of the anxiety disorders in adulthood had been linked with different types of anxiety sensitivity and CTLE characteristics. However, according to our knowledge, there is no study in the literature that examined the relationships between these two characteristics and SEPAD concurrently in a young adult population.

On the other hand, several studies in the literature claimed that medical students are susceptible to both anxiety disorders and depression in some way (Halperin et al., 2021; Ličanin et al., 2015; Tian-Ci Quek et al., 2019; Trindade Júnior et al., 2021). Some of those studies also found that medical students, especially during their first years in college, were more prone to have anxiety disorders than last years in college (Ličanin et al., 2015; Tian-Ci Quek et al., 2019;). Medical students struggle with several challenges during medical education including excess courses, expensive education materials, etc. Moreover, their education takes longer time than most other college students and all these characteristics may convert them more susceptible to anxiety disorders. On the other hand, anxiety sensitivity or CTLE characteristic may also ease their susceptibility to anxiety disorders.

Therefore, the aim of the present study is to investigate the prevalence of SEPAD in students who are in their first four years in a medical school. In addition, we aimed at investigating the relationships between SEPAD diagnosis and CTLE, and anxiety sensitivity characteristics in the present population and contribute limited literature about this field.

The research questions that have been addressed in this study are as follows:

- What is the prevalence of SEPAD diagnosis in a medical student population?
- Is there a significant difference between participants with SEPAD and without SEPAD based on their CTLE and anxiety sensitivity characteristics?
- Is there a significant relationship between severity of SEPAD, CTLE, and anxiety sensitivity characteristics?

Subjects and methods

Subjects

Power analysis was conducted by G-power during the design of the present study. With the help of power analysis, the minimum sample size was found as 265 individuals with 0.90 study power and Cohen value of 0.2. Since some of the studies in the literature claimed that medical students, especially during their first years in the college, were more prone to have anxiety disorders than last years in the college, we preferred to collect data from only participants who were in their first four years in the medical school (Ličanin et al., 2015; Tian-Ci Quek et al., 2019;). Therefore, the sample of this study consisted of 369 medical school students who are in their first four years in a medical school in Turkey. Informed consent was obtained from all the participants before data collection and patient anonymity was preserved in the present study.

Researchers followed the rules belonging to the World Health Organization Declaration of Helsinki in 1995 (as revised in Edinburgh 2000). The appropriate permission (Decision number: 2017/147) was received from the Clinical Research Ethics Committee of the university on 23.10.2017.

The Structured Clinical Interview for Separation Anxiety Symptoms was applied for all participants by researchers. After this interview, participants were asked to fill in the socio-demographic form, Separation Anxiety Symptoms Inventory, Adult Separation Anxiety Questionnaire, Anxiety Sensitivity Index-3, and Childhood Trauma Questionnaire.

Measures

- 1 *Socio-demographic form*: The form consists of 13 questions such as age, gender, grades, education status for mother and father, average monthly income, physical and mental illness history, etc. The socio-demographic form was created by the researchers in the present study.
- 2 *Structured Clinical Interview for Separation Anxiety Symptoms (SCI-SAS)*: SCI-SAS is a semi-structured clinical interview that evaluates each of the 8 DSM-IV criteria symptoms of separation anxiety, separately for childhood and adult symptoms. SCI-SAS consists of two different sub-scale for adult and childhood and each of them has 8 questions in it (Cyranowski et al., 2002). SCI-SAS The validity and reliability of the Turkish version of the scale was confirmed by Dirioz et al. (2012a). The SCI-SAS had a very good test-retest and inter-rater reliability. The internal consistency coefficient (i.e., Cronbach's Alpha) was 0.57 for childhood SCI-SAS and 0.58 for adult SCI-SAS.
- 3 *Separation Anxiety Symptoms Inventory (SASI)*: SASI was developed by Silove et al. (1993) to measure childhood separation anxiety levels in adults (Silove et al., 1993). It is a 15 item self-report scale for adults, providing a four-point Likert-type measurement. Each item questions the symptoms of separation anxiety likely to occur in childhood, with a distribution between zero (never felt) and three (felt very often). The validity and reliability of the Turkish version of the scale were confirmed by Dirioz et al. (2012b). The internal consistency coefficient (i.e., Cronbach's Alpha) was 0.89 for SASI.
- 4 *Adult Separation Anxiety Questionnaire (ASA)*: ASA was developed by Manicavasagar et al. (2003) to measure adult separation anxiety levels in adults (Manicavasagar et al., 2003). ASA has 27 questions in it. Each question is rated on a 4-point scale assessing the frequency of occurrence of each symptom, from 0—This never happens to 4—This happens all the time. The validity and reliability of the Turkish version of the scale were confirmed by Dirioz et al. (Dirioz et al., 2012b). The internal consistency coefficient (i.e., Cronbach's Alpha) was 0.93 for ASA.
- 5 *Anxiety Sensitivity Index-3(ASI-3)*: ASI-3 is the latest version of the ASI, developed by Taylor et al. (Taylor et al., 2007) and the validity

and reliability of the Turkish version of the scale were confirmed by Mantar et al. (Mantar et al., 2010). ASI-3 measures concern about the consequences of bodily sensations associated with anxious arousal. ASI-3 consists of 18 items based on self-report and each item is rated from 0 to 4. The scale contains three-factor analytically derived subscales relating to social concerns, fears of physical symptoms, and fears of cognitive symptoms. It was found that ASI-3 had a high internal consistency (Cronbach $\alpha = 0.93$) and the scale had a fairly good test-retest reliability ($r = 0.64$, $p < 0.001$)

6 *Childhood Trauma Questionnaire (CTQ)*: The CTQ was developed by Bernstein et al. (2012) to measure childhood traumatic experiences and it was translated into Turkish by Şar et al. (Bernstein et al., 2003; Sar et al., 2012). The questionnaire was a self-report measure, and it used a five-point Likert type scale in which the options range from “never” to “very often.” It had 28 items and gives a total score that consists of five sub-scores including sexual abuse, physical abuse, emotional abuse, emotional neglect, and physical neglect. High scores indicate high rates of traumatic life experiences. While scores greater than 5 are significant for sexual and physical abuse, scores above 7 demonstrate emotional abuse and physical neglect. Moreover, emotional neglect requires scores above 12. Regarding the total score for the questionnaire, 35 or above indicates childhood trauma. The internal consistency coefficient (i.e., Cronbach’s Alpha) was 0.93 for CTQ.

Statistical analysis

All analyses were conducted with the use of Statistical Package for Social Sciences (SPSS-26.0) for Windows. Mean, standard deviation, frequencies, and percentage values were used for descriptive variables, and median and interquartile range values were used for data showing non-parametric distribution. All numeric variables were tested for normality with the Kolmogorov-Smirnov test.

Independent samples t-test was used for independent groups in the comparison of two normally distributed groups, and the Mann Whitney U test was used in the comparison of the two groups in terms of not normally distributed numerical variables. One-way ANOVA was used to compare more than two groups in terms of normally distributed numerical variables. The Kruskal Wallis test was used to compare more than one group that was not normally distributed.

Correlations between normally distributed numerical variables were evaluated with Pearson correlation coefficient, and correlations between non-normally distributed numerical variables were evaluated with Spearman correlation coefficient. A p-value below 0.05 was considered statistically significant.

Results

SEPAD characteristics of participants

The sample of the present study consisted of 369 people in total, 221 (59.9%) of the participants were female and 148 (40.1%) were male. 32.8% of the participants were in the first grade, 22.2% of the participants were in the second grade, 22.5% of participants were in the third grade, and 22.5% of the participants were in the fourth grade of medical school. The mean age was 20.1 ± 1.8 .

One purpose of this study was to examine the prevalence of SEPAD in the present sample. In terms of examining all participants for SEPAD based on SCI-SAS, there were 55 participants (14.9%) who met the criteria of childhood SEPAD based on SCI-SAS childhood part. On the other hand, 74 participants (20.1%) met the criteria of adult SEPAD based on the SCI-SAS adult part.

In the present study, participants were asked about their physical illness and mental disorder history based on their self-assessment. 7.9% of the participants reported that they had a physical illness and 6.5% of

participants reported that they had a mental disorder. A statistically significant difference was found in terms of the ASA, ASI-3, SCI-SAS adult scores of the sufferers from mental disorders ($p < 0.01$, $p < 0.01$, $p < 0.01$, respectively). When the participants were examined according to their income level perceptions, a difference was found between the groups with the CTQ scale ($p = 0.005$). It was determined that the participants with low-income level perception had higher CTQ scores than participants who indicated higher income levels ($p = 0.005$) (Table 1).

The socio-demographic characteristics of the participants are given in Table 1.

Comparison of scale scores based on gender

Regarding examining the relationships between all scores and gender, we found that participants’ CTQ, SASI, ASA, SCI-SAS child, and SCI-SAS adult scores differed statistically significantly in terms of gender ($p < 0.01$, $p < 0.01$, $p < 0.01$, $p < 0.01$, $p = 0.02$, respectively). The mean total score taken from the CTQ scale was found to be 36.5 ± 12.6 , the mean total score taken from the SASI was 47.6 ± 6.8 , and the mean score of the ASA was 81.1 ± 13.4 in male participants (Table-1). When we investigated the same scores for female participants, the mean total score taken from the CTQ scale was found to be 32.7 ± 8.5 , the mean total score taken from the SASI was 50.3 ± 5.7 , and the mean score of the ASA was 86.4 ± 10.7 in female participants. Regarding examination SEPAD for gender, results of the present study showed that both child and adult scores of SCI-SAS were higher in females ($p < 0.01$, $p = 0.02$, respectively).

CTLE characteristics of participants

In terms of examining all participants for CTLE with the help of CTQ, we examine all participants based on CTQ cut-off scores to see the rates of each childhood trauma sub-type in all participants. According to this examination in all participants by using cut-off scores of CTQ, the rate of those who suffered emotional neglect in their childhood was 62.1% (n: 229), the rate of those who suffered physical neglect was 36.3% (n: 134), the rate of those who suffered emotional abuse was 23.3% (n: 86), the rate of those who were physically abused was 15.7% (n:58), the rate of those who were sexually abused was 16.3% (n:60).

The relationships among SEPAD, CTQ, and ASI-3 characteristics

Another purpose of the present study was to examine whether there was a significant relationship between SEPAD and CTLE between the participants who met the criteria for either adult or childhood SEPAD (who scored 2 or higher out of at least 3 questions) and who did not meet criteria for those diagnoses. In terms of examining the relationship between SEPAD and CTLE, we compared CTQ scores in the groups (who met criteria for SEPAD or who did not meet criteria for any of SEPAD). A statistically significant difference was found in emotional abuse and sexual abuse sub-scores between participants who met childhood separation anxiety criteria of SCI-SAS (n:55, 14.9%) and those who did not (n:314, 85.1%) ($Z = -2.810$, $p = 0.005$; $Z = -2.080$, $p = 0.04$, respectively). A statistically significant difference was found in physical abuse and sexual abuse sub-scores between participants who met adult separation anxiety criteria of SCI-SAS (n:74, 20.1%) and those who did not (n:314, 85.1%) ($Z = -2.524$, $p = 0.01$; $Z = -2.068$, $p = 0.04$, respectively) (Table 2).

The other purpose of the present study was to examine whether there was a relationship between SEPAD and anxiety sensitivity characteristics between the participants who met the criteria for either adult or childhood SEPAD (who scored 2 or higher out of at least 3 questions) and who did not meet criteria for those diagnoses. Regarding examining the relationship between anxiety sensitivity and SEPAD diagnosis, our results indicated that all three sub-dimension scores of ASI-3 and total ASI-3 scores were found higher in participants who meet diagnostic criteria for either childhood or adult SEPAD based on SCI-SAS (Table 2).

Table 1

The socio-demographic characteristics of participants and the correlations between socio-demographic characteristics and CTQ, SASI, ASA, ASI-3, and SCI-SAS scores

		N (%)	CTQ		SASI		ASA		ASI-3		SCI-SAS CHILD		ADULT	
			Mean (SD)	p*	Mean (SD)	p*	Mean (SD)	p*	Mean (SD)	p*	Mean (SD)	p*	Mean (SD)	p*
Female	Age Mean (SD)	221 (59.9)	32.7 (8.5)	<0.01	50.3 (5.7)	<0.01	86.4 (10.7)	<0.01	20.35 (13.1)	0.13	5.6 (3.5)	<0.01	5.2 (4.0)	0.02
Male	Age Mean (SD)	148 (40.1)	36.5 (12.6)		47.6 (6.8)		81.1 (13.4)		21.85 (12.7)		4.7 (3.5)		4.6 (3.5)	
Total	Age Mean (SD)	369 (100)	34.2 (10.5)		49.2 (6.4)		84.2 (16.1)		20.9 (12.9)		5.2 (3.5)		4.9 (3.7)	
Physical Illness	Yes	29 (7.9)	34.06 (8.7)	0.87	47.5 (8.3)	0.33	84.8 (12.2)	0.80	21.9 (14.8)	0.83	5.1 (3.4)	0.85	5.1 (3.7)	0.74
	No	340 (92.1)	34.2 (10.6)		49.3 (6.2)		84.1 (12.1)		20.8 (12.7)		5.2 (3.6)		4.9 (3.7)	
Mental disorder	Yes	24 (6.5)	38.1 (12.9)	0.11	50.3 (7.8)	0.22	93.8 (6.0)	<0.01	32.5 (13.2)	<0.01	6.8 (4.5)	0.07	6.8 (3.1)	<0.01
	No	345 (93.5)	33.9 (10.2)		49.1 (6.2)		83.6 (12.2)		20.1 (12.5)		5.1 (3.4)		4.8 (3.7)	
Living conditions	Living with family	46 (12.5)	34.0 (9.7)	0.60	49.2 (5.8)	0.44	84.3 (12.9)	0.98	17.4 (11.0)	0.16	5.0 (3.5)	0.80	5.1 (3.8)	0.86
	Living with friends	92 (24.9)	33.9 (12.9)		48.7 (6.4)		84.4 (12.6)		22.0 (14.2)		5.2 (3.9)		5.3 (4.2)	
	Staying at dormitory	179 (48.5)	34.3 (9.1)		49.6 (6.5)		84.3 (11.4)		20.5 (12.2)		5.3 (3.4)		4.7 (3.4)	
	Other	52 (14.1)	34.5 (10.9)		48.8 (6.4)		83.6 (13.1)		23.4 (14.0)		5.1 (3.6)		4.8 (3.5)	
Monthly income perception	Good	96 (26.0)	33.7 (13.4)	0.005**	49.0 (6.9)	0.54	84.9 (13.3)	0.48	21.7 (12.8)	0.55	5.2 (3.5)	0.60	5.0 (3.6)	0.85
	Medium	259 (70.2)	33.9 (8.8)		49.3 (6.1)		83.9 (11.7)		20.6 (13.0)		5.3 (3.7)		4.9 (3.7)	
	Low	14 (3.8)	41.9 (13.3)		47.5 (6.4)		85.0 (12.3)		20.7 (11.0)		4.2 (3.5)		4.9 (3.8)	

*: Mann-Whitney U Test **Kruskal-Wallis Test. CTQ: Childhood Trauma Questionnaire. SASI: Separation Anxiety Symptoms Inventory. ASA: Adult Separation Anxiety Questionnaire. ASI-3: Anxiety Sensitivity Index-3. SCI-SAS: Structured Clinical Interview for Separation Anxiety Symptoms. SD: Standard Deviation

Table 2

The comparison of CTQ and ASI-3 scores of participants in terms of their sepap characteristics

	Childhood SEPAD		z	p*	Adult SEPAD		z	p*
	Yes [§] (n:55 %14.9)	No (n:314 %85.1)			Yes [§] (n:74 %20.1)	No (n:295 %79.9)		
	Mean± SD	Mean± SD			Mean± SD	Mean± SD		
Emotional Abuse	7.7±3.4	6.6±2.7	-2.810	0.005	7.2±3.3	6.6±2.7	-1.384	0.16
Physical Abuse	5.7±5.0	5.7±5.6	-0.964	0.33	5.7±2.2	5.7±5.8	-2.524	0.01
Emotional Neglect	9.2±3.9	9.1±3.7	-0.012	0.99	9.4±3.1	9.1±3.7	-0.558	0.58
Physical Neglect	7.4±2.4	7.0±2.2	-1.367	0.17	7.1±2.2	7.0±2.7	-0.810	0.42
Sexual Abuse	5.7±1.6	5.4±1.6	-2.080	0.04	5.5±1.1	5.4±1.7	-2.068	0.04
Total CTQ	35.8±10.8	33.9±10.4	-1.511	0.13	35.1±9.6	33.9±10.6	-1.238	0.22
Total ASI-3	27.8±12.4	19.7±12.6	-4.571	<0.01	27.4±14.3	19.3±12.0	-4.740	<0.01
Physical concerns [§]	8.8±5.2	6.28±4.9	-3.622	<0.01	8.8±5.7	6.1±4.7	-4.001	<0.01
Cognitive concerns [§]	11.4±5.4	8.0±5.6	-4.492	<0.01	11.09±6.1	7.8±5.4	-4.368	<0.01
Social concerns [§]	7.6±5.09	5.5±4.6	-3.031	0.002	7.5±5.2	5.3±4.5	-3.382	0.001

* Mann-Whitney U test, Mean ± SD: Mean ± Standard Deviation, CTQ: Childhood Trauma Questionnaire, SASI: Separation Anxiety Symptoms Inventory, ASA: Adult Separation Anxiety Questionnaire, ASI: Anxiety Sensitivity Index-3, SCI-SAS: Structured Clinical Interview for Separation Anxiety Symptoms, [§]: Participants who met childhood SEPAD criteria based on SCI-SAS, [¶]: Participants who met adult SEPAD criteria based on SCI-SAS [§]: Dimension Scores of the Anxiety Sensitivity Indeks-3

The Spearman Analysis of SCI-SAS, ASA, SASI, CTQ, and ASI-3 Scales

Based on analyses to compare these scales, a statistically significant positive moderate correlation was found between SCI-SAS adult, SCI-SAS childhood, ASA, and SASI scores (r:0.496, p <0.01; r:0.524, p <0.01; r:0.597, p <0.01; r:0.457, p <0.01). A statistically significant positive weak correlation was found between SCI-SAS adult, SCI-SAS childhood scores, and ASI-3 total score and sub-scores (r: 0.330, r:0.299, r:0.315, r:0.220, r:0.403, r:0.364, r:0.358, r:0.283). A statistically significant positive weak correlation was found between CTQ and ASI-3 total scores (r:0.307, p <0.01). A statistically significant positive moderate correlation was found between ASA and SASI total scores (r:0.599, p <0.01). A statistically significant positive moderate

correlation was found between ASA and ASI-3 total scores (r:0.581, p <0.01). Lastly, a statistically significant positive moderate correlation was found between SASI and ASI-3 total scores (r:0.456, p <0.01). The correlations of the SCI-SAS, ASA, SASI, CTQ, and ASI-3 scales with each other were examined in Table 3.

Discussion

Based on the findings of the present study, SEPAD seems very common in medical students who are in the early years of medical school. The rate of participants who met childhood SEPAD criteria is found as 14.9%, and the rate of those who met adult SEPAD criteria is found as 20.1% based on SCI-SAS in the present study. SEPAD was believed to

Table 3
The correlations of CTQ, SASI, ASA, ASI-3, and SCI-SAS scales in all participants

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.SCI-SAS Child	1.000													
2.SCI-SAS Adult	0.664**	1.000												
3.CTQ Total	0.026	0.154**	1.000											
4.Emotional Neglect	-0.025	0.114*	0.885**	1.000										
5.Emotional Abuse	0.082	0.138**	0.700**	0.493**	1.000									
6.Physical Neglect	0.048	0.137**	0.699**	0.509**	0.324**	1.000								
7.Physical Abuse	-0.007	0.125*	0.476**	0.349**	0.447**	0.244**	1.000							
8.Sexual Abuse	0.075	0.162**	0.299**	0.180**	0.245**	0.180**	0.186**	1.000						
9.ASA	0.496**	0.597**	0.138**	0.100	0.199**	0.093	0.147**	0.062	1.000					
10.SASI	0.524**	0.457**	0.073	0.019	0.176**	0.017	0.124*	0.000	0.599**	1.000				
11.ASI-3 Total	0.330**	0.403**	0.307**	0.241**	0.293**	0.228**	0.191**	0.071	0.581**	0.456**	1.000			
12. Physical concerns of ASI-3	0.299**	0.364**	0.202**	0.163**	0.202**	0.153**	0.106*	0.022	0.471**	0.428**	0.797**	1.000		
13.Cognitive concerns of ASI-3	0.315**	0.358**	0.308**	0.240**	0.312**	0.231**	0.200**	0.083	0.538**	0.355**	0.853**	0.522**	1.000	
14.Social concerns of ASI-3	0.220**	0.283**	0.264**	0.195**	0.239**	0.187**	0.170**	0.098	0.438**	0.369**	0.810**	0.488**	0.566**	1.000

Spearman's correlation coefficient **: $p < 0.01$. SCI-SAS: Structured Clinical Interview for Separation Anxiety Symptoms, CTQ: Childhood Trauma Questionnaire. SASI: Separation Anxiety Symptoms Inventory. ASA: Adult Separation Anxiety Questionnaire. ASI-3: Anxiety Sensitivity Index-3.

experience during just childhood until DSM-5 classified it under the section on anxiety disorders (APA, 2013). We could not find any study about the prevalence of SEPAD, especially in medical students so far. However, there are several studies in the literature showed that SEPAD is very common in adults (Shear et al., 2006; Manicavasagar et al., 2000; Cyranowski et al., 2002). For instance, in the United States, NCS-R indicated lifetime prevalence for adult SEPAD as 6.6% and child SEPAD as 4.1% (Shear et al., 2006). Moreover, most of these studies in the literature showed that most SEPAD may start in adulthood (Shear et al., 2006; Manicavasagar et al., 2000; Cyranowski et al., 2002). For example, in the NCS-R study in the United States, they indicated that 77.5% of SEPAD patients were adult-onset (Shear et al., 2006). During medical school, students can experience several anxiety symptoms because of the intense syllabus, loneliness, the need for studying long hours. Our findings also showed that SEPAD seems to be one of the common mental disturbances in these young adult populations. Whereas SEPAD can affect the functionality and wellness of these young individuals as well. In a study by Silove et al. (2010), patients with adult SEPAD were found to be severely disabled in all areas of the Work and Social Adjustment Scales such as work, home management, social leisure activities, private leisure activities, and relationships (Silove et al., 2010).

Regarding gender differences for SEPAD, our findings indicated that adult SCI-SAS scores are higher in female participants. It is known that in the literature like most anxiety disorders SEPAD is also more common in the female gender (Shear et al., 2006; Silove et al., 2010). Therefore, the findings of the present study are in the same direction as the literature.

There could be other socio-demographic or clinical features in relation to SEPAD. For example, the association of SEPAD with other psychiatric disorders was frequently studied and high rates of comorbidities were reported in the literature (Carmassi et al., 2015; Pini et al., 2010). When we examine this relationship, we found that sufferers from mental disorders have higher scores on adult SCI-SAS and ASA. Based on the findings of the present study, it seems that participants who have mental disorder history also have higher adult SEPAD and childhood SEPAD symptom severity (higher SCI-SAS adult and ASA scores).

According to the findings of the present study in terms of the relationship between CTLE and SEPAD, we can see that CTLE were strongly in relation with both childhood and adult SEPAD. In terms of trauma

sub-type, especially sexual abuse seems to be in relationship with both childhood and adult SEPAD. There is a growing body of literature with mounting evidence showing that CTLE can trigger a mental disorder or worsen the prognosis of existing disorder (Ölmez et al., 2018; Stein et al., 1996; Gül et al., 2016; De Venter et al., 2017; Örsel et al., 2011). There are several studies in the literature showing that especially some specific trauma types are in a relationship with specific mental disorders (Ölmez et al., 2018; Stein et al., 1996; Gül et al., 2016; De Venter et al., 2017; Örsel et al., 2011). However, we could not find any study which examines the relationship between childhood trauma sub-type and SEPAD in the literature so far. So, we believed that the findings of the present study can contribute to the literature about the relationship between CTLE and SEPAD. Trauma during childhood has several effects on the brain. CTLE can lead to learned helplessness and emotion dysregulation (Davidson and McEwen, 2012). Additionally, CTLE influences early attachment relations, and this causes several problems in interpersonal relationships during their lifetime (Dye, 2018). Therefore, it is very crucial to examine CTLE characteristics in individuals with mental disorders and clinicians should query about CTLE for SEPAD patients to improve treatment modals and prognosis.

In the present study, our results also indicated that all anxiety sensitivity scores (total ASI-3, physical, cognitive, and social concerns scores) were significantly higher in both groups who met childhood or adult SEPAD criteria than those who did not meet the childhood or adult SEPAD criteria (Table 2). Moreover, when we examine the correlations among SCI-SAS scores and ASI-3 scores there were also significant correlations among these scales. Several studies in the literature showed that high anxiety sensitivity predicts the development of anxiety disorders (Taylor et al., 1992; Mantar et al., 2011; Grant et al., 2007). Since SEPAD is a new diagnosis for the adult population there is only a limited number of studies in the literature examining anxiety sensitivity characteristics for adult SEPAD in comparison to childhood SEPAD (Atli et al., 2012; Wheaton and Kaiser, 2021). In one of two studies known to us, Atli et al. compared patients with adult SEPAD, patients with panic disorder, and healthy controls for their anxiety sensitivity characteristics with ASI-3. Their results indicated that adult SEPAD patients had equivalent ASI-3 scores to patients with panic disorder, and both clinical groups had elevated scores compared to healthy controls (Atli et al., 2012). In the second study, Wheaton and Kaiser (2021) examined 761

adults based on the relationship between adult SEPAD symptoms, anxiety sensitivity, and intolerance to uncertainty and their results revealed that intolerance to uncertainty and anxiety sensitivity were significantly positively correlated with adult SEPAD symptoms.

Therefore, based on the present research with current literature about anxiety sensitivity, it can be stated that anxiety sensitivity is not peculiar to SEPAD but can distinguish SEPAD patients from healthy individuals (Atli et al., 2012).

Limitations

Our study has some limitations. First, since we investigated participants based on retrospective recall of childhood SEPAD criteria, this lead to being subject to memory and reporting biases. Second, we measure anxiety sensitivity and CTLE on scales by self-report, sometimes it can cause misinformation. Third, the age range of our participants varies in a limited zone due to all participants being medical school students. Moving forward, future studies with different adult age groups are needed to examine the relationship between adult SEPAD, anxiety sensitivity, and CTLE characteristics. On the other hand, the present study has several strengths. One of them was the first study to examine adult SEPAD, CTLE, and anxiety sensitivity characteristics in an adult population. Second, the present study is the first study that investigates the relationship between childhood trauma sub-type and SEPAD. Moreover, since the results of the present study were derived from a semi-structured clinical assessment our findings are still valuable for the limited literature in this field.

Conclusion

The findings of the present study may contribute to the limited literature about adult SEPAD and related factors. More specifically, the findings of the present study may contribute to the current debate whether anxiety sensitivity and CTLE may have a key role in the progress of SEPAD. In addition, the assessment of anxiety sensitivity and CTLE characteristics of individuals with SEPAD may have important therapeutical implications for them.

Contributions of authors for the paper

Safiye Bahar Ölmez, MD: Design of the study, literature searches and analyses, manuscript writing

Enes Sarıgedik, MD: Statistical analyses, interpretation of data, manuscript writing

Ahmet Ataoğlu, MD: Design of the study, editing of the manuscript

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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