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Do childhood trauma and attachment dimensions predict psychotic-like experiences in a non-clinical sample?

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Key words
psychotic-like experiences, childhood trauma, attachment dimensions

Abstract
Psychotic-like experiences (PLEs) are very common in the healthy population of society and can be seen without being clinically diagnosed. Many studies have emphasized the relationship between PLEs and childhood trauma or attachment dimensions. The purpose of this study was examining the relationship between five sub-dimensions of childhood trauma (emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect), two dimensions of attachment (model of self and others), and three sub-dimensions of PLEs (positive, negative, and depressive). The Community Assessment of Psychic Experiences (CAPE), Childhood Trauma Questionnaire (CTQ), and Relationship Questionnaire (RQ) were used as assessment tools. It was assumed that early childhood traumas and attachment dimensions would significantly predict PLEs. The sample was compromised of 412 participants between the ages of 17-65. The results of the study indicated that individuals who had high score on childhood trauma and low score on attachment dimensions (model of self and others) had high score on PLEs. Besides, high scores on emotional abuse and low scores on attachment dimensions (model of self and others) may explain high scores on psychotic-like experiences. The results were discussed in the light of previous research and future directions were proposed for subsequent studies.

Anahtar kelimeler
Psikotik benzeri yaşantılar, çocukluk çağı travması, bağlanma boyutları

Öz

Çocukluk çağı travmaları ve bağlanma boyutları klinik olmayan örneklemdeki psikotik benzeri yaşantıları yordayabilir mi?

Psikoz benzeri yaşantılar toplumun sağlıklı kesiminde oldukça yaygındır ve klinik olarak tanı alınmadan da görülebilmektedir. Birçok araştırma psikotik benzeri yaşantıların çocukluk çağı travması veya bağlanma boyutları ile olan ilişkisini vurgulamıştır. Bu araştırmanın amacı çocukluk çağı travmasının beş alt boyutu (duygusal istismar, fiziksel istismar, cinsel istismar, duygusal ihmal ve fiziksel ihmal) ve bağlanmanın iki boyutu (benlik ve başkaları modeli) ile psikotik benzeri yaşantılarının üç alt boyutu (pozitif, negatif ve depresif) arasındaki ilişkiyi incelemektedir. Ölçme araçları olarak Toplumda Psişik Yaşantılar Ölçeği, Çocukluk Çağı Ruhsal Travma Ölçeği ve İlişkiler Ölçeği kullanılmıştır. Çocukluk çağı travmasının ve bağlanma boyutlarının psikotik benzeri yaşantıları anlamlı şekilde yordayabileceği varsayılmıştır. Örneklem, 17-65 yaş arasında toplam 412 katılımcıdan oluşmaktadır. Çalışmanın sonuçları çocukluk travma puanları yüksek olan ve bağlanma boyutlarında (benlik ve başkaları modeli) düşük puan alan bireylerin psikotik benzeri yaşantı puanlarının yüksek olduğunu işaret etmektedir. Ayrıca yüksek duygusal istismar puanları ile bağlanma boyutlarında (benlik ve başkaları modeli) alınan düşük puanlar yüksek psikotik benzeri yaşantı puanlarını açıklayabilmektedir. Bulunan sonuçlar, önceki araştırmalar ışığında tartışılmış ve gelecek çalışmalar için öneriler sunulmuştur.

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Psychotic-like experiences (PLEs) are manifestations which resemble positive and negative symptoms of psychosis (DeRosse & Karlsgodt, 2015; Kaymaz & van Os, 2010). These experiences are also called subclinical psychotic symptoms; however, these symptoms do not meet the diagnostic criteria of any psychotic disorder (Kelleher & Cannon, 2011). According to the fully dimensional model, psychotic experiences can be seen in both clinical and non-clinical populations and these experiences are existed along a continuum from subclinical psychotic expressions to clinically significant psychotic symptoms (DeRosse & Karlsgodt, 2015). For example, people might have the symptoms of psychosis (e.g., hallucinations and delusions) without getting diagnosed with a clinically significant psychiatric disorder (Van Os et al., 2009).

Early childhood trauma has a major impact on the development of insecure attachment that makes individuals more vulnerable and prone to have psychiatric disorders in adulthood (Bowlby, 1969). Besides, insecure attachment is a theoretically supported concept for investigating how childhood trauma may lead to psychosis later in life for both clinical and non-clinical samples (Berry et al., 2009; Blair et al., 2018; Longden et al., 2012; Sheinbaum et al., 2014). The stress-vulnerability model of schizophrenia can explain the developmental pathway of attachment from early childhood adversity to psychosis. This model often focuses on genetic causes on the development of schizophrenia, but environmental factors like childhood abuse and neglect also take place in this model. It is well-known that high sensitivity to stress and dysregulated affect are important characteristics of psychosis. Likewise, according to attachment theory, internal working models of self and others are also responsible for emotional regulation (Spangler & Zimmermann, 1999). The stress-vulnerability model proposes that individuals with schizophrenia are vulnerable to stress and emotionally show an exaggerated response to stressful situations. These stressful events like childhood traumatic experiences may induce hypersensitivity and inability to regulate affective response to stressors (Read & Gumley, 2008). Moreover, it was stated that environmental factors like trauma, particular illnesses, and problematic interpersonal relationship with both significant and non-significant others may cause "acquired vulnerability" and increase the risk for developing a psychiatric disorder in later years (Zubin & Spring, 1977 as cited in Read & Gumley, 2008).

Furthermore, attachment has been evaluated as a possible pathway from childhood trauma to psychosis. For example, previous studies have suggested that insecure attachment is a possible mediator between specific childhood adversities and psychotic symptoms (Blair et al., 2018; Sheinbaum et al., 2014; Sitko et al., 2014). More specifically, Longden et al. (2012) revealed that early traumatic events could lead to voice-hearing symptoms through insecure attachment. Blair et al. (2018) also suggested that the collective effect of insecure attachment and early trauma play a major role in the development of PLEs. Besides, Berry et al. (2009) empirically supported the relationship between early trauma and insecure attachment in psychotic patients. Previous research results have suggested that there could be an association between early trauma exposure, insecure attachment dimensions and psychotic symptoms. Therefore, to gain a deeper understanding about relationship of PLE and its dimensions with childhood trauma and attachment dimensions in healthy individuals would be important for the future directions of preventive interventions. It was hypothesized that, (1) there would be a significant relationship between childhood trauma, attachment dimensions, and PLEs, (2) higher levels of PLEs would be significantly explained by higher level of childhood trauma and lower score of attachment dimensions (model of self and others).

METHOD

Participants

The sample was comprised of 412 participants aged between 17 and 65 years. Participants who do not have a psychiatric diagnosis and not using a psychiatric medication included in the present study. 289 participants (70%) were women and 123 participants (30%) were men. The mean age of the participants was 28.79 (SD = 9.5). Most of the participants were university graduates (N=282) and single (N=269). Furthermore, 209 participants (%51) were currently working and 192 participants (%46) had no job. In socio-demographic information form, there was a question asking, "Did you experience a traumatic event in the last 5 years?", and 114 participants (28%) answered this question as "yes".

Materials

The Community Assessment of Psychic Experience (CAPE) The CAPE was developed by van Os

et al. (1999) to investigate lifelong PLEs in the general population. The CAPE is a self-report scale including 42 items that measures positive psychotic symptoms (20 item), negative symptoms (14 item), and depressive symptoms (8 item) (Stefanis et al., 2002). The items are rated on a 4-point Likert scale and total score can range between 42 and 168. Higher scores indicate frequent psychotic experiences. Original validation and factor analysis studies of the CAPE were conducted by Stefanis et al. (2002). The Cronbach's alpha coefficients were reported as .91, .84, .81, and .76 for the CAPE-42, and positive, negative, and depressive subscales of the CAPE, respectively. Saka and colleagues (2015) performed a Turkish translation of the CAPE. The reliability and validity study of the measurement has been recently realized in a representative population sample of 453 healthy individuals by Mortan-Sevi et al. (2019). Internal consistency analysis indicated that the instrument has a good reliability with Cronbach's alpha coefficient .91 for total score, and Cronbach's alpha coefficients for the subscales ranged from .79 to. 83.

The Relationships Questionnaire (RQ) The RQ was developed by Bartholomew and Horowitz (1991). The measurement consists of four short paragraphs corresponding to four attachment styles (secure, preoccupied, fearful, and dismissive). The RQ is rated on a 7-point Likert scale and scores for model of self and others are calculated by using continuous scores from four styles via the formulation developed by Griffin and Bartholomew (1994). A score of an internal working model of self was calculated as (fearful + preoccupied) - (secure + dismissing) and score of an internal working model of others was calculated as (fearful + dismissing) - (secure + preoccupied). These models are scored between +12 and -12. Highest and positive scores correspond to positive internal working model of self and others. Negative scores demonstrated negative internal working model of self (anxious attachment) and others (avoidant attachment). In this study, model of self scores were ranged from −11 to 11 whereas model of others scores were ranged from −12 to 9.

Bartholomew and Horowitz (1991) showed strong reliability and validity (alpha scores ranging from .74 to .95) for the RQ. Turkish version was standardized by Sümer and Güngör (1999). Correlations between the attachment styles were ranged from .58 to .72 (with the one-month time interval) (Sümer & Güngör, 1999).

The Childhood Trauma Questionnaire (CTQ) The CTQ is a self-report, retrospective measurement developed by Bernstein et al. (1994). 28 items of the CTQ evaluate the frequency and severity of emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect during childhood and adolescence (before age 20). The CTQ is rated on a 5-point Likert scale and the total score of the CTQ is ranged from 25 to 125 (subscales from 5 to 25). Higher scores indicate a high frequency. Bevilacqua et al. (2012) stated that cut-off scores for sexual abuse, physical abuse, and physical neglect subscales are eight, for emotional neglect is fifteen, and for emotional abuse is ten. The Turkish version of the measurement was standardized by Şar et al. (2012). The Cronbach alpha coefficient was found as .93 which indicates good internal reliability for the measurement.

Table 1. Descriptive Statistics of Study Measures

Measures	*M*	*SD*	*Range*
CAPE Total	71.71	13.71	43-125
CAPE Positive	30.89	6.27	20-57
CAPE Negative	25.80	5.94	14-46
CAPE Depressive	15.02	3.88	8-28
Self-Model	0.89	4.52	-11-11
Others-Model	0.73	4.06	-12-9
CTQ	34.45	10.34	25-96
Emotional Abuse	6.84	3.04	5-22
Physical Abuse	5.64	2.26	5-24
Sexual Abuse	5.60	2.18	5-25
Emotional Neglect	9.69	4.41	4-25
Physical Neglect	6.66	2.36	4-20

CAPE: Community Assessment of Psychic Experiences.

Procedure

After getting approval from Bahçeşehir University Ethical Committee for conducting the study, an inform consent was obtained from all participants who were volunteers for participating to the study. Participants with a psychiatric diagnosis and using a psychiatric drug were excluded. For avoiding bias, titles of measurements were edited. The participants are comprised of students from Bahçeşehir University and their acquaintances by convenient sampling. Participants received scales via closed envelope and the questionnaire battery took approximately 20 minutes to complete.

Statistical Analysis

The relations between study variables were examined through Pearson correlation analysis and multiple regression analysis using SPSS Statistics 25 Program. The descriptive information of measures (means,

Table 2. Correlations between the CAPE and Other Variables

	1	2	3	4	5	6	7	8	9	10	11	12
1.CAPE	-	.83**	.87**	.85**	-.39**	-.20**	.35**	.39**	.23**	.19**	.24**	.20**
2.CAPE Positive		-	.51**	.54**	-.25**	-.09	.26**	.27**	.21**	.10*	.15**	.22**
3.CAPE Negative			-	.73**	-.38**	-.25**	.30**	.33**	.16**	.19**	.23**	.14**
4.CAPE Depressive				-	-.38**	-.19**	.35**	.43**	.21**	.22**	.24**	.12*
5.Self-Model					-	-.10*	-.12*	-.18**	-.03	-.07	-.07	-.07
6.Others-Model						-	-.05	-.09	-.00	.00	-.06	.02
7.CTQ							-	.79**	.68**	.53**	.84**	.66**
8.Emotional Abuse								-	.53**	.32**	.56**	.31**
9.Physical Abuse									-	.25**	.42**	.31**
10.Sexual Abuse										-	.22**	.33**
11.Emotional Neglect											-	.48**
12.Physical Neglect												-

*$p < .05$, **$p < .01$. CAPE: Community Assessment of Psychic Experiences.

Table 3. Regression Analyses for Predictors of the CAPE Total

Variable	*B*	*SE*	*B*	*t*	*p*
Self-Model	-.96	.13	-.32	-7.34	.000
Others-Model	-.50	.14	-.15	-3.48	.001
Emotional Abuse	1.15	.26	.26	4.46	.000
Physical Abuse	.29	.31	.05	.93	.352
Sexual Abuse	.33	.29	.05	1.14	.256
Emotional Neglect	.00	.17	.00	.01	.993
Physical Neglect	.37	.29	.06	1.30	.196
R^2	.29				
F	23.17**				

*$p < .05$, **$p < .01$. CAPE: Community Assessment of Psychic Experiences.

standard deviations, and ranges) were presented in Table 1.

RESULTS

Relations of PLEs with childhood trauma and attachment dimensions

Pearson correlation analysis was performed to investigate the relationships between study variables. Mostly, significant but weak or moderate correlations were found between the scores of the CAPE, childhood trauma, and attachment dimensions (model of self and others). However, results indicated that model of others had no significant relationship with the CAPE positive dimension, childhood trauma total score and subscale scores including emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect. Correlations between the CAPE and other variables were presented in Table 2.

The role of childhood trauma and attachment dimensions in predicting total PLEs

A multiple linear regression was conducted to predict the CAPE total score based on childhood trauma and attachment scores. The assumption of collinearity showed that variance inflation factor (VIF) scores were below 10. Collinearity analysis indicated that there was not a multi-collinearity between variables of the model (model of self, VIF = 1.05; emotional abuse, VIF = 1.86; model of others, VIF = 1.02). A significant regression equation was found ($F(7,404) = 23.17$, $p < .01$), with an R^2 of .29. Results showed that negative model of self significantly predicted the CAPE total score, $\beta = -.32$, $t(7,407) = -7.34$, $p < .001$. Emotional abuse also explained a significant proportion of variance in the CAPE total score, $\beta = .26$, $t(7,404) = 4.46$, $p < .001$. Negative model of others was the third significant predictor of the CAPE total score, $\beta = -.15$, $t(7,404) = -3.48$, $p < .01$. The combination of these independent variables predicted 29% of the CAPE total score with adjusted R^2 of .27. However, the CAPE total score was not predicted by physical abuse, sexual abuse, emotional neglect, and physical neglect. The results of multiple regression analysis were also demonstrated in Table 3.

Table 4. Regression Analyses for Predictors of the CAPE Positive

Variable	*B*	*SE*	*B*	*t*	*p*
Self-Model	-.29	.06	-.21	-4.41	.000
Others-Model	-.09	.07	-.06	-1.32	.189
Emotional Abuse	.37	.13	.18	2.89	.004
Physical Abuse	.27	.15	.09	1.72	.086
Sexual Abuse	-.09	.14	-.03	-.64	.521
Emotional Neglect	-.11	.09	-.08	-1.29	.198
Physical Neglect	.44	.14	.17	3.05	.002
R^2	.15				
F	10.02**				

*$p < .05$, **$p < .01$. CAPE: Community Assessment of Psychic Experiences.

Table 5. Regression Analyses for Predictors of the CAPE Negative

Variable	*B*	*SE*	*B*	*t*	*p*
Self-Model	-.41	.06	-.31	-7.15	.000
Others-Model	-.28	.06	-.20	-4.52	.000
Emotional Abuse	.36	.11	.18	3.17	.002
Physical Abuse	.00	.14	.00	.02	.987
Sexual Abuse	.25	.13	.09	1.99	.047
Emotional Neglect	.10	.08	.07	1.28	.203
Physical Neglect	.01	.13	.00	.07	.948
R^2	.26				
F	20.65**				

*$p < .05$, **$p < .01$. CAPE: Community Assessment of Psychic Experiences.

The role of childhood trauma and attachment dimensions in predicting positive PLEs

A multiple linear regression was employed to predict the CAPE positive dimension score based on childhood trauma and attachment scores. Collinearity analysis showed that there was not a multicollinearity between variables of the model (model of self, VIF = 1.05; emotional abuse, VIF = 1.86; physical neglect, VIF = 1.40). A significant regression equation was found ($F(7,404) = 10.02$, $p < .01$), with an R^2 of .15. Results showed that negative model of self significantly predicted the CAPE positive dimension score, $\beta = -.21$, $t(7,404) = -4.41$, $p < .001$. Emotional abuse also explained a significant proportion of the CAPE positive dimension score, $\beta = .18$, $t(7,404) = 2.89$, $p < .01$. Moreover, physical neglect was the third significant predictor, $\beta = .17$, $t(7,404) = 3.05$, $p < .01$. The combination of these independent variables predicted 15% of the CAPE positive dimension score with adjusted R^2 of .13. However, the CAPE positive dimension was not predicted by model of others, physical abuse, sexual abuse and emotional neglect subscales. The results of multiple regression analysis were also demonstrated in Table 4.

The role of childhood trauma and attachment dimensions in predicting negative PLEs.

A multiple linear regression was conducted to predict the CAPE negative dimension score based on childhood trauma and attachment scores. Collinearity analysis showed that there was not a multicollinearity between variables of the model (model of self, VIF = 1.05; model of others, VIF = 1.02; emotional abuse, VIF = 1.86; sexual abuse, VIF = 1.20). A significant regression equation was found ($F(7,404) = 20.65$, $p < .01$), with an R^2 of .26. Negative model of self significantly predicted the CAPE negative dimension score, $\beta = -.31$, $t(7,404) = -7.15$, $p < .001$. Negative model of others also explained a significant proportion of variance in the CAPE negative dimension score, $\beta = -.20$, $t(7,404) = -4.52$, $p < .001$. Besides, emotional abuse was the third significant predictor of the CAPE negative dimension score, $\beta = .18$, $t(7,404) = 3.17$, $p < .01$. Finally, sexual abuse was the fourth significant predictor, $\beta = .09$, $t(7,404) = 1.99$, $p < .05$. The combination of these independent variables predicted 26% of the CAPE negative dimension score with adjusted R^2 of .25. However, the CAPE negative dimension was not predicted by

Table 6. Regression Analyses for Predictors of the CAPE Depressive

Variable	*B*	*SE*	*B*	*t*	*p*
Self-Model	-.26	.04	-.30	-7.09	.000
Others-Model	-.12	.04	-.12	-2.96	.003
Emotional Abuse	.42	.07	.33	5.78	.000
Physical Abuse	.02	.09	.01	.23	.815
Sexual Abuse	.17	.08	.09	2.08	.038
Emotional Neglect	.02	.05	.02	.33	.743
Physical Neglect	-.06	.08	-.04	-.75	.455
R^2	.30				
F	24.94**				

*$p < .05$, **$p < .01$. CAPE: Community Assessment of Psychic Experiences.

model of others, physical abuse and emotional neglect subscales. The results of multiple regression analysis were also demonstrated in Table 5.

The role of childhood trauma and attachment dimensions in predicting depressive PLEs

A multiple linear regression was performed to predict the CAPE depressive dimension score based on childhood trauma and attachment scores. Collinearity analysis showed that there was not a multicollinearity between variables of the model (emotional abuse, VIF = 1.86; model of self, VIF = 1.05; model of others, VIF = 1.02; sexual abuse, VIF = 1.20). A significant regression equation was found ($F(7,404) = 24.94$, $p < .01$), with an R^2 of .30. Emotional abuse significantly predicted the CAPE depressive dimension score, $\beta = .33$, $t(7,404) = 5.78$, $p < .001$. Negative model of self also explained a significant proportion of variance in the CAPE depressive dimension score, $\beta = -.30$, $t(7,404) = -7.09$, $p < .001$. Negative model of others was the third significant predictor of the CAPE depressive dimension score, $\beta = -.12$, $t(7,404) = -2.96$, $p < .01$. Besides, sexual abuse was the fourth significant predictor, $\beta = .09$, $t(7,404) = 2.08$, $p < .05$. The combination of independent variables predicted 30% of CAPE A depressive dimension score with adjusted R^2 of .29. However, the CAPE depressive dimension was not predicted by model of others, physical abuse, and emotional neglect subscales. The results of multiple regression analysis were also demonstrated in Table 6.

DISCUSSION

The purpose of this study was examining the relationship between five sub-dimensions of childhood trauma (emotional abuse, physical abuse, sexual abuse, emotional neglect, and physical neglect), two dimensions of attachment (model of self and others), and three sub-dimensions of PLEs (positive, negative, and depressive). It was also assumed that early childhood traumas and attachment dimensions would predict PLEs.

The relations of PLEs with attachment dimensions and childhood trauma were evaluated through correlation analysis. Results suggested that negative model of self and others were found to be significantly related to the frequency of PLEs, negative and depressive symptoms of PLEs although the correlations were weak or moderate. Negative model of self was also found to be significantly related to the frequency of positive symptoms of PLEs. In other words, individuals with a negative model of self (with anxious attachment) and negative model of others (with avoidant attachment) were more likely to have PLEs, negative and depressive symptoms of PLEs. Besides, individuals with a negative model of self more frequently had positive symptoms of PLEs. In accordance with these findings, contemporary studies with non-clinical sample suggested that both anxious and avoidant attachment had an association with negative symptoms (Blair et al., 2018; Tiliopoulos & Goodall, 2009) and depressive symptoms (Jinyao et al., 2012). Furthermore, several studies emphasized the relationship between anxious attachment and positive symptoms in non-clinical sample (Berry et al., 2007; Pickering et al., 2008). In attachment theory perspective, internal working model of self and others have linked with emotion regulation strategies (Pascuzzo et al., 2015). Thus, individuals use these strategies for coping with distress. For example, people with negative model of self are more likely to use hyper activating strategies like self-criticism and feeling of helplessness which cause having enduring negative thoughts and feelings whereas people with negative working model of others are more likely to use deactivating strategies like denial of emotions and avoiding showing emotions. These negative emotions and thoughts may cause psychopathology like psychosis later for

both individuals with insecure attachment models (negative working model of self and others) (Pascuzzo et al., 2015). On the other hand, another finding of this study indicated that no significant association was found between the negative model of others (avoidant attachment) and positive symptoms of PLE. Individuals with a negative working model of others (avoidant attachment) usually abstain from intimate relationships and this was similar to the characteristic of negative symptoms (e.g. social withdrawal) rather than positive symptoms of PLEs. This can partly explain the lack of correlation between positive symptoms and negative model of others (avoidant attachment).

Furthermore, childhood trauma including both abuse and neglect types was positively associated with frequency of PLEs, positive, negative and depressive symptoms of PLEs. More specifically, individuals who have childhood trauma including emotional, physical, sexual abuse and emotional, physical neglect were more likely to have PLEs. In accordance with this result, a recent study indicated that childhood trauma has an association with PLEs in non-clinical population (Cole et al., 2016). Childhood trauma (both abuse and neglect) and PLEs were found to be significantly related. What is more, these findings also emphasize the continuum hypothesis of psychosis since childhood trauma is a risk factor for both clinically diagnosed psychosis and subclinical psychosis.

Another aim of this study is to understand the roles of childhood trauma and attachment dimensions in predicting the PLEs. Result of regression analysis indicated that both attachment dimensions (a negative working model of self and others) and emotional abuse might explain the frequency of PLEs. In accordance with these results, the recent systematic review mentioned that attachment anxiety and avoidance had a relationship with PLEs in both clinical and non-clinical populations (Korver-Nieberg et al., 2014). On the other hand, this study showed that attachment anxiety (negative model of self) was a stronger predictor of PLE than attachment avoidance (negative model of other). Therefore, it was indicated that attachment anxiety (negative model of self) was more relevant to PLEs than attachment avoidance (negative model of other). In line with this result, recent studies showed that attachment anxiety was more determinant than attachment avoidance for psychotic symptoms in both clinical (Harder, 2014) and non-clinical population (Goodall et al., 2015). Positive symptoms (e.g., hallucinations and delusions) are known to be more representative than negative symptoms of psychosis phenomena (Mortan-Sevi et al., 2019). In our study, a relationship between attachment anxiety and positive symptoms was found in a non-clinical population. This result was compatible with literature findings and attachment theory. On the other hand, individuals with a high level of attachment anxiety and avoidance (negative model of self and others) are characterized by social isolation and having suspicions of others' attitudes (Meins et al., 2008). This profile was both related to positive (e.g., paranoid delusions) and negative symptoms (e.g., social withdrawal). Thus, this finding theoretically explains the role of self and other models in predicting PLEs.

Apart from these results, this finding also indicated that emotional abuse could be a stronger predictor of PLEs rather than other abuse and neglect types (sexual and physical abuse; emotional and physical neglect). Therefore, these childhood trauma types did not predict the frequency of PLEs. Most of the participants did not report sexual or physical abuse in this study. Thus, the low rate of reporting of physical and sexual abuse by participants may be related to why these traumatic experiences were not independent predictors of frequency of PLEs. It was also known that there is a less chronic occurrence of both physical and sexual abuse especially in the non-clinical population (Rössler et al., 2016). Moreover, recent studies highlighted that emotional abuse as a most significant contributor of subclinical psychosis than other trauma types (Goodall et al., 2015; Toutountzidis et al., 2018).

Furthermore, other regression models investigated the main predictors of positive, negative and depressive symptoms of PLEs. Positive symptoms of PLEs were predicted by the working model of self and others, and emotional abuse. In the light of these findings of this study, Berry et al. (2006) found that subclinical positive symptoms are more associated with attachment anxiety whereas negative symptoms are more associated with attachment avoidance in a non-clinical sample. This might explain why the working model of others (attachment avoidance) was not one of the predictors of positive symptoms of PLEs. On the other hand, many studies emphasize that emotional abuse and neglect had a major impact on the development of positive symptoms (Berenbaum et al., 2008; Cristóbal-Narváez et al., 2016; Johnson et al., 2001; Powers et al., 2011).

Negative symptoms of PLEs were predicted by the working model of self and others, emotional

abuse and sexual abuse. Previous studies demonstrated that both attachment anxiety (Tiliopoulos & Goodall, 2009) and attachment avoidance (Berry et al., 2006; Meins et al., 2008) had a relation with negative symptoms. Likewise, attachment avoidance has an association with social anhedonia of negative symptoms (Berry et al., 2006). Furthermore, emotional abuse was also associated with negative symptoms of PLE (Toutountzidis et al., 2018) but previous studies also found that childhood abuse was not related to negative symptoms (Read et al., 2003). More specifically, sexual abuse was associated with positive symptoms than negative symptoms (Ross, Anderson & Clark, 1994). Most studies which investigate psychosis phenomena and childhood trauma excluded negative symptoms (Read et al., 2003). On the other hand, these studies were conducted with a clinical population and a small sample size, so it was difficult to make an interpretation and comparison with this study. Moreover, these discrepancies may due to differences between studies regarding their assessment instruments, a variety of participants' responses and characteristic of sample groups.

Finally, depressive symptoms of PLEs were predicted by the model of self and others, emotional abuse and sexual abuse. Prior research underlined that association between emotional abuse and depression (Chapman et al., 2004; Khan et al., 2015). Furthermore, the predictor role of attachment anxiety and attachment avoidance of depressive symptoms were well documented (Hankin et al., 2005). Beyond, sexual abuse was one of the main indicators of depressive symptoms (Nelson et al., 2002).

Strengths and Limitations of the Study

The results of this study would make a significant contribution to the literature, because it detected a serious psychiatric disorder before it shows up, examined important factors, which are relevant with these symptoms in Turkish sample and demonstrated the continuity assumption mentioned previously. Moreover, preventive treatment programs based on the results of the study may also be prepared.

Nevertheless, this study had some limitations. First, the convenient sampling can be accepted as a limitation. Besides, the sample was mostly compromised from participants with high educational level and females. Hardt and Rutter (2004) indicated that participants are more likely to underestimate their responses rather than over-reporting their true rates in self-report scales, thus this might cause lack of correlation of between trauma types and other relevant variables. Recall bias should bear in mind due to the nature of all trauma scales. And lastly, there is a possibility of social desirability bias regarding the existence of self-report measurement in this study.

Conclusions

The result of this study supported the assumption that there is a link between PLEs, childhood trauma and attachment dimensions in the general population. As expected, PLEs were explained by lower levels of working model of self and others and higher levels of childhood trauma (emotional abuse, sexual abuse, and physical neglect).

The findings of this study showed that emotional abuse was the main trauma type and negative working model of self (attachment anxiety) were most important predictor of PLE and subclinical psychiatric symptoms in non-clinical sample.

Future studies may take into consideration of conducting a clinical interviewing before getting an assessment or conducting a study with a smaller sample size. Moreover, implementation of deeper clinical interviewing with the good therapeutic alliance and relationship may help to get the accurate outcome of PLEs, childhood trauma and attachment dimensions from participants.

AUTHOR NOTE

This study is a part of a BAU-BAP project named "Childhood Trauma, Attachment Dimensions, Automatic Thoughts, Perceived Social Support, and Coping Styles as predictors of Psychotic-like Experiences and Subclinical Psychiatric Symptoms in Non-Clinical Sample" and a part of the master thesis of the first author, which was performed under supervision of the second author.

Compliance with Ethical Standards

This study was approved by Bahçeşehir University Ethical Committee (Trial Number: 20021704-604.01.01-4103, Date: 2018/09)

Conflict of Interest

The authors declare that they have no conflict of interest.

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