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The Associations between Attachment, Adverse Childhood Experiences and Re-Victimization in Patients with a Psychosis Spectrum Disorder

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ABSTRACT

Background: As attachment and trauma have been shown to be potential determinants of psychotic dysregulation and of recovery from psychosis, it is essential to better understand the associations between attachment, adverse childhood experiences (ACE) and re-victimization in patients with a psychosis spectrum disorder.

Aims: To examine whether the occurrence and severity of ACE and re-victimization are differently associated with the various attachment categories (secure, dismissive, preoccupied and fearful-avoidant) within a population of patients with a psychosis spectrum disorder.

Method: In this explorative study in a sample of 273 patients with psychotic disorder, we described the prevalence and severity of ACE and re-victimization and their associations with the four attachment styles in question (secure, dismissive, preoccupied and fearful-avoidant or disorganized).

Results: The highest ACE frequencies were found for emotional abuse (36.6%), emotional neglect (36.6%) and domestic violence (32.6%). As well as emotional and physical abuse, emotional and physical neglect were noticeably more frequent in all the insecure attachment classes than in the secure attachment class. Household substance abuse was high in the fearful-avoidant attachment class and parental divorce in the dismissive and fearful-avoidant attachment classes. Re-victimization occurred in 64.5% of the total sample, with a repeat frequency of 91.6% in the severe ACE class. The fearful-avoidant attachment style was very frequent (33.3%) in the severe re-victimization class.

Conclusion: Attachment functioning, interpersonal childhood trauma and re-victimization all deserve greater recognition in populations with a psychosis spectrum disorder. If their associations are well understood, future treatment might be improved.

Keywords: attachment (categorical), childhood trauma, victimization, psychosis, schizophrenia.

Introduction

Childhood abuse and neglect are related to psychotic symptoms [1-5] and part of the complex etiological puzzle of psychosis spectrum disorders [6]. Childhood abuse and neglect are also described as "attachment trauma" or cumulative developmental trauma (CDT). These types of stressful or traumatic events occur repeatedly and cumulatively within specific relationships, which are usually perpetrated by parents or other caregivers [7,8]. When young children are subjected to interpersonal trauma, the development of attachment bonds with primary caregivers can be altered or disrupted [9-11]. This has been shown to interfere not only with mastery of emotion regulation, but also with autonomy and the acquisition of social skills crucial to psychosocial development [12-14].

The combination of interpersonal trauma in childhood and disrupted primary attachment in particular is likely to contribute to the development of a wide range of psychopathologies, psychosis among them [15]. Although Berry et al. [16] found, in a sample with psychosis, higher levels of anxious attachment in patients reporting trauma that involved significant others in childhood relationships, this effect was not significant after control for depression. Further studies found that insecure attachment was moderately correlated with the total number of events [17,18]. Various other studies reported ambiguous results regarding the mediating role of attachment insecurity in the relationship between childhood trauma and psychosis [19-25]. In a population with schizotypal and psychotic-like experiences, Sheinbaum et al. [26] found relatively small mediating effects of insecure attachment. Other authors found moderate mediating effects of disorganized attachment in the relationship between childhood trauma and paranoia [22] and between childhood trauma and negative symptoms [23]. Some studies reported weak or absent mediating effects of insecure attachment [20,21,24].

The variations in study results may be due to differences not only in setting and outcome measures, but also in the instrumentation of key concepts. Different studies used different childhood trauma questionnaires, some of which included an assessment of emotional and physical neglect and some of which did not. Emotional neglect in particular is common in patients with psychoses [27] and could be associated with paranoid beliefs [25].

With respect to attachment, most studies used the dimensional perspective of attachment propagated by Bartholomew [12], which makes a distinction between attachment anxiety (about separation, abandonment or insufficient love) and attachment avoidance (of intimacy, dependency and emotional expressiveness) [13,14,28].

Combinations of the anxious and avoidance attachment dimensions define four attachment patterns or categories in a two-dimensional space: "secure"; "preoccupied" (or anxious-ambivalent [29]); "dismissing-avoidant" (or dismissive [30]); and "fearful-avoidant" or "disorganized" [13,28]. Some studies assessed fearful-avoidant (or disorganized) attachment using the designated subscale of the Psychosis Attachment Measure-Revised [31]. Various studies focusing on the mediating role of attachment singled out one dimension, thereby neglecting Bartholomew's attachment model and complicating the statistical modeling of attachment orientations and the effects of insecure attachment styles [22,23]. To retain information about differences within and combined effects of the anxious and avoidant attachment dimension, Mikulincer and Shaver [28] argued in favor of the two-dimensional attachment model. Despite this, the categorical approach may better express the particularities of fearful-avoidant or disorganized attachment [32], which are especially relevant in relation to childhood trauma and psychosis [31].

In view of the ambiguous associations that are found between insecure attachment and childhood trauma in samples with a psychosis spectrum disorder, our study investigated the association between trauma (ACE and re-victimization) and various insecure attachment styles in patients with psychoses. The present study used a trauma questionnaire assessing both childhood abuse and neglect. Attachment is measured categorically, including fearful-avoidant or disorganized attachment. We expected insecure attachment styles to be associated with a higher occurrence and severity of adverse childhood experiences, and also with higher re-victimization in adulthood.

Methods

This study had a cross-sectional design using baseline data from the UP's study [33], a Dutch longitudinal multicenter cohort study on recovery from psychotic disorders that aims to explore the psychological, neuropsychological and social determinants of personal recovery. The UP's study is a collaboration between Erasmus University Medical Center and nine mental health institutions in the southwestern Netherlands, all of which provide ambulatory teams in which patients are included, interviewed, and followed up by trained students and researchers [33,34]. Eligible patients have to meet the following criteria: (1) age between 18 and 65 years; (2) fulfilling the DSM 5 criteria for a psychotic disorder (i.e., brief psychotic disorder, schizophreniform disorder, schizophrenia, schizoaffective disorder, delusional disorder, psychotic disorder due to substance use, or otherwise unspecified psychotic disorders); (3) an understanding of Dutch sufficient to complete the measurements; and (4) ability to provide informed consent.

The sociodemographic characteristics gathered during the interview were gender, age, education and residential status. Clinical characteristics comprised initial diagnosis, PANSS-8 remission scores [35] and screening scores for Major Depressive Disorder, Anxiety Disorder and PTSD risk. Further details of the UP's study are described in the design protocol [33]. The present study included 308 participants (complete sample N=273).

ASSESSMENTS

Adult attachment was assessed using the Psychosis Attachment Measure (PAM), a self-report questionnaire developed by Berry et al. [36] that contains positively worded items concerning general relationships, whether romantic or not. The PAM consists of 16 items derived from other self-report attachment instruments that refer to thoughts, feelings, and behaviors in relationships with

important others. The items contain 4 answer categories (0=not at all to 3=very much). Several validation studies of the PAM have been conducted in clinical samples; the Cronbach's alpha coefficients they reported ranged from 0.70-0.86 for the anxiety dimension and 0.55-0.91 for the avoidance dimension [37-39].

In our study, we used the 13 item version of the PAM (which excluded the reversed items), computing categorical classifications of attachment style by applying cutoff scores by median split, in accordance with the validation study by van Bussel et al. [32]. This produced four adult attachment categories: secure, dismissive, preoccupied and fearful-avoidant (disorganized). Between them, the three latter categories are grouped as insecure attachment styles, the most maladaptive being the fearful-avoidant attachment style [40].

The Adverse Childhood Experience (ACE) and Adverse Adult Experience (AAE) questionnaires [41,42] were used to assess the number of different types of adverse events experienced in childhood (before age 18) and adulthood (age 18 and older). Both questionnaires comprise 10 "yes" or "no" items: emotional abuse, physical abuse, sexual abuse, physical neglect, emotional neglect, household substance abuse, household mental illness, household crime, domestic violence, and divorce/ separation.

Although the ACE and AAE questionnaires are recognized as reliable and valid measures of childhood and adult trauma [43], concerns have been raised regarding their use, including their approach to obtaining an individual ACE and AAE score by summing responses by awarding one point each to a group of heterogeneous questions [44]. To overcome this issue, we categorized adverse experiences into three groups: abuse (3 items), neglect (2 items) and household adversities (5 items). To assess the severity of ACE and AAE, we created three classes: 0: no trauma; 1: one score or more on abuse or neglect or household adversities; and 2: one score or more on abuse and/or neglect and/or household adversities (i.e., a combination of 2 or 3 groups).

The literature has interpreted the term "re-victimization" in various ways [45]. We subscribed to the conceptualization that it concerns about both childhood and adult victimization [46-48]. We investigated it separately for each adversity and for each ACE severity class (classes 0, 1 and 2).

Severity of symptoms of psychotic disorders was assessed using the PANSS-8: as criteria for clinical remission, eight core items were selected from the 30-item Positive and Negative Syndrome Scale [35]. Previous studies have shown the observer-rated PANSS-8 to be a reliable and valid scale in a population with psychotic disorders: Cronbach's alpha-values were 0.70 or higher, and Pearson's correlation coefficients between PANSS-8 and the original 30-items version were > 0.85 [49]. In this study internal consistency in the one-factor model was acceptable (Cronbach's alpha = 0.76; McDonald's Omega = 0.73). Remission was defined as ratings of mild or less (scores of 3 or < 3) over the previous two weeks on all items, with items scored as 1 (absent) to 7 (extreme) [50,51].

STATISTICAL ANALYSES

Descriptive statistics were used to compare the characteristics of patients in the response sample and complete cases. In this exploratory study we reported adverse childhood experiences and re-victimization as frequencies and percentages broken down by attachment styles. All analyses were conducted using SPSS (version 28).

Results

DEMOGRAPHIC AND CLINICAL CHARACTERISTICS

Table 1 shows the demographic and clinical characteristics of the UP's sample (N=302). The final analyses found only minor differences between the response sample and the complete sample (N=273). At baseline, the mean age of participants was 41 years; 67 % were male; and 6.7% had completed only primary school. The initial diagnoses were mainly schizophrenia (46.5%) or psychosis not otherwise specified (21.9%). Over half of the sample lived alone without children (57.1%). The remission rate as determined by the PANSS-8 was relatively high (62%), and 31.8% scored 10 or more on the Patient Health Questionnaire-9, and 24.4% on the Generalized Anxiety Disorder-7, indicating a possible major depressive disorder or anxiety disorder. The Trauma Screening Questionnaire showed a PTSD risk of 21.4% [52]. The median score on the anxiety attachment dimension of the PAM was 0.75; on the avoidance attachment dimension, it was 1.46. The categorical approach of attachment produced 4 classes: 30.4% of participants were securely attached, 22% were dismissive, 19.6% were preoccupied and 28% were fearful-avoidant (disorganized) attached. Adverse experiences were scored negatively by 24.6% of the participants in childhood and by 24.5% in adulthood.

ACE per ATTACHMENT CATEGORY

Table 2 shows the frequencies of adverse childhood experiences per item of the ACE questionnaire, for the complete sample, and separately for each of the four attachment categories (i.e., secure, dismissive, preoccupied, and fearful-avoidant). The highest frequencies in the complete sample were found for emotional abuse (36.6%), emotional neglect (36.6%), and domestic violence (32.6%). Noteworthy differences in ACE between the secure attachment class and insecure classes concerned emotional and physical abuse, and emotional and physical neglect. Sexual abuse showed minor differences between attachment styles. Household substance abuse was greater in those with fearful-avoidant attachment, and parental divorce was more prevalent in those with dismissive and fearful-avoidant attachment.

Regarding the prevalence of the attachment categories per ACE category (i.e., no childhood trauma, ACE in one category, and multiple trauma), two results stand out: 38.8% were securely attached in the group with "no childhood trauma" and 21.1% in the group with "multiple trauma", and 20.9% were fearful-avoidant attached in the group with "no childhood trauma" and 34.4% in the group with "multiple trauma".

Table 1. Demographic and clinical characteristics of the UP's sample (valid N, Percentages, median and IQR)

	Sample Valid N, Percentages, median (IQR)		**Complete PAM cases** Valid N, Percentages, median (IQR)	
Gender (male)	302	66.9%	273	66.3%
Age (mean, SD)	301	41.4 (12.03)	272	41.4 (12.0)
Education	285		261	
- Primary school		6.7%		6.5%
- Secondary school				
lower		7.4%		7.4%
higher		7.4%		7.6%
-Professional education				
lower		13.7%		13.0%
middle		44.6%		44.8%
higher		13.3%		13.0%
-University		7.0%		7.3%
Residential status	301		273	
-Single		57.1%		57.1%
-Single parent family		13.6%		13.6%
-With partner				
with children		10.0%		10.3%
without children		9.3%		9.2%
-Other		9.0%		9.9%
First diagnosis	288		262	
- Schizophrenia		46.5%		47.7%
- Schizoaffective disorder		8.7%		8.8%
- Brief psychotic disorder		16.0%		15.3%
- Psychosis NOS		21.9%		21.0%
- Other		6.9%		7.3%
In remission (PANSS-8)	276	62.0%	262	62.2%
Depression (PHQ-9 score >= 10)	299	31.8%	273	30.4%
Anxiety (GAD-7 score >= 10)	299	24.4%	273	24.9%
PTSD risk (TSQ-10 score >= 6)	266	21.4%	251	21.5%
Attachment (PAM) (Median, IQR)	286		273	
- Anxiety		0.75 (0.88)		0.75 (0.88)
- Avoidance		1.46 (0.63)		1.50 (0.63)
Attachment (PAM) (categorical)	286		273	
- Secure		30.4 %		30.4 %
- Dismissive		22.0 %		22.0 %
- Preoccupied		19.6 %		19.4 %
- Fearful-avoidant		28.0 %		28.2 %
Trauma				
- No ACE	289	24.6 %	273	24.5 %
- No AAE	290	24.5 %	273	24.2 %
Total	302		273	

IQR: Interquartile Range. PANSS-8: Positive and Negative Symptom Scale-8. Remission is defined as ratings of mild or less (scores of 3 or < 3) over the previous two weeks on all items with items scored as 1 (absent) to 7 (extreme) [50,51]. PHQ-9: Patient Health Questionnaire-9, for which a cut-off score of 10 or above on the summed-item score has been recommended as a method of screening for major depressive disorder [53]. GAD-7: Generalized Anxiety Disorder questionnaire-7, for which a cut-off point of 10 or greater has been recommended for further evaluation when screening for anxiety disorders [54]. PTSD: Post Traumatic Stress Disorder. TSQ: Trauma Screening Questionnaire, for which a cut-off score of 6 has been found to be optimal, also in clients with psychotic disorders, 44.5% correct positives, and 93.6% correct negatives [52]. PAM: Psychosis Attachment Measure. Categories were created by median split (van Bussel 2023). ACE: Adverse Childhood Experiences. AAE: Adverse Adulthood Experiences.

Table 2. Prevalence of adverse childhood experiences per attachment category

ACE's	Total sample % (N)	Secure	Dismissive	Preoccupied	Fearful-avoidant
Abuse					
Emotional abuse	36.6% (100)	25.3% (21)	38.3% (23)	39.6% (21)	45.5% (36)
Physical abuse	25.6% (70)	15.7% (13)	26.7% (16)	26.4% (14)	35.1% (27)
Sexual abuse	27.8% (76)	27.7% (23)	23.3% (14)	28.3% (15)	31.2% (24)
Neglect					
Emotional neglect	36.6% (100)	27.7% (23)	43.3% (26)	37.7% (20)	40.3% (31)
Physical neglect	15.0% (41)	7.2% (6)	18.3% (11)	18.9% (10)	18.2% (14)
Household adversities					
Domestic violence	32.6% (89)	31.3% (26)	35.0% (21)	35.8% (19)	29.9% (23)
Household substance abuse	17.2% (47)	12% (10)	18.3% (11)	17.0% (9)	22.1% (17)
Household mental illness	20.5% (56)	15.7% (13)	20.0% (12)	24.5% (13)	23.4% (18)
Parental divorce	24.2% (66)	18.1% (15)	30.0% (18)	15.1% (8)	32.5% (25)
Incarcerated household member	6.6% (18)	4.8% (4)	8.3% (5)	7.5% (4)	6.5% (5)

RE-VICTIMIZATION

The frequencies of re-victimization per item of the ACE questionnaire were the highest for emotional abuse (27.7%), emotional neglect (23.4%), and domestic violence (19.8%). In the fearful-avoidant attachment category, frequencies of re-victimization for emotional abuse and emotional neglect were even higher (i.e., 32.5% and 27.3%).

Table 3 presents the severity of re-victimization. ACE was absent from 24.5% of the complete sample and AAE from 24.2%. Re-victimization occurred in 64.5% of the complete sample. The proportion of re-victimization in ACE class 1 was 75% (n = 57 of 76); in ACE class 2 it was even higher at 91.6% (n = 119 of 130).

Table 3. Severity of re-victimization (n)

	0. No AAE	1. AAE in one category	2. AAE in two or three categories	Total
0. No ACE	13.2% (36)	9.2% (25)	2.2% (6)	24.5% (67)
1. ACE in one category	7.0% (19)	13.2% (36)	7.7% (21)	27.8% (76)
2. ACE in two or three categories	4.0% (11)	12.5% (34)	31.1% (85)	47.6% (130)
Total	24.2% (66)	34.8% (95)	41.0% (112)	100% (273)

ACE: adverse childhood experience. AAE: adverse adulthood experience.

Table 4 shows the prevalence's of the attachment styles per re-victimization class. The secure attachment style was noticeably less frequent in the re-victimization class 2 (18.6%) than in class 0 (35.1%). The fearful-avoidant attachment class, however, was more prevalent in the re-victimization class 2 (33.3%) than in class 0 (23.7%).

Table 4. Prevalence's of the attachment styles per re-victimization class (n)

	Secure	Dismissive	Preoccupied	Fearful-avoidant	Total
0. No ACE and/or no AAE	35.1% (34)	18.6% (18)	22.7% (22)	23.7% (23)	100%
1. ACE in one category and re-victimi-zation	44.6% (25)	24.8% (15)	5.2% (3)	25.7% (14)	100%
2. ACE in two or three categories and re-victimi-zation	18.6% (24)	25.6% (27)	22.7% (28)	33.3% (40)	100%
Total	30.4% (83)	22% (60)	19.4% (53)	28.2% (77)	100%

0. No ACE and /or no AAE

1. *a score of 1 or more in one ACE category (abuse or neglect or household adversities) and re-victimization*

2. *a score of 1 or more in two or three ACE categories (abuse and/or neglect and/or household adversities) and re-victimization*

ACE: adverse childhood experience

Discussion

Within a sample of patients with a psychosis spectrum disorder, this study sought to establish whether the occurrence and severity of adverse childhood experiences, and also of re-victimization, were differently associated with the insecure attachment styles.

We found the highest ACE frequencies for emotional abuse, emotional neglect and domestic violence. Emotional and physical abuse, and also emotional and physical neglect, were noticeably more frequent in the insecure attachment classes than in the secure attachment class. Household substance abuse was higher in the fearful-avoidant attachment class, and parental divorce in the dismissive and fearful-avoidant attachment classes. Re-victimization occurred in 64.5% of the total sample with a repeat frequency of 91.6% in the severe ACE class. The fearful-avoidant attachment style was very frequent (33.3%) in the most severe re-victimization class.

The prevalence's of the attachment styles found in our sample approximate to the average rates of secure and

insecure attachment found in other psychosis studies [20,55-58]: 28% of the participants in our sample were categorized as having a fearful-avoidant attachment style and 30.4 % as being securely attached. Dismissive attachment was reported in 22 % and preoccupied attachment in 19.6%. Relative to those in a healthy population, the frequencies of fearful-avoidant and anxious attachment were particularly high. However, the percentage of secure attachment was lower [56]. Although research by Voestermans et al. [59] in a population with personality disorders showed a higher frequency of fearful attachment (40%), they used a different technique (including a control group) to categorize attachment styles [60]. This may have influenced the distribution of the attachment categories.

Childhood trauma was common within our sample: relative to the ACE in a healthy population [61], except for household mental illness and household substance abuse, all ACE were more frequent. A review by Read et al. [62] reported even higher frequencies of childhood abuse in samples of patients with a psychotic disorder. These higher percentages may be explained by the fact that their review included inpatient samples. Another study by Read et al. showed rates of childhood neglect for psychotic adult inpatients ranging from 22% to 62% [63]. Results similar to those in our study were found by Delisi et al. [64] in an outpatient sample of patients with an antisocial personality disorder who were under supervised release from prison. While Battle et al. [65] found higher frequencies of abuse and neglect in a sample with various types of personality disorders, this may have been related partly to the fact that 33% of their sample consisted of inpatients.

Our results also suggest that childhood abuse and neglect (but not sexual abuse), are associated with the insecure attachment styles, where the differences in ACE percentages between the attachment classes were small. Our results are in line with the attachment theory [7,8,28], which holds that the development of attachment bonds can be altered or disrupted in young children who have been exposed to trauma, especially in relationships with primary caregivers [9-11]. In the literature, various studies found no associations between childhood trauma and avoidant attachment and either no associations or only weak associations with anxious attachment [20,24]. In samples with a psychosis spectrum disorder, two studies found moderate associations between childhood trauma and disorganized or fearful-avoidant attachment [22,23].

The complex relationship between childhood trauma and attachment has been described by Hesse et al. [66] and Read et al. [27], who explained that insecure attachment can be understood as the outcome of intersubjective experiences linked to deficits in the regulation of emotion within the infant-parent dyad, and also to overtly traumatic experiences. In other words, at least some cases of insecure attachment result from subtle relational trauma [29], rather than from other adverse influences such as overt abuse. Regardless of its origin, insecure attachment can contribute, both during childhood and later in life, to greater vulnerability and poorer resilience in response to trauma [30]. The development of psychopathology, including psychosis, may therefore involve a developmental trajectory that links parental insensitivity to a child, the child's early insecure attachment, and its consequences for the development of the personality and the impact of traumatic experiences [27].

An unexpected finding was the almost total lack of difference between the attachment classes with regard to the frequencies of sexual abuse. An earlier review of the literature [67] on the relationship between childhood sexual abuse and attachment showed that, with few exceptions, a majority of hypotheses and the theoretical rationale on which they are based are quite consistent with what Baron and Kenny et al.[68] defined as moderate relationships.

Our lack of results can be explained on the basis of the item on sexual abuse in the ACE questionnaire. Whereas all items regarding abuse and neglect ask questions about trauma that happened "often or very often" in the relationship with a parent or other adult in the home where the child lived, the question about sexual abuse is defined as follows: have you "ever" been touched in a sexual manner or has there "ever" been intercourse with a person who was at least 5 years older. Although sexual abuse itself is usually experienced as traumatic, the nature of the child's relationship with the perpetrator, and also the frequency or severity of sexual abuse, can have a different effect on attachment. Canton-Cortes et al. 69 do indeed confirm that the impact of childhood sexual abuse on attachment style can be affected particularly by the type of abuse, the child's relationship with the perpetrator, and the continuity of abuse. In this area, our study does not provide sufficient information.

Our finding that the prevalence of household substance abuse was greater in those with fearful-avoidant attachment is supported by the literature, which states that parental substance abuse may negatively affect children who grow up in such homes. Such effects include the development of an insecure attachment style [70]. Although the prevalence of household substance abuse in our study was fairly low (17.2%), we found this to be the case. In a population with schizophrenia, Levit et al. found a frequency of household substance abuse of 31% [71]; in a healthy population, Felitti et al. found a percentage of 25.6% [61].

The prevalence of parental divorce was higher in those with dismissive and fearful-avoidant attachment, a point that is debated in the literature. Brennan et al. [72] stated that, in a healthy population, parental divorce per se was not related to the attachment styles or relationship outcomes in offspring. This may be because some intact marriages are distressed and have insecurity-producing effects on children's attachment styles, whereas some post-divorce arrangements differ in the extent to which they promote security or insecurity in offspring [72]. The effects on attachment we found in our study may be more specific to a population with higher scores on ACE in general and a higher vulnerability to stress.

Re-victimization occurred in 64.5% of our sample, contrasting with the 7.5% frequency found by Pereda [73] in a general population. However, part of the difference

between the two results may be explained by the fact that Pereda's study conceptualized trauma in childhood and adulthood as interpersonal violent events, and did not include the occurrence of neglect.

In the severe ACE class, we found a high repeat frequency of 91.6%. In addition, the fearful-avoidant attachment class, was very frequent (33.3%) in the severe re-victimization class, suggesting that severe childhood trauma and/or re-victimization are associated especially with the development of fearful-avoidant attachment, which is associated with a higher risk for developing psychosis [31]. In samples with psychosis, mediation studies support an association between the severity of childhood trauma and fearful-attachment [22,23]. In a population with personality disorders, Voestermans et al.[59] also found that patients with a fearful attachment style had higher childhood trauma-severity scores.

That childhood poly-victimization exerts a cumulative effect on interpersonal victimization in adulthood was confirmed by Pereda et al. [73] and Widom et al. [74]. Mikulincer and Shaver [28] stated that this accumulation of effects might indicate either that attachment insecurity puts people at risk for becoming victims of interpersonal trauma in adulthood, or that interpersonal trauma can increase attachment insecurity, or both.

Strength and Limitations

A strength of our study is the fact that the UP's sample appears to be representative of the current outpatient psychosis population in Dutch mental health care [34]. The low mean scores on the PANSS-8 and the high remission rate were consistent with the scores in another cohort psychosis studies [75]. The 21.4% prevalence of PTSD risk in our sample is also consistent with the prevalence found by de Bont et al. [52]. The frequencies of participants indicated for an anxiety disorder (24.4%) and for a depressive disorder (31.8%) were both lower than those in other studies [76,77] in patients with a psychotic disorder. While Achim et al. [77] found that 38.8% of the participants were diagnosed with an anxiety disorder, Buckley et al. [76] found that 50% of the participants had a depressive disorder. Our lower scores may be related to the fact that our sample was more heterogeneous than the samples with schizophrenia in the studies by Achim et al. and Buckley et al.[76,77].

Another strength is the breadth of the outcome measures. The assessment of childhood trauma included all attachment traumata (i.e., abuse and neglect), which are essential when investigating the relationship of childhood trauma with attachment. The categorical measurement of attachment made it possible to assess fearful-avoidant attachment which was hypothesized to reflect both a negative model of the self and others in relationships, and higher levels of both attachment anxiety and avoidance [22]. A recent study found that this attachment style associated most strongly with psychosis [19].

Our findings should be interpreted in the light of the following limitations

The first is our use of self-report questionnaires to measure attachment, adverse childhood, and adulthood experiences, which may have been liable to social-desirability bias and self-report bias. Self-reports of attachment are also seen as an indicator of attachment and do not generate detailed descriptions of attachment figures and social relationships [28]. The ACE questionnaire has also some shortcomings, such as limited item coverage and response options (yes or no) [44]. As Baldwin et al. [78] indicated a discrepancy between prospective and retrospective measures of childhood trauma, the retrospective nature of the ACE questionnaire may have distorted some reports on childhood trauma.

The second limitation is that cross-sectional data preclude a developmental interpretation of the results. Various mediation studies show that, to varying degrees, attachment insecurity mediates the relationship between childhood trauma and psychosis [22-24,26]. This implies the existence of a developmental pathway in which a history of childhood trauma may negatively affect the formation of secure internal modes of self and others. To corroborate and expand these findings, future studies using a longitudinal design are needed. Ideally, they would start early in childhood.

The third limitation in some subgroups is that our analyses were affected by low numbers of patients. This made some comparisons difficult, especially regarding the prevalence's of insecure attachment per re-victimization class. A replication of our study in a larger patient sample is needed to circumvent this limitation.

The fourth limitation concerns the question of whether the degree of insecure attachment in our sample may have been influenced by comorbid psychiatric symptoms, especially psychosis. Berry et al. [79] argued not only that insecure attachment can lead to paranoia, but also that paranoia may lead to insecure attachment. These reciprocal effects of attachment and psychosis might be clarified by results from longitudinal studies. However, since the majority of our sample scored low on the PANNS-8, we assume that the impact of psychotic symptoms was low.

Fifth, although a psychotic episode can be experienced as a traumatic event, we assessed neither how participants had experienced their psychoses nor the frequencies of the episodes. The average duration of care in our sample was 14 years, suggesting that a larger group had experienced multiple psychoses.

Finally, some groups of patients were less willing or less able to participate in the cohort study. These included care-avoiding patients, those with severe psychotic symptoms, and those who had left the mental healthcare team [34]. For this reason, our cohort may not provide a complete picture of the attachment styles and ACE that can occur in an outpatient population with psychosis.

Clinical Implications

Our study suggests that childhood abuse and neglect, household substance abuse and parental divorce in childhood are associated with insecure attachment, in a population with a psychosis spectrum disorder. It also suggests that more severe traumatization in childhood and/or adulthood (re-victimization) is related to a higher frequency of fearful-avoidant attachment. Given the

complex interrelationship between attachment and trauma, we argue that, in a population with psychosis, both should be considered in routine diagnostic assessments in clinical practice. This might help to determine therapeutic interventions (e.g. trauma-focused therapy [80-83] or interventions related to attachment [28,84-87]) appropriate for this population. Although we studied adult patients with psychosis, it is important to screen longitudinally for signs of insecure attachment and symptoms of trauma in children and adolescents, in whom preventative therapeutic strategies could then be pursued.

As traumatization cannot always be prevented, we recommend that attention be paid to protective effects of more secure attachment. Interventions to improve relationships with important others, such as family, friends and professionals, are especially important to creating a social environment characterized by secure attachment bonds which can prevent dysregulation and promote the recovery process.

Data availability statement

Due to privacy restrictions applicable to the ongoing cohort study, the data are not publicly available. Access to data may be applied for in consultation with the principal investigator.

Author contributions.

All authors contributed to drafting the manuscript, contributed to the conception and design of the study, and approved the final version.

Declaration of conflicting interests

The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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