The role of childhood trauma in cognitive performance in schizophrenia and bipolar disorder – A systematic review

Running title: Childhood trauma and cognition in psychosis

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Study	Participants (Patients / Healthy participants) *N*	Stress questionnaire	Stressful events (Patients / Healthy participants)	Stress severity (Patients / Healthy participants) Mean / SD	Stress frequency (Patients / Healthy participants) Percentage or *N*	Combination of CT frequency and severity (Patients / Healthy participants) Percentage or *N*
Patients at ultra-high risk of psychosis						
Ucok et al., 2015	UHR = 53	CTQ (28-item version)	• Total CTQ • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect	• Total CTQ = 40.4 ± 12.6 • Physical abuse = 6.4 ± 2.8 • Emotional abuse = 9.5 ± 4.5 • Sexual abuse = 5.8 ± 3.0 • Emotional neglect = 14.7 ± 5.0 • Physical neglect = 4.1 ± 1.5	• Not reported	• Dichotomisation into low and high CT levels • High CT levels: • Physical abuse = 41.5% • Emotional abuse = 57.7% • Sexual abuse = 24.4% • Emotional neglect = 59.6% • Physical neglect = 0%
Patients with first-episode psychosis and healthy participants						
Aas et al., 2012a	FEP = 83 HP = 63	CECA-Q	• Either parent died • Separation from either parent • Physical abuse • Sexual abuse	• Not reported	• Not reported	• Dichotomisation into absent/non-severe and severe CT levels
Aas et al., 2011	FEP = 138 HP = 138	CECA-Q	• Either parent died • Separation from either parent • Physical abuse • Sexual abuse	• Not reported	• Not reported	• Dichotomisation into absent/non-severe and severe CT levels • Either parent died = 9% (FEP) versus 8% (HP) • Separation from either parent = 50% (FEP) versus 31% (HP) • Physical abuse = 24% (FEP) versus 13% (HP) • Sexual abuse = 16% (FEP)

	versus 8% (HP)

Supplementary Table 1. Childhood trauma assessment and analysis - Patients at ultra-high of psychosis, patients with first-episode psychosis and healthy participants

Abbreviations: CECA-Q, Childhood Experience of Care Abuse Questionnaire; CTQ, Childhood Trauma Questionnaire; CT, Early-life stress; FEP, patients with first-episode psychosis; HP, healthy participants; UHR, Ultra – high risk subjects of schizophrenia.

Study	Participants (Patients / Healthy participants) *N*	Stress questionnaire	Stressful events (Patients / Healthy participants)	Stress severity (Patients / Healthy participants) Mean / SD	Stress frequency (Patients / Healthy participants) Percentage	Combination of CT frequency and severity (Patients / Healthy participants) Percentage or *N*
Poletti et al., 2017	BD = 76 HP = 90	RFQ	• Harsh parenting • Overt family conflict	• Total Score: • BD = 27.15 ± 8.87 • HP = 24.20 ± 6.33	• Not reported	• Dichotomisation of low and high scores
Bucker et al., 2013	BP = 64 HP = 28	CTQ (28 – item version)	• Total CTQ • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect	• Not reported	• Not reported	• Dichotomisation into absent and high CT levels • High levels: • BP with trauma = 40.6% • HP with trauma = 32.1%
Aas et al., 2012b	SZ = 174 BP = 167	CTQ (28-item version)	• Total CTQ • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect	• Not reported	• Not reported	• Dichotomisation into low and high CT levels • High CT levels: • Physical abuse = 15.6% • Emotional abuse = 34.2% • Sexual abuse = 21.6% • Emotional neglect = 9.3% • Physical neglect =46.4% • Total score - low levels (below median) = 54.19% • Total score - high levels (above median) = 45.07%

Marshall et al., 2016	BP = 233 HP = 90	CTQ (28 – item version)	• Total CTQ • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect	• Total CTQ = 60.30 ± 12.50 (BP) versus 52.00 ± 8.20 (HP) • Physical abuse = 15.60 ± 4.80 (BP) versus 12.80 ± 4.10 (HP) • Emotional abuse = 8.90 ± 4.00 (BP) versus 8.80 ± 3.30 (HP) • Sexual abuse = 10.90 ± 6.70 (BP) versus 7.60 ± 4.10 (HP) • Emotional neglect = 15.60 ± 4.60 (BP) versus 13.50 ± 4.00 (HP) • Physical neglect = 7.70 ± 1.60 (BP) versus 9.10 ± 1.90 (HP)	• Not reported	• Not reported
van Os et al., 2017	PSY = 1119 Siblings of PSY[a] = 1059 HP = 586	CTQ (25-item version)	• Total CTQ • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect	• Not reported	• Not reported	• Continuous variable • Dichotomous variable of absent and existent CT exposure at baseline. • Total scores for existent levels: • PSY = 27.3% • Siblings = 18.6% • HP = 15.4%
Mansueto et al., 2017[b]	PSY = 532	CTQ (25-item version)	• Total CTQ • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect	• Total CTQ = 1.62 (±0.51)	• Not reported	• Dichotomisation into non-severe or severe CT levels • Non-severe CT levels 429 • Severe CT levels = 103

Green et al., 2015	SZ = 617 HP = 659	CAQ (20-item version)	• Total score • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect • Any CAQ exposure • Abuse or neglect	• Not reported for all participants	• Not reported	• Dichotomisation into absent or existent CT levels • Existent CT levels: • Physical abuse = 27.5% (SZ) – 13.6% (HP) • Emotional abuse = 44.7% (SZ) – 20.4% (HP) • Sexual abuse = 7.3% (SZ) – 1.2% (HP) • Emotional neglect = 55.3% (SZ) – 26% (HP) • Physical neglect = 25.3% (SZ) – 17.2% (HP) • Any CAQ exposure = 93.1% (SZ) – 74.5% (HP) • Abuse or neglect = 69.4% (SZ) – 44.2% (HP)
Green et al., 2014	SZ = 617 HP = 659	CAQ (20-item version)	• Total score • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Loss • Family dysfunction • Financial difficulties	• Total CAQ score: • SZ = 6.25 $\pm$ 4.87 • HP = 2.85 $\pm$ 3.19	• Not reported	• Dichotomisation into absent or existent CT levels • Physical abuse = 20.26% (SZ) – 10.32% HP • Emotional abuse = 32.90% (SZ) –15.48% (HP) • Sexual abuse = 5.35% (SZ) – 0.91% (HP) • Emotional neglect = 40.68% (SZ) – 20.91% (HP) • Loss = 40.68% (SZ) – 31.11% (HP) • Family dysfunction=

						66.29% (SZ) – 54.02% (HP) • Financial difficulties = 18.6% (SZ) – 13.05% (HP)
McCabe et al., 2012	SZ = 408 HP = 267	CAQ (20 item version)	• Five factors of stress types • Abusive Parenting • Loss, Poverty and Sexual Abuse • Neglectful Parenting • Dysfunctional Parenting • Sibling Loss	• Not reported	• Not reported	• Dichotomisation into absent or existent CT levels • Abusive Parenting = 63.3% (SZ) – 40.9% (HP) • Loss, Poverty and Sexual Abuse = 45.6% (SZ) – 35.5% (HP) • Neglectful Parenting = 51.0% (SZ) – 23.3% (HP) • Dysfunctional Parenting = 68.9% (SZ) – 34.6% (HP) • Sibling Loss = 5.3% (SZ) – 4.4% (HP)
Ruby et al., 2017	SZ = 28	ETI	• General events • Physical abuse events • Emotional abuse events • Sexual abuse events • Sum of all events • Negative rating of all events	• General events = 4.7 ($\pm$2.8) • Physical abuse events = 2.2 ($\pm$1.8) • Emotional abuse events = 2.7 ($\pm$2.7) • Sexual abuse events = .88 ($\pm$1.8) • Sum of all events = 10.4 ($\pm$6.8)	• Not reported	• Not reported
Li et al., 2017	SZ = 162	CTQ (28-item version)	• Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect	• Not reported	• Not reported	• Physical abuse = 26.5% • Emotional abuse = 21.2% • Sexual abuse = 35.8% • Emotional neglect = 55.8%

						• Physical neglect = 66.5%
Kelly et al., 2016	SZ = 80	CTQ (28-item version)	• Total CTQ • Focus on physical abuse	• Not reported	• Not reported	• Dichotomisation into absent and high CT levels • High CT levels: • Females with PA = 12.5% • Females w/o PA = 17.5% • Males with PA = 13.75% • Males w/o PA = 56.25%
Shannon et al., 2011	SZ = 85	CTQ (28-item version)	• Total CTQ • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect	• Not reported	• Not reported	• Dichotomisation into absent/low versus moderate/high CT levels of total CTQ score: • High CT levels = 45% • High CT levels for different CT events: • Physical abuse = 10.6% • Emotional abuse = 14.1% (PSY) • Sexual abuse = 17.6% • Emotional neglect = 18.8% • Physical neglect =16.4% • High CT levels: • 29.4% high CT levels for one CT event • 15.3% high levels for two or more categories

Schenkel et al., 2005	SZ = 40	Medical charts and interview	• History of childhood abuse or neglect • Physical abuse • Sexual abuse • Neglect	• Low severity of CT events = 12.5% • Moderate severity of CT events = 50% • High severity of CT events = 37.5%	• Not reported	• Dichotomisation into absent or existent CT levels • Any experience of physical abuse, sexual abuse and/or neglect = 45% • Physical abuse = 15% • Sexual abuse = 10% • Neglect and physical abuse = 2.5% • Neglect and sexual abuse = 2.5% • Physical and sexual abuse = 10% • Physical abuse, sexual abuse and neglect = 5% • Moderate frequency of at least 2 events = 62.5% • Severe frequency of at last 2 events = 37.5% • Low severity of CT events = 12.5% • Moderate severity of CT events = 50% • High severity of CT events = 37.5%
Lysaker et al., 2002	SZ = 36	CAQ	• Physical abuse	• 20.0 (± 5.3)	• Not reported	• Not reported

Supplementary Table 2. Childhood trauma assessment and analysis - Patients with established bipolar disorder, schizophrenia, psychosis and healthy participants.

[a] No psychiatric diagnosis
[b] Only baseline data reported
Abbreviations: BD, patients with bipolar disorder; CATS, The Child Abuse and Trauma Scale; CAQ, Childhood Adversity Questionnaire; CTQ, Childhood Trauma Questionnaire; CT, Early-life stress; ETI, Early Trauma Inventory; HP, healthy participants; PSY, patients with psychosis; RFQ, Risky Families Questionnaire; SZ, Patients with schizophrenia.

Study	Participants (Patients / Healthy participants) *N*	Stress questionnaire	Stressful events (Patients / Healthy participants)	Stress severity (Patients / Healthy participants) Mean / SD	Stress frequency (Patients / Healthy participants) Percentage	Combination of CT frequency and severity (Patients / Healthy participants) Percentage, *N*, or Mean / SD
Patients at ultra-high risk of psychosis, patients with first episode of psychosis, patients with established schizophrenia and healthy participants						
Schalinski et al., 2017	PSY = 168 (SZ = 134) HP = 50	MACE	• Physical abuse • Verbal abuse • Non-verbal emotional abuse • Witnessing interparental abuse • Abuse of siblings • Peer-related verbal abuse • Physical bullying • Intra-, extra-familial and peer-related sexual abuse • Emotional neglect • Physical neglect	• PSY = 29.1 (15.4) • HP = 13.7 (8.6)	• Not reported	• Duration in years: • PSY = 6.8 (6.3) • HP = 1.7 (2.8) • Participants with multiplicity: • PSY = 140 (83.3%) • HP = 22 (44%)
Palmier-Claus et al., 2016	UHR = 14 FEP = 20 SZ = 20 HP = 120	CTQ (28-item version)	• Total CTQ • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect	• Total CTQ: • 45.8 $\pm$ 16.2 (UHR) • 39.9 $\pm$ 12.3 (FEP) • 45.1 $\pm$ 15.5 (SZ) • 31.2 $\pm$ 7.5 (HP)	• Not reported	• Not reported
Garcia et al., 2016	FEP = 79 HP = 58	CTQ (28-item version)	• Total CTQ • Physical abuse • Emotional abuse • Sexual abuse • Emotional neglect • Physical neglect	• Not reported	• Not reported	• Not reported

Supplementary Table 3. Childhood trauma and social cognitive function in patients at ultra-high risk of psychosis, patients with first episode of psychosis, patients with established schizophrenia and healthy participants

Abbreviations: CTQ, Childhood Trauma Questionnaire; CT, Early-life stress; HP, healthy participants; MACE Scale, Maltreatment and Abuse Chronology of Exposure.