

World Journal of *Psychiatry*

World J Psychiatr 2021 December 19; 11(12): 1167-1424



EVIDENCE REVIEW

- 1167 Child abuse and psychopathy: Interplay, gender differences and biological correlates
di Giacomo E, Santorelli M, Pessina R, Rucco D, Placenti V, Aliberti F, Colmegna F, Clerici M

REVIEW

- 1177 Polyamines and polyamine-metabolizing enzymes in schizophrenia: Current knowledge and concepts of therapy
Bernstein HG, Keilhoff G, Laube G, Dobrowolny H, Steiner J
- 1191 Nuclear receptors modulate inflammasomes in the pathophysiology and treatment of major depressive disorder
Wang H, Kan WJ, Feng Y, Feng L, Yang Y, Chen P, Xu JJ, Si TM, Zhang L, Wang G, Du J
- 1206 Review of barriers and interventions to promote treatment engagement for pediatric attention deficit hyperactivity disorder care
Baweja R, Soutullo CA, Waxmonsky JG

MINIREVIEWS

- 1228 Newer antipsychotics: Brexpiprazole, cariprazine, and lumateperone: A pledge or another unkept promise?
Barman R, Majumder P, Doifode T, Kablinger A
- 1239 E-technology social support programs for autistic children: Can they work?
Wall NG, Smith O, Campbell LE, Loughland C, Wallis M, Henskens F, Schall U
- 1247 Factors related to compliance with the COVID-19 health regulations among young people
Jaureguizar J, Redondo I, Galende N, Ozamiz N
- 1259 Mechanism of olfactory deficit in neurotrauma and its related affective distress: A narrative review
Logan M, Kapoor S, Peterson L, Oliveira M, Han DY
- 1267 Physical activity and mental well-being during COVID-19 pandemic
Abdelbasset WK, Nambi G, Eid MM, Elkholi SM

ORIGINAL ARTICLE**Basic Study**

- 1274 Differential aberrant connectivity of precuneus and anterior insula may underpin the diagnosis of schizophrenia and mood disorders
Aryutova K, Paunova R, Kandilarova S, Stoyanova K, Maes MH, Stoyanov D

- 1288** Validity and reliability of the Dutch version of the displaced aggression questionnaire

Smeijers D, Denson TF, Bulten EH, Brazil IA

Case Control Study

- 1301** BDNF methylation and mRNA expression in brain and blood of completed suicides in Slovenia

Ropret S, Kouter K, Zupanc T, Videtic Paska A

- 1314** Developing a nomogram for predicting the depression of senior citizens living alone while focusing on perceived social support

Byeon H

Retrospective Study

- 1328** Affect regulation in psychoanalytic treatments of patients with a borderline personality disorder-psychoanalysis and psychodynamic psychotherapy-a comparison

Steinmair D, Wong G, Frantal S, Rohm C, Löffler-Stastka H

Observational Study

- 1346** Impact of lockdown relaxation and implementation of the face-covering policy on mental health: A United Kingdom COVID-19 study

Rathod S, Pallikadavath S, Graves E, Rahman MM, Brooks A, Soomro MG, Rathod P, Phiri P

SYSTEMATIC REVIEWS

- 1366** Autism spectrum disorder and personality disorders: Comorbidity and differential diagnosis

Rinaldi C, Attanasio M, Valenti M, Mazza M, Keller R

- 1387** Psychological impact of the COVID-19 pandemic on individuals with serious mental disorders: A systematic review of the literature

Fleischmann E, Dalkner N, Fellendorf FT, Reininghaus EZ

- 1407** Psychoeducation in bipolar disorder: A systematic review

Rabelo JL, Cruz BF, Ferreira JDR, Viana BM, Barbosa IG

ABOUT COVER

Editorial Board Member of *World Journal of Psychiatry*, Subho Chakrabarti, MD, FRCP, FAMS, Professor, Department of Psychiatry, Postgraduate Institute of Medical Education and Research, Chandigarh 16002, India. chakrabarti.subho@pgimer.edu.in

AIMS AND SCOPE

The primary aim of *World Journal of Psychiatry* (WJP, *World J Psychiatr*) is to provide scholars and readers from various fields of psychiatry with a platform to publish high-quality basic and clinical research articles and communicate their research findings online.

WJP mainly publishes articles reporting research results and findings obtained in the field of psychiatry and covering a wide range of topics including adolescent psychiatry, biological psychiatry, child psychiatry, community psychiatry, ethnopsychology, psychoanalysis, psychosomatic medicine, etc.

INDEXING/ABSTRACTING

The WJP is now abstracted and indexed in Science Citation Index Expanded (SCIE, also known as SciSearch®), Current Contents/Clinical Medicine, Journal Citation Reports/Science Edition, PubMed, and PubMed Central. The 2021 edition of Journal Citation Reports® cites the 2020 impact factor (IF) for WJP as 4.571; IF without journal self cites: 4.429; 5-year IF: 7.697; Journal Citation Indicator: 0.73; Ranking: 46 among 156 journals in psychiatry; and Quartile category: Q2.

RESPONSIBLE EDITORS FOR THIS ISSUE

Production Editor: Xu Guo; Production Department Director: Yu-Jie Ma; Editorial Office Director: Jia-Ping Yan.

NAME OF JOURNAL

World Journal of Psychiatry

ISSN

ISSN 2220-3206 (online)

LAUNCH DATE

December 31, 2011

FREQUENCY

Monthly

EDITORS-IN-CHIEF

Rajesh R Tampi

EDITORIAL BOARD MEMBERS

<https://www.wjgnet.com/2220-3206/editorialboard.htm>

PUBLICATION DATE

December 19, 2021

COPYRIGHT

© 2021 Baishideng Publishing Group Inc

INSTRUCTIONS TO AUTHORS

<https://www.wjgnet.com/bpg/gerinfo/204>

GUIDELINES FOR ETHICS DOCUMENTS

<https://www.wjgnet.com/bpg/gerinfo/287>

GUIDELINES FOR NON-NATIVE SPEAKERS OF ENGLISH

<https://www.wjgnet.com/bpg/gerinfo/240>

PUBLICATION ETHICS

<https://www.wjgnet.com/bpg/gerinfo/288>

PUBLICATION MISCONDUCT

<https://www.wjgnet.com/bpg/gerinfo/208>

ARTICLE PROCESSING CHARGE

<https://www.wjgnet.com/bpg/gerinfo/242>

STEPS FOR SUBMITTING MANUSCRIPTS

<https://www.wjgnet.com/bpg/gerinfo/239>

ONLINE SUBMISSION

<https://www.f6publishing.com>



Child abuse and psychopathy: Interplay, gender differences and biological correlates

Ester di Giacomo, Mario Santorelli, Rodolfo Pessina, Daniele Rucco, Valeria Placenti, Francesca Aliberti, Fabrizia Colmegna, Massimo Clerici

ORCID number: Ester di Giacomo 0000-0001-5433-1268; Mario Santorelli 0000-0002-3637-2354; Rodolfo Pessina 0000-0001-5561-2037; Daniele Rucco 0000-0002-9922-9774; Valeria Placenti 0000-0001-7847-6760; Francesca Aliberti 0000-0002-6305-0406; Fabrizia Colmegna 0000-0002-4984-9908; Massimo Clerici 0000-0001-8769-6474.

Author contributions: Santorelli M and di Giacomo E wrote this manuscript; Rucco D, Colmegna C, Pessina R, Placenti V, Aliberti F and Clerici M collected data; All authors analyzed papers and approved the final version of the manuscript.

Conflict-of-interest statement: No conflict of interest to disclose.

Country/Territory of origin: Italy

Specialty type: Psychiatry

Provenance and peer review: Invited article; Externally peer reviewed.

Peer-review model: Single blind

Peer-review report's scientific quality classification

Grade A (Excellent): 0
Grade B (Very good): 0
Grade C (Good): 0
Grade D (Fair): 0
Grade E (Poor): 0

Ester di Giacomo, Massimo Clerici, School of Medicine and Surgery, University of Milano Bicocca, Monza 20900, Italy

Ester di Giacomo, Fabrizia Colmegna, Massimo Clerici, Department of Psychiatry, ASST Monza, Monza 20090, Italy

Mario Santorelli, Rodolfo Pessina, Francesca Aliberti, School of Medicine and Surgery, Psychiatric Residency Training Program, University of Milano Bicocca, Monza 20900, Italy

Daniele Rucco, Department of Psychology, Linguistics and Cognitive Neuroscience, University of Milano Bicocca, Monza 20900, Italy

Valeria Placenti, Department of Psychiatric Residency Training Program, University of Genova, Genova 16126, Italy

Massimo Clerici, Department of Medicine and Surgery, University of Milano-Bicocca, Monza 20900, Italy

Corresponding author: Ester di Giacomo, MD, PhD, Academic Research, School of Medicine and Surgery, University of Milano Bicocca, Via Cadore 48, Monza 20900, Italy.
ester.digiacomo@unimib.it

Abstract

Child abuse is an important source of mental and physical adverse consequences for victims, their family, and their community. The impact of violence during childhood on the development of the victim is a very sensitive theme. Other than internalizing symptoms, it is interesting to analyze the possibility that a victim may assume the role of persecutor. With this aim, we evaluate Literature and examine the interplay among different types of child abuse (emotional neglect, emotional abuse, physical neglect, physical abuse and sexual abuse) and the development of psychopathy. We consider the role of post-traumatic stress disorder and that of personal environment as potential mediators between abuse and psychopathy. Furthermore, an in-depth analysis on possible differences due to the victim's gender is performed. Finally, analysis focused on genetic variants, such as the polymorphism of 5HTT and MAO-A, or a biological alteration, like the difference in daily cortisol levels that could be related to the development of psychopathy after a trauma.

Open-Access: This article is an open-access article that was selected by an in-house editor and fully peer-reviewed by external reviewers. It is distributed in accordance with the Creative Commons Attribution NonCommercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>

Received: February 25, 2021

Peer-review started: February 25, 2021

First decision: May 13, 2021

Revised: May 27, 2021

Accepted: November 18, 2021

Article in press: November 18, 2021

Published online: December 19, 2021

P-Reviewer: Conde D

S-Editor: Wang LL

L-Editor: Filipodia

P-Editor: Wang LL



Key Words: Child abuse; Sexual abuse; Physical abuse; Psychopathy; Neglect; Intergenerational transmission

©The Author(s) 2021. Published by Baishideng Publishing Group Inc. All rights reserved.

Core Tip: Childhood trauma and psychopathy are strictly related; emotional abuse, emotional neglect and physical abuse show stronger association with the development of psychopathy. Even if sexual abuse is more frequent in females, most researches did not find a significant correlation between psychopathy and sexual abuse in both genders. Furthermore, trauma is the hallmark of secondary psychopathy causing, in a fragile mind, the uprising of mental illness.

Citation: di Giacomo E, Santorelli M, Pessina R, Rucco D, Placenti V, Aliberti F, Colmegna F, Clerici M. Child abuse and psychopathy: Interplay, gender differences and biological correlates. *World J Psychiatr* 2021; 11(12): 1167-1176

URL: <https://www.wjgnet.com/2220-3206/full/v11/i12/1167.htm>

DOI: <https://dx.doi.org/10.5498/wjp.v11.i12.1167>

INTRODUCTION

Child abuse is a strong predictor of short and long term physical and mental illness. Five types of maltreatment are commonly recognized: Sexual, physical and emotional abuses (EAs) and physical and emotional neglect. Child sexual abuse is a serious concern with worldwide prevalence rates between 8%-31% for girls and 3%-17% for boys[1]. Every year, about 4%-16% of children are physically abused and one in ten is neglected or psychologically abused. During childhood, between 5% and 10% of girls and up to 5% of boys are exposed to penetrative sexual abuse, and up to three times higher numbers of children are exposed to any kind of sexual abuse[2].

Many research findings support the hypothesis that exposure to early life stress in the form of child abuse and/or neglect is associated with a huge increased vulnerability to major psychiatric and other medical disorders[3]. Research shows that children who have been physically or sexually abused have a greater risk of depression, suicidality, post-traumatic stress disorder, as well as antisocial personality disorder, psychopathic traits or psychopathy. Psychopathy is characterized by distinct interpersonal and affective traits (e.g., manipulateness, callousness), as well as a disinhibited, reckless lifestyle (e.g., impulsivity, irresponsibility)[4].

The aim of the present narrative review is to evaluate the interplay between child abuse and psychopathy with special attention to gender differences and possible biological causes.

PRIMARY AND SECONDARY PSYCHOPATHY

An original theory differentiates the psychopathy in two subcategories: Primary psychopathy that have innate biological origins and could be characterized by low levels of anxiety and secondary psychopathy developed in response to adverse environmental experiences (Table 1). Primary psychopaths are incapable of emotions such as empathy and guilt, and so appear callous, cold, and lacking anxiety. In contrast, secondary psychopaths have a relatively normal capacity for emotional experience. Due to environmental stressors and trauma, however, they experience an excess of negative emotions and so exhibit high levels of anxiety and emotional distress, hostility, aggression, and impulsive behavior. Those differences would mirror the characteristics of the Psychopathy Checklist-Revised - PCL-R Factor 1 (F1; interpersonal and affective traits) and Factor 2 (F2; impulsive, antisocial, and chronically unstable lifestyle).

Dargis *et al*[5] studied the correlation between primary and secondary psychopathy (PCL:R) and trauma (Childhood Trauma Questionnaire-CTQ) in a sample of 110 psychopaths (PCL-R > 30) vs 112 inmates (PCL-R < 30). The psychopaths were split in 2 subgroups: Low negative affect (LN, $n = 72$) and high negative affect (HN, $n = 38$).

Table 1 Primary and secondary psychopathy

Ref.	Sample (women, %)	Tests	Significant association
Borja and Ostrosky[7], 2013	194 (0)	ETI - PCL-R	EA, SA (HP <i>vs</i> LP) and PA (HP, MP <i>vs</i> LP)
Craparo <i>et al</i> [13], 2013	22 (0)	TEC - PCL-R	Total score (early exposure)
Dargis <i>et al</i> [9], 2017	183 (0)	CTQ - PCL-R	Total score, EA, EN, PA and PN
Dargis <i>et al</i> [5], 2018	222 (0)	CTQ - PCL-R	Total score, EA, EN, PA, PN (HN); PA and PN (LH)
Gobin <i>et al</i> [11], 2015	88 (57.95)	CTQ - PPI	PA
Kolla <i>et al</i> [10], 2013	45 (0)	ETI - PCL-R	PA
Ometto <i>et al</i> [8], 2016	107 (43.92)	CTQ - PCL:YV	Total score, EN and PA
Poythress <i>et al</i> [15], 2006	615 (0)	CATS - PPI	Total score
Schimmenti <i>et al</i> [6], 2015	78 (0)	TEC - PCL-R	EA and PA (only to factor 2)
Schraft <i>et al</i> [14], 2013	170 (15.64)	CTQ - PCL:YV	Total score, EA, EN, PN
Woodfield <i>et al</i> [12], 2016	101 (0)	LEC-5 - SRP-SF	Total score

HN: High negative affect; LN: Low negative affect; LP: Low psychopathy levels; MP: Medium psychopathy level; HP: High psychopathy level; PA: Physical abuse; EN: Emotional neglect.

The HN subgroup scored significantly higher at the CTQ total score than the LN subgroup. In particular, the HN subgroup scored significantly higher in EA, PA, EN; while they did not differ for PN and SA. HN psychopaths scored higher than the other inmates at the CTQ total score and in all types of abuse except for SA. LN psychopaths significantly suffered more PA and PN than other inmates. The hallmark of the difference between secondary psychopathy (HN) and primary psychopathy (LN) was emotional neglect and EA that were significantly higher in HN compared to LN offenders suggesting that emotional maltreatment has specific associations with that subtype of psychopathy.

Schimmenti *et al*[6] evaluated the link between child abuse (CA) (measured with the Traumatic Experiences Checklist-TEC) and psychopathy (measured with Psychopathy Checklist-Revised - PCL-R) in 78 male prisoners. The EA was significantly related to the PCL-R total score, factor 1 (interpersonal/affective facets) and factor 2 (lifestyle/antisocial facets); while Physical abuse (PA) was linked only to factor 2. Furthermore PCL-R total scores were higher when EA occurred in childhood. As a consequence, the authors hypothesized a key role of EA in childhood; in fact, it was the best predictor of psychopathy scores and could distort the affective development of children, as implied in the construct of malignant narcissism, which has been theoretically proposed as a crucial dimension for understanding the inflated self-representation and lack of empathy among criminals.

Similarly, Borja *et al*[7] evaluated the relationship between several early traumatic events and psychopathy analyzing 194 male inmates with the PCL-R and the Early Trauma Inventory (ETI). They divided inmates in 3 subgroups: Those with low psychopathic levels (LP, $n = 96$, scoring 0-19 point at the PCL-R); inmates with medium psychopathy level (MP, $n = 59$, scoring from 20 to 29) and inmates with a high level of psychopathy (HP, $n = 44$, scores > 30). EA and SA were significantly higher in HP compared to LP group. Moreover PA was higher in MP *vs* LP and HP *vs* LP. After a regression analysis they found that early-life traumatic events and EA strongly influenced the PCL-R total score. Additionally HP and MP were exposed to more hostile environment than LP. Ometto and colleagues[8] underlined the relationship between abuse, detected through the CTQ, and the development of psychopathy (Psychopathy Checklist:Youth Version; PCL:YV) in 107 teenagers. The PCL:YV total score was positively correlated to the abuse and inversely correlated to the frequency of general social skill (measured with The Multidimensional Personality Questionnaire-Brief Form [MPQ-BF]). In the same study, Emotional neglect (EN) was positively related to the PCL:YV total factor and interpersonal, affective and lifestyle factors. PA was positively correlated to the PCL:YV total factor and affective, lifestyle and antisocial factors of the PCL:YV. Emotional and sexual abuse were not related to psychopathy. At a Multiple linear regression for the association of distinct types of maltreatment (CTQ) and social skills (Social Skills Inventory for Adolescents; SSIA) with psychopathic features (PCL: YV), EN was the only abuse related to psychopathy,

especially with the interpersonal Factor.

Dargis *et al*[9] examined psychopathy (PCL:R) and trauma (CTQ) in 183 inmates and discovered a significant correlation between the CTQ total score and Psychopathy, in particular PA, PN, EN and EA were significantly related to the PCL:R but no significant relation with SA was found. Factor 2 (lifestyle and antisocial features load) was related to the CTQ total score while EA, EN, PA and Factor 4 (antisocial features) were related to PA and CTQ total score; no link between factor 1 and trauma was detected. Dargis and colleagues evaluated Antisocial Personality Disorder (ASPD), trauma and Conduct Disorder (CD): PA was the only form of trauma related to ASPD while CD was related exclusively to SA. With the same aim, Kolla *et al*[10] evaluated the link among ASPD, psychopathy (PCL-R) and trauma in 45 subjects divided in 3 subgroups: 10 inmates with ASPD and psychopathy (PCL-R > 25), 15 ASPD without psychopathy (PCL-R < 25) and 15 non offenders. The first group reported greater physical abuse during childhood but no more sexual or EAs than those without psychopathy.

THE IMPACT OF POST TRAUMATIC STRESS DISORDER

Another important variable that deserves consideration is the role of PTSD in the interplay between trauma and psychopathy; the work of Gobin *et al*[11] analyzed this variable in 88 inmates (51 females and 37 males) evaluating ASPD (Structured Clinical Interview for DSM Axis II Personality Disorders; SCID-II), trauma (CTQ), psychopathy (Psychopathic personality inventory; PPI) and PTSD (PTSD checklist civilian version). Physical and crime-related trauma were associated with ASPD, while sexual abuse was not. Victims of PA were 5.04 times more likely to be diagnosed with ASPD than those without history of PA. Likewise, inmates with history of crime related trauma were 2.92 more likely to be diagnosed with ASPD than those without. PA was confirmed as the only type of trauma related to psychopathy, whereas the severity of PTSD symptoms was not related to the PPI or ASPD. The role of PTSD was also examined by Woodfield *et al*[12] They underlined a relation between psychopathy (Self-report psychopathy scale-short Form; SRP-SF), trauma (The life events checklist; LEC-5) and PTSD (The Posttraumatic Stress Disorder-checklist Version 5). The total LEC-5 score was significantly related to both primary and secondary factors, but the secondary had a stronger correlation with trauma. More importantly, only the secondary facet of psychopathy had a correlation with PTSD, showing a key role in moderating the effect of trauma on the development of PTSD. Specifically, trauma exposure was positively associated with increased PTSD symptoms in individuals with low levels of secondary psychopathy, and negatively associated with PTSD symptoms with those with high levels of secondary psychopathy. These findings contribute to the understanding of the nature of the relationships between PTSD, psychopathic facets, and trauma exposure, as the association between trauma exposure and PTSD is explained by secondary but not primary psychopathic traits.

Craparo *et al*[13] examined the role of age in mediating the effect of trauma on the development of psychopathy. They measured traumatic experiences (TEC) and traits of psychopathy (PCL-R) in 22 male subjects and suggested that an early exposure to relational trauma in childhood can play a relevant role in the development of more severe psychopathic traits. Indeed, subjects with higher PCL-R score experienced relational traumatic events earlier in life compared to the rest of participants. There was also a significant negative association between age at first relational trauma and psychopathy scores.

THE ROLE OF COMMUNITY VIOLENCE

Another variable that needs to be taken in consideration is the role of violence in the community in the relationship between trauma and psychopathy.

Schraft *et al*[14] highlighted the effect of community violence (Community Experience Questionnaire; CEQ) on trauma (CTQ) and psychopathy (PCL:YV) in their work on 170 detained adolescents (147 males, 23 females). The CTQ total score was positively correlated to the PCL:YV total score and scores of the PCL:YV behavioral and antisocial factors. The CEQ total score positively correlated to the PCL:YV total scores, as well as to scores of interpersonal, behavioral, and antisocial factors. EA, PN and EN were associated with higher levels of psychopathic traits. Higher levels of traumatic exposure within home and community were associated with higher levels of

psychopathic characteristics. Higher CEQ scores were related to higher scores in behavioral and antisocial facets of psychopathy.

PSYCHOPATHY, TRAUMA AND DISSOCIATION

Poythress *et al*[15] evaluated the role of Dissociative experiences (Dissociative experiences scale; DES) in the link between trauma (Child abuse and Trauma Scale; CATS) and psychopathy in 615 male inmates. Psychopathy, abuse, and dissociation scales were weakly but significantly associated one with another. Tests of correlation revealed that the lifestyle features of psychopathy were significantly more linked to abuse total scores than affective or interpersonal features. Furthermore, lifestyle feature of psychopathy was significantly more correlated to the DES total score than interpersonal features, but not to affective ones. Abuse was not related to interpersonal and affective features of psychopathy. In contrast, abuse exerted a direct effect on impulsive and irresponsible lifestyle, and that relationship was not mediated by dissociative experiences. Their research demonstrated that child abuse is positively linked, even if weakly, to psychopathy and moderately to the impulsive and irresponsible lifestyle of psychopaths without a significant mediation of dissociative symptoms.

BIOLOGICAL CORRELATES

Different studies analyzed the role of biological alterations that may link trauma and psychopathy (Table 2). Cima and colleagues[16] evaluated variations of salivary cortisol in 47 (24 psychopath and 21 non psychopath) inmates tested with the PPI scale for psychopathy, the CTQ for childhood trauma, compared to the group of non-psychopaths -control group (27 males). The salivary cortisol was analyzed four times a day at 8 am, 11am, 2pm and 4pm. Criminals, non-psychopathic as well as psychopathic, reported significantly more traumatic childhood experiences than the control group and the non-psychopathic criminals did not differ from psychopathic criminals except for PN, which difference was significant. Trauma and salivary cortisol were not related in the whole sample.

Nevertheless, they found a reduction on the Daily Average Cortisol (DAC) in psychopaths that was also significantly related to PA. Besides, the cortisol area under the curve (AUC) in that group was related to EA and EN, the diurnal cortisol slope was related to PN with a significant relation between the PPI total score and DAC. Traumatic experiences, in that group, was also positively related to impulsive nonplanfullness (fourth subscale of the PPI) and external blame attribution factor on the PPI, while there was a negative association between traumatic childhood experiences, cold-heartedness and stress immunity. The crucial finding of this study was the evidence of hypoarousal in psychopaths with a reduction of the diurnal cortisol compared to non-psychopaths. This finding fits with the notion that non-psychopathic offenders are more reactive, emotional delinquents, while psychopathic offenders are more instrumental and cold-blooded.

Two studies analyzed monoamine oxidase-A (MAO-A) and 5-hydroxyindoleacetic acid transporter (5HTT) alterations in connection to psychopathy and trauma. Sadeh *et al*[17] analyzed 237 inmates with the CTQ and the PCL:SV, and their genetic variations of 5HTT and MAO-A were detected from saliva samples. The PCL:SV factor 1 (interpersonal/affective facets) was higher in 5HTT long/Long allele *vs* short/short, but it was not found an etiological explanation linking trauma, psychopathy and genetic alterations. The PCL:SV factor 2 (lifestyle/antisocial facets) was higher in people with the MAO-A variant with low activity *vs* high activity moreover 5HTT long/Long have higher PCL:SV factor 2 than short/short. In particular MAO-A genotype was most consistently associated with the impulsive and irresponsible traits of the Lifestyle factor. Interestingly, no correlation was found between genetic alteration and the trauma-psychopathy link. Likewise, in the work of Hollebarch *et al* [18], which evaluated trauma (CTQ), psychopathy (Self-Reported Psychopathy scale) and the MAO-A uVNTR genotype in a sample of 2796 people, MAO-A uVNTR genotype was significantly associated to general psychopathy in women, meaning that women with the MAOA-L genotype had slightly higher levels of psychopathy compared to their MAOA-H counterparts, but they did not find the same in men. Childhood trauma was associated with psychopathic traits in adults, both in men and women. They did not find any interaction between MAOA uVNTR genotype and any

Table 2 Different studies analyzed the role of biological alterations that may link trauma and psychopathy

Ref.	Sample (women, %)	Tests	Significant association	Biological analysis
Cima <i>et al</i> [16], 2008	47 (0)	CTQ - PPI	PN (Psychopath <i>vs</i> inmates not psychopath)	DAC (related to PN) reduction in psychopath; AUC related to EA, EN
Hollerbach <i>et al</i> [18], 2018	2796 (45.24)	CTQ- SRPS	Total score	Total score in women (MAOA-L); MAOA-L in women related to EA, EN and PN
Sadeh <i>et al</i> [17], 2013	237 (0)	CTQ- PCL:SV	NS	F1 (5HTT long/long <i>vs</i> 5HTT short/short; F2 (MAOA-L <i>vs</i> MAOA-H)

DAC: Daily average cortisol; AUC: Cortisol area under curve; F1: Factor 1 of PCL:SV; F2: Factor 2 of PCL:SV; MAOA-L: MAO-A low activity; MAOA-H: MAO-A high activity.

traumatic factor on psychopathic traits. Their results suggest that psychopathy in general, and social deviance in particular, were associated with childhood trauma in men and women, and that psychopathic traits are subject to variation of the MAOA uVNTR genotype in women. Hollerbach and colleagues[18] discovered that the “childhood trauma” factor was not influenced by a variation of MAO-A in men, while women with MAOA-H genotype showed a slightly higher scores of PN, EN and EA. In general, no significant link that could explain the influence of trauma on psychopathy has been discovered yet. We could explain this result with the primary and secondary psychopathy theory, according to which the primary psychopathy has a genetic cause that determines the onset of the illness whereas the secondary psychopathy has traumatic and problematic environmental reasons as etiological causes. Further genetic study might explain the role of the genetic alterations that support the onset of psychopathy.

GENDER DIFFERENCES IN THE RELATIONSHIP BETWEEN TRAUMA AND PSYCHOPATHY

Watts *et al*[19] analyzed trauma (CTQ) and psychopathy (Levenson self-report psychopathy scale) in a non-forensic sample of 1169 subjects (73% female) (Table 3). They underlined two gender differences: the first one was the relation between boldness and childhood neglect that was negative or small to moderate in males but almost absent in females. The second was the relation between disinhibition, meanness and childhood maltreatment that was stronger for males than females. In their sample, men suffered more child abuse than women with the exception of sexual and EAs that were more frequent in females.

Thomson and colleagues[20] evaluated the role of sex differences in the association between the 4-facet model of psychopathy (PCL-SV) (interpersonal, affective, lifestyle, antisocial) and aggression (physical, verbal, and indirect), and LPA (Lifetime Physical Abuse) in a sample of 369 males and 204 females. The relation between physical aggression and affective facet of psychopathy was significant in both genders. High affective traits predicted physical aggression in women with a history of physical abuse but not in women without it. Instead, physical aggression was predicted by low affective traits in men with a history of physical abuse while lower levels of physical aggression were associated with low affective traits in men without a history of physical abuse. Moreover, verbal aggression was significantly related to the antisocial factor of psychopathy in women. Furthermore, high antisocial traits predicted verbal aggression exclusively in men who suffered from physical abuse.

Gender differences were also analyzed by Sevecke *et al*[21]. They studied 170 male and 171 female adolescent detainees using the CTQ, the PCL-YV and the Dimensional Assessment of Personality Pathology Basic Questionnaire (DAPP-BQ) for personality assessment. They found that gender was a strong predictor of the PCL:YV total score and all four psychopathy dimensions; incarcerated male adolescents had a significantly higher PCL:YV total score as well as all four psychopathy dimensions than incarcerated female adolescents. The PA was related to the antisocial facet of the PCL-YV in both males and females and it was also related to the interpersonal facet in males. No relation was found between SA and psychopathy in both genders. Interestingly, the subjects who did not suffer from PA had a stronger association

Table 3 Trauma and psychopathy in a non-forensic sample of 1169 subjects

Ref.	Sample (women, %)	Tests	Significant association in men	Significant association in women
Blonigen <i>et al</i> [25], 2012	226 (100)	PTE-PCL-R	/	Total score (AF)
Farina <i>et al</i> [24], 2018	976(19.98); P:253 (45); M:723 (13)	MAYSI-2+ CTQ- YPI +PPI-SF	PA, EA	PA, EA
Hicks <i>et al</i> [26], 2011	140 (100); 31 Pr, 39 Sc	I-PCL-R	/	PA (Sc); SA (Pr ¹⁹)
Krischer <i>et al</i> [23], 2008	283 (47.43)	CTQ- PCL:YV	PA (total score, AFC and AF); EA (AF)	EN (related with AF)
Lansing <i>et al</i> [22], 2018	107 (52.23)	CTQ- YPI	NS	EA
Sevecke <i>et al</i> [21], 2016	341(50.14)	CTQ - PCL:YV	PA (related to AF and IF)	PA (related to AF)
Thomson <i>et al</i> [20], 2019	573 (35.60)	LPA + AQ - PCL-SV	PAG (affective facet of psychopathy); LAT related to PAG in history of PA	PAG (related to AF); HAT related to PAG; in history of PA; VA ⁴ (related to ANF ⁵)
Watts <i>et al</i> [19], 2017	1169 (73)	CTQ - LPS	Child abuse (more frequent in male)	EA, SA (more frequent in female)

LPS: Levenson self-report psychopathy scale; HAT: High affective trait; PAG: Physical aggression; VA: Verbal aggression; ANF: Antisocial factor of psychopathy; LPA: Lifetime physical abuse; AQ: Aggression questionnaire; LAT: Low affective trait; AF: Antisocial factor of psychopathy; IF: Interpersonal factor of psychopathy; YPI: Youth Psychopathic Trait Inventory; AFC: Affective factor of psychopathy; MAYSI-2: Youth Screening Instrument Version 2 Traumatic Experiences Scale; PPI-SF: Psychopathic Personality Inventory-Short Form; P: Pennsylvania; M: Missouri; PTE: Potentially traumatic events; I: Interview, interview, prison file, and responses on the life events checklist; Pr: Primary psychopath; Sc: Secondary psychopath.

between emotional dysregulation and psychopathy than those who reported PA. Opposite to the study of Sveiche *et al* (no reference), Lansing *et al*[22] did not find any significant difference on the psychopathy scale in males compared to females. Women had higher frequencies of emotional and sexual abuse than men. In particular EA was the most frequent abuse for EOPD (Early onset persistent delinquent) girls while PA was the most common abuse among EOPD boys. Nearly half of the girls in their sample suffered from SA which was infrequently reported by boys. A significant correlation between psychopathy and abuse was documented only in women and it resulted particularly strong with EA. Lansing and colleagues supported a lack of significant relation between psychopathy and SA in men, and between PA and psychopathy in women. Kricher and colleagues[23] examined 185 adolescent inmates *vs* 98 students (control group) and discovered that abuse was more frequent among inmates than in the control group; women, in particular, reported significantly more emotional, sexual and physical abuses than men. Contrasting with previous studies, neither the PCL: YV total score, or any of its four factors significantly differed between abused and non-abused women except for the Factor 4 (antisocial psychopathy) that significantly correlated to Emotional Neglect in delinquent girls. Instead, boys that suffered PA had higher PCL-YV total scores as well as higher Affective and Antisocial Factors. Furthermore, they showed poorer Anger Control, more Irresponsibility and more Serious Criminal Behavior. Likewise, boys who reported EA were also characterized by significantly higher scores in the Antisocial Factor of the PCL-YV. Authors discovered a significant correlation between the Affective Factor 2 and Physical Abuse and between the Interpersonal Factor 1 of the PCL-YV and Emotional Neglect in male inmates. In contrast with Kricher *et al*[24], Farina and colleagues found a significant relation between trauma and psychopathy in both males and females. Their sample was recruited in 2 different penitentiaries: 253 inmates from Pennsylvania and 723 in Missouri, tested with the YPI and PPI-SF scale for psychopathy and the CTQ for trauma. In the Pennsylvania sample they found significantly more SA and EA in females than in males. Psychopathy was associated with physical and EAs in both male and female juvenile offenders with stronger association in girls. No correlation was found between SA and psychopathy in both genders. Another important variable they evaluated was the impact of PTSD in the relation between trauma and psychopathy in males and females. Blonigen *et al*[25] considered a sample of inmate women (26 of whom had a PCL-R > 30). Interpersonal and affective facets of psychopathy were unrelated to Potentially traumatic events (PET) or PTSD. Instead, they found a significant relation among antisocial facet and PET; furthermore, antisocial facet was uniquely associated with PTSD too. The lifestyle facet was prefer-

entially linked to abuse in adulthood and antisocial facet to abuse in childhood. Moreover, both PTE and PTSD were related to the factor 2 of psychopathy, known as the externalizing spectrum of psychopathy. The theory of primary and secondary psychopathy was also investigated in the study of Hicks *et al*[26] They evaluated psychopathy (PCL-R) with a different cut off (25), splitting the sample in 2 groups: 70 psychopaths and 70 controls. Out of 70 psychopaths, 31 were primary and 39 were secondary psychopaths. The secondary psychopaths had personality traits of negative emotionality and low behavioral constraint, more substance use disorder, more violent behavior and more mental health problems including symptoms of post-traumatic stress disorder and suicide attempts than primary psychopaths. The secondary psychopaths suffered more PA than controls prisoners or primary psychopaths. Instead, primary psychopaths experienced significantly more SA than controls. Moreover, secondary psychopaths reported significantly more PTSD symptoms, history of mental health treatments and suicidal attempts than control or primary psychopaths. An interesting finding was that primary psychopaths had lower rates of suicide attempts, though those rates did not differ significantly from that of control prisoners.

DISCUSSION

Child abuse is a serious public concern with adverse short and long term consequences. The aim of the present narrative review is the identification of the development of psychopathic traits in victims, with a special attention to gender differences and biological reasons.

Primary psychopaths, who are those characterized by a low level of anxiety and lack of emotions and sense of guilt, suffer less emotional maltreatments than secondary psychopaths, thus confirming the development of that subtype of psychopathy (secondary) in response to adverse experiences. In accordance, EA and neglect are related to affective facet with higher level of psychopathy at the PCL-R if EA occurs during childhood.

The severity of psychopathy is also linked to the moment of exposure to relational trauma with more serious traits in case of early exposure during childhood. Traumatic exposure to domestic violence or violence in the community is linked to higher degrees of psychopathy. Dissociative symptoms as well as post-traumatic stress disorder demonstrate weak association in the development of psychopathy after a childhood trauma. Similarly, biological correlates that could justify the development of psychopathy in response to traumatic experiences have not been demonstrated yet, even if women show a variation in the MAOA uVNTR genotype might be associated with psychopathic traits in victims of childhood trauma. Generally speaking, men show stronger psychopathic traits at the PCL-R and all psychopathic dimensions. A strong gender-oriented difference among several abuses and the development of psychopathy has not been highlighted yet. Sexual abuse has not been linked to higher levels of psychopathy, but it is the only type of abuse that shows higher frequency in primary psychopaths. This evidence is controversial because the severe adverse consequences of sexual abuse are well documented. It is feasible that sexual abuse might be less reported or disclosed, especially by men, due to stigmatization often linked to this type of abuse.

Although some kinds of abuse are associated with increased risk of developing psychopathy, with gender-oriented differences, the lack of biological explanations still limit knowledge on primary psychopathy.

CONCLUSION

Our work highlights a significant relation between trauma and psychopathy: EA, emotional neglect and physical abuse are the most frequent types of abuse related to psychopathy in males and females. Sexual abuse was the only kind of abuse that did not show a significant relation with psychopathy in most studies that we analyzed even if it was more frequent in women than men. A biological background, able to promote the onset of psychopathy is plausible and should be further investigated. Trauma is the key etiological factor of secondary psychopathy.

The most frequent limitations we detected were evaluations with self-reported scales since psychopaths have a high inclination to lie. Moreover, almost every study investigates inmates, a population with a more frequent history of trauma that could

biased the impact of trauma on psychopathy.

REFERENCES

- 1 **Barth J**, Bermetz L, Heim E, Trelle S, Tonia T. The current prevalence of child sexual abuse worldwide: a systematic review and meta-analysis. *Int J Public Health* 2013; **58**: 469-483 [PMID: 23178922 DOI: 10.1007/s00038-012-0426-1]
- 2 **Gilbert R**, Widom CS, Browne K, Fergusson D, Webb E, Janson S. Burden and consequences of child maltreatment in high-income countries. *Lancet* 2009; **373**: 68-81 [PMID: 19056114 DOI: 10.1016/S0140-6736(08)61706-7]
- 3 **Nemeroff CB**. Paradise Lost: The Neurobiological and Clinical Consequences of Child Abuse and Neglect. *Neuron* 2016; **89**: 892-909 [PMID: 26938439 DOI: 10.1016/j.neuron.2016.01.019]
- 4 **Jewkes RK**, Dunkle K, Nduna M, Jama PN, Puren A. Associations between childhood adversity and depression, substance abuse and HIV and HSV2 incident infections in rural South African youth. *Child Abuse Negl* 2010; **34**: 833-841 [PMID: 20943270 DOI: 10.1016/j.chiabu.2010.05.002]
- 5 **Dargis M**, Koenigs M. Two subtypes of psychopathic criminals differ in negative affect and history of childhood abuse. *Psychol Trauma* 2018; **10**: 444-451 [PMID: 29035064 DOI: 10.1037/tra0000328]
- 6 **Schimmenti A**, Di Carlo G, Passanisi A, Caretti V. Abuse in childhood and psychopathic traits in a sample of violent offenders. *Psychol Trauma* 2015; **7**: 340-347 [PMID: 26147519 DOI: 10.1037/tra0000023]
- 7 **Borja K**, Ostrosky F. Early traumatic events in psychopaths. *J Forensic Sci* 2013; **58**: 927-931 [PMID: 23550705 DOI: 10.1111/1556-4029.12104]
- 8 **Ometto M**, de Oliveira PA, Milioni AL, Dos Santos B, Scivoletto S, Busatto GF, Nunes PV, Cunha PJ. Social skills and psychopathic traits in maltreated adolescents. *Eur Child Adolesc Psychiatry* 2016; **25**: 397-405 [PMID: 26224584 DOI: 10.1007/s00787-015-0744-y]
- 9 **Dargis M**, Newman J, Koenigs M. Psychopathic traits in adult criminal offenders. *Personal Disord Theory, Res Treat* 2017; **7**: 221-228 [DOI: 10.1037/per0000147.Clarifying]
- 10 **Kolla NJ**, Malcolm C, Attard S, Arenovich T, Blackwood N, Hodgins S. Childhood maltreatment and aggressive behaviour in violent offenders with psychopathy. *Can J Psychiatry* 2013; **58**: 487-494 [PMID: 23972111 DOI: 10.1177/070674371305800808]
- 11 **Gobin RL**, Reddy MK, Zlotnick C, Johnson JE. Lifetime trauma victimization and PTSD in relation to psychopathy and antisocial personality disorder in a sample of incarcerated women and men. *Int J Prison Health* 2015; **11**: 64-74 [PMID: 26062658 DOI: 10.1108/IJPH-06-2014-0016]
- 12 **Woodfield R**, Dhingra K, Boduszek D, Debowska A. Facets of psychopathy in relation to trauma-exposure and posttraumatic stress symptomology in a sample of incarcerated male offenders. *Int J Prison Health* 2016; **12**: 244-252 [PMID: 27921637 DOI: 10.1108/IJPH-06-2016-0020]
- 13 **Craparo G**, Schimmenti A, Caretti V. Traumatic experiences in childhood and psychopathy: a study on a sample of violent offenders from Italy. *Eur J Psychotraumatol* 2013; **4** [PMID: 24371511 DOI: 10.3402/ejpt.v4i0.21471]
- 14 **Schraft C V**, Kosson DS, McBride CK. Exposure to Violence within Home and Community Environments and Psychopathic Tendencies in Detained Adolescents. *Crim Justice Behav* 2013; **40**: 1027-1043 [DOI: 10.1177/0093854813486887]
- 15 **Poythress NG**, Skeem JL, Lilienfeld SO. Associations among early abuse, dissociation, and psychopathy in an offender sample. *J Abnorm Psychol* 2006; **115**: 288-297 [PMID: 16737393 DOI: 10.1037/0021-843X.115.2.288]
- 16 **Cima M**, Smeets T, Jelicic M. Self-reported trauma, cortisol levels, and aggression in psychopathic and non-psychopathic prison inmates. *Biol Psychol* 2008; **78**: 75-86 [PMID: 18304719 DOI: 10.1016/j.biopsycho.2007.12.011]
- 17 **Sadeh N**, Javdani S, Verona E. Analysis of monoaminergic genes, childhood abuse, and dimensions of psychopathy. *J Abnorm Psychol* 2013; **122**: 167-179 [PMID: 22985017 DOI: 10.1037/a0029866]
- 18 **Hollerbach P**, Johansson A, Ventus D, Jern P, Neumann CS, Westberg L, Santtila P, Habermeyer E, Mokros A. Main and interaction effects of childhood trauma and the MAOA uVNTR polymorphism on psychopathy. *Psychoneuroendocrinology* 2018; **95**: 106-112 [PMID: 29843018 DOI: 10.1016/j.psyneuen.2018.05.022]
- 19 **Watts AL**, Donahue K, Lilienfeld SO, Latzman RD. Gender moderates psychopathic traits' relations with self-reported childhood maltreatment [Internet]. *Pers Individ Dif* 2017; **119**: 175-180 [DOI: 10.1016/j.paid.2017.07.011]
- 20 **Thomson ND**, Bozgunov K, Psederska E, Aboutanos M, Vasilev G, Vassileva J. Physical Abuse Explains Sex Differences in the Link Between Psychopathy and Aggression. *J Interpers Violence* 2019; 886260519865956 [DOI: 10.1177/0886260519865956]
- 21 **Sevecke K**, Franke S, Kosson D, Krischer M. Emotional dysregulation and trauma predicting psychopathy dimensions in female and male juvenile offenders. *Child Adolesc Psychiatry Ment Health* 2016; **10**: 43 [PMID: 27822303 DOI: 10.1186/s13034-016-0130-7]
- 22 **Lansing AE**, Plante WY, Beck AN, Ellenberg M. Loss and Grief Among Persistently Delinquent Youth: The Contribution of Adversity Indicators and Psychopathy-Spectrum Traits to Broadband Internalizing and Externalizing Psychopathology. *J Child Adolesc Trauma* 2018; **11**: 375-389 [PMID: 30344839 DOI: 10.1007/s40653-018-0209-9]

- 23 **Krischer MK**, Sevecke K. Early traumatization and psychopathy in female and male juvenile offenders. *Int J Law Psychiatry* 2008; **31**: 253-262 [PMID: [18514903](#) DOI: [10.1016/j.ijlp.2008.04.008](#)]
- 24 **Farina ASJ**, Holzer KJ, DeLisi M, Vaughn MG. Childhood Trauma and Psychopathic Features Among Juvenile Offenders. *Int J Offender Ther Comp Criminol* 2018; **62**: 4359-4380 [PMID: [29598432](#) DOI: [10.1177/0306624X18766491](#)]
- 25 **Blonigen DM**, Sullivan EA, Hicks BM, Patrick CJ. Facets of psychopathy in relation to potentially traumatic events and posttraumatic stress disorder among female prisoners: the mediating role of borderline personality disorder traits. *Personal Disord* 2012; **3**: 406-414 [PMID: [22452777](#) DOI: [10.1037/a0026184](#)]
- 26 **Hicks BM**, Vaidyanathan U, Patrick CJ. Validating female psychopathy subtypes: differences in personality, antisocial and violent behavior, substance abuse, trauma, and mental health. *Personal Disord* 2010; **1**: 38-57 [PMID: [20582155](#) DOI: [10.1037/a0018135](#)]



Published by **Baishideng Publishing Group Inc**
7041 Koll Center Parkway, Suite 160, Pleasanton, CA 94566, USA

Telephone: +1-925-3991568

E-mail: bpgoffice@wjgnet.com

Help Desk: <https://www.f6publishing.com/helpdesk>

<https://www.wjgnet.com>

