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INTERAÇÃOENTRE TRAUMA INFANTIL, PERCEPÇÃO DE VÍNCULO PARENTAL E CARACTERÍSTICAS ANTISSOCIAIS NA VIDA ADULTA: UM ESTUDO TRANSVERSAL DE *MACHINE LEARNING* EM AMOSTRA DE HOMENS USUÁRIOS DE COCAÍNA

Porto Alegre

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Dissertação apresentada como requisito parcial para a obtenção do título de Mestre em Psiquiatria, à Universidade Federal do Rio Grande do Sul, Programa de Pós-Graduação em Psiquiatria e Ciências do Comportamento.

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Orientadora: Dra. Simone Hauck

Co-orientadora: Dra. Lisieux Elaine de Borba Telles

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Porto Alegre, 19 de fevereiro de 2020.

A Comissão Examinadora, abaixo assinada, aprova a tese"Interação entre trauma infantil, percepção de vínculo parental e características antissociais na vida adulta: um estudo transversal de *Machine Learning* em amostra de homens usuários de cocaína", como requisito parcial para obtenção do Grau de Mestre em Psiquiatria.

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Este trabalho é dedicado ao meu parceiro de vida e à minha família.

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RESUMO

Título: Interações entre trauma infantil, percepção de vínculo parental e características antissociais na vida adulta: um estudo transversal de *Machine Learning* em amostra de homens usuários de cocaína.

Introdução: O Transtorno de Personalidade Antissocial (TPAS) descreve indivíduos com um padrão de desrespeito pelos direitos alheios que começa na infância e continua durante a idade adulta. A relação entre vínculo parental, trauma na infância e TPAS é bem estabelecida. Entretanto, permanecem incertos que tipos de trauma infantil e que padrões de vínculo parental são mais associados a tal desfecho e de que forma estas variáveis se relacionam.

Objetivos: Inicialmente, objetivamos revisar sistematicamente a literatura a respeito do tema. Posteriormente, objetivou-se para melhor compreensão desta complexa relação analisar essas variáveis utilizando-se a análise estatística tradicional e o método *machine learning*(ML) em uma amostra de homens dependentes químicos.

Métodos: A revisão sistemática foi conduzida a partir de busca nas bases de dados Embase, Scielo, Web of Science e PubMed e de acordo com o *guideline* Prisma Statement. Foram selecionados artigos que avaliassem a relação em TPAS ou traços antissociais e trauma infantil através da*Childhood Trauma Questionnaire* (CTQ) – a qual avalia cinco subtipos de trauma -ou vínculo parental através da *Parental Bonding Instrument* (PBI) – a qual avalia as dimensões ‘controle’ e ‘afeto’. Posteriormente, foi conduzido um estudo transversal com amostra de 346 homens usuários de cocaína, selecionados de internações psiquiátricas públicas. Foram critérios de exclusão: coeficiente de inteligência menor que 70, incapacidade de participação ou não concordância com o termo de consentimento. Foram aplicados CTQ, PBI e MINI. A análise estatística foi realizada utilizando-se o método de regressão logística e ML.

Resultados: Na revisão sistemática, foram localizados 357 *abstracts* com os termos de busca definidos. Destes, 18 fecharam todos os critérios de inclusão. Pode-se observar elevada heterogeneidade entre os estudos. Com relação a CTQ, o achado mais consistente foi a associação entre abuso e negligências físicas e TPAS. Abuso sexual foi a variável menos consistentemente associada ao desfecho. No que se refere ao PBI, o achado mais consistente

foi a relação entre baixo afeto materno e paterno e TPAS. A dimensão que avalia controle mostrou achados mais heterogêneos, não podendo se concluir de que forma esses padrões interagem.

No estudo realizado com amostra de 346 indivíduos dependentes químicos, na análise de regressão logística, foram estatisticamente significativos como preditores de TPAS abuso emocional (OR=1.95, p=0.001), abuso físico (OR=1.45, p=0.032), controle paterno (OR=1.42, p=0.027) e negligência física (OR=0.61, p=0.017). Na análise de ML, as variáveis com significância estatística foram abuso emocional e físico (importância de 100 e 69,6%, respectivamente) e afeto e controle paterno (importância de 11,2 e 6,7%, respectivamente).

Conclusão: Há escassa evidência na literatura de como estas variáveis interagem entre si. Mais estudos se mostram necessários em termos de saúde pública e iniciativas que podem prevenir os fatores associados a TPAS na vida adulta. Nossos achados contribuem para a melhor compreensão desse fenômeno e sugerem especificidades em relação à população em estudo. Nossos resultados indicam uma maior contribuição do trauma, abuso emocional e físico, como preditor de TPAS nessa população, bem como das variáveis paternas. Observou-se uma alta taxa de comorbidades de doença psiquiátrica entre os indivíduos com TPAS, sugerindo um perfil específico que pode ser mais suscetível a intervenções, do que indivíduos com TPAS em geral. Por fim, não se pode afirmar relação de causalidade a partir dos achados do presente estudo. Estudos longitudinais e com outras populações são necessários para avançar na compreensão dos fenômenos em estudo.

ABSTRACT

Title: Interactions between childhood trauma, perceived parental bonding and antisocial personality disorder in adulthood: a cross-sectional study of Machine Learning in a sample of male cocaine users.

Background: Antisocial Personality Disorder (ASPD) describes a pattern of disregard for the rights of others that begins in childhood and continues into adulthood. The relationship between parental bonding, childhood trauma, and ASPD is well established. However, which types of child trauma and which parental bonding patterns are more associated with ASPD and how these variables interact remain uncertain.

Objectives: Initially, we aimed to systematically review the literature about the topic. Subsequently, we aimed to better understand this complex relationship by analyzing these variables using traditional statistical analysis and machine learning (ML) method in a sample of male cocaine users.

Methods: The systematic review was conducted by searching on Embase, Scielo, Web of Science and PubMed databases according to Prisma Statement guideline. We selected articles that assessed the relationship between ASPD or antisocial traits and childhood trauma through Childhood Trauma Questionnaire (CTQ) –which assesses five trauma subtypes - or parental bonding through the Parental Bonding Instrument (PBI) - which assesses 'overprotection' and 'care' dimensions.Subsequently, a cross-sectional study was conducted with a sample of 346 male cocaine users selected from public psychiatric hospitalizations. Exclusion criteria were intelligence coefficient below 70, inability to participate or not agreement with the consent form. CTQ, PBI and MINI were applied. Statistical analysis was performed using a logistic regression method and ML approach.

Results: In the systematic review, we found 357 abstracts with the defined search terms. Of these, 18 met all inclusion criteria. High heterogeneity can be observed between studies. Regarding CTQ, the most consistent finding was the association between physical abuse and neglect and ASPD. Sexual abuse was the variable least consistently associated with ASPD. Regarding PBI, the most consistent finding was the relationship between low maternal and paternal care and ASPD. The overprotection dimension showed more heterogeneous findings and it is not possible to conclude how these patterns interact. In the study conducted with the

sample of 346 male cocaine users, in the logistic regression analysis, the variables statistically significant associated with ASPD were emotional abuse (OR 1.95, p = 0.001), physical abuse (OR = 1.45, p = 0.032), parental overprotection (OR = 1.42, p = 0.027) and physical neglect (OR = 0.61, p = 0.017). In the ML analysis, the variables with statistical significance were emotional and physical abuse (importance of 100 and 69.6%, respectively) and paternal care and overprotection (importance of 11.2 and 6.7%, respectively).

Conclusion: There is little evidence in literature of how these variables interact with each other. Further studies are needed in terms of guiding public health interventions and initiatives that can prevent factors associated with ASPD in adulthood. Our findings contribute to a better understanding of this phenomenon and suggest specificities in relation to the studied population. Our results indicate a greater contribution of emotional and physical abuse as predictors of ASPD, in this population, as well as paternal parenting factors. There was a high rate of comorbidities with psychiatric illness among individuals with ASPD, suggesting a specific profile that may be more susceptible to particularly interventions than individuals with ASPD in general. Finally, a causal relationship cannot be affirmed from the findings of the present study. Longitudinal studies and studies with other population are needed to advance in the understanding of the phenomena under study.

SUMÁRIO

1 INTRODUÇÃO

O Transtorno de Personalidade Antissocial (TPAS) é definido, pelo DSM-V, como um padrão difuso de desconsideração por si e pelos outros e por violação dos direitos alheios, sendo os critérios diagnósticos os que seguem: fracasso em ajustar-se às normas, tendência à falsidade, impulsividade ou fracasso em fazer planos para o futuro, irritabilidade, descaso pela segurança própria ou dos outros, irresponsabilidade e ausência de remorso(American Psychiatric Association, 2013). Na literatura, são usados diversos termos e conceitos relacionados à personalidade antissocial - comportamento e conduta antissocial, traços de personalidade antissocial, sociopatia, psicopatia, entre outros - que são usualmente usados como sinônimos, mas que podem se referir a condições diferentes, sobrepostas ou não, o que gera confusão.

Pode-se dizer que indivíduos que se engajam em comportamentos antissociais como violação de regras ou desconsideração pelos outros apresentam traços, comportamento ou conduta antissocial, embora nem todos estes indivíduos fechem critérios para TPAS, o qual, segundo o DSM-V,exige a presença de três ou mais dos critérios diagnósticos acima descritos e início antes dos 15 anos (American Psychiatric Association, 2013). A ocorrência de comportamento antissocial é muito mais prevalente na população do que o TPAS e não configura necessariamente um transtorno, mas sim um comportamento que pode estar presente, eventualmente, em pessoas sem patologias mentais.

Por fim, psicopatia descreve um perfil mais grave de comportamento e de funcionamento interpessoal, e confere aos indivíduos maior risco de reincidência no contexto criminal e menores chances de reabilitação. Enquanto a maioria dos psicopatas também preenchem critérios para TPAS, nem todos os indivíduos com TPAS podem ser considerados psicopatas (Hare, 1996). Robert Hare desenvolveu, em 1980, uma ferramenta que avalia a psicopatia, a *Psychopathy Checklist* (PCL), revisada e publicada em 1991 como *Psychopathy Checklist-Revised* (PCL-R). A PCL-R investiga, a partir de entrevista semiestruturada e da revisãode todas as informações colaterais disponíveis sobre o indivíduo, a presença de psicopatia. Reserva-se esse termo para indivíduos que pontuam acima do ponto de corte - diferente em cada população - na escala mencionada. O autor sugere que escores maiores que 30 na escala identificam casos de psicopatia (Hare, 1996). A escala foi traduzida e adaptada

para o português brasileiro por Hilda Morana e colaboradores em 2005, quando foi definido como ponto de corte para psicopatia a pontuação de 23 no contexto brasileiro(Morana, Arboleda-Flórez, & Câmara, 2005).

Há dados que indicam que o comportamento antissocial e a criminalidade são decorrentes de inúmeros fatores genéticos e ambientais (American Psychiatric Association, 2013; Rautiainen et al., 2016; Reichborn-Kjennerud et al., 2015; Reti et al., 2002; Rhee & Waldman, 2002; Silberg, Rutter, Tracey, Maes, & Eaves, 2007; Wellausen & Bandeira, 2010). Entre os fatores ambientais para TPAS estão exposição intraútero a fatores tóxicos e complicações perinatais, abuso e negligência na infância e relações familiares disfuncionais(Reti et al., 2002; Rhee & Waldman, 2002; Silberg et al., 2007).São fatores de risco para desenvolvimento de conduta delitiva na adolescência:escassa supervisão parental, negligência, disciplina punitiva, separação conjugal ou pais solteiros, família numerosa, história de delinquência na família, baixa condição socioeconômica, rejeição entre os pares, déficit de atenção e hiperatividade, baixo QI e abandono escolar (Escobar-Córdoba & Castellanos, 2014). Parece haver associação entre características agressivas na mãe e comportamento criminal do filho na adolescência, bem como características antissociais nos pais também se mostraram associadas a tal comportamento nos filhos (Wellausen & Bandeira, 2010).

Vínculo Parental

O estudo do estilo de vínculo parental é uma área de interesse crescente nas últimas décadas, sendo uma boa parentalidade condição necessária para o desenvolvimento de uma boa relação entre os pais e as crianças. Entende-se por boa parentalidade a capacidade dos pais em atender suficientemente as necessidades físicas, educacionais, emocionais e psicológicas da criança (Karim & Begum, 2017).

Há evidências de que vínculo parental se relaciona a patologias de personalidade na idade adulta. Um prejuízo no vínculo precoce está associado a uma ampla gama de patologias na vida adulta, como ansiedade (Enns, Cox, & Clara, 2002; Faravelli et al., 1991; Silove, Parker, Hadzi-Pavlovic, Manicavasagar, & Blaszczynski, 1991; Wiborg & Dahl, 1997), depressão, suicídio, transtornos de personalidade, dependência de substâncias(G. Gerra et al., 2007; Torresani, Favaretto, & Zimmermann, 2000), distúrbios comportamentais na

adolescência (REY & PLAPP, 1990), esquizofrenia(Winther Helgeland & Torgersen, 1997), transtornos alimentares (Sordelli, Fossati, Devoti, Viola, & Maffei, 1996), entre outros.

Diversos modelos sugerem que a qualidade de vínculo parental na infância inicial exerce também um papel fundamental no desenvolvimento de comportamentos antissociais na vida adulta (Trentacosta & Shaw, 2008). Em seu estudo clássico, Bowlby (1969) sugeriu que jovens infratores que tiveram frágil vínculo afetivo com suas mães revelaram maiores índices de psicopatia(Bowlby, 1969). Kimbrel (2007) e Craig e colaboradores (2015) também demonstraram que prejuízos no vínculo precoce predizem maiores escores em comportamentos antissociais (Craig, 2015; Kimbrel, Nelson-Gray, & Mitchell, 2007). Por fim, Sousa e colaboradores (2011) avaliaram longitudinalmente vínculo e comportamento antissocial, e demonstraram que uma boa qualidade de vínculo é protetor para TPAS no futuro(Sousa et al., 2011). Farrington e colaboradores (2006) demonstraram que frágil supervisão parental prediz maiores índices de traços antissociais, enquanto menor envolvimento paterno se mostrou um forte preditor de conduta antissocial(Farrington, 2006).

Há interesse na compreensão do papel do vínculo parental no desenvolvimento de traços antissociais no adulto, e fatores parentais como abuso, doença mental dos genitores e separação ou perda podem ser contribuintes para o surgimento de traços antissociais. Além disso, déficits parentais no cuidado, na supervisão e na disciplina, como: inconsistência, baixo interesse, rigidez e autoritarismo são implicados como fatores etiológicos importantes (Reti et al., 2002).

Não se pode, entretanto, afirmar causalidade direta (linear) entre os estilos parentais e as manifestações antissociais dos filhos na idade adulta. Alguns dos efeitos atribuídos aos pais podem, na verdade, refletir um efeito inverso: efeitos constitucionais das crianças poderiam torná-las mais difíceis de lidar, refletindo em menos afeto parental e aumento de controle. Tais comportamentos parentais podem, por sua vez, piorar o comportamento dos filhos, retroalimentando o padrão. Além disso, fatores genéticos também podem mediar estas associações: a percepção das crianças de comportamentos parentais disfuncionais pode refletir a psicopatologia dos pais, que pode estar mediando, por influências genéticas, o comportamento disfuncional das crianças (Reti et al., 2002). Há, também, teorias que sustentam a ideia de que os mesmos traços de personalidade da criança que predispõem ao

surgimento de doença mental tenderiam a predispor a baixos níveis de afeto e elevado grau de controle nos pais (Enns et al., 2002).

Experiência Infantil de Trauma

Da mesma forma que vínculos parentais disfuncionais, as diferentes formas de experiências traumáticas na infância podem se relacionar com o desenvolvimento de traços de personalidade disfuncionais ou transtornos mentais (Cohen et al., 2014). A prevalência de trauma na infância entre pacientes com transtornos mentais ou de personalidade é bastante relevante (Lobbestael, Arntz, & Bernstein, 2010).Trauma na infância - incluindo abuso físico, emocional ou sexual, ou negligência física ou emocional - representa um fator de risco ambiental importante para o surgimento de patologias de personalidade, e a sua ocorrência parece estar relacionada a diversos desfechos na vida adulta (Grover et al., 2007; Hodgins et al., 2010; Kim, Park, & Kim, 2016; Nikulina, Widom, & Czaja, 2011; Zelkowitz, Paris, Guzder, & Feldman, 2001). Swogger e colaboradores (2011) demonstraram maior risco de suicídio entre criminosos abusados em comparação aos sem história de abuso físico (Swogger, You, Cashman-Brown, & Conner, 2011).

Condutas antissociais parecem se relacionar com abuso físico na infância (Cohen et al., 2014; McGrath, Nilsen, & Kerley, 2011), e Kim e colaboradores (2016) demonstraram que abuso na infância se relaciona a maior recidivismo criminal (Kim et al., 2016). Siegel e colaboradores (2003) demonstraram prospectivamente, em amostra de 206 mulheres vítimas de abuso na infância, maior chance de envolvimento em condutas criminais na idade adulta (Siegel, 2003). Ainda, abuso e negligência física se mostraram associados a traços de personalidade antissocial e características sádicas de personalidade em amostra de usuários de substâncias psicoativas (Bernstein, Stein, & Handelsman, 1998). Em estudo conduzido em 2010 por Lobbestael e colaboradores, por outro lado, abuso físico foi o único preditor de TPAS com significância estatística dentre as cinco formas de trauma avaliadas (Lobbestael et al., 2010).

Comorbidade com dependência química

Essas associações – trauma infantil, vínculo parental e TPAS - são particularmente importantes entre indivíduos com abuso de substâncias. Existem evidências substanciais que mostram uma alta prevalência de trauma na infância entre indivíduos com dependência de

cocaína, o que a torna uma população mais vulnerável (Sordi & Hauck, 2015). Scheidell e colaboradores (2018) avaliaram longitudinalmente uma amostra comunitária de 12.288 participantes e encontraram uma relação direta entre o número de traumas na infância e o uso de maconha e cocaína na adolescência e idade adulta (Scheidell et al., 2018).

Também há evidência de que a qualidade do vínculo parental se relaciona a transtornos por uso de substâncias. Pettenon e colaboradores (2015) comparou amostra de usuários de crack com amostra de usuários de drogas não-ilícitas e encontrou que os usuários de crack reportavam mais frequentemente uma percepção de mães negligentes, bem como maior percepção de pais com vínculo do tipo controle sem afeto em comparação com usuários de drogas não ilícitas, os quais tinham maior probabilidade de perceberem seus pais com parentalidade ótima (Pettenon et al., 2015). Gerra e colaboradores (2019) avaliaram usuários de maconha e compararam-na a controles e encontraram afeto parental como fator protetor para uso de maconha, enquanto negligência física e emocional como fator de risco associado ao uso da droga, fatores esses que mediaram a influência genética (M. C. Gerra et al., 2019).

Além disso, existe uma forte correlação entre TPAS e transtorno por uso de substâncias. Um quarto dos usuários de crack apresentará TPAS (De Almeida Ribeiro et al., 2016; Paim Kessler et al., 2012) Como essas variáveis se relacionam, ainda está sob investigação.

Machine Learning

Considerando que estamos frente a um fenômeno complexo em que as características de vínculo parental interagem com os fatores constitucionais da criança e ambientais em um modelo dinâmico e complexo, com parte da carga genética compartilhada potencialmente influindo nas duas pontas da interação, o uso de modelo de análisescomo o *MachineLearning*(ML) pode oferecer dados que não podem ser abarcados pelas análises tradicionais e modelos lineares, trazendo novas perspectivas para esse campo de estudo.

Trata-se de um método que usa algoritmos para criar modelos que predizem algum desfecho a partir da análise dos dados disponíveis.

2 JUSTIFICATIVA

Embora a associação entre trauma na infância e qualidade do vínculo parental e os transtornos de personalidade esteja bem estabelecida na literatura, esse é um fenômeno bastante complexo com interações potencialmente não lineares e dinâmicas. O uso de técnicas avançadas de análise como o ML pode trazer novas perspectivas quanto à interação desses fatores na constituição de características antissociais em comorbidade com a dependência química. Mesmo que a população com TPAS possa ser de difícil estudo através de instrumentos de autorrelato, esse ainda é um meio válido para obter dados retrospectivos para gerar novas hipóteses a serem pesquisadas, por exemplo, em estudos de coorte, desde que essa limitação seja considerada.

3 OBJETIVOS

3.1 Objetivo geral

Através da análise dos dados das escalas *Childhood Trauma Questionnaire* (CTQ), *Parental BondingInstrument* (PBI) e *Mini InternationalNeuropsychiatric Interview* (MINI), o objetivo geral do presente trabalho é avaliar a relação entre trauma infantil, vínculo parental e TPAS em amostra de dependentes químicos e clarificar de que forma tais variáveis interagem.

3.2 Objetivos específicos

3.2.1 Avaliar a contribuição de cada tipo de trauma infantil como preditor de TPAS na vida adulta.

3.2.2 Avaliar a contribuição do vínculo parental como preditor de TPAS na vida adulta.

3.2.3 Avaliar a contribuição dos aspectos maternos e paternos de vínculo parental na predição de TPAS na vida adulta.

3.2.4 Analisar as diferenças dos achados utilizando-se a análise estatística tradicional e a de ML.

4 ASPECTOS ÉTICOS

Todos os participantes deste projeto foram informados dos objetivos da pesquisa, tiveram seu anonimato preservado e concordaram com a participação através da assinatura do termo de Consentimento Livre e Esclarecido, permitindo que os dados do seu atendimento sejam utilizados para fins científicos e de ensino. Aos que não aceitaram a participação no estudo, foi garantida a continuidade do tratamento sem prejuízo. Suas identidades bem como a dos profissionais foram mantidas em sigilo.

O presente estudo faz parte de um Projeto maior, previamente aprovado junto ao Comitê de Ética em Pesquisa em Seres Humanos do Hospital de Clínicas de Porto Alegre/UFRGS, sob número 14-0249, utilizando-se de uma parte dos dados para análise.

5 METODOLOGIA

5.1 DELINEAMENTO

Trata-se de um estudo observacional transversal.

5.2 PARTICIPANTES

A amostra do presente estudo consiste em 346 homens maiores de 18 anos, usuários de crack, que tiveram teste de urina positivo para cocaína (Bioeasy® cocainetest, Alere™, Belo Horizonte, Brazil) e que foram selecionados em hospitais psiquiátricos públicos com unidade de tratamento especializado em adição na cidade de Porto Alegre, Rio Grande do Sul, Brasil.

Foram critérios de exclusão: incapacidade do paciente de participar da pesquisa, baseado em critérios do exame clínico e psiquiátrico (presença de psicose, por exemplo), coeficiente de inteligência menor que 70, estimado através de testes de vocabulário e teste de bloco da WechslerAdultIntelligenceScale, terceira edição (WAISS-III)e não concordância com a participação (pacientes que não assinaram o termo de consentimento informado).

5.3 PROCEDIMENTOS E LOCAL

Os pacientes foram convidados a participar do estudo tão logo eles fossem capazes de compreender os objetivos do estudo, após a internação. As entrevistas de aplicação dos instrumentos foram conduzidas entre o quinto e o sétimo dia de desintoxicação para minimizar os efeitos cognitivos dos primeiros dias após internação.

Os procedimentos ocorreram nas unidades de tratamento para adição das internações psiquiátricas do Hospital São Pedro, da Clínica São José e da Unidade Álvaro Alvim, localizadas em Porto Alegre/RS.

5.4. INSTRUMENTOS UTILIZADOS

5.4.1 *Parental BondingInstrument* - Instrumento de Vinculação Parental (PBI)

Uma das medidas psicométricas já bem estabelecida na literatura que avalia fatores relevantes da contribuição do comportamento dos pais no estabelecimento do vínculo entre pais e filhos é o *ParentalBondingInstrument* (PBI). O PBI foi desenvolvido em 1979 por Parker e colaboradores e adaptado e validado ao contexto brasileiro por *Hauck* e colaboradores, em 2006 (Hauck et al., 2006; Parker, Tupling, & Brown, 1979). O PBI acessa retrospectivamente como o indivíduo percebeu sua criação até seus 16 anos de vida, ou seja, a qualidade do vínculo com os pais (Parker et al., 1979). É usado para avaliar duas dimensões do comportamento parental: o afeto e o controle. O afeto se refere à sensibilidade, cuidado,calor e disponibilidade *versus* frieza e rejeição, enquanto a dimensão do controleavalia intrusão e controle *versus* encorajamento da autonomia.A partir dessas duas variáveis, Parker (1979) identificou a existência de quatro tipos de vínculos, de acordo com as combinações formadas:

1- elevado afeto e baixo controle, conceitualizado como **parentalidade ótima**(“Optimalparenting”);

2- elevado afeto e elevado controle, conceitualizado como **controle com afeto** (“Affectionateconstraint”);

3- baixo afeto e elevado controle, conceitualizado como **controle sem afeto** (“Affectionlesscontrol”)

4- baixo afeto e baixo controle, conceitualizado como **parentalidade negligente** (“Neglectful parenting”).

Trata-se de um questionário autoaplicável que lista várias atitudes e comportamentos dos pais, em uma escala tipo Likert (0 a 3), com 25 perguntas em relação ao pai e à mãeseparadamente, em que o sujeito responde o quão parecido aquele comportamento descrito é com o comportamento dos pais até os seus 16 anos, medidos através de duas dimensões (afeto e controle).

A subescala*afeto* compreende 12 itens que representam um continuum entre afeto frio/negligente e afetuoso, enquanto a subescala*controle* compreende 13 itens representando o continuum entre independência e controle/intrusão.Cada subitem recebe um valor entre 0 a 3 pontos, sendo 0equivalente a "muito diferente", e 3 a "muito parecido", referindo-se às características de cada um dos pais separadamente. Assim, a variável afeto varia entre 0 e 36, e a controle, entre 0 e 39 pontos, sendo que pontuações elevadas indicam elevado afeto e controle, respectivamente. A partir desta pontuação, pode-se alocar o pai e a mãe em cada uma das categorias referidas previamente (parentalidade ótima, controle com afeto, controle sem afeto e parentalidade negligente).

Este instrumento foi adaptado e validado para o português brasileiro em 2006 por Hauck e colaboradores. O instrumento encontra-se anexado ao final do projeto.

5.4.2 Childhood Trauma Questionnaire (CTQ)

A avaliação de trauma na infância é complexa.Com o objetivo de criar uma avaliação breve, confiável e válida para uma ampla gama de experiências traumáticas na infância, Bernstein e colaboradores (1994) desenvolveram um instrumento autoaplicável, o*Childhood Trauma Questionnaire*, o qual é amplamente utilizado em pesquisas (Bernstein et al., 1994).

Trata-se de um questionário autoaplicável de 70 itens que investiga cinco componentes traumáticos: abuso físico e emocional, abuso sexual e negligência física e emocional (Bernstein et al., 1994).Posteriormente, em 2003, o mesmo autor desenvolveu uma versão breve do CTQ de 28 itens que foi validada mantendo as mesmas propriedades da versão original de 70 itens, porém de aplicação mais rápida(Bernstein et al., 2003).

O CTQ na sua versão breve é um questionário autoaplicável retrospectivo, internacionalmente aceito para avaliação de abuso infantil e experiências de negligência. Constitui-se de 28 assertivas relacionadas com situações ocorridas na infância pontuadas em uma escala Likert de cinco pontos, criando uma escala dimensional (Bernstein et al., 2003). Cada assertiva descreve um comportamento parental, e o indivíduo responde de acordo com a frequência que este comportamento ocorreu: 1 para nunca e 5 para sempre. Este instrumento foi validado para o Brasil em 2006e encontra-se anexado ao final do projeto(Grassi-Oliveira, Stein, & Pezzi, 2006).

5.4.3 Mini International Neuropsychiatric Interview (MINI)

O MINI é uma entrevista diagnóstica padronizada breve, baseada nos critérios do DSM-III-R/IV e da CID-10, que pode ser aplicada em um período de tempo entre 15 a 30min, e que pode ser utilizada por clínicos após um treinamento curto. Trata-se de questões com respostas dicotômicas (sim/não) que avalia 17 transtornos do Eixo I do DSM-IV, bem como risco de suicídio e personalidade antissocial (Lecrubier et al., 1997).

5.5. ANÁLISE ESTATÍSTICA

A análise estatística foi realizada utilizando-se o software R. Um total de 346 indivíduos estavam disponíveis para a análise. Foi realizada uma análise descritiva das características clínicas e sociodemográficas de ambos os grupos, mostradas como média e desvio padrão ou frequência e porcentagem. O teste-*t* foi utilizado para comparar variáveis quantitativas nos dois grupos, enquanto o teste do qui-quadrado foi utilizado para comparar as variáveis categóricas entre os grupos.

5.5.1 Regressão Logística

Um modelo de regressão logística multivariável foi utilizado para determinar a associação entre as variáveis do PBI e da CTQ e o diagnóstico de TPAS na idade adulta. As

variáveis incluídas no modelo multivariável foram abuso e negligência emocional, abuso e negligência física, abuso sexual, vínculo parental materno e paterno.

5.5.2 *Machine Learning*

Foi construído um modelo de MLusando o algoritmo '*Elastic Net*' para predizer TPAS. CTQ e PBI foram usados como recursos para construir o modelo de aprendizado. O CTQ foi analisado como uma variável numérica contínua, considerando o escore total de cada uma das 5 subescalas que avaliam cada tipo de trauma. O PBI também foi considerado uma variável numérica contínua e foi considerado o escore total de afeto e controle para cada um dos cuidadores na análise. Foi utilizado, para isso, o software R (versão R 3.6.1) e o RStudio (versão 3.5.3) com o pacote R "caret" (versão 6. 0-73) e "glmnet" (versão 2.0-18) 28,29. A '*Elastic Net'* é uma melhoria dos métodos '*LeastAbsoluteShrinkageandSelectionOperator'* (LASSO)e '*RidgeRegression'*, pois eles apresentam várias desvantagens em comparação ao método '*Elastic Net'*. Isso, por sua vez, apresenta algumas vantagens: 1) seleciona variáveis automaticamente, configurando os coeficientes para zero (como no LASSO) e diminuindo o coeficiente (como na regressão de crista) simultaneamente; 2) é capaz de lidar com um grande conjunto de variáveis; 3) especifica grupos de variáveis correlacionadas; 4) mostra baixo risco de sobreajuste.

6 **RESULTADOS**

6.1 ARTIGO 1 – ENVIADO À REVISTA "CHILD ABUSE AND NEGLECT" EM 08/10/2019 E INICIALMENTE ACEITO PARA SUBMISSÃO EM 12/12/2019 CONFORME ANEXO 9.4

"ASSOCIATION BETWEEN DIFFERENT TYPES OF CHILDHOOD TRAUMA AND PARENTAL BONDING WITH ANTISOCIAL TRAITS IN ADULTHOOD: A SYSTEMATIC REVIEW"

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Abstract

Background: ASPD describes individuals with a pervasive pattern of disregard for the rights of others that begins in childhood and continues into adulthood. The relationship between parental bonding, trauma and ASPD is well established, however it remains unclear what types of trauma or which patterns of bonding are most associated. Objectives: Review the literature regarding what types of trauma and bonding characteristics were related to antisocial personality traits. **Method:** We searched databases for articles that acessed the relationship between antisocial personality traits and CTQ and/or PBI fallowing PrismaStatement. **Results:** 357 abstracts were selected in the databases, and 18 articles met criteria inclusion. There was a big heterogenity between studies. Regarding CTQ, the most consistent finding was the association between physical abuse and neglect and antisocial traits. Sexual abuse was the variable least related to antisocial traits on the present review. Regarding PBI, the most consistent finding was the relationship between maternal and paternal care and antisocial traits. Regarding overprotection , data is less consistent. **Conclusions:** The literature little explores how these variables interact with each other. More studies are important in terms of public health and political and educational initiatives that can prevent risk factors factors associated with ASPD.

Keywords: childhood trauma, parental bonding, antisocial personality disorder, systematic review, CTQ, PBI.

Association between different types of childhood trauma and parental bonding with antisocial traits in adulthood: A Systematic Review

1. Introduction

Antisocial personality disorder (ASPD) describes individuals with a pervasive pattern of disregard for, and violation of, the rights of others that begins in childhood or early adolescence and continues into adulthood. People with ASPD are unsuccessful in adjusting to social norms regarding legal behavior, and may engage in acts which are grounds for detention. They often lie and manipulate and may fail to make plans for the future. In addition, they tend to be unstable and aggressive and may be disregarded for their own safety and for the safety of others. The prevalence is around 0.2 to 3.3%, and in prisons and forensic environments it can reach 70%**(American Psychiatric Association, 2014**).

Risk factors for ASPD include both biological and genetic factors (**American Psychiatric Association, 2014**). Environmental factors can also play a substantial role in the development of antisocial behavior (**Rhee et. al. 2002**; **Maes et. al. 2007**; **Silberg et. al. 2007**).

Among the environmental factors, there is evidence in literature that support child trauma is related to antisocial personality: **Weiler et. al. 1996** showed that abused and neglected children have higher psychopathy scores in Psycopathy Checklist Revised (PCL-R) in adulthood. Similarly, **Luntz et. al. 1994** found that abused or neglected children were more likely than comparison group to meet criteria for ASPD. Overall, although literature identifies abuse and neglect as potential correlates of antisocial traits (**O'Neill et. al. 2003, Krischer et. al. 2008, Craparo, et. al. 2013, Evren et. al. 2006**), few studies have assessed what specific type of trauma predicts ASPD, and there is evidence that different types of maltreatment have distinct psychopathological effects (**Lobbestael et. al. 2010**).

Furthermore, there is evidence that bonding is also related to personality pathology in adult life (**Parker et. al., 1999**). In his classic developmental study, **Bowlby (1969)** suggested that juvenile offenders who had poor mother bonding early in life had more psychopathy. **Kimbrel et. al. 2007** and **Craig et. al. 2015** also demonstrated that poor parental bonding

predicts high antisocial scores or delinquency. **Sousa et. al. 2010** longitudinally examined bonding and later antisocial behavior and found that the quality of bonds were protective to later antisocial personality.

The assessment of childhood trauma is complex, and several instruments have been developed to evaluateit. **Bernstein et. al. 1994**have developed a self-applicable, reliable and valid instrument for a wide range of childhood traumatic experiences, the Childhood Trauma Questionnaire (CTQ), which is widely used in research. It is a 28-item self-report questionnaire assessing on a 5-point Likert scale (from 1 - *'never through'* - to 5 - *'very often'*) that assesses the frequency of different types of child maltreatment including sexual, physical, and emotional abuse and emotional and physical neglect. CTQ has been adapted and validated to Brazilian Portuguese (**Grassi-Oliveira et. al., 2006**).

Although there are lots of scales that asses parental bonding, the Parental Bonding Instrument (PBI), developed by Parker et. al. (1979), has been the most widely used. The PBI is still considered to be the most consistent measure used to check parental style either in clinical or in non-clinical samples (**Enns, 2002**). The instrument has proved to be stable over a 20 year period, and mood and life experiences have had a low impact on the stability of the perception of parental bonding, as measured by PBI (**Wilhelm, et. al. 2005**). PBI was designed to measure parental styles as perceived by the respondents during their first 16 years (**Parker, 1979**). The PBI is a Likert-like scale (ranging from 0 to 3) consisting of 25 items related to father and mother.

It was developed to assess two principal dimensions of parental behaviors reflecting warmth and care (*versus* coldness and rejection) and psychological autonomy (*versus* control and intrusiveness) (**Parker et. al, 1979**). The two dimension model has been widely used, and have been proved to be consistently associated with psychiatric diseases and mental health in adulthood (**Parker et al 199; Hauck et al., 2007**). Subsequent research using PBI found that in some populations dimensions of parenting could be better represented in three dimensions, that were differently named in each of the studies (**Terra et. al, 2009; Kendler et al., 1997; Murphy et. al., 1997**). The PBI has been adapted and validated to Brazilian Portuguese (**Hauck et al, 2006; Terra et al, 2009**).

The relationship between parental bonding, trauma in childhood and ASPD is well established. However, in order to better understand the role of parenting and childhood trauma

in the development of later antisocial personality disorder, the aim of the present systematic review is to examine the literature regarding what types of trauma and parental bond characteristics were related to antisocial personality traits. For that, we considered the variables trauma and bonding assessed by the described scales CTQ and PBI, aiming at having more homogenized descriptions of the risk factors being evaluated.

1 Method

2.1 Search strategy and selection criteria

The present study was registered at PROSPERO (ID 130005) and followed Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement to guide the development of the review protocol and to report the findings (**Moher et. al., 2009**). We searched scientific articles in PubMed, Embase, Web of Science and Scielo with the following search terms: *("Object Attachment" OR "Object Attachments" OR "Psychological Bonding" OR "Bonding (Psychology)" OR "Bondings (Psychology)" OR "Emotional Bonds" OR "Emotional Bond" OR "parental bonding" OR "parental bonding instrument" OR "PBI") OR ("Childhood trauma" OR "Adult Survivors of Child Adverse Events" OR "Childhood trauma questionnaire" OR "CTQ") AND ("Antisocial Personality Disorders" OR "Antisocial Personality Disorder" OR "Psychopathic Personality" OR "Psychopathic Personalities" OR "Antisocial Personality" OR "Antisocial Personalities").* The search was performed in these databases between January and March of 2019, without date criteria. Medical Subject Headings (MeSH) terms were used in PubMed to define the search terms. Gray literature was not included.

Studies were included in the systematic review according to the following a priori criteria for eligibility:

- Inclusion criteria were met if the study assessed the association between different types of childhood trauma or parental bonding with antisocial traits in adulthood. Clinical studies, cross-sectional, cohort and case-control studies were included, both population-based and clinical samples. Trauma should be assessed by CTQ and parental bonding by PBI to be included.

- Exclusion criteria were the following: review articles and pre-clinical studies, studies in non-english language, participants younger than 18 years or mean age less than 18 years, trauma assessed by methods other than CTQ and parental bonding assessed by methods other than PBI. Date of publication was not an exclusion criterion.

Each article was rated with the Newcastle-Ottawa Quality Assessment Scale (**NOQAS**) to evaluate the risk of bias and quality of the study.

2.2 Procedure

Selected abstracts have been uploaded to EndNote, which automatically identifies and removes the duplicates. After selecting abstracts and deleting the duplicates, two researchers independently performed the primary screening and selected through the titles and abstracts studies for full-text inclusion. The divergences were assessed by a third researcher who made the final decision (*consensus*).

After primary screening, manuscripts were reviewed independently in the secondary screening by two authors, according to eligibility criteria previously defined. Divergences were assessed by a third researcher who made the final decision (consensus) in such cases.

2.3 Data extraction

The following data were extracted from each study: first author, publication year, study design, outcome assessed, outcome tool, tool for antisocial traits, sample size, number of participants in each group (if applicable), mean age and standard deviation,site where the study was performed and main result.

3 Results

Figure 1 shows the flow chart, which illustrates the selection process of the articles. Using the search terms described above, 357 abstracts were selected in the databases. Of these, a total of 79 articles were selected for full-text analysis after primary screening. The final sample of the present systematic review consisted of 18 articles with a total of 12.278 participants.

The data extracted from each article are listed in **Table 1**, while the quality of the

studies is described in **Table 2**. Outcomes of interest in this systematic review will be described below. Of the 18 articles included, 10 evaluated exclusively CTQ, 07 exclusively PBI and 01 analyzed both simultaneously.

3.1 *Parental Bonding*

PBI was analyzed in different ways among the studies. Among the 7 studies that used exclusively this instrument, four used the two dimensions model (*care* and c*ontrol/autonomy)* (**Bogaerts, 2005; Gao, 2009; McCartney, 2001; Timmerman, 2005)**. The study conducted by **Krastins et. al.** also used PBI in two dimensions, but it will be described separately in item 3.3 because it assessed PBI and CTQ simultaneously.

Bogaerts et. al.examined differences between a group of 84 male child molesters recruited from either an educational training program or from prison and 80 matched normal control subjects. They concluded that the group of child molesters reported less parental care from both parents than the comparison group (mean score for 'care mother' 34.2/SD 7.9 and 38.1/SD 6.5 and for 'care father' 31.6/SD 7.4 and 34.4/SD 7.2 in each group, respectively) and greater autonomy from the father (mean 'autonomy father' 28.5/SD 7.4 and 34.4/SD 7.2, respectively). All this differences were statistically significant. Mother autonomy was not significant.

Gao et. al. examined the cross-sectional relationship between maternal and paternal bonding, childhood physical abuse and psychopathic personality assesssed by Hare's Self-Report Psychopathy scale (SRP-II) at age 28 years in a community sample of 333 males and females. After controlling the influences of sex, ethnicity, child abuse and social adversity, low maternal care (β=-0.39, t=-6.36, $p<0.001$) and paternal overprotection (β=-0.12, t=-2.33, $p<0.05$) were associated with total psychopathy.

McCartney et. al. aimed to study if the perceived experiences of parenting were associated with adult interpersonal functioning and ASPD in a group of patients detained in high secure care sample, divided by legal classification - according to 1983 Mental Health Act - in Psychopathic Disorder (PD) and Mental Illness (MI). They found that the psychopathic disorder sample had significantly lower perceptions of care for both father (mean score 17.8/SD 10.1 for PD and 25.1/SD 9.0 for MI) and mother (mean score 17.8/SD 10.1 for PD and 25.1/SD 9.0 for MI) when compared with the mental illness sample.

Timmerman et. al. conducted a cross-sectional study with forensic psychiatric inpatients, prisoners and normal controls. Dimensionally, ASPD were significantly associated with less perceptions of care from mother (B=0.12; R^2=0.13) and father (B=0.20; R^2=0.10) and with more protection/control from the mother (B=0.05; R^2=0.11). Categorically, only the association with paternal care remained significant (B=1.1; R^2=0.08)

Two studies considered PBI using three domains. **Enns et. al.** considered the following domains for PBI:*care, control and authoritarianism.* This study examined the pattern of association between parenting dimensions and adult mental disorders including ASPD in male and female separately. After controlling for sociodemographic variables, odds ratios (OR) for ASPD were statistically significant for mother lack of care in both genders (OR=1.20 in male and OR=1.25 in female). In males, mother overprotection (OR=1.23) and authoritarianism (OR=1.12) and father lack of care (OR=1.15) were also significant. Father overprotection was protective for ASPD in males (OR=0.89). They found, also, that the impact of mothering generally appears to be greater than the impact of fathering.

Reti et. al. also analyzed PBI in three domains: *care, behavioral restrictiveness and denial of psychological autonomy*. The authors assessed the role of parenting in the development of adult antisocial personality traits in a community-based sample and analyzed males and females separately. Antisocial traits in males were associated with low maternal care (β=-0.133) and high maternal behavioral restrictiveness (β=0.139). In females, antisocial traits were associated with low paternal care (β=-0.135) and high maternal denial of psychological autonomy (β=0.191).

Finally, only one study (**Patock-Peckham, 2010)** considered four domains (*care, rejection, autonomy and overprotection*) and examined potential parental influences to both pathological reasons for drinking and antisocial personality in a population of university students and also analyzed males and females separately. Among females, only low maternal care was associated with higher levels of antisocial symptoms (*standardized coefficient*=-0.315). Among males, low paternal care and higher levels of overprotection were associated with antisocial symptoms (*standardized coefficient*=-0.232 and 0.258, respectively), as well as higher levels of maternal autonomy and rejection (*standardized coefficient*=0.169 and 0.248).

3.2 Childhood Maltreatment

Of the 10 studies that assessed exclusively CTQ and its association with antisocial traits, two (**Cima, 2008** and **Dargis, 2017)** used a control group.The first compared a group of prison inmates to a healthy control group. According to median scores in (PCL-R) , the prison inmates were divided into the group of psychopathic and nonpsychopathic offenders. Differences between controls were significant for all CTQ subscale scores when compared to both psychopathic and nonpsychopathic offenders. In contrast, non-psychopathic and psychopathic offenders did not differed in CTQ subscales, except in physical neglect, higher in non-psychopaths group ($t(45)=2.36$, $p<0.05$ e $d=.71$). The second one analyzed a sample of incarcerated males divided in high and low negative affect and a control group and compared the means of CTQ subscales in each group. Negative affect is a general dimension of affect that includes aversive mood states. While individuals with high negative affect experience intense feelings of anger and discomfort, low negative affect is a state of serenity (**Watson et. al., 1988**). The low negative affect psychopathic group scored higher than the comparison group on physical abuse and physical neglect and the high negative affect psychopathic group scored higher than the comparison group on all traumas.

The other studies had a cross-sectional design. Four of them conducted the study with clinical samples. **Bernstein et. al.** proposed to examine predictive relationships between types of childhood maltreatment and personality disorders in a substance-abusing population. In correlation analysis, all subtypes of trauma related to ASPD. Physical abuse and physical neglect (*standardized regression coefficients*=0.22 and 0.20, respectively, $p<0.01$) predicted antisocial and sadistic personality when considered in *path* analyses.

Bierer, et. al. used an outpatient sample of personality disorder subjects to determine the relative associations of childhood trauma indices to specific personality disorders and history of suicide. Antisocial personality disorder was specifically predicted by physical abuse ($\chi^2 =7.71$, $df=1$, $p=.005$) and sexual abuse ($\chi^2 =6.83$, $df=1$, $p=.009$), and history of suicide gestures was associated with emotional abuse.

Cohen et al. tested the hypothesis physical abuse might be associated with antisocial traits, independently of other maltreatment types and other personality traits co occurring. In correlation analysis, physical and emotional abuse were related to ASPD ($r=0.315$ e 0.270, respectively). In the final model, however, they confirmed their hypothesis and found that

physical abuse was the only maltreatment variable associated with antisocial traits (β=0.214, *p*=0.007)

Kounou et. al. compared thefrequency of childhood maltreatment between patients in treatment for mood disorders in two different countries (France and Togo) and explored the link between trauma and personality disorders. The two populations had opposite results: while in the Togolese sample a positive association was found between physical abuse and ASPD (*r*=0.298, *p*< 0.055), in the French sample, after adjusting for other types of childhood maltreatment, physical abuse was not associated with ASPD.

Only one study was conducted with a sample of probationers. In this one, **Kim et. al.** aimed to understandthe independent contribution of specific types of maltreatment to criminal recidivism. They found that recidivism was uniquely associated with physical neglect (Adjusted Odds Ratio [AOR]= 2.862).

Finally, three studies used population based samples. **Hengartner et. al.** explored potential risk factors for different personality disorders, assessing child maltreatment and environmental risk factors. In bivariate association, poverty, conflicts with parents, bullying victimization, emotional abuse and neglect and physical abuse and neglect were significantly related to all 10 personality disorders assessed. Sexual abuse was also related to ASPD. On *path* analysis – method employed to evaluate causal model with more than one independent variable - just physical abuse was related to ASPD (*standardized coefficient=0.110).*

Shin et. al. studied the association between childhood maltreatment and three types of criminal behavior: property crime, violent crime and fraudulent. In *path* analysis, only physical abuse was directly related to property and violent crime (*standardized coefficient*=0.26 for both), while physical and sexual abuse were directly related to fraudulent crime (*standardized coefficients*=0.31 and 0.14, respectively*).* Therefore, physical abuse was significantly related to all types of crime.

Zhang et. al. assessed the impact of childhood maltreatment on the development of personality disorders. The only type of maltreatment associated with ASPD was physical abuse (OR=3.48). The other types of trauma were not significant to predict ASPS.

3.3 *Parental Bonding AND Childhood Trauma*

Krastins et. al. examined relationship between ASPD and retrospective reports of childhood maltreatment, parental bonding, and teasing. They controlled for symptoms of depression and anxiety, and was the only study to consider both PBI and CTQ and its relation to ASPD. In correlation analysis, associations between ASPD scores and emotional abuse and neglect and sexual abuse were significant but small, although associations between ASPD and physical abuse and neglect were medium sized. On PBI analysis, only maternal and paternal care showed significant and inverse associations to ASPD, all small in size. On hierarchical multiple regression analysis, however, physical abuse, physical neglect and lack of paternal care made the largest unique contributions to the prediction of ASPD scores after controlling for comorbid depression and anxiety.

4 Discussion

To the authors' knowledge, this is the first systematic review that assessed the association between childhood trauma and parental bonding, measured by means of CTQ and/or PBI, with antisocial traits or ASPD.

It is worth mentioning the scarcity of studies that evaluate this relationship in adults, considering that in all the searched literature there are only 11 articles that relate CTQ to antisocial traits and 8 that relate it with PBI. Only one study used both scales. An important finding refers to the heterogeneity of the studies, concerning both samples and outcomes.

Regarding CTQ, four studies demonstrated - at least in some type of analysis or some comparison between subgroups - association of all 5 subtypes of trauma with antisocial traits **(Bernstein, 1998; Dargis, 2017; Hengartner, 2013; Cima, 2008).**

The most consistent finding was the association between physical abuse and antisocial traits, observed in all studies except in two of them **(Kim, 2016 and Kounou, 2015).** In all other studies, at least in some type of analysis, this association was found, and sometimes it was the only variable associated with the outcome.

These findings were also found by other authors. **Lobbestael et. al. 2010** investigated the relationship of these five subtypes of childhood maltreatment, assessed by Interview of

Traumatic Events in Childhood, with 10 personality disorders and showed physical abuse to be the only significant predictor of ASPD.

The second most consistent finding was regarding physical neglect, present in 5 of the 11 studies (**Kim, 2016; Bernstein, 1998; Dargis, 2017; Krastins, 2014; Cima, 2008**), although **Bernstein, 1998** and **Hengartner, 2013** have also shown this association in some analysis: the first, in correlation analysis, found that all types of trauma were associated with ASPD, while the second, in linear model analysis, found the same result.

There was less consistent association between emotional abuse and neglect and antisocial traits. **Cohen, 2014** found, in correlation analysis, association between emotional abuse and ASPD, and **Krastins, 2014** found a low effect association between this variable and the outcome. Two other studies that demonstrated an association of all traumas to the outcome reinforce this relationship **(Bernstein, 1998 and Hengartner, 2013)**.

However, there are studies in literature that show an important association between negligence and crime. **Dembo et. al. 1998** found that neglect might be a stronger predictor of recidivism than physical or sexual abuse in adolescence, after controlling for family, peer, academic, mental health, and substance-abuse covariates, although physical and sexual abuse were also associated with relapse. **Kingree et. al. 2003** found that higher levels of emotional neglect were associated with recidivism in a six month follow up period in a sample of juvenile offenders, and it was the only trauma subtype associated to any recidivism in regression analysis. On the other hand, physical neglect was negatively associated with recidivism. **Nikulina et. al. 2011** also found that childhood neglect significantly predicted criminal behavior in young adults.

Sexual abuse was the variable least related to antisocial traits on the present review: this association was demonstrated only by two studies. **Shin, 2016** found this association only for the fraudulent crime outcome, while for other types of crime this result was not significant, and **Bierer, 2003** demonstrated association between sexual abuse and ASPD.

This finding is in accordance with **Maxfield et. al. 1996.** The author investigated in a prospective cohort with a sample of maltreated people identified from a court. They found that compared to controls and victims of other types of trauma, victims of physical abuse were the most likely to be arrested, while being victim of sexual abuse was not significantly associated with crime. This result is similar to **Cohen, 2014,** who found that sexual abuse had

fewer significant relationships with all types of personality pathology than did the other maltreatment measures. **Lobbestael et al. 2010** in his study found that sexual abuse was associated with paranoid, schizoid, borderline, and avoidant traits, but not with ASPD. Finally, a meta-analysis on recidivism among juveniles examined child maltreatment and other variables in relation to recidivism and found that having been physically or sexually abused were related to an increased risk of recidivism. However, the strongest variable was that related to previous delinquency and age of the first act (**Cottle et. al. 2001**).

Regarding PBI, data seem more heterogeneous, partly because the results differ, but also because PBI is used in different dimensions, which impairs some comparisons.

The most consistent finding was the relationship between maternal and paternal care and antisocial traits. Low maternal care was significantly associated with antisocial traits in all studies, although in Reti, 2002 this correlation was found only in males. Low paternal care was not significantly associated with antisocial traits in only one study **(Gao, 2009).** In all others, low paternal care was associated with antisocial traits.

Hoeve et. al. 2012 investigated in a meta-analysis the link between parental style to parents and delinquency and found that poor parental style was related to delinquency in both boys and girls, and that a larger effect size was found for bonding to mother than to father. Also, the authors found stronger effect size if the child had the same sex of the parent.

Regarding the overprotection variable, the data is less consistent. High maternal overprotection was associated with antisocial traits in three studies in at least some gender **(Reti, 2002; Enns, 2002; Timmerman, 2005).** The other studies did not find this association. On the other hand, low maternal overprotection was not related to antisocial traits in any study.

Thus, regarding the mother, the variables most associated with antisocial traits are low maternal care (the most consistent) and high overprotection (less consistent). On the other hand, high paternal overprotection was found associated with antisocial traits in two studies **(Gao, 2009; Patock-Peckham, 2010),** while low paternal overprotectionwas found related to antisocial traits in only one study **(Enns, 2002).** Thus, regarding the father, the only variable consistently associated with antisocial traits was low care, while for overprotection data are contradictory.

These findings are in agreement with other literature data. **Veenstra et. al. 2006** have demonstrated that overprotection is linked to antisocial behaviors in both preadolescent boys and girls, as well as rejection. Besides, **Barnes et. al. 1992** found that parents who perform a coercive control were found to be more likely to have adolescents with deviance and delinquency. This study also showed that parental control was less consistently associated to delinquency than parental support, includes value, acceptance and love.

Three studies divided the sample by gender**(Reti, 2002; Enns, 2002; Patock-Peckham,2010).** In females, data are more homogeneous: the three studies showed that low maternal care was related to the antisocial traits, and in two of them (**Reti, 2002; Patock-Peckham,2010)** it was the only associated variable with the outcome. The variable overprotection (both maternal and paternal) was not associated with antisocial traits in females in any of the three studies.

In males, low maternal care **(Reti, 2002; Enns, 2002)** and paternal care **(Enns, 2002; Patock-Peckham, 2010)** were associated with antisocial traits. Regarding overprotection, high maternal overprotection was related to antisocial traits in some studies **(Reti, 2002; Enns, 2002)**. However, antisocial traits were associated with both low **(Enns, 2002)** and high **(Patock-Peckham, 2010)** father overprotection. In males, as for females, the most relevant variable for antisocial traits is care from both father and mother. High maternal overprotection seems to be associated with antisocial traits in males (**Reti, 2002; Enns, 2002**), while the role of paternal overprotection is not established in literature for males.

There are several studies that evaluate bonding by gender. **Mak et. al. 1996,** for example,demonstrated that for adolescents a combination of low paternal care and high paternal overprotection predicted delinquency regardless of gender.

In summary, there is a greater consistency of association of low maternal and paternal care to antisocial traits in adult life in both genders. Regarding overprotection, there seems to be a tendency for high overprotection from both parents to be associated with antisocial traits. Only one study found low overprotection associated with antisocial traits, and this finding was significant only in the male sample **(Enns, 2002).** So, the role of maternal and paternal overprotection is still not well established nor understood.

Medical literature poorly explores the interrelation of bonding, trauma and antisocial traits and how these variables interact with each other. Evidence from regression analysis

suggests that bonding is more relevant than abuse (**Gao, 2009**), but there is a lack of evidence about this complex interaction. More studies elucidating these interactions are extremely important in terms of polices and educational initiatives that can prevent risk factors primarily associated with psychopatic behavior.

5 Limitations

The present systematic review has several limitations.

First, only studies that assessed parental bonding by PBI and trauma by CTQ were considered. Other ways of measuring these variables were not considered. Besides that, CTQ and PBI are self-report questionnaires, which may raise a recall bias. On the other hand, using specific instruments to evaluate the studied factors, allows a more reliable comparison among the different results.

No searches were made in gray literature to assess unpublished data, thus it is possible that potentially eligible studies had been disregarded. In addition, the studies included only the adult population. There is a lot of studies about bonding and trauma within juvenile offenders that were not included. Because of the cross-sectional design of all studies, it is not possible to make causal inferences between trauma or bonding and antisocial traits. Reverse causation should be considered.

Another important limitation concerns the heterogeneity of nomenclature with regard to antisocial traits. Moreover, it should be considered that there is a limitation on the reliability of self-applied instruments in antisocial individuals, since they tend to lie and this may impair the findings.

Despite these limitations, we believe that the present study contributes to the understanding of how these variables correlate.

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Tables

Table 1

Characteristics of included studies

Study	Local	Study Design	OutcomeAssessed	Outcome tool	Tool for ASPD	Samplesize	No. withoutcome N(%)	Population	Scales	Age (years)/ SD	Results
Bernstein, 1998	North America	Cross-sectional	ASPD	PDQ-R	PDQ-R	378	Continuousvariable	Patientsbeingtreated for addiction	CTQ	40.2/8.8	PA and PN wererelated to a subclusterof "psychopathic" PD.
Bierer, 2003	North America	Cross-sectional	ASPD	RDP	RDP	182	17 (9.3)	Patientswith PD	CTQ	37.8/8.4	ASPD wasspecificpredictedbyas and PA.
Bogaerts, 2005	Europe	Case-control	Childmolesters	Notapplicable	ADP-IV	164	84 (51.2)	Childmolesters x normal controlgroup	PBI -care -control	NI	Groupofchildmolestersreportedless parental carefrombothparentsandgreaterexperiencedautonomyfromthefather.
Cima, 2008	Europe	Case-control	Psychopathy	PPI	PPI	74	NI	Prisoninmates (psychopathicandnonpsychopathic) x healthycontrols	CTQ	Prisioners 30.4/9.7 Control 24.9/8.56	Differencesbetweencontrolsweresignificant for all CTQ subscalescores. Non-psychopathicandpsychopathicoffendershaddifferentresults in PN.
Cohen, 2014	North America	Cross-sectional	ASPD	PDQ4+	PDQ4+	231	59 (25)	Psychiatricpatients	CTQ	39.32/12.75	PA wastheonlymaltreatmentvariablea

											ssociatedwithantisocialtraits
Dargis, 2018	North America	Case-control	PCL-R scores	PCL-R	PCL-R	222	NI	Incarcerated males (highandlownegativeaffect, NA) x controlgroup	CTQ	NI	Low-NApsychopathicgroupscoredhigherthanthecomparisongroupon PA and PN. High-NApsychopathicgroupscoredhigherthanthecomparisongrouponall traumas.
Enns, 2002	North America	Cross-sectional	ASPD	CIDI	CIDI	5360	NI	NoninstitutionalizedciviliansfromNationalSurveydividedbygender	PBI - care -control - autho-rianism	NI	Lackof maternal carewasassociatedwith ASPD in bothgender.
Gao, 2009	Africa	Cross-sectional	PCL-R scores	PCL-R	PCL-R	333	Continuousvariable	Subsamplederivedfrom a largersampleof 1795 childrenfromtheislandofMauritius	PBI -care -control	28/NI	Psychopathywas more related to lackof maternal care
Hengartner, 2013	Europe	Cross-sectional	ASDP	ADP-IV	ADP-IV	512	Continuousvariable	Subsamplederivedfrom a epidemiologysurvey	CTQ	29.61/6.74	PA was relates to ASPD
Kim, 2016	Asia	Cross-sectional	Recidivism	NI	MINI	183	8 (4,37)	Probationers	CTQ	40.1/11.8	Recidivismwasuniquelyassociated withPN.

Kounou, 2015	Africa Europe	Cross-sectional	ASPD	PDQ4+	PDQ4+	150	11 (7,3)	Patientsbeingtreated for mooddisorders in twodifferent countries (Togo and France)	CTQ	France 41/12.0 Togo 38.9/9.2	In Togo, PA wasassociatedwith ASPD. In theFrenchgroup,therelationship between PA and ASPD wasnotsignificant.
Krastins, 2014	Oceania	Cross-sectional	ASPD	PDQ4+	PDQ4+	411	Continuousvariable	Peoplerecruitedfrom a university	CTQ PBI - care - over protection	29.75/11.43	PA, PN andleveloffathercaremadethelargestuniquecontributions to theprediction of ASPD scores.
McCartney, 2001	Europe	Case-control	Psychopathic Disorder	HA Legal classification	MHA Legal classification	79	48	Patientsdetainedat a highsecurehospitaldivided in twogroups: PsychopathicDisorder x Mental Illness	PBI - care - overprotection	NI	PsychopathicDisordersamplehadsignificantlylowerperceptionsofcare for bothfatherandmother as comparedwiththe Mental Illnesssample
Patock-Peckham, 2010	North America	Cross-sectional	ASPD	PPS	PPS	404	Continuousvariable	Collegestudentsdividedbygender	PBI -care -rejection -autonomy - overprotection	19.6/2.66	Having a caringmotherwereassociatedwithlowerlevelsofantisocialsymptomsamongwomen. Having a caringfatherweredirectlyassociatedwithlowerlevelsofantisocialsymptomsamongmen.
Reti, 2002	North America	Cross-sectional	Antisocialtraits	IPDE	IPDE	742	Continuousvariable	SubjectsparticipatingsampledfromtheBaltimoreEpidemiologicCatchmentAreadividedbygender	PBI -care - behavioralrestrictiveness - denialofpsych	51/NI	Adultantisocialtraits in maleswereassociatedwithlow maternal careandhighmaternalbehavioralrestrictiveness. In females, it wasassociatedwithlow paternal careandhigh maternal

									ologicalautonomy		denialofpsychologicalautonomy.
Shin, 2016	North America	Cross-sectional	Three typesof crime: property, violent, fraudulent	Crime questionnaireadaptedfromaNational Study[1]	Notapplicable	337	NI	Communitysample	CTQ	21.7/2.1	PA wasdirectlyrelated to allthreetypesof crime
Timmerman, 2005	Europe	Case-control	ASPD	PDQ-R (controlsand prisioners) IPDE (forensicinpatients)	PDQ-R IPDE	426	NI	Menwith a criminal status (forensicinpatientsandprisoners) x control normal group	PBI -care -protection	Forensicin patients 35/11.3 Controls 43.6/11.7 Prisioners 33.8/8.9	Dimensionally, ASPD weresignificantlyassociatedwithlesscarefrombothparentsandwith more protectionfrommother. Categorically, onlytherelationshipwithcareoffatherremainedsignificant.
Zhang, 2013	Asia	Cross-sectional	ASPD	PDQ4+	PDQ4+	2090	18 (0,86)	Subjectssampledfrom a Mental Health Centre	CTQ	NI	Individualswith ASPD weremostlikely to haveexperienced PA.

*Abreviations:***ASPD:** Antisocial Personality Disorder; **PD:** Personality Disorder; **PDQ4+:** Personality Diagnostic Questionnaire-4th Edition; **PDQ-R**: Personality Diagnostic Questionnaire-Revised; **RPD**: DSM-III Revised Personality Disorders; **ADP-IV:** Assessment of the DSM-IV Personality Disorders; **PPI:**Psychopatic personality inventory; **PCL-R**: Psychopathy Checklist-Revised; **CIDI**: Composite International Diagnostic Interview, baseado no DSM III-R; **MINI:** Mini International Neuropsychiatric Interview; **MHA:** Mental Health Act; **PPS:** Primary Psychopathology Scale; **IPDE:** International Personality Disorder Examination; **PA**: Physical abuse; **PN**: Physical neglect; **EA:** Emotional abuse; **EM:** Emotional neglect; **SA:** Sexual abuse;

NI: not informed

[1] National Longitudinal Study of Adolescent Health Study

Table 2

Quality assessment of the studies shown in Table 1 according to the NewcastleOttawa Quality Assessment

	Author	Selection	Comparability	Outcome
CROSS-SECTIONAL	Kim et al.(2016)	***	*	**
	Shin et al. (2016)	****	*	**
	Dargis et al. (2017)	****	**	**
	Cohen et al. (2014)	****	**	**
	Gao et al. (2009)	***	*	**
	Reti et al. (2002)	****	*	**
	Enns et al. (2002)	****	**	**
	Bernstein et al. (1998)	***	*	**
	Kounou et al. (2015)	****	*	**
	Krastins et al. (2014)	****	**	**
	Hengartner et al. (2013)	****	**	**
	Zhang et al. (2013)	****	**	**
	Patock-Peckham et al (2009)	***	*	**
	Bierer et al. (2003)	****	**	**
	Mccartney et al. (2001)	****	*	**
CASE-CONTROL	Cima et al. (2008)	****	*	**
	Bogaerts et. al. (2008)	***	*	**
	Timmerman et al. (2005)	****	*	**

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6.2 ARTIGO 2

"ASSOCIATION BETWEEN DIFFERENT TYPES OF CHILDHOOD TRAUMA AND PARENTAL BONDING WITH ANTISOCIAL TRAITS IN ADULTHOOD: A CROSS SECTIONAL STUDY OF MACHINE LEARNING IN A SAMPLE OF MALE COCAINE USERS"

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ABSTRACT

Title: Association between different types of childhood trauma and parental bonding with antisocial traits in adulthood: a cross sectional study of machine learning in a sample of male cocaine users

Background: Childhood trauma and parental bonding were identified as factors correlated with later antisocial personality disorder (ASPD). Individuals with substance abuse are particularly at risk for antisocial behavior, as well as for history of childhood trauma and poor parental bonding. How those variables interact augmenting the risk for ASPD is yet to be better understood.

Objective: To better understand this complex interaction by using both traditional statistical analysis (i.e. logistic regression) and machine learning (ML) approaches in a sample of male cocaine users.

Methods: This cross-sectional study evaluated 346 male impatient cocaine users. Childhood Trauma Questionnaire (CTQ), Parental Bonding Instrument (PBI) and Mini International Neuropsychiatric Interview (MINI) were applied. Statistical analysis was performed using the logistic regression method and ML.

Results: 346 individuals were included, and 20.2% (n=70) met criteria for ASPD. We found a marked higher prevalence of mental illness in ASPD group when compared to those without ASPD. On logistic regression analysis, emotional abuse (OR 1.95, p = 0.001), physical abuse (OR = 1.45, p = 0.032), paternal overprotection (OR = 1.42, p = 0.027) and physical neglect (OR = 0.61, p = 0.017) were related to ASPD. On ML analysis the best model in predicting ASPD had an AUC of 75,5%, sensitivity of 50%, specificity of 85% and confidence range 95%. The variables that reached statistical significance were emotional and physical abuse (importance of 100 and 69.6%, respectively) and paternal care and overprotection (importance of 11.2 and 6.7%, respectively).

Conclusions: Emotional and physical abuse were the factors with the strongest correlation with ASPD, pointing to specific characteristics of this population. Although physical neglect was unexpected negatively related to ASPD in the logistic regression model, this result was not confirmed in ML. Poor paternal bonding was stronger than maternal bonding in predicting ASPD in our sample. Finally, the increased risk for adult mental disorders from poor bonding and trauma is generally nonspecific and it remains for future studies to elucidate the implications of such heterogeneity of environmental factors on development of ASPD in general population and among individuals with substance use disorder.

“ASSOCIATION BETWEEN DIFFERENT TYPES OF CHILDHOOD TRAUMA AND PARENTAL BONDING WITH ANTISOCIAL TRAITS IN ADULTHOOD: A CROSS SECTIONAL STUDY OF MACHINE LEARNING IN A SAMPLE OF MALE CACAINE USERS”

Introduction

Antisocial personality disorder (ASPD) describes, according to DSM-V, individuals with a pervasive pattern of violation of the rights of others that begins in childhood or early adolescence and continues into adulthood(American Psychiatric Association, 2013). The diagnostic criteria include behaviors such as repeatedly performing acts that are grounds for arrest, failure to obey laws and norms, lying, manipulation, repeated fights or assaults, disregard for the safety of self and others, failure to sustain consistent work behavior, mistreating other individuals, impulsive behavior, pattern of irresponsibility and lack of remorse. The prevalence is around 0.2 to 3.3% in general population (American Psychiatric Association, 2013).

Although ASPD is often treated as an unitary construct, it is known to be a heterogeneous disorder. Karpman (1948)suggests the existence of what he calls primary and secondary psychopathy(Karpman, 1948). Psychopathy is a different concept from ASPD and describes a more serious profile of behavior and interpersonal functioning .Primary psychopathy refers to a constitutional affective deficit associated with genetic vulnerabilities, being characterized by a marked lack of remorse, egocentricity and pathological narcissism. This subtype would be associated with nonviolent crimes and less comorbidity with mental disorders (Hicks et al., 2010). On the other hand, the second subtype, called secondary psychopathy, refers to an acquired manifestation, as a result of interaction with environmental factors, and reflects an unstable pattern, manifested by higher levels of anxiety, more borderline personality traits, greater impulsiveness, worse interpersonal functioning, greater tendency to engage in illegal activities, violent and institutional misconduct behavior, greater comorbidity with other psychiatric disorders and suicide and better response to treatment (Hicks et al., 2010; Karpman, 1948; Lee & Salekin, 2010; Skeem et al., 2007; Ullrich et al., 2010).

Risk factors for ASPD include biological, genetic and environmental aspects (Maes et al., 2006; Rautiainen et al., 2016; Reichborn-Kjennerud et al., 2015; Rhee & Waldman, 2002; Silberg et al., 2007). Much interest has focused on the role of parenting in the development of ASPD; however, its role remains poorly understood. Distinct parental factors as low maternal and paternal care (Bogaerts et al., 2005; McCartney et al., 2001; Timmerman & Emmelkamp, 2005)and paternal overprotection (Gao et al., 2010; Patock-Peckham & Morgan-Lopez, 2010)were identified as factors that lead to later antisocial traits.Moreover, there is also evidence that childhood trauma – which includes physical and emotional abuse and neglect and sexual abuse - is associated with ASPD traits in adult life (Craparo et al., 2013; Evren et al., 2006; Krischer & Sevecke, 2008; Luntz, Barbara K., Widom, 1994; O'Neill et al., 2003; Weiler & Widom, 1996). However, it is yet unclear what types of trauma predict ASPD, and studies suggest that some types of trauma are associated with ASPD and others are not. Lobbestael et. al. (2010) investigated the relationship between these five forms of childhood trauma and ten different personality disorders and found only physical abuse leading to ASPD(Lobbestael et al., 2010).

This association is particularly important among individuals with substance abuse. There is substantial evidence that shows a high prevalence of childhood trauma among individuals with substance use disorder, which makes it a more vulnerable population(Sordi & Hauck, 2015). Besides that, there is a strong correlation between ASPD and substance use disorder. A quarter of crack cocaine users will present ASPD (De Almeida Ribeiro et al., 2016; Kessler et al., 2012). How those variables relate to each other are still under investigation.

Hence, further clarifying the nature of the relationships between childhood trauma and poor parental bonding and ASPD in adulthood, exploring how these variables interact with each other can be of great value. Standard investigation has focused on traditional statistical approaches that explore a linear relationship between variables at group-level data(Ives Cavalcante Passos et al., 2016). In this context, Machine Learning (ML) approaches can be advantageous and have increasingly been used in prognostic psychiatry, as they can assume a complex relationship between variablesand are focused at an individual patient level (Ives C. Passos et al., 2019). The main objective of the present study is to better understand this

complex interaction by using both traditional statistics and ML approaches in a sample of male cocaine users.

Methods

This is a cross-sectional observational study.

Participants and procedures

The sample of the present study consists of 346 male cocaine users selected from three public psychiatric hospitals with an inpatient treatment unit specialized in Addiction Disorder in the city of Porto Alegre, Rio Grande do Sul, Brazil. All patients admitted to the hospitals were invited to participate, and refusal rate was less than 1%. All participants had a positive cocaine urine test (Bioeasy® cocaine test, Alere ™) at admission.

Patients should be over 18 years old to participate.

Exclusion criteria were inability to consent to participate in the research, based on clinical and psychiatric examination (presence of psychosis, for example), intelligence coefficient estimated through vocabulary testing and block testing from Wechsler Adult Intelligence Scale, third edition (WAISS-III)below 70 and non-agreement with participation (patients who did not sign the informed consent).

Patients were invited to participate in the study as soon as they were able to understand the study objectives, after admission to the Hospital. Instrument application interviews were conducted between the fifth and seventh detoxification days in order to minimize the cognitive effects of the first days after hospitalization.

Instruments

Mini International Neuropsychiatric Interview (MINI): It is a standardized diagnostic interview based on the DSM-III-R / IV and CID-10 criteria and consists of questions with dichotomous answers (yes/ no) that evaluate 17 DSM-IV Axis I disorders, as well as risk of suicide and ASPD (Lecrubier et al., 1997).

Childhood Trauma Questionnaire (CTQ): Developed by Bernstein et al in 1994, this self-applicable instrument investigates five traumatic components: physical and emotional abuse,

sexual abuse, and physical and emotional neglect (Bernstein et al., 1994). In 2003, the same author developed a short version of the 28-item CTQ that was validated while maintaining the same properties as the original 70-item version, but of faster application(Bernstein et al., 2003). Items on the CTQ inquire about experiences in childhood and adolescence and assess in a 5-point Likert-type scale with response options ranging from '*never true*' to '*very often true'* for these five subtypes of trauma.The scale provides a quantitative index of the severity of trauma, with higher scores indicating a more severe degree of childhood trauma. This instrument was validated for Brazil in 2006 (Grassi-Oliveira et al., 2006).

Parental Bonding Instrument (PBI):PBI was developed in 1979 by Parker et. al. and adapted and validated in the Brazilian culture (Hauck et al., 2006; Parker et al., 1979; Terra et al., 2009). PBI retrospectively assesses how the individual perceived their parents before the age of 16 years(Parker et al., 1979). It is a self-applicable questionnaire that lists various attitudes and behaviors of parents, on a Likert scale (0 to 3), with 25 questions regarding the father and mother separately, in which the subject answers how it describes parents behavior. The scale evaluates two dimensions of parental behavior: *care* and *overprotection.* The care dimension refers to sensitivity, care, warmth and availability versus coldness and rejection, while the overprotection dimension evaluates intrusion and control versus encouragement of autonomy. Considering these two dimensions, Parker (1979) identified the presence of four types of bonds, according to the combination of care and control dimensions: 1) high affection and low control, conceptualized as "*optimal parenting*"; 2) high affection and high control, conceptualized as "*affectionate constraint*"; 3) low affection and high control, conceptualized as "*affectionless control*" and 4) low affection and low control, conceptualized as "*neglectful parenting*". Studies have demonstrated PBI to be a reliable instrument, stable over time, and with little influence of economic class and psychopathology (Wilhelm & Parker, 1990). The instrument, however, is sensitive to cultural effects (Parker & Lipscombe, 1979).

Statistical analysis

Statistical analysis was carried out using R software. A total of 346 individuals were available for the analysis. A descriptive analysis was conducted to represent clinical and sociodemographic characteristics of the sample, divided in two groups - with and without ASPD – for comparisons, shown as mean and standard deviation or frequency and percentage. The t-test

was used to compare quantitative variables within both groups, while the chi-square test was used to compare categorical variables within groups.

Logistic Regression Approach

A multivariable logistic regression model was used to determine the association between multiple variables from PBI and CTQ and ASPD diagnosis in adulthood. Variables included in multivariable model were emotional abuse and neglect, physical abuse and neglect, sexual abuse, paternal and maternal care and overprotectionbased on domain knowledge from experts.

Machine Learning Approach

Machine learning analysis

We also built a ML model using elastic net regularization algorithm to predict ASPD (**Figure 01**). CTQ and PBI were used as features to build the ML model. CTQ was analyzed as a continuous numerical variable, considering the total score of each of the 5 subscales that assess each type of trauma. PBI was also considered as a continuous numerical variable, and it was considered total *care* and *overprotection* score for each of the caregivers in the analysis. The ML analysis was performed with R software (Version R 3.6.1) and RStudio (Version 3.5.3) with the R package "caret" (Version 6. 0-73), and "glmnet" (Version 2.0-18) 28,29 (Fig. 1a). Elastic Net is an improvement from the Least Absolute Shrinkage and Selection Operator (LASSO) and Ridge Regression methods since they show several drawbacks compared to Elastic Net. This, in turn, displays some advantages: 1) it selects variables automatically, setting coefficients to zero (as in LASSO) and shrink coefficient (as in ridge regression) simultaneously; 2) it is able to handle a large set of variables; 3) it specifies groups of correlated variables; 4) it shows low risk of overfitting.

Missing data and imputation

We split our dataset into training (80% of the whole sample) and test dataset (20%) randomly. Afterwards, we imputed data on variables that have equal to or less than five percent of missing by using the median for numeric variables and mode for categorical variables (**Figure 02).** We performed imputation using the training dataset. In the next step,

we used a standard ML protocol with repeated 10-fold cross-validation. We repeated 10-fold cross-validation 10 times to improve tuning.

Class imbalance problem

Class imbalance is a common problem in ML analysis where observations in one class (e.g. subjects that did not develop ASPD) exceed observations in the other class (e.g. subjects that develop ASPD). A typical ML algorithm trained using an imbalanced data set assigns new observations to the majority class and leads to very different sensitivity and specificity scores in the model. For this reason, we used upsampling for the class imbalance problem with the package "Mice" (version 0.0.3).

Model Performance

We tested the trained models in the testing "unseen" datasets. Individual-level predicted probabilities of conversion to ASPD were calculated based on balanced accuracy, sensitivity, specificity, the positive predictive value (PPV), the negative predictive value (NPV), and Area Under the ROC Curve (AUC).

Ethics

The study was approved by the Institutional Review Board and Ethics Committee of the Hospital de Clinicas de Porto Alegre, Hospital Psiquiátrico São Pedro e Clínica São José. All participants provided written informed consent. For those who do not accepted participation in the study, treatment was granted without prejudice.

Results

A total of 346 individuals were included in the present study. Of these, 20.2% (n=70) met criteria for ASPD. **Table 1** describes the clinical and sociodemographic characteristics of the sample. When the two groups were compared, they were found to present similar rates of education, and there were no differences in ethnicity or age. Regarding mental disease, individuals with ASPD had higher rates of social phobia, suicide risk, psychotic syndrome during life, generalized anxiety disorder, depression, alcohol addiction (all $p<.001$) and post-traumatic stress disorder ($p<0.05$).

In a multivariable logistic regression model, ASPD significantly correlated with emotional abuse (odds ratio [OR]=1.95, p=0.001), physical abuse (OR=1.45, p=0.032) paternal overprotection (OR=1.42, p=0.027) and physical neglect (OR=0.61, p=0.017). Results are shown in **Table 2**.

On ML analysis, the best model in predicting ASPD in a sample of individuals with cocaine addiction was the one with an AUC of 75,5%, sensitivity of 50%, specificity of 85% and confidence range 95%. The variables that reached statistical significance in predicting ASPD in adulthood were emotional and physical abuse, and paternal *care* and *overprotection* in this order of importance. Maternal care and overprotection were not statistically significant, nor was it emotional and physical neglect and sexual abuse in prediction for ASPD in adulthood. **Figure 03** presents the predictors of ASPD and their importance in the ML models and **Figure 04** shows the receiver operating characteristic (ROC) curve for this analysis.

Discussion

The high prevalence of ASPD (20.2%) in the sample confirms a strong association between this diagnosis and cocaine use disorder, which has also been demonstrated in several other studies(Compton et al., 2005; Goldstein et al., 2007; Regier et al., 1990; Simmons & Havens, 2007; Waldman & Slutske, 2000; Westermeyer & Thuras, 2005). The marked higher prevalence of mental illness in cocaine users comorbid with ASPD compared to those without ASPD in our sample suggest that the co-occurrence of drug use disorder with ASPD points to the secondary subtype of ASPD suggested by Karpman (1948). This finding has important clinical implications. The primary ASPD subtype, related to a constitutional lack of capacity for empathy and lack of guilty, is traditionally recognized as “untreatable”. This might lead to a tendency of considering individuals with addiction disorders with ASPD as less suitable for treatments. Nevertheless, the high rates of psychiatric comorbidities suggest an important role of environmental factors in combination with individual predisposition, and points towards the potential benefit of target interventions to supply for possible environmental failures through the development. Those ASPD traits can be more responsive to treatments such as psychotherapy and medication, in opposition to what is expected in primary ASPD. Besides guiding treatment options, these findings can contribute to mitigating the stigma associated with the presence of ASPD traits in individuals with substance use disorder. Furthermore, the need for hospitalization also suggests our sample as closer to the unstable ASPD subtype.

In our sample, regarding childhood trauma, emotional and physical abuse were the factors with the strongest correlation with ASPD,while emotional or physical neglect and sexual abuse were not. These results are partially consistent with those found in previous studies, where physical abuse and neglect are the factors most associated with ASPD traits, while sexual abuse seems not to be linked to the diagnosis (Bernstein et al., 1998; Bierer et al., 2003; Cima et al., 2008; L. J. Cohen et al., 2014; Dargis & Koenigs, 2018; Kim et al., 2016; Kounou et al., 2015; Shin et al., 2016; Zhang et al., 2013). There are still few studies showing the correlation between emotional abuse and ASPD (Cima et al., 2008; P. Cohen, 2008; Hengartner et al., 2013; Hyeon Gi Hong et al., 2016; Krastins et al., 2014), and the present finding might be related to specificities of our sample. This is an important finding. We must keep in mind that our study is controlling the effect of childhood trauma regarding the perceived quality of parental bonding, thus taking into account this interaction, as well as the characteristics of our sample. By highlighting the importance of emotional abuse along with physical abuse in this population, it might be hypothesized that emotional abuse plays a major role in the secondary (unstable) ASPD subtype, thus reinforcing specificities of this subgroup. It is relevant both in terms of prevention as well as when one thinks in tailored interventions for this subtype. Although physical neglect was unexpected negatively related to ASPD in the logistic regression model, this result was not confirmed in ML analysis, and the logistic regression may have failed in taking into account some complexities of the interaction, reinforcing the importance of using non-traditional technics such as ML to evaluate this phenomenon.

Concerning parental bonding, poor paternal bonding was more important than maternal bonding in predicting ASPD in our sample. Paternal overprotection was also related to ASPD. Some studies found that both maternal and paternal care were associated with ASPD traits (Bogaerts et al., 2005; Krastins et al., 2014; McCartney et al., 2001; Patock-Peckham & Morgan-Lopez, 2010; Reti et al., 2002; Timmerman & Emmelkamp, 2005), but it is important to highlight that we have assessed the interaction of parental bonding with childhood trauma in predicting ASPD, thus taking into account both dimensions at the same time, which can further clarify the role of different factors. Also this study evaluates cocaine users and may reflect a specific pattern in this population, thus replications in other samples are necessary. Nonetheless, emphasizing the importance of the bonding with the father in relation to personality development is very important, as it is sometimes disregarded as less

important as the relation with the mother. Both parents seem to be consistently relevant to the development of a healthy personality and other studies have been found the importance of the relationship with the father in terms of resilience to traumatic events (Hauck et al., 2007).

The relation between parental styles, trauma exposure, and personality development is a complex interaction where direct (linear) causality is frequently difficult to infer. Some of the effects attributed to parents may actually reflect an inverse effect: children's constitutional characteristics could make them more difficult to cope with, reflecting less caring and more controlling parents. Such parenting behaviors can, in turn, worsen children's behavior. In addition, genetic factors may also mediate these associations: children's perception of dysfunctional parenting behaviors may reflect parental psychopathology, which may be mediating, by genetic influences, children's dysfunctional behavior. Moreover, poor parenting may reflect the pathological family environment: poor parental bonding measured on PBI also increases the chance that these children have also been exposed to trauma, such as abuse (McLaughlin et al., 2000). Nevertheless, although being challenging, exploring the relationships among those factors is essential, both in terms of prevention and treatment at the individual level, but also aiming at developing public health interventions.

Some data were based on retrospective self-report, and so subjects may underreport data and have a biased recall, especially in a substance use disorder sample. With respect to the needs of effective fitting of models based on supervised ML, our total sample size can be considered small. Furthermore, the study design does not allow for causal conclusions between predictors and conversion to ASPD but explores the relationship between the variables.Future longitudinal studies should replicate these findings using larger samples from multiple centers and pursue a data fusion approach, combining clinical data with other biological measures, such as genetics, to build more accurate tools to predict ASPD.

Finally, the increased risk for adult mental disorders from poor bonding and trauma is generally nonspecific. It remains for future studies to elucidate the implications of such heterogeneity of environmental factors on development of ASPD in general population and among individuals with substance use disorder.

Table 1

Table 1: Clinical and sociodemographic characteristics.

Variables	ASPDgroup (n=70)	No ASPDgroup (n=275)	P-value
Sociodemographiccharacteristics.			
Gender, male (%)	70 (100%)	275 (100%)	
Age in years, mean (SD)*	27,97 (6.3)	29,32 (7.9)	0,186
Years of study, mean (SD)*	13,03 (2.79)	12,98 (2.8)	0,892
Ethnicity, n (%)**			0.443
Black	15 (21.4%)	33 (12%)	
White	43 (61.4%)	184 (66.9%)	
Other	12 (17.1%)	58 (21.1%)	
Missing	0 (0%)	2 (0.72%)	
PsychiatricDiagnosis[a]**			
Social Fobia (Current,) n (%)	14 (20%)	15 (5.4%)	<0.001
Missing	4 (5.7%)	0 (0%)	
Suicide risk (Current), n (%)	40 (57.1%)	73 (26.5%)	<0.001

Missing	4 (5.7%)	6 (2.2%)	
Post traumatic stress disorder, n (%)	8 (11.4%)	11 (4%)	0.010
Missing	2 (2.9%)	4 (1.5%)	
Psychotic syndromeduring life, n (%)	23 (32.9%)	43 (15.6%)	0.001
Missing	6 (8.5%)	14 (5.1%)	
Generalized anxiety disorder (Current), n (%)	14 (20%)	29 (10.5%)	0.011
Missing	9 (12.8%)	7 (25.5%)	
Depression, n (%)			<0.001
No	33 (47.1%)	204 (74.1%)	
Current major depressive episode	19 (27.1%)	44 (16%)	
Recurret major depressive disorder	14 (20%)	26 (9.5%)	
Missing	4 (5.7%)	1 (0.4%)	
Alcohol addiction (Current), n (%)	32 (45.7%)	33 (12%)	<0.001
Missing	4 (5.7%)	0 (0%)	

ASPD, Antisocial Personality Disorder; **SD,**Standard Deviation;

* basedonT testanalysis

** based on χ^2 square analysis

[a]diagnosis according to answers in Mini International Neuropsychiatric Interview (MINI) instrument

Table 2 Odds ratios and its 95% confidence interval of risk factors for ASPD in adulthood in logistic regression model

Variable	**p-value**	**OR**	**95% CI**
Maternal care	0.345	0.85	0.62 - 1.19
Maternal Control	0.056	0.74	0.54 - 1.00
Paternal care	0.347	0.85	0.60 - 1.19
Paternal control	0.027 *	1.42	1.04 - 1.95
Emocional abuse	0.001 **	1.95	1.30 - 2.94
Physical abuse	0.032 *	1.45	1.03 - 2.06
Sexual abuse	0.620	1.07	0.81 - 1.40
Emocional neglect	0.143	0.73	0.47 - 1.10
Physical neglect	0.017 *	0.61	0.40 - 0.90

* (<0.05), ** (<0.01)

Figures

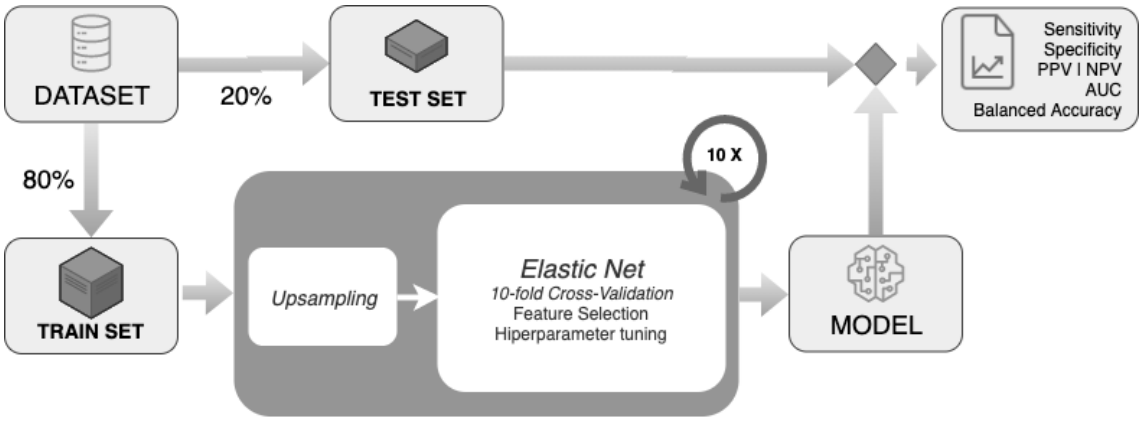

Figure 01. Machine learning model using elastic net regularization algorithm to predict ASPD

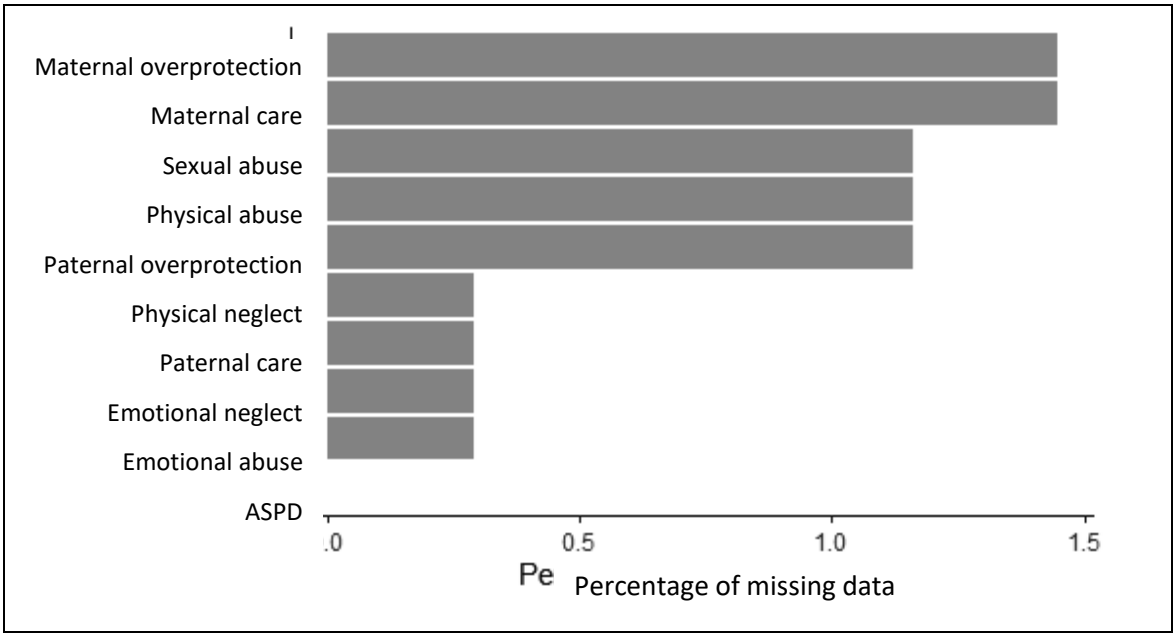

Figure 02. Percentage of missing data for each variable

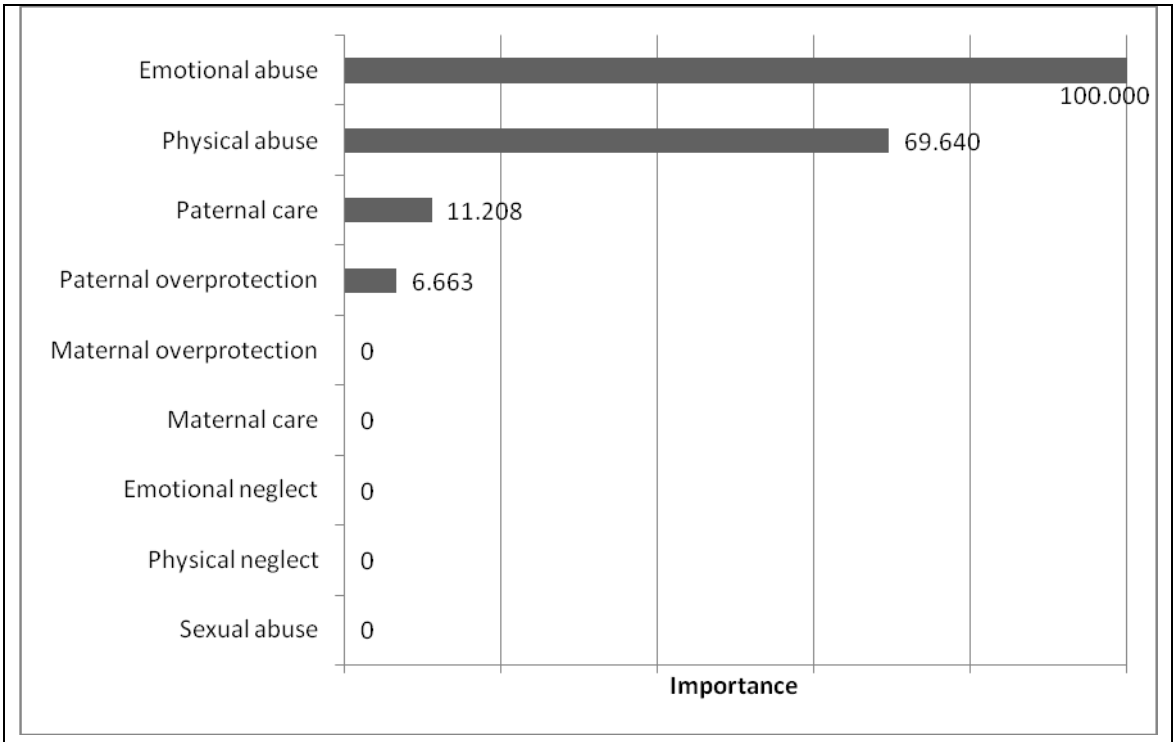

Figure 03. Predictors of ASPD – Elastic Net

Bar graph showing the importance of variables in differentiating ASPD individuals

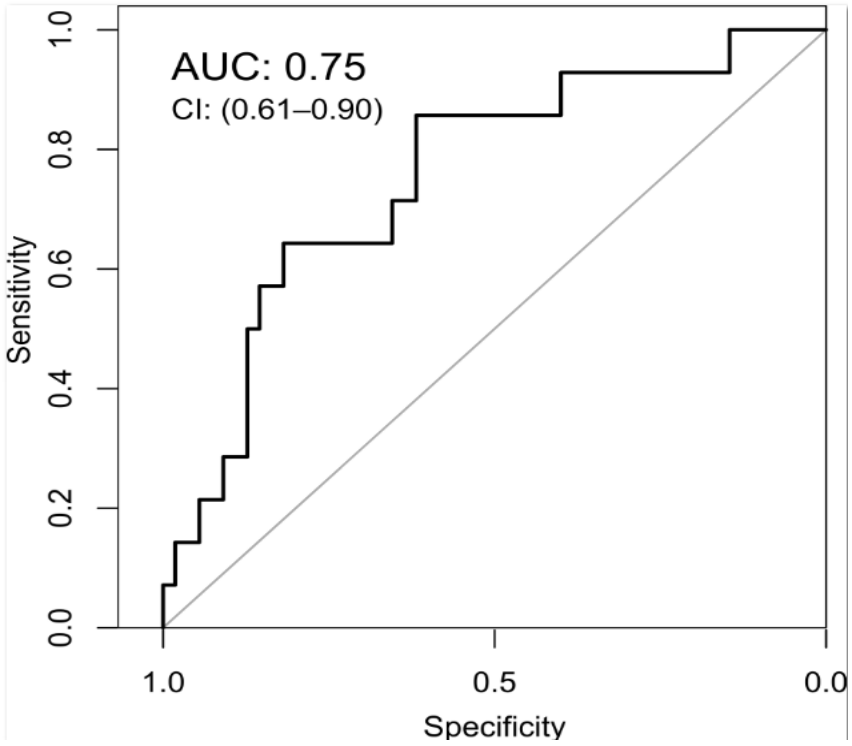

Figure 04. Receiver operating characteristic (ROC) curve.

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7 CONSIDERAÇÕES FINAIS

O primeiro artigo trata-se da primeira revisão sistemática, que sintetiza estudos usando CTQ, PBI e traços antissociais ou TPAS. A literatura se mostra extremamente heterogênea no que se refere ao estudo da associação entre os diferentes tipos de trauma infantil, a qualidade de vínculo parental e TPAS, e ainda há muito a ser compreendido a respeito desta complexa interação. Há evidências consistentes de associação entre abuso e negligência físicos e traços de personalidade antissocial, enquanto não parece haver, entretanto, evidência de associação entre abuso sexual e este desfecho. Com relação ao vínculo parental, afeto materno e paterno são os fatores mais consistentemente associados a traços antissociais na vida adulta.

No segundo artigo, nossos achados demonstram forte associação entre TPAS e transtorno por uso de substâncias, conforme evidenciado pela elevada prevalência deste diagnóstico na amostra. A enorme contribuição do abuso emocional é um achado relevante e que pode sugerir particularidades em relação a esta população. Este resultado avança no sentido da compreensão da contribuição destes fatores.

Embora negligência física tenha negativamente se correlacionado a TPAS na análise de regressão logística, este achado não se confirmou na análise de ML, reforçando que análises não tradicionais podem contribuir na compreensão de interações tão complexas. Há uma sobreposição nas variáveis que a técnica de ML possivelmente foi capaz de controlar de forma mais eficaz, por isso obtendo resultados diferentes. Além disso, a análise de MLpode evidenciar uma maior contribuição do trauma na infância em relação ao vínculo parental, embora essas variáveis apresentem sobreposições.

Por fim, nossos achados de uma maior importância do vínculo paterno em relação ao materno como preditor para TPAS podem sugerir especificidades desta população e ainda precisam ser melhor compreendidos. Pode-se supor, também, que existam fatores genéticos e biológicos que podem mediar essa associação: pais dependentes químicos podem, por exemplo, ser negligentes no seu cuidado como consequência de sua patologia psiquiátrica. Nossos achados sugerem a existência de um subtipo de TPAS nessa população. Nesse sentido, deve-se considerar que essa seja uma subpopulação que podese beneficiar de intervenções específicas. A elaboração e estudo de intervenções direcionadas às questões encontradas em

nosso estudo, como a alta taxa de comorbidade com doença psiquiátrica, o importante papel do abuso emocional, além do físico e, finalmente, a maior importância do vínculo paterno, pode ser uma contribuição significativa.

Embora se ressalte o ineditismo do emprego de ML para avaliação de preditores de TPAS, estudos futuros são necessários para elucidar as implicações da heterogeneidade dos fatores ambientais no desenvolvimento de TPAS na população em geral e entre indivíduos com transtorno por uso de substâncias, tendo em vista que o papel do trauma infantil e vínculo parental no desenvolvimento de patologia mental é pouco específico. Mostra-se de extrema importância replicar o presente estudo em diferentes amostras para observar especificidades das subpopulações. A compreensão destas interações pode servir como base para planejamento de intervenções e de ações preventivas.

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9. ANEXOS

9.1 PARENTAL BONDING INSTRUMENT – MOTHER (PBI)

Este questionário lista várias atitudes e comportamentos dos seus pais. Você deverá colocar uma marca no parêntese mais apropriado de cada questão, pensando, primeiro, na forma que você lembra sua mãe, até a idade dos teus 16 anos.

	Muito Parecido	Moderadamente Parecido	Moderadamente Diferente	Muito Diferente
1. Falava comigo com uma voz meiga e amigável	( )	( )	( )	( )
2. Não me ajudava tanto quanto eu necessitava	( )	( )	( )	( )
3. Deixava-me fazer as coisas que eu gostava de fazer	( )	( )	( )	( )
4. Parecia emocionalmente fria comigo	( )	( )	( )	( )
5. Parecia entender meus problemas e preocupações	( )	( )	( )	( )
6. Era carinhosa comigo	( )	( )	( )	( )
7. Gostava que eu tomasse minhas próprias decisões	( )	( )	( )	( )
8. Não queria que eu crescesse	( )	( )	( )	( )
9. Tentava controlar tudo que eu fazia	( )	( )	( )	( )
10. Invadia minha privacidade	( )	( )	( )	( )
11. Gostava de conversar comigo	( )	( )	( )	( )
12. Freqüentemente sorria para mim	( )	( )	( )	( )
13. Tendia a me tratar como bebê	( )	( )	( )	( )
14. Parecia não entender o que eu necessitava ou queria	( )	( )	( )	( )
15. Deixava que eu decidisse coisas por mim mesmo(a)	( )	( )	( )	( )
16. Fazia com que eu sentisse que não era querido(a)	( )	( )	( )	( )
17. Conseguia me fazer sentir melhor quando eu estava chateado(a)	( )	( )	( )	( )
18. Não conversava muito comigo	( )	( )	( )	( )
19. Tentava me fazer ficar dependente dela	( )	( )	( )	( )
20. Ela sentia que eu não poderia cuidar de mim mesmo, a menos que ela estivesse por perto	( )	( )	( )	( )
21. Dava-me tanta liberdade quanto eu queria	( )	( )	( )	( )
22. Deixava-me sair tão freqüentemente quanto eu queria	( )	( )	( )	( )
23. Era superprotetora comigo	( )	( )	( )	( )
24. Não me elogiava	( )	( )	( )	( )
25. Deixava que eu me vestisse como quisesse	( )	( )	( )	( )

9.2 PARENTAL BONDING INSTRUMENT – FATHER (PBI)

Este questionário lista várias atitudes e comportamentos dos seus pais. Você deverá colocar uma marca no parêntese mais apropriado de cada questão, pensando, primeiro, na forma que você lembra seu pai, até a idade dos teus 16 anos.

	Muito Parecido	Moderadamente Parecido	Moderadamente Diferente	Muito Diferente
1. Falava comigo com uma voz meiga e amigável	( )	( )	( )	( )
2. Não me ajudava tanto quanto eu necessitava	( )	( )	( )	( )
3. Deixava-me fazer as coisas que eu gostava de fazer	( )	( )	( )	( )
4. Parecia emocionalmente frio comigo	( )	( )	( )	( )
5. Parecia entender meus problemas e preocupações	( )	( )	( )	( )
6. Era carinhoso comigo	( )	( )	( )	( )
7. Gostava que eu tomasse minhas próprias decisões	( )	( )	( )	( )
8. Não queria que eu crescesse	( )	( )	( )	( )
9. Tentava controlar tudo que eu fazia	( )	( )	( )	( )
10. Invadia minha privacidade	( )	( )	( )	( )
11. Gostava de conversar comigo	( )	( )	( )	( )
12. Freqüentemente sorria para mim	( )	( )	( )	( )
13. Tendia a me tratar como bebê	( )	( )	( )	( )
14. Parecia não entender o que eu necessitava ou queria	( )	( )	( )	( )
15. Deixava que eu decidisse coisas por mim mesmo(a)	( )	( )	( )	( )
16. Fazia com que eu sentisse que não era querido(a)	( )	( )	( )	( )
17. Conseguia me fazer sentir melhor quando eu estava chateado(a)	( )	( )	( )	( )
18. Não conversava muito comigo	( )	( )	( )	( )
19. Tentava me fazer ficar dependente dele	( )	( )	( )	( )
20. Ele sentia que eu não poderia cuidar de mim mesmo, a menos que ele estivesse por perto	( )	( )	( )	( )
21. Dava-me tanta liberdade quanto eu queria	( )	( )	( )	( )
22. Deixava-me sair tão freqüentemente quanto eu queria	( )	( )	( )	( )
23. Era superprotetor comigo	( )	( )	( )	( )
24. Não me elogiava	( )	( )	( )	( )
25. Deixava que eu me vestisse como quisesse	( )	( )	( )	( )

9.3 CHILDHOOD TRAUMA QUESTIONNAIRE (CTQ)

Estas afirmações se referem a algumas de suas experiências enquanto você estava crescendo, desde criança e até sua adolescência. Compreendemos a natureza pessoal de muitas destas questões, mas ainda assim gostaríamos que você tentasse respondê-las o mais sinceramente possível. Para cada afirmação, circule a resposta que melhor descrever como você se sentiu. Se você desejar mudar sua resposta, coloque um **X** na antiga resposta e circule a nova escolha.

Enquanto eu crescia...	**nunca foi verdade**	**raramente foi verdade**	**algumas vezes foi verdade**	**muitas vezes foi verdade**	**quase sempre foi verdade**
1. Eu não tinha comida suficiente para comer.	●	●	●	●	●
2. Eu sabia que havia alguém para me cuidar e me proteger.	●	●	●	●	●
3. As pessoas, na minha família, me chamavam de coisas do tipo "estúpido", "preguiçoso" ou "feio de doer".	●	●	●	●	●
4. Meus pais estavam sempre muito bêbados ou drogados para cuidar da família.	●	●	●	●	●
5. Havia alguém na família que ajudava a me sentir especial ou importante.	●	●	●	●	●
6. Eu tinha que usar roupas sujas.	●	●	●	●	●
7. Eu me senti amado.	●	●	●	●	●
8. Eu achava que meus pais desejavam que eu nunca tivesse nascido.	●	●	●	●	●
9. Eu apanhei tanto de alguém da família que por isto tive que ir ao hospital ou consultar um médico.	●	●	●	●	●
10. Não havia nada que eu desejasse mudar em minha família.	●	●	●	●	●
11. Alguém, em minha família, me bateu tanto que isso me deixou com marcas e contusões (roxo).	●	●	●	●	●
12. Eu apanhei com cinto, vara, corda ou várias outras coisas que machucavam.	●	●	●	●	●
13. As pessoas em minha família cuidavam umas das outras.	●	●	●	●	●
14. Pessoas, em minha família, disseram coisas que me machucaram ou me ofenderam.	●	●	●	●	●
15. Eu acredito que fui fisicamente abusado (machucado).	●	●	●	●	●
16. Eu tive uma ótima infância.	●	●	●	●	●
17. Eu apanhei tanto que um professor, vizinho ou médico chegou a notar.	●	●	●	●	●

18. Eu senti que alguém da minha família me odiava.	●	●	●	●	●
19. As pessoas da minha família se sentiam unidas.	●	●	●	●	●
20. Tentaram me tocar ou me fizeram tocar de uma maneira sexual.	●	●	●	●	●
21. Ameaçaram me machucar ou contar mentiras sobre mim se eu não fizesse algo sexual.	●	●	●	●	●
22. Eu tive a melhor família do mundo	●	●	●	●	●
23. Tentaram me forçar a fazer algo sexual ou assistir coisas sobre sexo.	●	●	●	●	●
24. Alguém me molestou.	●	●	●	●	●
25. Eu acredito que fui maltratado (a) emocionalmente.	●	●	●	●	●
26. Houve alguém para me levar ao médico quando eu precisei.	●	●	●	●	●
27. Eu acredito que fui abusado (a) sexualmente.	●	●	●	●	●
28. Minha família foi uma fonte de força e apoio.	●	●	●	●	●

9.4 CARTA DE ACEITE INICIAL PARA SUBMISSÃO ARTIGO 1 NA REVISTA CHILD ABUSE AND NEGLECT[191009-001235]

Child Abuse & Neglect <chiabu@elsevier.com>

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9.5 CARTA DE SUBMISSÃO ARTIGO 1 NA REVISTA CHILD ABUSE AND NEGLECT

Elsevier Editorial System(tm) for Child Abuse & Neglect

Manuscript Draft

Manuscript Number: CHIABUNEG-D-19-00914

Title: Association between different types of childhood trauma and parental bonding with antisocial traits in adulthood: a systematic review

Article Type: Invited Review

Corresponding Author: Dr. Manuela Bourscheit,

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Order of Authors: Manuela Bourscheit; Bárbara Tietbohl-Santos; Lucas Oliveira; Luciana Terra; Lisieux Telles; Simone Hauck

Abstract: Background: ASPD describes individuals with a pervasive pattern of disregard for the rights of others that begins in childhood and continues into adulthood. The relationship between parental bonding, trauma and ASPD is well established, however it remains unclear what types of trauma or which patterns of bonding are most associated. Objectives: Review the literature regarding what types of trauma and bonding characteristics were related to antisocial personality traits. Method: We searched databases for articles that acessed the relationship between antisocial personality traits and CTQ and/or PBI fallowing Prisma Statment. Results: 357 abstracts were selected in the databases, and 18 articles met criteria inclusion. There was a big heterogenity between studies. Regarding CTQ, the most consistent finding was the association between physical abuse and neglect and antisocial traits. Sexual abuse was the variable least related to antisocial traits on the present review. Regarding PBI, the most consistent finding was the relationship between maternal and paternal care and antisocial traits. Regarding overprotection , data is less consistent. Conclusions: The literature little explores how these variables interact with each other. More studies are important in terms of public health and political and educational initiaves that can prevent risk factors factors associated with ASPD.