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## Interpersonal Polyvictimization: Addressing the Care Planning Needs of Traumatized Children and Youth

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## **Interpersonal Polyvictimization and Care Planning in Children and Youth**

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### **Declaration of Competing Interest**

No conflicts of interest to declare.

## Abstract

*Background:* Exposure to maltreatment has a detrimental impact on both physical and mental health. However, research on the relationship between polyvictimization and care planning needs is scarce.

*Objectives:* This study investigated the associations between interpersonal polyvictimization and care planning needs for children and youth, controlling for sex and age differences.

*Participants and Settings:* The sample included 18,701 children and youth ( $M_{age} = 12.33$ ,  $SD_{age} = 3.53$ ) between 4 and 18 years. Participants were recruited from over 58 mental health agencies, facilities, and schools in Ontario, Canada between November 2012 and February 2020.

*Methods:* Multivariate binary logistic regression was used to investigate polyvictimization, sex and age groups, as predictors on care planning outcomes. Significant interaction effects were further examined using simple effects analyses.

*Results:* Children and youth experiencing polyvictimization, compared to those who did not, were more likely to report attachment difficulties, lack of informal support, interpersonal conflict, substance use and harm to self or others. In addition, sex had a significant impact on attachment and interpersonal conflict.

*Conclusions:* Findings emphasize the importance of focusing on interpersonal polyvictimization and sex differences when developing treatment plans for a variety of care planning needs. Mental health practitioners could utilize the study findings to guide their clinical practices and ensure effective services are provided to those seeking mental health care.

**Keywords:** interRAI; polyvictimization; children; substance use; harm to self; care plans

## 1. Introduction

Children and youth (hereafter referred to as children) who have experienced trauma have greater rates of psychiatric and medical service utilization than peers without traumatic experiences (De Bellis, 2001). They are at greater risk for internalizing issues (De Bellis & Zisk, 2014), externalizing issues (McLaughlin & Lambert, 2017), self-injurious behaviours and substance abuse (Brown et al., 2018). Among the most notable studies in the field, Felitti et al. (1998) discovered a dose-response relationship between adverse childhood experiences (ACEs) and health outcomes; such that, an increase in the number of trauma types was linked to greater odds of experiencing specific health outcomes. The findings from the study highlighted the long-lasting, deleterious effects that ACEs have on development and the cumulative impact of these experiences on overall health.

In recent years, the focus of the child trauma literature has shifted towards polyvictimization (PV); the exposure to several distinct instances and types of victimization within the same time period (Finkelhor et al., 2007). PV has consistently been associated with higher rates of mental health problems (Adams et al., 2016; McLafferty et al., 2018; Moffit, 2013; Widom, 2017), such as severe symptoms of post-traumatic stress disorder and dissociation (Ford & Delker, 2018). However, the association between PV and specific care planning needs (e.g., informal support, suicidal ideation, interpersonal conflict) of children are poorly understood. The childhood victimization literature typically focuses on specific types of victimization independently rather than cumulatively, hindering our understanding (Ford & Delker, 2018). Examining PV in the context of care planning needs may shed light on specific areas that mental health practitioners could focus their interventions, ensuring that effective services are being disseminated to those seeking mental health care. A brief literature review of selected care planning needs for investigation in the current study are highlighted below.

### *1.1. Attachment, Informal Support and Interpersonal Conflict*

The relationship between a child and their primary caregiver is pivotal for development. This relationship, typically resistant to change (Ward et al., 2018), sets the tone for later relationships in the child's life (Spruit et al., 2020). The attachment style created with the primary caregiver influences the child's perceptions about themselves, their peers, and others. Maltreatment is considered to be very destructive in the attachment system (Erozkan, 2016), especially when the abuse is perpetrated by a primary caregiver or while under their care (San Cristobal et al., 2017). Children who have caregivers that are sensitive to the children's needs often will establish secure attachments (Spruit et al., 2020), whereas children experiencing insensitive parenting are at greater risk of attachment insecurity and disorganization (San Cristobal et al., 2017; Spruit et al., 2020).

The attachment styles with caregivers are complex and the negative effects of ACEs have a detrimental impact on the child. This can be observed through the relationships these children have with families, peers and community members (Erozkan, 2016). Children who have experienced PV are more likely to have experienced the dissolution of their family when compared to their peers who have not been victimized (Ford et al., 2010). Furthermore, children who experience maltreatment often come from families who are socially isolated from relatives, friends, and members of their community (Lyons et al., 2005) and perceive a reduction in family support (Turner et al., 2017).

Conflictual family relationships impact peer relationships as well (Auerbach et al., 2014). Children with secure attachments tend to have positive expectations about their social interactions, making them less likely to engage in bullying or be a victim to bullying (Ward et al., 2018). In contrast, children who have experienced PV may adopt poorer self-esteem (Turner

et al., 2017) and experience challenging interpersonal relationships and social contexts (Crosson-Tower, 2010). PV presents a particular challenge for children who struggle with peer relationships, as caregivers are relied on for support. Children who experience maltreatment at home and at school, may be at particular risk for maladaptive outcomes as they do not have a strong support system for relief (Turner et al., 2017).

### *1.2. Substance Use*

The extent to which victimization influences substance use in the child population is understudied (Davis et al., 2019). In general, rates of substance use are greatest during adolescent years (Wright et al., 2013) and similarities related to substance use have been reported between males and females (Ford et al., 2010). Youth who have experienced victimization are at an increased risk for substance use (Brown et al., 2018; Davis et al., 2019), with polyvictimized youth are at even greater risk (Davis et al., 2019). Studies have suggested this population of youth are 3 to 5 times more likely to be at risk of substance use disorders (Ford et al., 2010). The cumulative effects of ACEs are thought to be the most predictive risk factor for future alcohol and marijuana use in children (Wright et al., 2013).

### *1.3. Harm to Self and Others*

Maltreatment experienced in childhood places children at risk for suicidal behaviour, commonly occurring in adolescence (Armiento et al., 2016; Brown et al., 2018; Ford et al., 2010) and delinquent behaviours that pose a threat to others (Fox et al., 2015; Stewart et al., in press). Several studies have also supported sex differences in the engagement of nonsuicidal self-injury (NSSI) with females more likely to engage in this behaviour when compared to their male peers (Armiento et al., 2016). Males on the other hand, are more prone to physical victimization when compared to their female counterparts (Stewart et al., in press; Sullivan et al., 2006). In a study

conducted by Brown et al. (2018), participants who had a history of NSSI reported higher levels of childhood maltreatment irrespective of the type (i.e., emotional abuse, physical abuse).

Furthermore, children who have experienced abuse or neglect were more likely to commit a violent act than their peers who had not experienced abuse or neglect (Fox et al., 2015). As such, there is evidence to suggest a link between experiencing victimization and being a perpetrator of physical and relational victimization to others (Sullivan et al., 2006).

#### *1.4. Sex Differences*

The literature consistently supports differing rates of psychopathology between female and male samples with females disproportionately affected by internalizing symptoms (Asscher et al., 2015; Stewart, Toohey et al., 2020; Vaillancourt et al., 2017). Research conducted with polyvictimized children supports the notion that females are overrepresented in sexual victimization, often subjected to psychological and emotional abuse, whereas boys report greater numbers of victimization by physical assault (Aho et al., 2016; Kerig, 2018). Using a sample of juvenile-justice involved youth, polyvictimized girls were also found to be at greater risk for severe mental health problems (e.g., suicidality), posttraumatic stress and dissociative problems (Ford & Delker, 2018). Thus, these findings suggest that sex differences are important considerations when discussing PV.

#### *1.5. Present Study*

The present study examines the associations between PV and the care planning needs of a large sample of children and youth who have been referred for mental health services. Based on the extant literature, it was hypothesized that in a multivariate model, greater PV would be associated with greater odds of the need for care planning to address attachment, interpersonal conflict, informal support issues, substance use, risk of harm to self and others. In addition,

females were expected to be more likely in odds to trigger care planning to address harm to self and males will be more likely in odds to trigger care planning to address harm to others.

## 2. Method

### 2.1. Participants

The sample used for analysis included 18,701 children and youth between 4 and 18 years of age ( $M_{age} = 12.33$ ,  $SD_{age} = 3.53$ ), recruited from 58 agencies and facilities across the province of Ontario as part of typical practice. Table 1 lists other relevant demographic characteristics, such as biological sex, age group, a history of foster family placement, legal guardianship, and marital status of parents. As seen in Table 1, the majority of children in the sample were males, older than 12 years, had no history of foster family placement, and lived with both parents.

**Table 1**

*Sample demographic characteristics (N = 18,701)*

	<i>N</i>	Percent
Sex		
Male	10330	55.24
Female	8371	44.76
Age		
4-7	2078	11.11
8-11	5383	28.78
12-18	11240	60.10
History of foster family placement <sup>1</sup>		
None	16103	86.23
One foster family	1446	7.74
Multiple foster families	1126	6.03
Legal guardianship		
Both parents	10862	58.08
Mother only	5238	28.01



Father only	773	4.13
Other relatives or non-relatives	963	5.15
Child protection agency	735	3.93
Public guardian	22	.12
Youth responsible for self	108	.58
Marital status of parents <sup>2</sup>		
Never married	3930	21.03
Married	7575	40.54
Partner/significant other	483	2.59
Widowed	387	2.07
Separated	2448	13.10
Divorced	2811	15.04
Unknown	1050	5.62

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*Note.* <sup>1</sup>*N* = 18,675; <sup>2</sup>*N*=18,684

## 2.2. Procedure

Data collected from over 58 agencies from November 2012 to February 2020 by trained assessors (e.g., nurses, social worker, psychologists, child and youth workers) at the time of intake into clinical services were part of this study. Referrals were made by their parents, teachers, family physicians, or other allied service providers. Utilizing a clinician-rated, semi-structured interview, information was obtained from a variety of sources including the child/youth, guardians, family members as well as collateral contacts (e.g., teachers, therapists). Additionally, information from medical records, report cards, academic assessments, and relevant clinical documents were also reviewed and integrated into the assessment process. All assessors completed a full-day training session regarding how to administer the interRAI ChYMH, and completed competency testing. Using a de-identified web-based software system data were entered by assessors. The software system securely stores the data at interRAI Canada

and provides a unique, randomly generated study-specific participant number. All personal identifiers were removed prior to data being available for analysis.

### *2.3. Measures*

#### *2.3.1. interRAI Child and Youth Mental Health Instrument*

The interRAI Child and Youth Mental Health (ChYMH; Stewart et al., 2015) instrument is a comprehensive, standardized, and multi-sectoral mental health instrument for children aged 4 to 18 years. It contains evidence-based items, scales, and domains relevant to the population used in this study. The information is gathered by assessors, who have at least two years of clinical experience working with children and who completed a two-day training program on the administration of the instrument. The interRAI ChYMH is part of an integrated health information assessment system (see Stewart et al., in press; Stewart, Theall, Morris et al., 2020; Stewart, Hirdes et al., 2015; Stewart, Hirdes, McKnight et al., 2017; Stewart, LaRose, et al., 2015; Stewart, Theall, Morris et al., 2015, 2016) with multiple applications exhibiting strong reliability and validity and can be used for resource allocation and case-mix systems (Fries et al., 2019; Lau et al., 2018, 2020; Li et al., in press, Phillips et al., 2012; Stewart & Babcock, 2020; Stewart, Babcock, Li et al., 2020; Stewart & Hamza, 2017; Stewart & Hirdes, 2015; Stewart, Klassen et al., 2016; Stewart, et al., 2020; Stewart, Morris et al., 2019; Stewart, Poss et al., 2019). This instrument contains specific trigger algorithms that are used as case finding methodologies to identify children and youth at risk in need of intervention.

#### *2.3.2. Interpersonal Trauma and PV*

Four items addressed interpersonal traumatic life events experienced by a child or youth. Physical abuse refers to any episode resulting in non-accidental injury, physical confinement, or excessive physical discipline experienced by the child. Sexual abuse refers to any form of

exposure of genitals, sexual assault, sexual touching or coercion. Witnessing domestic violence pertained to the child being aware, or knowing of, or witnessing verbal threats or physical actions toward another family member. Emotional abuse included pervasive hostility whereby the self-esteem, identity, emotional needs of the child or youth were invalidated. The items taken from the interRAI ChYMH have item responses ranging from 0 = “never”, 1 = “more than 1 year ago”, 2 = “31 days to 1 year ago”, 3 = “8 to 30 days ago”, 4 = “4 to 7 days ago”, and 5 = “present within the last 3 days”. Given the low prevalence of recent traumatic life events, the responses were dichotomized into 0 - never and 1 - more than one year ago to in the last three days.

In addition, three items addressed history of care that included severe failure to provide basic needs to the child. Specifically, physical and safety neglect referred to the failure to meet the physical or safety needs of the child. Finally, emotional neglect referred to the failure to provide nurturance, warmth, love, or affection to the child or youth. The neglect items were coded as 0 = “none”, 1 = “0 to 4 years”, 2 = “5 to 11 years”, 3 = “12 to 18 years”. All three neglect items were weighted and combined to indicate any history of neglect. Therefore, responses were dichotomized into 0 - none and 1 - history of any neglect 0 to 18 years.

The responses were further summed resulting in an ordinal PV variable, with values ranging from 0 (no trauma) to 5 (five types of trauma). Here, any case of two or more trauma types experienced by the child/youth counts as PV. This cumulative trauma approach detects PV but cannot indicate severity and chronicity of the abuse. The specific types and details of the abuse were addressed within care planning guidelines (Stewart et al., 2016; Stewart, Theall, Perry et al., 2015) and intervention approaches utilized the Traumatic Life Events Collaborative

Action Plan as part of the assessment-to-intervention process as it relates to best practice (Stewart, Theall, Morris et al., 2015; Stewart et al., 2015).

### 2.3.3. Collaborative Action Plans (CAPs)

The interRAI ChYMH assessment instrument includes Collaborative Action Plans (CAPs; Stewart et al., 2015, 2016) which are unique to the interRAI suite of instruments. CAPs are based on a comprehensive evaluation of a child's or youth's strengths and needs and serve to inform clinical decision-making in the process of care planning. Each CAP has a unique triggering algorithm designed to alert clinicians about a need that has to be addressed (Martin et al., 2007; Mathias et al., 2010). Each CAP includes evidence-informed practice, individualized goals of care, care planning guidelines and recommendations. Furthermore, CAPs contribute to the coordination of service provision across the life span, the continuum of care across multiple agencies and service sectors (Mathias et al., 2010).

As part of the instrument, certain items serve as “triggers” to activate specific CAPs. For the purpose of this study, we examined six CAPs described below. All CAPs were coded as 0 – not triggered, 1- triggered.

*Attachment CAP* (DeOliveira et al., 2015) identifies children (ages 4 to 11) with a history of inconsistent or unreliable care and difficulties with seeking comfort. Care planning guidelines are designed to improve attachment relationships with parents/caregivers are provided as part of the intervention process.

*Informal Support CAP* (Theall et al., 2015) provides a case finding algorithm to identify children and youth whose families require and lack informal support (such as extended family or friends). Best practice guidelines to foster informal support and address areas where formal supports are provided are provided within this care planning protocol.

*Interpersonal Conflict CAP* (Stewart, McKnight, Beharry et al., 2015) identifies high risk youth due to problematic interpersonal relationships and provides care planning guidelines to address persistent conflict with care staff that may hinder mental health recovery while building conflict management and coping skills in the child/youth.

*Substance Use CAP* (Henderson et al., 2015) is based on items related to alcohol or illicit drug use, or misuse of prescription or over-the-counter medication. This CAP provides an algorithm to identify high risk youth between the ages of 12 to 18 years of age who are at risk for substance use problems (e.g., illicit drug use, misuse of over-the-counter medication).

*Harm to Others CAP* (Stewart, Kam et al., 2015) identifies children/youth with imminent risk to physically hurt others. Items triggering this CAP include: violence ideation, preoccupation with violence and recency of acts of actual harm to others. Guidelines are provided for immediate intervention during aggressive episodes, as well as strategies for de-escalation and prevention of future violence.

*Suicidality and Purposeful Self-harm CAP* (Arbeau, Stewart et al., 2015) is based on items related to risk of suicide or purposeful self-harm. The CAP provides an algorithm to identify high risk children and youth who are at risk and also outlines clinical considerations to ensure the immediate safety of the child/youth and to prevent future self-harm.

#### *2.4. Analytic strategy*

The results were analyzed using the SAS 9.4 software package. Prior to analyses, binary logistic regression assumptions were evaluated. Binary logistic regression analyses were utilized to examine multivariate models. All models included interpersonal trauma PV as the main predictor variable, as well as sex (male, female) and age (grouped into 4 to 7; 8 to 11; and 12 to

18 years of age) as covariates. Care planning needs (CAPs) served as dependent variables. The youngest age group (4 to 7 years) and male sex served as reference groups.

Significant interaction effects were further examined using the UCLA Statistical Consulting Group guidelines (UCLA Statistical Consulting Group, 2020) for analyzing categorical-by-continuous interaction in binary logistic regression models. First, we calculated simple odds ratios, followed by their comparisons and interpretation of exponentiated interaction coefficients. Finally, we conducted a simple effects analysis. All statistical tests were two-tailed. The significance level was set at alpha .05, which corresponded to 95% confidence intervals in logistic regression analyses.

### **3. Results**

#### *3.1. Preliminary Analyses*

Pearson chi-square analyses were utilized to examine relationships among PV and CAPs. As seen in Table 2, there is a common pattern in the case of all CAPs: as the PV increases, the percentage of children who trigger care planning increases as well. Notably, more than half of children in the sample are in need of care planning to address self-harm (about 51%) and attachment (almost 53%). Moreover, eight out of ten children with five trauma types are in need of care planning to address interpersonal conflict.

**Table 2***Pearson Chi-square Analyses of Care Planning (CAPs) and Polyvictimization*

	No trauma	One trauma type	Two trauma types	Three trauma types	Four trauma types	Five trauma types	$X^2$	$p$	Cramer's $v$
Attachment CAP <sup>1</sup>							457.00	<.0001	.275
No	87.58	70.31	65.05	63.62	58.15	47.06			
Yes	12.42	29.69	34.95	36.38	41.85	52.94			
Interpersonal conflict CAP <sup>2</sup>							953.74	<.0001	.226
No	54.60	37.78	33.64	29.89	27.09	19.41			
Yes	45.40	62.22	66.36	70.11	72.91	80.49			
Substance use CAP <sup>3</sup>							371.95	<.0001	.182
No	92.64	88.17	84.07	81.87	74.80	70.89			
Yes	7.36	11.83	15.93	18.13	25.20	29.11			
Informal support CAP <sup>2</sup>							408.21	<.0001	.148
No	86.52	78.94	75.68	72.52	73.18	69.00			
Yes	13.48	21.06	24.32	27.48	26.82	31.00			
Harm to others CAP <sup>2</sup>							411.52	<.0001	.148
No	87.58	81.79	78.38	74.88	73.09	66.58			
Yes	12.42	18.21	21.62	25.12	26.91	33.42			

	No trauma	One trauma type	Two trauma types	Three trauma types	Four trauma types	Five trauma types	$X^2$	$p$	Cramer's $v$
Self-harm CAP <sup>2</sup>							568.06	<.0001	.174
No	81.71	74.17	69.94	66.33	62.36	49.33			
Yes	18.29	25.83	30.06	33.67	37.64	50.67			

Notes. <sup>1</sup> $N = 6058$

<sup>2</sup> $N = 18,677$

<sup>3</sup> $N = 11,222$

OR – odds ratio; CI- confidence interval



### 3.2. Main Analyses

Analyses probed for an interaction between sex (male, female) and PV. The models included all main effects and the PV x sex interaction. The interaction was significant in the case of attachment CAP, Wald  $X^2(1) = 5.65, p = .0175$ , as well as the interpersonal conflict CAP, Wald  $X^2(1) = 5.45, p = .0196$ . Therefore, the models for attachment and interpersonal conflict CAP include follow-up analyses for a significant interaction.

However, the PV x sex interaction was not significant in the case of the substance use CAP, (Wald  $X^2(1) = 2.75, p = .0970$ ), the informal support CAP (Wald  $X^2(1) = 0.40, p = .5286$ ), the harm to others CAP (Wald  $X^2(1) = 0.27, p = .6045$ ) and the self-harm CAP (Wald  $X^2(1) = 3.25, p = .0716$ ). Therefore, for these CAPs, the main effect models are reported.

### 3.3. Moderation Results

#### 3.3.1. Attachment CAP

Table 3 provides estimates, 95% confidence intervals, significance, and model fit information for the model. In the model, age was significantly related to the attachment CAP, such that children aged 8-11 were less likely in odds to trigger the CAP than children aged 4-7 ( $OR = .85, 95\% CI: 0.74, 0.97$ ).

**Table 3**

*Moderation Analyses of Triggered Attachment Care Planning Needs as a Function of Polyvictimization, Sex, and Age*

	<i>B (SE)</i>	95% CI	<i>p</i>
<b>Attachment CAP<sup>1</sup></b>			
Intercept	-1.72 (.07)	-1.85, -1.59	<.0001
Sex (Female)	.21 (.09)	.03, .38	.0206
Sex (Male)	-		
Age 4-7	-		
Age 8-11	-.16 (.07)	-.30, -.03	.0187
PV	.48 (.03)	.42, .54	<.0001
PV x sex (Female)	-.11 (.05)	-.20, -.02	.0175
PV x sex (Male)	-		
Max-rescaled <i>R</i> <sup>2</sup>	.09		
Likelihood ratio <i>X</i> <sup>2</sup>	374.56		<.0001

*Notes.* <sup>1</sup>*N* = 6058;

PV- polyvictimization; OR – odds ratio; CI- confidence interval

### *3.4. Simple odds ratios analyses*

To further examine the interaction between PV and sex, simple odds ratios analyses were conducted, wherein the relationship between PV and the attachment CAP was examined in females as compared to males. For females, for each additional trauma, the odds of triggering the CAP increased (*OR* = 1.45 (95% CI: 1.35, 1.56)). A similar relationship was found in males (*OR* = 1.62 (95% CI: 1.53, 1.71)). Therefore, for each additional interpersonal trauma type, the odds of triggering attachment care planning increase by a factor of 1.45 (45%) for females and a factor of 1.62 (62% increase) for males.

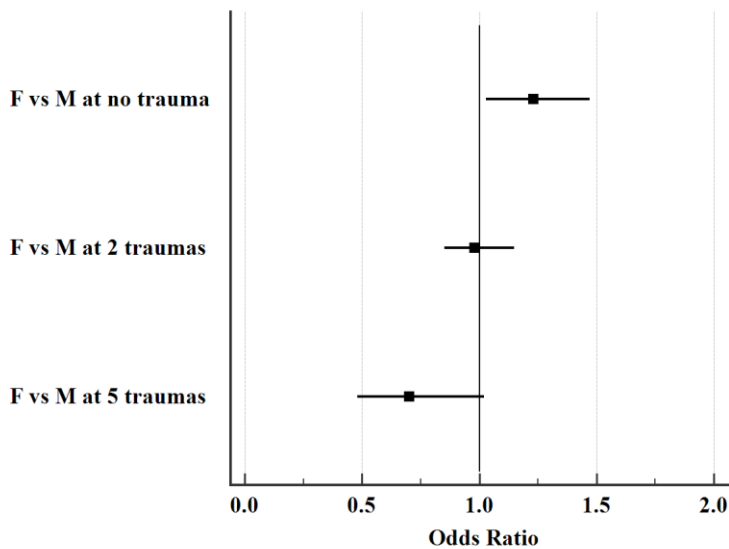
Next, we examined whether the difference between these simple slopes was significant at  $\alpha = .05$ . To do that, we exponentiated the odds ratios, which resulted in a ratios of odds ratios (ROR). The difference between the simple slopes between females and males was significant,  $ROR = 0.89$ , 95% CI: 0.82, 0.98,  $p = .0175$ ). Since the  $ROR$  is less than one, an increase in PV is associated with an increase in odds of triggering the attachment CAP. For females, the increase is by a smaller factor when compared to that of males.

### 3.5. Simple effects analysis

Finally, we examined the simple effects of sex at different levels of interpersonal PV (none, two types of trauma, five types of trauma). Therefore, children and youth with no interpersonal trauma were compared to those with the minimum and maximum PV (two and five types of trauma). Figure 1 demonstrates odds ratios and corresponding 95% Wald confidence intervals for triggering the attachment CAP as a function of sex (females compared to males) at no interpersonal trauma, two types of trauma, and five types of trauma. As seen in Figure 1, when there was no interpersonal trauma reported, the odds of triggering the CAP were significantly different for females and males because the 95% confidence intervals exclude the reference  $OR = 1$ . Specifically, females were more likely than males in odds to trigger the attachment CAP ( $OR = 1.23$  (95% CI: 1.03, 1.47)). However, with two or five trauma types, the sex difference disappeared as the 95% OR CI crosses the reference  $OR = 1$  (two traumas:  $OR = 0.98$ , 95% CI: 0.85, 1.15; five trauma types:  $OR = 0.70$ , 95% CI: 0.48, 1.02).

**Figure 1**

*Simple Effects of Sex on Attachment CAP at Different Levels of Interpersonal PV*



### *3.5.1. Interpersonal Conflict CAP*

Table 4 provides estimates, 95% confidence intervals, significance, and model fit information for the model with PV x sex interaction. In the model, age was significantly positively related to the interpersonal conflict CAP, such that children aged 8-11 and 12-18 years were more likely in odds to trigger the CAP than children aged 4-7 (age 8-11:  $OR = 1.34$ , 95% CI: 1.21, 1.48; age 12-18:  $OR = 1.28$ , 95% CI: 1.16, 1.41).

**Table 4**

*Moderation Analyses of Triggered Interpersonal Conflict Care Planning Needs as a Function of Poly-victimization, Sex, and Age*

	<i>B (SE)</i>	95% CI	<i>p</i>
Interpersonal conflict CAP <sup>1</sup>			
Intercept	-0.19 (.05)	-0.28, -0.10	<.0001
Sex (Female)	-.34 (.04)	-0.42, -0.27	<.0001
Sex (Male)	-		
Age 4-7	-		
Age 8-11	.29 (.05)	0.19, 0.39	<.0001
Age 12-18	.24 (.05)	0.15, 0.34	<.0001
PV	.32 (.02)	0.28, 0.35	<.0001
PV x sex (Female)	.06 (.02)	0.01, 0.10	.0196
PV x sex (Male)	-		
Max-rescaled $R^2$	.07		
Likelihood ratio $X^2$	1000.86		<.0001

Notes. <sup>1</sup>*N* = 18,677

PV- polyvictimization; OR – odds ratio; CI- confidence interval

### 3.6. Simple odds ratios analyses

The relationship between PV and interpersonal conflict CAP was examined in females as compared to males. For both sexes, for each additional trauma, the odds of triggering the CAP increased (females: *OR* = 1.46 (95% CI: 1.41, 1.50; males: *OR* = 1.37 (95% CI: 1.33, 1.42). Therefore, with each additional interpersonal trauma type, the odds of triggering interpersonal conflict care planning increased by a factor of 1.46 (46%) for females and a factor of 1.37 (37% increase) for males.

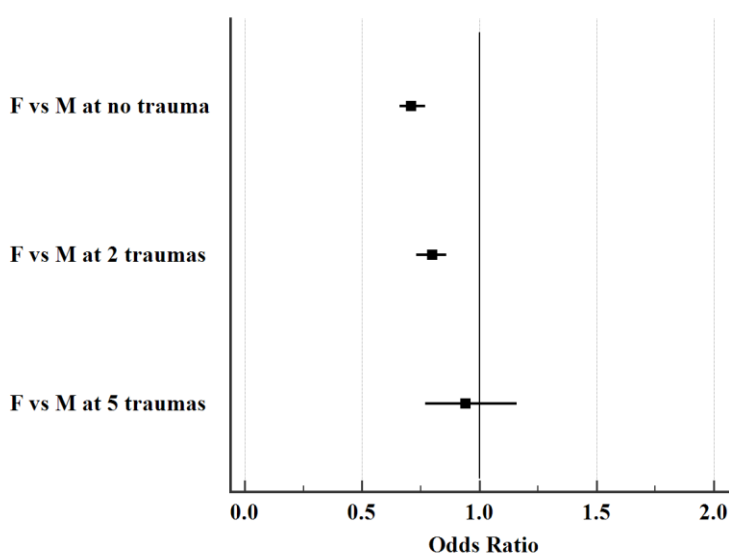
Next, we examined the ratio of ratios (ROR). The difference between the simple slopes between females and males was significant,  $ROR = 1.06$  95% CI: 1.01, 1.11,  $p = .0196$ ). Because the  $ROR$  is greater than one, an increase in PV is associated with an increase in the odds of triggering the attachment CAP by a greater factor in females than in males, meaning that in females, the slope is significantly sharper than in males.

### 3.7. Simple effects analysis

Figure 2 demonstrates odds ratios and corresponding 95% confidence intervals for triggering the interpersonal conflict CAP as a function of sex (females compared to males) at no interpersonal trauma, two types of trauma, and five types of trauma. An examination of the simple effects of sex at different levels of interpersonal PV revealed that when there was no interpersonal trauma reported, females were less likely than males in odds to trigger the CAP ( $OR = 0.71$  (95% CI: 0.66, 0.77)). The sex difference remained significant with two trauma types ( $OR = 0.80$ , 95% CI: 0.73, 0.86) but not five trauma types ( $OR = 0.94$ , 95% CI: 0.77, 1.16).

### Figure 2

*Simple Effects of Sex on Interpersonal Conflict CAP at Different Levels of Interpersonal PV*



### *3.8. Main Effects Analyses*

#### *3.8.1. Substance Use CAP*

Binary logistic regression was utilized to examine whether PV was significantly related to the likelihood of triggering the CAP, taking into account sex and age differences. Table 5 provides estimates, odds ratios, 95% confidence intervals, significance, and model fit information for the model. Higher PV was related to a greater likelihood in odds of triggering the CAP: each additional trauma was associated with a 41% increase in triggering the substance use care planning. At the same time, there was no sex difference in the odds of triggering the CAP.

#### *3.8.2. Informal Support CAP*

Using a similar model, binary logistic regression analyses revealed a positive relationship between PV and the CAP: each additional trauma was associated with a 29% increase in triggering the informal support care planning (see Table 5). In addition, females were less likely in odds to trigger the CAP than males. Likewise, youth aged 12 to 18 were less likely in odds to trigger the CAP than the 4 to 7-year old children; there was no difference between 8 to 11 and 4 to 7-year old children in the likelihood of triggering the CAP.

#### *3.8.3. Harm to Others and Self-harm CAPs*

Finally, binary logistic regression models were utilized to examine the relationship between PV and the likelihood of triggering harm to self or others CAPs, taking into account sex and age differences. As seen in Table 5, PV was positively associated with the CAP, such that each additional trauma was associated with 36% increase in triggering the risk of harming others care planning. Females and youth aged 12-18 were less likely in odds to trigger the harm to others CAP compared to males and children aged 4-7 years respectively. Children aged 8-11 did not differ from those aged 4-7 in the likelihood of triggering the harm to others CAP.

In the case of the self-harm CAP, PV was positively associated with the CAP: each additional trauma was associated with a 26% increase in triggering the risk of self-harm care planning. Females were 104% more likely to trigger the CAP than males. Children aged 8-11 triggered it 96% more often and youth aged 12-18 triggered it 377% more often than those aged 4-7.

**Table 5**

*Binary Logistic Regression Analyses of Care Planning (CAPs) as a Function of Polyvictimization, Sex, and Age*

	<i>B (SE)</i>	<i>OR (95% CI)</i>	<i>P</i>
<b>Substance use CAP<sup>1</sup></b>			
Sex (Female)	.05 (.06)	1.05 (0.94, 1.18)	.4160
Sex (Male)	-		
PV	.37 (.02)	1.41 (1.36, 1.46)	<.0001
Max-rescaled <i>R</i> <sup>2</sup>	.06		
Likelihood ratio <i>X</i> <sup>2</sup>	363.29		<.0001
<b>Informal support CAP<sup>2</sup></b>			
Sex (Female)	-.26 (.04)	0.77 (0.72, 0.84)	<.0001
Sex (Male)	-		
Age 4-7 years	-		
Age 8-11 years	.09 (.07)	1.09 (0.96, 1.25)	.1765
Age 12-18 years	-.13 (.06)	0.88 (0.78, 0.99)	.0378
PV	.26 (.01)	1.29 (1.26, 1.33)	<.0001
Max-rescaled <i>R</i> <sup>2</sup>	.04		
Likelihood ratio <i>X</i> <sup>2</sup>	427.74		<.0001



	<i>B (SE)</i>	OR (95% CI)	<i>P</i>
<b>Harm to others CAP<sup>2</sup></b>			
Sex (Female)	-.83 (.04)	0.44 (0.40, 0.48)	<.0001
Sex (Male)	-		
Age 4-7 years	-		
Age 8-11 years	.03 (.07)	1.04 (0.91, 1.18)	.5996
Age 12-18 years	-.38 (.06)	0.68 (0.60, 0.78)	<.0001
PV	.31 (.01)	1.36 (1.33, 1.40)	<.0001
Max-rescaled <i>R</i> <sup>2</sup>	.08		
Likelihood ratio <i>X</i> <sup>2</sup>	940.13		<.0001
<b>Self-harm CAP<sup>2</sup></b>			
Sex (Female)	.71 (.04)	2.04 (1.90, 2.20)	<.0001
Sex (Male)	-		
Age 4-7 years	-		
Age 8-11 years	.67 (.09)	1.96 (1.63, 2.35)	<.0001
Age 12-18 years	1.56 (.09)	4.77 (4.02, 5.66)	<.0001
PV	.23 (.01)	1.26 (1.23, 1.29)	<.0001
Max-rescaled <i>R</i> <sup>2</sup>	.14		
Likelihood ratio <i>X</i> <sup>2</sup>	1892.77		<.0001

Notes. <sup>1</sup>*N* = 11,442

<sup>2</sup>*N* = 18,677

PV- polyvictimization; OR – odds ratio; CI- confidence interval

#### 4. Discussion

The present study adds to the growing knowledge of PV and care planning needs using a large sample of Canadian children and youth referred for mental health issues. Consistent with

the proposed hypotheses, PV was associated with a greater need for care planning to address attachment, interpersonal conflict, informal support issues, substance use, risk of harm to self and others. In addition, females were more likely in odds to exhibit harm to self and males were more likely in odds to exhibit harm to others. These results have significant implications on the treatment plans utilized when working with children who have experienced PV.

Children who have experienced maltreatment are at increased risk for greater mental health problems (Adams et al., 2016; McLafferty et al., 2018; Moffit, 2013; Stewart, Toohey et al., 2020; Widom, 2017), with exposure to multiple forms of maltreatment being the norm, rather than the exception (Finkelhor et al., 2011). When compared to a single type of interpersonal trauma, PV of an interpersonal nature has been linked to chronic and adverse effects to a child's development (e.g., emotion dysregulation, difficulties with attention, etc.) due to the psychological and relational consequences to the individual (Dugal et al., 2016). Interpersonal trauma creates a dilemma for children as they often rely on caregivers for support. In interpersonal traumas, the caregivers are often the perpetrators of abuse; with studies reporting numbers greater than 90% of maltreated children being victimized by a parent (Valentino, 2017). To safely interact with caregivers who may be insensitive and unable to help regulate the child's emotions, the child may adopt a dissociative or disorganized attachment style (Dugal et al., 2016; Erzokan, 2016).

In this study, more than half the sample were in need of care planning to address attachment. This finding is consistent with previous literature suggesting that children who have experienced interpersonal PV have disrupted caregiver-child relationships (Valentino, 2017). Additionally, age appeared to be a significant predictor of triggering the attachment CAP; with younger children (ages 4 to 7 years) having a greater likelihood in odds of triggering the CAP

when compared to the group between 8 and 11 years of age. Our findings corroborate that early childhood, specifically, between 4 and 7 years of age is a particularly sensitive time as children are susceptible to the maladaptive outcomes of maltreatment (Erozkan, 2016) and early experiences of interpersonal trauma negatively affects the child's attachment system (San Cristobal et al., 2017). Younger children heavily rely on the warmth, sensitivity and the security projected by their caregivers (Valentino, 2017).

Thus, intervention approaches are needed to support the development of relationships with trusting individuals who can provide warm, sensitive connections to foster the development of secure attachment styles (DeOliveira et al., 2015), being mindful of individual differences based on the child's sex. The slightly greater odds and rate of triggering the attachment CAP for males in this study, is consistent with research conducted with high-risk samples. Preliminary research suggests that males tend to display more disorganized and insecure attachment styles when compared to female peers. Even in cases where both males and females exhibit an insecure attachment style, males tend to display more attention-seeking, disruptive, and aggressive behaviours where females display more behaviours in an attempt to please others (David et al., 2005; Li et al., 2009).

Through the development of secure relationships with nurturing caregivers, other improvements can be obtained including more appropriate approaches to address conflict in interpersonal relationships (Stewart, McKnight et al., 2015) with others, including peers (Arbeau, Stewart, Jordan et al., 2015); as children who have disruptive attachment styles often develop negative belief systems about those around them, creating difficulties in the formation and maintenance of interpersonal relationships (Dugal et al., 2016). D'Esposito et al. (2011), using a sample of 243 students between 12 and 15 years of age, found that poor peer relationships were

related to victimization in females. Females tend to develop more intimate and tight-knit social networks when compared to male peers and as a result, they are more likely to experience bullying within their social milieu. Female peer conflicts are often met with heightened verbal abuse (i.e., rumours being spread, criticism based on appearances) that may go unnoticed when compared to overt behaviours exhibited by males during conflict, increasing the likelihood of such covert behaviours occurring across greater periods of time (Besag, 2006).

Similar findings of a heightened sensitivity to interpersonal trauma found in females was illustrated by the current study's findings. In terms of care planning needs related to interpersonal conflict, each additional trauma was associated with an increase in the odds of triggering the interpersonal conflict CAP. For females, the increase was slightly greater (46%) compared to male peers (37%). Research has supported several sex differences in biological stress systems, type of trauma experienced, and quality of peer relationships that may have contributed to the present study's findings. Females are more likely to be victims of sexual abuse (both within the home and by peers), and emotional maltreatment by parents or caregivers compared to male peers. This type of maltreatment is associated with a heightened sensitivity to interpersonal traumas, a dysregulation in the capacity to form and maintain healthy relationships (Kerig, 2018), and an increased prevalence of internalizing behaviours (Asscher et al., 2015).

Additionally, children who have experienced PV of an interpersonal nature also tend to exhibit lower social supports (Dugal et al., 2016). In this study, each additional trauma was associated with a 29% increase in triggering the informal support CAP, but no significant sex or age difference was found. Limited social support and diminished access to supportive resources is a modifiable risk factor associated with child maltreatment (Freisthler et al., 2014). Caregivers who have fewer contacts to their social networks (Freisthler et al., 2014), perceive a reduction in

family support (Freisthler et al., 2014; Turner et al., 2017) and are more socially isolated (Lyons et al., 2005), are at increased risk for high-powered parenting practices that can lead to child abuse. This lack of informal support may perpetuate child maltreatment as parents do not have any assistance in childrearing (Lyons et al., 2005). Interventions can also enhance informal supports in the lives of children who have been exposed to interpersonal trauma.

Childhood interpersonal trauma has also been linked to substance use disorders (Dugal et al., 2016). In this study, each additional trauma was associated with a 41% increase in the triggering of a substance use care plan. Researchers believe that youth who experience victimization may experience negative emotions and may resort to substance use as a coping mechanism. Such adverse effects of PV may be exacerbated by alcohol and drug use (Ford et al., 2010). Indeed, those youth who are exposed to violence across multiple contexts are thought to have an increased chance of using maladaptive coping mechanisms, such as substance use, when compared to those who experience one victimization event (Klassen, Hamza & Stewart, 2017; Stewart, Baiden & Theall-Honey, 2014; Stewart, Baiden, Theall-Honey, & den Dunnen, 2014; Wright et al., 2013). Ensuring proper treatment is provided for children that addresses underlying trauma can deter them from illicit substance use and alcoholism to self-medicate. Additionally, addressing the underlying trauma can reduce the likelihood of engaging in self-harm to cope with emotion dysregulation given that suicidality, self-harm (Baiden et al., 2019; Brown et al., 2018; Ford et al., 2010) and harm to others (Fox et al., 2015) have been associated with PV.

Our study found a dose-response relationship between the number of traumatic experiences (e.g., one, two, etc.) and suicidal behaviour. In the present study, each additional trauma was associated with a 26% increase in triggering the risk of self-harm CAP. Traumas of an interpersonal nature are thought to place children and youth at greater risk of developing

suicidal ideation. The self-harming behaviours could be the child or youth modelling their caregivers' behaviours (Armiento et al., 2016) or serve as a method of self-regulation for the adversity experienced as a result of maltreatment by a caregiver or peer (Armiento et al., 2016; Turner et al., 2012). To investigate this, Turner et al. (2012) conducted a study examining the cumulative effect of PV on suicidal ideation using a sample of adolescents. They discovered adolescents who experienced peer victimization and maltreatment by a caregiver were 2.5 times and 4.5 times more likely to experience the onset of suicidal ideation, respectively.

Previous literature has posited that age and sex influence the prevalence of suicidal behaviours. Adolescence in particular, is a stage in development associated with increased likelihood of nonsuicidal self-injurious behaviours and suicide (Armiento et al., 2016; Brown et al., 2018; Das et al., 2016). The present study corroborates these findings as youth (ages 12 to 18 years) triggered the self-harm CAP 377% more often than those aged 4 to 7. Furthermore, the current study found that females were 104% more likely to trigger the self-harm care plan than males. In several studies, females have been found to engage in nonsuicidal self-injurious behaviours more often than males (Armiento et al., 2016; Bakken & Gunter, 2012). The differences are assumed to be attributed to social expectations and stereotypical gender roles (Bakken & Gunter, 2012).

With respect to harm to others, PV was positively associated with the harm to others CAP, such that, each additional trauma was associated with a 36% increase in triggering the risk of harming others care plan. Children and youth who have experienced maltreatment may be irritable, impulsive, and interpret neutral stimuli in their environments negatively when compared to their peers who have not been maltreated (Asscher et al., 2015). Furthermore, children and youth who have experienced abuse or neglect are more likely to commit a violent

act than their peers who have not experienced abuse or neglect (Fox et al., 2015). There is evidence to suggest a link between experiencing victimization and being a perpetrator of physical and relational victimization to others (Sullivan et al., 2006). Consistent with our hypothesis, males were also more likely in odds to trigger the harm to others CAP than females.

The finding that males were more likely to exhibit physically aggressive behaviours when compared to females has been supported in several meta-analyses (Lansford et al., 2012). In several studies, being a female was considered a protective factor towards violent offending (Tiffin & Nadkarni, 2010) as females tend to be more compliant and responsive to the needs of others (Asscher et al., 2015). Additionally, sex differences are thought to occur between victimization and behaviours that are harmful to others as a result of the type of abuse experienced and their consequences. Males tend to be victims of physical abuse more so than female peers, which is a risk factor for externalizing behaviours. Females tend to be victims of sexual abuse more so than male peers and this is often associated with internalizing behaviours (Asscher et al., 2015; Stewart, Thornley et al., 2020).

#### *4.1. Limitations*

As has been previously noted by other authors who have conducted studies on the experiences of interpersonal traumas, results reported herein may be an underestimate due to the lack of disclosure. To circumvent the results of underreporting, information for this research study was corroborated by a variety of sources related to the child and youth. Despite potential difficulties with the accuracy of reporting, retrospective analyses of interpersonal trauma can still yield important contributions to the trauma literature. In addition to the potential of underreporting, PV in the context of this research study was strictly interpersonal in nature. Other forms of trauma (e.g., car accidents) were not captured in the present study sample.

Likewise, in the sample, children who did not experience interpersonal trauma may still have experienced other forms of trauma which were not the focus of the study. In the current study, the child and youth's race, socioeconomic status, chronicity of abuse and age of onset of maltreatment were not reported. Future research will incorporate these variables, as they have important implications for long-term recovery. Finally, due to the study's cross-sectional design, causal relationships between interpersonal PV and care planning needs cannot be established.

## **5. Conclusions and Implications for Practice**

The detrimental effects of PV occur in several domains of the child and youth's life. This study outlined how PV is related to attachment, interpersonal conflict, informal support issues, substance use, risk of harm to self and others. This study, in concert with evidence in the literature, supports the viewpoint that polyvictimized children are at heightened risk for developing complications in these respective areas and require intervention due to complex needs related to trauma. To ensure these children are adequately cared for upon contact with mental health supports, mental health professionals should be sensitive to these domains to enhance care planning efforts. In addition, consideration of the child or youth's sex and age on these domains should be considered.

This study also has several policy and practice implications for the field. Specifically, findings suggest different approaches to intervention need to be considered based on sex differences when treating PV in males and females. While aggressive tendencies are more of a coping mechanism in males, self-injury tends to be the approach to regulation emotions in females. Additionally, females are more likely to experience internalizing problems (depression, anxiety), while males are more likely to exhibit externalizing problems (oppositonality, aggression, non-compliance). Intervention approaches that integrate differential responses in



boys and girls is of paramount importance to understand coping styles and maladaptive approaches when dealing with traumatic experiences.

Multi-modal, evidence-informed approaches to intervention that incorporate the specific needs of each child and family are most effective (Stewart et al., 2012). Where PV is apparent, the findings herein suggest that intervention approaches are needed to support the development of relationships with trusting individuals who can provide warm, sensitive connections to foster the development of secure attachments (DeOliveira et al., 2015). Through the development of warm, reliable, secure relationships with nurturing caregivers, other improvements can be obtained including more appropriate approaches to address conflict in interpersonal relationships (Stewart, McKnight et al., 2015) with others, including peers (Arbeau, Stewart, Jordan et al., 2015).

These results also suggest that specific care planning approaches based on the individualized needs of the child around the prevention of self-injury (see Arbeau, Stewart et al., 2015) and illicit substance use and alcoholism (Henderson et al., 2015) is needed given the heightened risk for those victims who have experienced PV. Focus should be placed on the integration of treatment components associated with best practice that focus on the family, school and child within a trauma-informed framework to support professional practice and known to produce effective outcomes (Stewart et al., 2012). The emotional and behavioural problems of child victims are likely complex and interact with developmental stages, sex, gender as well as with a variety of risk and protective factors. The need for curative trauma-informed interventions that address disturbances in attachment and developmental trauma will be key to foster a sense of safety, improved self-regulation, competence, and mastery in victimized children and youth (Stewart, Theall, Perry et al., 2015).

There are few assessment-to-intervention approaches that integrate best practice utilizing a case-finding methodology to identify children and youth at imminent risk. The interRAI assessment suite provides a comprehensive assessment that supports evidence-informed care planning based on the individualized needs of each child, youth, and family (e.g., attachment, traumatic life events, suicide, interpersonal conflict, substance use, criminality prevention). The use of such an integrated health information system that supports clinical decision making through the use of best practice can be utilized across care settings while providing a framework for improved information sharing and service system integration over time (Hirdes et al., 2020). Such an approach can also provide substantial opportunities for innovative treatment approaches in real world settings for our most vulnerable children, youth and their families.

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