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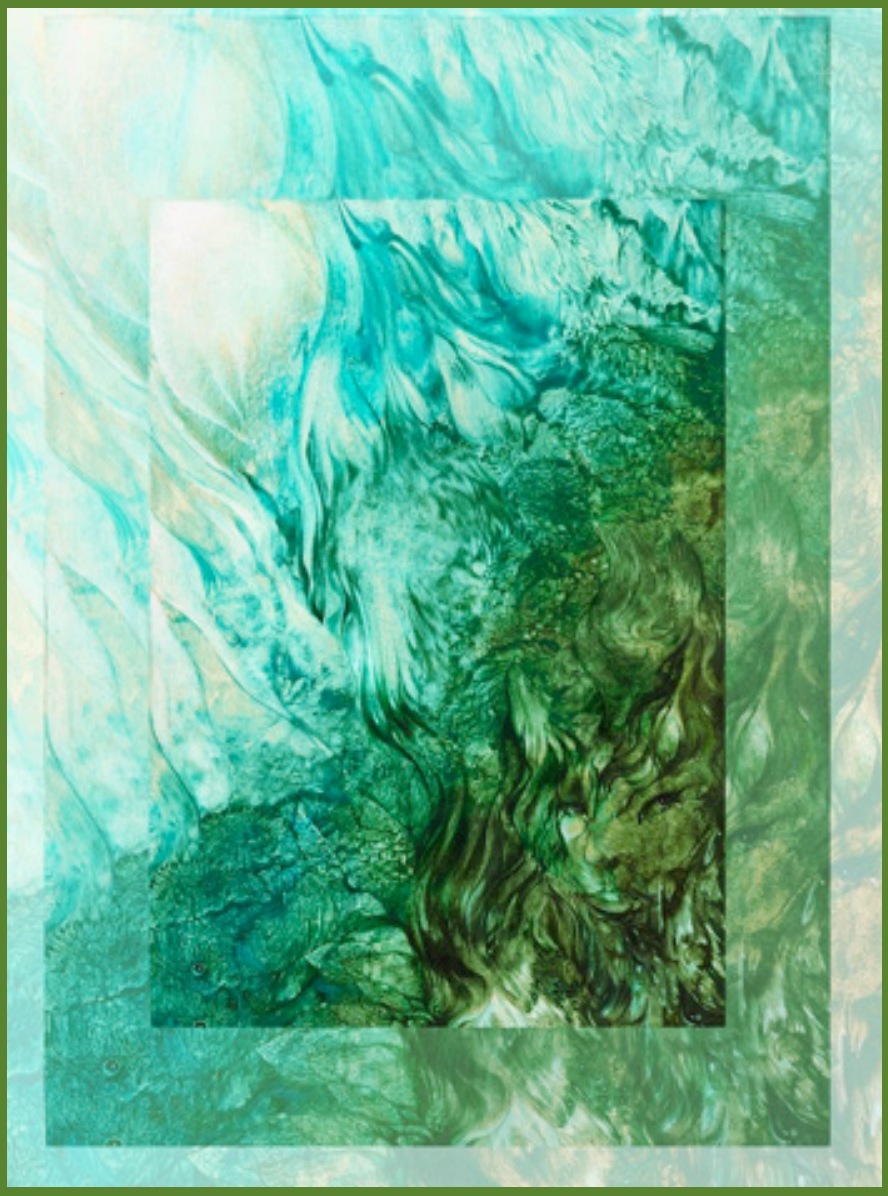

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Cover Illustration: Jutta Venosa is a multi-media artist living in Vienna, Austria. She is influenced by Austrian artist, Wolfgang Hutter, German artist, Ernst Fuchs, and American artist, Robert Venosa, in developing a style of fantastical realism. In this painting, The Hunter, there is a lion-like figure in the foreground, and it is left up to the viewer as to whether this is indeed the hunter, the haunted, or the redeemed.

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Peer Victimization in Sexually Abused Children: The Mediating Role of Post-Traumatic Stress Symptoms

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Abstract:

Objectives: Studies suggest that sexually abused children are at higher risk of being victimized by their peers. However, little is known about the factors influencing the risk of peer victimization. This study aimed to examine whether post-traumatic stress symptoms mediated the relationship between CSA-specific self-blame and peer victimization in sexually abused children.

Method: A sample of 352 children (232 girls and 120 boys), aged 5-14, victims of sexual abuse were recruited. Children completed the Children's Impact of Traumatic Events Scale II (CITES II; Wolfe, 2002) assessing post-traumatic stress symptoms and CSA-specific self-blame. Peer victimization was assessed with a cross-informant measure (Ladd & Kochenderfer-Ladd, 2002) completed by the child, the parent and the teacher.

Results: Results of logistic regression analyses revealed that post-traumatic stress symptoms are positively associated with self-reported peer victimization, while self-blame is only associated with parents' reports of the child peer victimization. A structural model revealed that post-traumatic stress symptoms mediated the relationship between self-blame and peer victimization as measured by all three informants.

Conclusion: These findings highlight the importance of considering post-traumatic stress symptoms and self-blame in interventions for children victims of sexual abuse. Strength-based interventions aiming to promote adaptive behaviors and a systemic approach could target and prevent further victimization, therefore fostering resilience among this vulnerable population of children.

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Conflicts of Interest:

We have no conflicts of interest to declare.

Keywords:

child sexual abuse, peer victimization, self-blame, post-traumatic stress symptoms, revictimization.

Introduction

Child sexual abuse (CSA) is a serious public health issue. It is estimated that one in five girls and one in ten boys have been victims of CSA before the age of 18 (Stoltenborgh, van IJzendoorn, Euser, & Bakermans-Kranenburg, 2011). CSA is associated with a host of deleterious consequences including internalized and externalized behavior problems (Lewis, McElroy, Harlaar, & Runyan, 2016) as well as post-traumatic stress disorder (PTSD; Hébert, Langevin, & Daigneault, 2016). CSA can also impact school adaptation and social relationships of child victims. For example, parents and teachers report lower social skills and more social difficulties in CSA victims when compared to non-abused peers (Blanchard-Dallaire & Hébert, 2014).

Peer victimization

Difficulties experienced in the school context may also translate into heightened risk of peer victimization for these vulnerable youths. The few available studies—focusing for the vast majority on adolescent samples—suggest that child maltreatment is associated with a higher risk of peer victimization (Auslander, Tlapek, Threlfall, Edmond, & Dunn, 2015; Benedini, Fagan, & Gibson, 2016). Yet, little is known about peer victimization specifically among children victims of CSA. One recent study found that 60% of sexually abused children reported experiencing at least one episode of school-based peer victimization (Hébert et al., 2016). In their study conducted with a Canadian community sample of children aged 6–12, Babchishin and Romano (2014) found that 95% of children who experienced any form of sexual victimization were also victimized by peers or siblings.

According to Olweus (2010), peer victimization is defined as being the target of intentional, repetitive and negative (hurtful or unpleasant) behavior by one or more person. Typically, these behaviors can be expressed either directly or indirectly (Shetgiri, 2013). Direct aggression includes physical violence (hitting, pushing, etc.), as well as verbal abuse, such as insults and threats. Indirect behavior refers to relational aggression that is characterized by the manipulation of social relationships or damage to reputation, such as rumors and exclusion. Like CSA, peer victimization is associated with negative outcomes that can persist into adolescence and adulthood, such as depression, anxiety and behavior problems (McDougall & Vaillancourt, 2015; Singham, Viding, Schoeler, Arseneault, & Ronald, 2017). One of the rare studies examining the co-occurrence of child maltreatment (sexual, physical and psychological abuse) and peer victimization found that participants who experienced both maltreatment and peer victimization displayed more psychological distress and post-traumatic stress symptoms (PTSS) than those who sustained only one type of victimization (Duncan, 1999). According to the author, these results suggest that individuals victimized in different contexts have fewer opportunities to escape maltreatment. Studies also suggest that relational victimization, such as ignoring, rejecting or spreading rumors, predicts psychological distress, beyond childhood maltreatment, in adults (Sansen, Iffland, & Neuner, 2014).

Moreover, several researchers have observed that experiencing multiple forms of violence during childhood has a cumulative effect on adult psychopathology (Putnam, Harris, & Putnam, 2013). Overall, children who experience any type of victimization in a given year are two to seven times more likely to be revictimized the following year (Finkelhor, Ormrod, & Turner, 2007). Revictimization of CSA victims, including peer victimization, is therefore a worrying issue considering the impact it can have on the development and mental health of children. However, factors influencing the risk of revictimization of CSA victims are not yet fully understood.

Factors influencing revictimization

Available literature on victimization experienced in the school context is very scarce. In order to design efficient interventions and foster resilience among CSA victims, it is important to better understand the factors contributing to their vulnerability towards other forms of violence. Examining factors that affect the risk of revictimization might not only ultimately minimize its occurrence, through targeted interventions, but could also prevent the onset of a more severe sequelae in victims. The present study will focus on addressing blame attributions related to the CSA and PTSS as potential factors influencing the risk of peer victimization among CSA victims.

CSA-specific self-blame. Among the various factors influencing the risk of revictimization, several researchers focused on the internal attributions of blame specific to CSA. Causal attribution refers to an individual's inference about the cause of an event (Abramson, Seligman, & Teasdale, 1978). Thus, according to this theory, an internal attribution corresponds to the belief that characteristics or behaviors specific to the individual have caused the event. Conversely, external attributions assign responsibility for

the event to someone or something else. For example, following sexual abuse, the child may blame himself/herself (internal attribution) or may believe that the fault rests more with the aggressor or the situation (external attribution). Attributions vary according to age, across contexts (Valle & Silovsky, 2002) and also with the time elapsed since the disclosure of the abuse (Feiring & Cleland, 2007). This underscores the importance of examining these attributions in a prospective manner, rather than retrospectively.

Blame attributions are perceived as factors that influence the relationship between CSA and psychological symptoms. For example, blame attributions have been found to predict depressive, anxiety, dissociative symptoms and low self-esteem among children and adolescents with CSA histories (Daigneault, Tourigny, & Hébert, 2006; Gauthier-Duchesne, Hébert, & Daspe, 2017). CSA-specific self-blame has also been identified as a salient risk factor for revictimization. For example, Arata (2000) found that SA-specific self-blame acted as a mediator between CSA and sexual victimization in adulthood. Results showed that severity of the perpetrated acts was associated with higher levels of self-blame, which were in turn related to an increased risk of sexual victimization in adulthood. Even though these studies shed light into the relationship between blame attributions and revictimization in adults, to our knowledge, no study has focused on specific attributions to the CSA in relation to interpersonal violence in a school context.

Post-traumatic stress symptoms. CSA-specific self-blame is associated with greater impairment in CSA victims (Valle & Silovsky, 2002); impairment that often translates into post-traumatic stress symptoms (PTSS; Cantón-Cortés, Cantón, & Cortés, 2012; Sharma-Patel et al., 2014). Specifically, PTSS have often been identified as risk factors for adult sexual victimization in women (Filipas & Ullman, 2006; Fortier et al., 2009). Again, knowledge about the relationship between PTSS and subsequent victimization of CSA victims comes mainly from the literature on sexual re-victimization of adult women.

With respect to peer victimization in children, one study found that PTSS triggered by Hurricane Katrina in Louisiana predicted increased peer victimization in schools (Terranova, Boxer, & Morris, 2009). Another study using a sample of adolescent girls in the child welfare system revealed that youth with more PTSS were at greater risk of being victimized by peers, even after controlling for the traumatic event experienced (Auslander et al., 2015). The results of this study also found that PTSS mediated the relationship between the severity of CSA and the physical, relational, and verbal victimization perpetrated by a peer (Auslander et al., 2015), suggesting that PTSS act as a mechanism towards being victimized by their peers. Some authors have argued that PTSS may alter information processing skills, risk perception and self-protection strategies, thus possibly increasing vulnerability to further victimization (Chu, 1992; Arata, 2000). For example, hyperarousal was found to mediate the relationship between CSA and sexual revictimization in a sample of adults (Risser, Hetzel-Riggin, Thomsen, & McCanne, 2006). Hyperarousal could reduce one's ability to distinguish real threats from safe situations, which could translate into a lowered vigilance towards signs of potentially dangerous situations, hence increasing the vulnerability to revictimization.

The current study

Against this backdrop, this study will address some of the gaps in the current literature. Rather than studying the phenomenon retrospectively with adult participants, it will focus on a sample of child victims of CSA. Moreover, a multi-informant measure will be used to obtain a more accurate and comprehensive assessment of peer victimization. Several studies have shown a differential report of peer victimization between the child, parent and the teacher, although the teacher report was less frequently considered in past studies (Harper, 2012; Hébert et al., 2016; Ronning et al., 2009). Social bias, such as emotion recognition and subjectivity bias, may also interfere with the informant's reporting style of peer victimization (John & DiLalla, 2013; Ladd & Kochenderfer-Ladd, 2002). Additionally, Ladd and Kochenderfer-Ladd (2002) found that their cross-informant measure better predicted relational adjustment than any of the single-informant measure. Hence, using a cross-informant measure can more accurately depict the scope of the situation and enhance validity.

The study's first aim is to contrast the three informants' (child, parent, and teacher) reports of peer victimization. The second objective of this study is to determine whether CSA-specific self-blame and PTSS predict peer victimization in CSA victims. Lastly, this study will test the mediating role of PTSS in the relationship between CSA-specific self-blame and the severity of peer victimization. It is expected that higher levels of self-blame and PTSS will be associated with more severe peer victimization, and that PTSS will contribute to the relationship between self-blame and victimization through a mediation process.

Methods

Procedure

This study is part of a larger project on the developmental trajectories of CSA victims. The children and their non-offending parent were recruited from five centers offering specialized services for sexually abused children and their families in the province of Quebec, Canada. Research assistants administered the questionnaires separately to children and parental figures during the initial assessment. After obtaining the parent's consent, teachers were invited to complete a questionnaire on the behaviors and attitudes of the child at school. This research project was approved by the ethics committees of the CHU Sainte-Justine and of the Université du Québec à Montréal.

Participants

Of the original sample of 376 participants, 24 participants were excluded because of insufficient data on one or more of the instruments used, with the exception of the teacher's evaluation of peer victimization. This led to a final sample of 352 sexually abused children (232 girls and 120 boys) aged 5–14 years old ($M = 9.03$, $SD = 2.13$). Socio-demographic characteristics of the sample are summarized in Table 1. The majority (72.8%) of cases involved CSA perpetrated by a family member. Characteristics of the abuse are described in Table 2.

Table 1: Sample Characteristics

Variable	Total ($n = 352$)
Mean age of children	9.03 (2.13)
Gender of Children	
Girls	65.9%
Boys	34.1%
Ethnicity	
Caucasian	98.3%
Other	1.7%
Family Structure	
Intact	21.9%
Single Parent	33.5%
Step Family	31.2%
Foster Family	13.4%
Annual Income	
Less than $20,000	28.0%
$20,000 - $39,999	22.3%
$40,000 - $59,999	19.8%
$60,000 and above	29.9%
Respondent's Education Level	
Primary School	3.5%
High School	39.5%
College	37.5%
University	19.5%

Table 2: Sexual Abuse Characteristics

Variable	Total ($n = 352$)[a]
Duration of the Abuse	
Single Episode	28.1%
Some Events	34.1%
Repetitive or Chronic	37.8%
Relationship with the Abuser	
Intra-familial	72.8%
Extra-familial	27.2%
Severity of the Abuse	
Less Severe	8.8%
Severe	30.9%
Very Severe	60.3%

Note. The severity of the CSA experience was coded as such: 1 = less severe (exhibitionism, voyeurism, kisses, exposure to pornographic material, physical contact over clothing), 2 = severe (physical contact under clothing, touching of the genitals), and 3 = very severe (oral sex, vaginal or anal penetration or attempted penetration).

[a]Because of missing data on some variables, number of participants ranges from 317 and 352.

Measures

Peer victimization. Peer victimization was assessed with a multi-informant measure. The Self-Report Victimization Scale (Ladd & Kochenderfer-Ladd, 2002), completed by the child, consists of four items assessing physical, verbal and indirect violence experienced in the school context. The Parent-Report Victimization Scale and Teacher-Report Victimization Scale (Ladd & Kochenderfer-Ladd, 2002) were completed by the parent and the teacher respectively and comprised the same items as the self-reported instrument and an additional one ("the child is teased or laughed at by other children"). The instrument assesses the frequency of victimization on a three-point scale ranging from 1 "never/seldom" to 3 "a lot/often" and provides an average total score. A higher score indicates a more frequent peer victimization. All versions showed satisfactory internal consistency in this sample (child's : $\alpha = .77$; parent's : $\alpha = .86$; teacher's: $\alpha = .85$).

CSA-specific self-blame. Children answered to three items from the Children's Impact of Traumatic Events Scale II (CITES II; Wolfe, 2002) concerning their levels of self-blame towards the CSA. The statements are: "I thought that what happened was my fault", "I felt that I caused problems to several people" and "I felt guilty about what happened". Items are scored on a three-point scale ranging from 0 (false) to 2 (very true) to provide a score of 0 to 6 for the full scale. The scale has good internal consistency ($\alpha = .80$) for this sample.

Post-traumatic stress symptoms. PTSS were measured using the 46 items of the PTSD subscale of the CITES II (Wolfe, 2002). This instrument assesses the severity of post-traumatic stress symptoms in response to sexual abuse in three categories of symptoms: hyperarousal (e.g. sleep difficulties), avoidance behaviors (e.g. situations related to the traumatic event, social withdrawal) and re-experience (e.g. nightmares, flashbacks). The child reports his answer on a three-point scale, ranging from 0 (false) to 2 (very true). The final score ranges from 0 to 92, with a higher score representing more traumatic symptoms. The internal consistency for this sample is excellent (α = .94).

Socio-demographic and abuse characteristics. The information regarding socio-demographics was obtained by means of a self-report questionnaire completed by the non-offending parent. CSA characteristics were compiled by a clinician using an adapted version (Parent & Hébert, 2000) of the History of Victimization Form (Wolfe et al., 1987).

Results

Results will be discussed in three sections. First, descriptive statistics will be presented and will address the first aim of the study. Analyses relative to the second and last objectives will be presented next.

Descriptive statistics

Correlations in Table 3 show that PTSS scores are positively associated with peer victimization, as evaluated by the child and parent. Both the child's and the parent's evaluation of the child's victimization are significantly correlated with levels of self-blame. Significant, yet low correlations (from $r = .13$ to .31, $p < .05$) were found between the three informants' evaluations of peer victimization. Mean scores of victimization are as follows: $M = 1.66$ ($SD = .59$) for the child version, $M = 1.48$ ($SD = .52$) for the parent version, and M = 1.28 ($SD = .41$) for the teacher. Three quarters of children (76.4%) endorsed a frequency of "sometimes" or "often" on at least one type of peer victimization. As for the parent's and the teacher's evaluations, respectively 66.5% and 45.2% of children experienced some kind of peer victimization. More than half of participants reach clinical levels of PTSS (54.1%) and 59.4% of children endorsed at least one item of self-blame.

Table 3: Summary of Correlations, Means and Sandard Deviations of the Studied Variables

Variables	1.	2.	3.	4.	M	SD
1. Self-blame (0 - 6)					1.91	2.10
2. Post-traumatic stress symptoms (0 - 92)	.55**				41.93	20.39
3. Peer victimization (child's evaluation: 1 - 3)	.28**	.41**			1.66	.59
4. Peer victimization (parent's evaluation: 1 - 3)	.17**	.19**	.31**		1.48	.52
5. Peer victimization (teacher's evaluation: 1 - 3)	-.01	.05	.13*	.27**	1.28	.41

Note. * $p < .05$; ** $p < .01$

Logistic regressions

In order to address this study's second objective, which consists of determining whether self-blame and PTSS were associated to peer victimization in the school context, logistic regressions were carried independently for each of the three informants' evaluation. For these analyses, the measure of peer victimization was dichotomized to indicate presence (1) or absence (0) of peer victimization. As suggested by Ladd and Kochenderfer-Ladd (2002), scores superior to one standard deviation or more above the mean were classified into the peer victimization group. A first logistic regression was performed with self-reported peer victimization as the dependent variable and self-blame and PTSS were included in the same block. The results indicated that the model was significant ($\chi^2(2) = 51.08$, $p < .01$). Nagelkerke's R^2 indicated that the model accounted for 21.9% of the variance of self-reported peer victimization. Only PTSS significantly predicted peer victimization (Exp(B) = 1.05, $p < .01$).

A second logistic regression was carried with parents' evaluation of victimization as the dependent variable. The model was significant ($\chi^2(2) = 8.37$, $p < .05$), but only accounted for 5% of the total variance. Only self-blame was significantly associated with peer victimization evaluated by the parent (Exp(B) = 1.23, $p < .05$). A third logistic regression showed that neither self-blame, nor PTSS contributed to predicting the risk of peer victimization evaluated by the teacher ($\chi^2(2) = 3.56$, *ns*).

Structural model

In order to determine whether PTSS mediated the relationship between self-blame and peer victimization, the three informants' evaluations of peer victimization were grouped in a latent variable within a structural model. This model was tested using Mplus 8 software (Muthén & Muthén, 1998-2017). As all three evaluations of peer victimization were characterized by a floor effect, data were analyzed using censored variables and MLR estimator.

Prior to testing the structural equation model, a confirmatory factor analysis was performed to verify if the three measures of peer victimization were consistent with the latent variable of global victimization. All three indicators were positively related to the latent variable ($\beta = .82$; $\beta = .43$; $\beta = .42$, *ps* $< .05$, for the parent's, child's and teacher's evaluation, respectively). However, as goodness of fit indices are not given when censored variables are used, the confirmatory factor analysis was re-run, while using the MLR estimator, but without the censored variables. New standardized coefficients were as follows: $\beta = .79$, $p < .05$ for the parent's evaluation, $\beta = .39$, $p < .05$ for the child's, and $\beta = .34$, $p < .05$ for the teacher's. These new coefficients were relatively similar to the ones obtained with the corrected variables and still reached significance. Therefore, all remaining analyses were carried using the MLR estimator, without correcting for the floor effect with the censored variables. Indices of fit for the latent variable were not examined, since the model was saturated.

The paths linking the latent variable and the observed variables were examined to assess the mediating role of the PTSS. More precisely, self-attributions of blame were included in

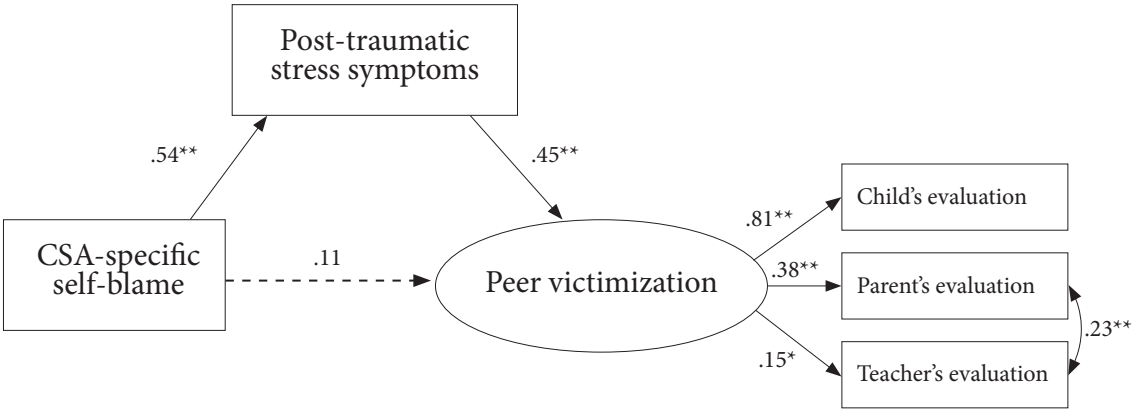

Figure 1: Final model of the relationship between self-attributions of blame, post-traumatic stress symptoms and peer victimization evaluated by three informants.

Rectangles indicate measured variables and the circle represents a latent variable. *$p < .05$; ** $p < .01$

the model as the independent variable, PTSS as the mediator and the latent variable of global peer victimization as the dependent variable. First, the direct effect, between self-blame and peer victimization, was tested. Results revealed that self-blame was positively associated to peer victimization ($\beta = .36$, $p < .01$).

Then, the mediator was included in the model and links between self-blame and PTSS, and PTSS and peer victimization were tested in a second analysis. Self-blame and PTSS were positively associated ($\beta = .54$, $p < .01$), and PTSS were in turn associated with global peer victimization ($\beta = .46$, $p < .01$). When PTSS were included in the model as a mediator, the direct effect between self-blame and peer victimization became non-significant ($\beta = .11$, *ns*). The indices showed an adequate fit (Santorra-Bentley $\chi^2(4) = 13.23$, $p < .05$; RMSEA = .08 [.04; .13]; CFI = .96; SRMR = .05), but the significant chi-square indicated that the model could, however, be improved. Thus, correlated error term for parent's and teacher's evaluation of peer victimization was added to the model ($\beta = .23$, $p < .01$).

The final model (Figure 1) showed an excellent fit (Santorra-Bentley $\chi^2(3) = 2.64$, *ns*; RMSEA = .00 [.00 ; .09]; CFI = 1.00; SRMR = .02). A Sobel test confirmed that PTSS mediated the relationship between self-blame attributions and peer victimization in the school context in CSA victims ($z = 3.82$, $p < .01$). In other words, greater self-blame was associated with more PTSS. PTSS were, in turn, associated with more frequent peer victimization. This model accounts for 26.6% of the total variance of peer victimization.

Discussion

The purpose of this study was to investigate the association between self-blame, PTSS and peer victimization among child victims of sexual abuse. Results will help better understand potential risk factors of revictimization, thus providing intervention targets to foster resilience in CSA victims. The preliminary analyses found that assessments of the

three informants do not capture the same scope of child victimization. Indeed, the agreement between the parent and the child's evaluations is moderate, while the agreement between the parent and the teacher, as well as the concordance between the child and the teacher are low. This overall low agreement between the informants confirms the trend that is often found across studies, even when different instruments are used to assess peer victimization (Harper, 2012; Holt, Kantor, & Finkelhor, 2009). Ladd and Kochenderfer-Ladd (2002) posited that the parent/child agreement tends to be stronger than the two other combinations because the parent's perception is mostly drawn from the child's recounts. As most peer victimization acts are perpetrated in situations where adult supervision is minimal (Smokowski & Kopasz, 2005), it is not surprising to observe a lower rate of peer victimization when reports are based on teachers' evaluation.

The second objective sought to examine the association between CSA-specific self-blame and PTSS, and each of the three victimization measures. Results revealed that only PTSS were associated with self-reported peer victimization, meaning that more PTSS was linked to an increased risk of being victimized by peers in the school context. With respect to the measure completed by the parent, CSA-specific self-blame, but not PTSS, was associated with victimization; with greater self-blame being related to an increased risk of being victimized in the school context as reported by parents. Analysis failed to identify significant predictors of teachers' report of peer victimization.

These findings suggest that different processes may come into play in the way informants report peer victimization. First, the relationship between PTSS and victimization reported by the child may be due to the fact that PTSS, particularly hyperarousal, leads to exaggerated reactions to minimal threats (Cloitre & Rosenberg, 2006). This hypersensitivity could artificially inflate the child's reports of peer victimization. This would explain, both why children report more victimization experiences than parents and teachers, and why only the self-reported victimization measure is associated with PTSS. Another explanation might be that children with more severe PTSS tend to avoid discussing their negative interpersonal experiences with their parents. They could be so overwhelmed by these symptoms that they would not be able to verbalize their experiences of victimization to their parents, preventing them from attesting to the phenomenon.

The results also suggest that CSA-specific self-blame is associated with peer victimization perceived by the parent. The child may internalize the idea that he or she is responsible for the CSA, which can lead to a sense of helplessness (Abramson et al., 1978). This helplessness can then translate into decreased defense capabilities, less self-assertion and thereby continuity of victimization. However, it is unclear why no relationship was found between self-blame and self-reported victimization. It could be that children having high levels of self-blame are less likely to perceive themselves as victims. In fact, they may also have a general tendency to attribute the cause of negative events (i.e. peer victimization experiences) to themselves, thus feeling helpless and thinking that nothing can be done to change the situation. They may come to tolerate violence and no longer recognize it. Failure to identify significant predictors of teachers' report of peer victimization may be related to lack of statistical power (King & Zeng, 2001) as only a small proportion of children ($n = 9$) fell in the victimization group based on teachers' reports.

The final objective was to examine the contribution of PTSS in the relationship between CSA-specific self-blame and victimization, evaluated by the three informants all at once. Confirmatory factor analysis determined that the assessments of the different informants could be combined to form a more comprehensive measure of global peer victimization. The results of the structural model then revealed that PTSS completely mediated the association between self-blame and the severity of peer victimization in the school context. Thus, greater self-blame was associated with more severe PTSS symptoms, which in turn were associated with greater peer victimization.

This study replicated the results of several other studies concerning the association between self-blame and PTSS. Sharma-Patel and her colleagues (2014) hypothesized that self-blame could result in an altered self-image (e.g. lack of confidence in one's abilities) that would translate into a constant impression of threat or danger, which characterizes PTSD. Another explanation might be that victims displaying higher levels of self-blame tend to engage more in avoidant coping, thus increasing PTSS severity (Cantón-Cortés, Cantón, Justicia, & Cortés, 2011). This strong association between self-blame and PTSS underscores the importance of including feelings of blame as a type of negative thought or feeling in the upgraded diagnosis criteria for PTSD in the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM—5; American Psychiatric Association, 2013).

The fact that more PTSS were found to be associated with more severe peer victimization is consistent with the few studies of victims of traumatic events (Auslander et al., 2015; Terranova et al., 2009). To our knowledge, this is the first study that has examined this link with child victims of SA. The association between PTSS and peer victimization found in this study is also consistent with several models attempting to explain why CSA victims are at greater risk of further victimization in adolescence or adulthood. Indeed, PTSS have been identified as risk factors for teen dating victimization (Hébert, Daspe, Blais, & Lavoie, 2017) and sexual revictimization in adulthood (Arata et al. 2000; Fortier et al., 2009). It has been suggested that PTSS, namely hyperarousal, reduces an individual's ability to adequately assess hazards and threats, putting them at risk of being exposed to potentially dangerous situations (Risser et al., 2006). Although this explanation has mainly been used to explain revictimization in adult women, it appears applicable to peer victimization. For example, more PTSS may hinder the child from assessing potentially dodgy situations in school settings, and exert protective strategies preventing them from being bullied. Others suggest that it is not the perception of danger per se that is hindered by arousal symptoms, but the person's ability to efficiently react to the threat; overarousal could lead to immobilization when confronted to danger, whereas underarousal could result in impaired capacity to engage in self-protective strategies (Noll and Grych, 2011). It might also be that CSA victims are more vulnerable targets for bullies. They may internalize the fact that they are to blame for negative events and that they deserve it, therefore precluding them from asserting themselves or soliciting help to put an end to their victimization. In addition, sense of powerlessness often experienced by CSA victims may make it difficult to disclose peer victimization experiences to adults and seek support.

Limitations

The unique contribution of this paper should be interpreted in light of several limitations. The main limit is the reliance on a cross-sectional design. Hence, no inferences can be drawn concerning directionality of the relationship between the studied variables. A longitudinal design would allow a better understanding of the temporality of the variables. Secondly, the instruments used to measure CSA-specific self-blame and peer victimization included few items. Although using a multi-informant measure to assess peer victimization is a strength, the measures used focused only on situations experienced in the school context. School-aged children are often involved in sport or community activities, and victimization may also occur outside the school setting (Turner, Finkelhor, Hamby, Shattuck, & Ormrod, 2011). It should also be noted that this sample involved child victims of severe sexual abuse, which may be more prone to negative self-blame attributions and complex trauma symptoms.

Future studies

Future studies should disentangle the different dimensions of PTSD (hyperarousal, re-experiencing, and avoidance) that might be associated with peer victimization. This would lead to a better comprehension of the specific mechanisms involved. Similarly, studying the types of victimization distinctly (i.e. physical, verbal and relational), rather than globally, would clarify the situations in which CSA victims are at risk. Since CSA-specific self-blame seems to impact the general tendency to blame oneself for the occurrence of negative events (Daigneault et al., 2006), it would be interesting to study how CSA-specific self-blame and general internal attributions interact with one another in the prediction of peer victimization.

Implications

Despite these limitations, the findings suggest important clinical implications. The results help identify the factors related to revictimization, provide treatment targets and guide victimization prevention efforts in the school context. PTSS and self-blame are already important targets in the treatment of sexual abuse victims, including Trauma-Focused Cognitive-Behavioral Therapy (Cohen, Mannarino, & Deblinger, 2006), and this study further emphasizes the importance of focusing on these symptoms in order to prevent peer revictimization. In addition, it appears essential that practitioners investigate children's experiences of peer victimization in order to guide treatment planning, especially in children with severe self-blame and PTSS. Moreover, attributing the blame of the abuse to an external source (perpetrator or situation) is frequently identified as a protective factor (Domhardt, Münzer, Fegert, & Goldbeck, 2015). Assessing and addressing the negative self-cognitions and feelings related to the SA could promote resilience in the sense that less self-blame is associated with fewer post-traumatic symptoms and less peer victimization.

Interventions and programs targeting peer victimization in school settings would benefit from relying on a systemic and multimodal approach. As such, considering factors at different levels of the ecosystemic model when designing new interventions or programs is more likely to foster resilience. Individual factors, such as assertiveness and external attributions to negative events may constitute important targets in order to maximize

resilience, especially for vulnerable children (i.e. children with a known history of adversity). For example, interventions may need to provide the children tools to accurately recognize and respond to potentially dangerous situations, and helping them become more assertive. Moreover, it seems paramount to extend the intervention to other levels of the ecological system, by including parents, school personnel and even community organizations, so that external resilience factors are also promoted. In fact, working with parents to favor an "open" dialogue with their child, and offering school personnel the tools to adequately intervene if a child discloses a situation of peer victimization or sexual abuse could enhance social support and foster resilience. Moreover, child sexual abuse prevention programs that are disseminated in schools should convey and emphasize that children are never to blame for the abuse. An effort to adopt a more systemic approach (i.e. including parents, school personnel) could help reinforce this message, hence minimizing the risk that the child endorses self-blame.

In conclusion, the results of this study indicate that different psychological processes come into play depending on the perspective of the informant assessing peer victimization. In addition, PTSS mediates the link between self-blame and peer victimization in CSA victims. This study addressed some of the gaps in the literature by studying cross-informant peer victimization among a sample of child victims of sexual abuse. The fact that the different reports of victimization are associated with different mechanisms (self-blame and PTSS) further outlines the pertinence of using a multi-informant approach to peer victimization to gather a more comprehensive portrayal of the phenomenon. Although the study design does not allow for inference of temporality, the study did contribute to the understanding of mechanisms involved in peer revictimization in CSA victims. Hopefully, the results of this study will help to identify aspects relevant to the prevention of school-based victimization for vulnerable children.

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A Review to Identify Gaps in Research and Service Delivery for Substance Use Prevention among At-risk Adolescents Involved in Child Welfare System: The Promises of Targeted Interventions

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Abstract:

Adolescents involved with the child welfare system are at a high risk of early initiation of substance use and development of substance use disorders. However, there is an enormous gap between the needs and availability of the intervention programmes for prevention and treatment of substance use problems in at-risk adolescents involved in the child welfare system. In the present article, we first review the prevalence of substance use problems and risk and protective factors for substance misuse among adolescents in the child welfare system. We then discuss the available interventions for reducing substance use problems in these populations, and the promises of personality-targeted interventions for reducing substance use problems in adolescents involved in the child welfare system, and the gap in research and practice.

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Keywords:

Adolescents; Child Welfare System; Substance Use; Selective Prevention Programmes; Personality-targeted Interventions

Introduction

Substance use problems are major concern in adolescents involved in child welfare system (e.g., Braciszewski & Stout, 2012; Narendorf & McMillen, 2010; Traube, James, Zhang, & Landsverk, 2012; Wekerle, Leung, Goldstein, Thornton, & Tonmyr, 2009). Several factors, such as exposure to child maltreatment, parental substance use, multiple placement changes, and lack of family support when transitioning into independent living situations, contribute to the increased risk of substance use problems in youth involved in child welfare system (Aarons et al., 2008; McCoy, McMillen, & Spitznagel, 2008; Walsh, MacMillan, & Jamieson, 2003). While child welfare services are structured in order to assure that children are provided with an environment that promotes appropriate social, emotional and physical development, previous studies reported that adolescents who receive chid welfare services are at increased risk of substance use problems (Pilowsky & Wu, 2006). In addition, early targeted prevention programmes that specifically address the risk of substance use among this group are not often implemented in this system, and even more rarely rigorously studied.

The prevalence of substance use among adolescents involved in child welfare system may vary based on several factors, such as the method used for measuring substance use, the population studied, and the age and location of the sample (Young, Boles, & Otero, 2007). Some studies estimated that 1 in 5 adolescents involved in child welfare system struggle with a substance use problem (Aarons, Brown, Hough, Garland, & Wood, 2001). In addition, living in foster homes increases the likelihood of substance abuse by five times compared to no history of removal (Pilowsky & Wu, 2006). Findings from the Canadian Incidence Study of Reported Child Abuse and Neglect-2003 (Trocmé et al., 2005) indicated that around 14% of all 10-15 year old individuals investigated for maltreatment and 16% of individuals with substantiated cases had substance abuse problem (Singh, Thornton, & Tonmyr, 2011). In addition, they tend to show more problems with drugs than alcohol (Singh et al., 2011). Results from another Canadian study of youth involved in child welfare system found a higher rate of cannabis and other drug use among this population compared to non-involved youth (Wekerle et al., 2009). Other studies confirmed these results showing youth involved in child welfare system have problems with drugs more than alcohol and indicated that the use of "hard" drugs, such as lifetime use of amphetamines, opiates, crack/cocaine, and hallucinogens is considerably higher in youth currently and formerly cared for in foster homes compared to peers in general population (see a systematic review by (Braciszewski

& Stout, 2012). In addition, the diagnosis of substance use disorders (particularly lifetime) is substantially higher among youth in child welfare system compared to youth in the general population (e.g., Aarons et al., 2001; Aarons et al., 2008; Braciszewski & Stout, 2012; Narendorf & McMillen, 2010; Pilowsky & Wu, 2006; Vaughn, Ollie, McMillen, Scott, & Munson, 2007; Wall & Kohl, 2007).

In addition to problems with substance use, adolescents involved in child welfare system seem to lag behind their peers from the general population and suffer from difficulties in several areas. A systematic review of 32 studies assessing the outcomes of youth who leave foster care indicated that they show several disadvantages compared to their peers from the general population, including lower educational outcomes, employment rate and income, and higher rates of homelessness, mental health problems, substance use problems, and criminal justice involvement (Gypen, Vanderfaeillie, De Maeyer, Belenger, & Van Holen, 2017). Importantly, the high prevalence of mental health disorders in this population is very concerning. A recent systematic review and meta-analysis of the epidemiological studies assessing the prevalence of mental disorders in children and adolescents in the child welfare system indicated that nearly half of children or adolescents (49%) in the child welfare system meet the criteria for a current mental disorder with the externalising disorders as the primary main problem (Bronsard et al., 2016). The most common mental disorders were disruptive disorder (27%; including conduct disorder (20%) and oppositional defiant disorder (12%)), following by anxiety and depressive disorders (18% and 11%, respectively), and attention-deficit/hyperactivity disorder (ADHD; 11%). These disorders are additional risk factors for developing substance use disorders (e.g., Brinkman, Epstein, Auinger, Tamm, & Froehlich, 2015; Bukstein, 2000) and subsequent involvement in delinquency, juvenile justice system, and homelessness, each possess additional risk factors for substance use disorders (Desai, Lam, & Rosenheck, 2000; Doria, Antoniuk, Assumpcao Junior, Fajardo, & Ehlke, 2015).

Despite the evidence of elevated risk of substance use problems among adolescents involved in child welfare system, relatively little attention has been devoted to research and practice related to the assessment, prevention, and treatment of these problems (Braciszewski & Stout, 2012; Casanueva, Stambaugh, Urato, Fraser, & Williams, 2011; Cheng & Lo, 2010; Ringeisen, Casanueva, Urato, & Stambaugh, 2009). The aim of the present article is to review the risk and protective factors for substance use among adolescents involved in the child welfare system and discuss the efficacy of available intervention strategies as well as the promises of and to discuss targeted interventions for reducing the risk of substance use problems in these populations.

Risk and Protective Factors for Substance Use among Youth in Child Welfare System

Although not an exhaustive overview of risk and protective factors, below we highlight some of the most important factors which confer risk and resilience to substance use disorders among youth in child welfare system.

Risk Factors

Earlier research has identified several risk factors including demographic, psychosocial, and contextual risk factors for substance use among youth in child welfare system (Aarons et

al., 2008; Vaughn et al., 2007). For example, maltreatment history, peer and sibling substance use, multiple placement changes, and later entry into child welfare system (Aarons et al., 2008), conduct disorder, history of physical abuse, and lower level of caregiver relatedness and monitoring (Wall & Kohl, 2007) and delinquency (Aarons et al., 2008; Traube et al., 2012) have been reported to increase the odds of substance use and related problems. In older youth, diagnosis of conduct disorder and post traumatic stress disorder (PTSD), Caucasian race, and living in congregate care or more independent placements (Vaughn et al., 2007), and having friends who used substances and skipping school (Thompson & Auslander, 2007) were associated with a higher risk of substance use problems. Findings from the Canadian Incidence Study of Reported Child Abuse and Neglect-2003 (Trocmé et al., 2005) indicated that the severity of the experienced maltreatment and other factors, such as older age, physical harm, negative peer involvement, caregiver substance abuse, running away, and irregular school attendance, were associated with substance abuse in adolescents aged 10–15 year old (Singh et al., 2011).

History of child maltreatment, number of out-of-home placements, and age at entry into the child welfare system are risk factors for substance use unique to youths in the child welfare system (Aarons et al., 2008). Exposure to childhood maltreatment is particularly an important risk factor for adolescent substance abuse (Edalati, Doucet, & Conrod, in press). There is evidence that exposure to childhood maltreatment during the critical periods of development can cause permanent alterations in the brain structure and function which consequently increases the risk of initiation of substance misuse and development of substance use disorders (Andersen & Teicher, 2009; Edalati & Krank, 2016). It has been indicated that young adults with histories of child maltreatment are more likely to expect positive effects from drinking alcohol and using substances to cope with negative emotions (i.e., anxiety, depression) and enhance positive affect (Goldstein, Flett, & Wekerle, 2010). In addition, experience of childhood maltreatment is associated with a heightened sensitivity to the effects of stress (Young-Wolff, Kendler, & Prescott, 2012), and continuing exposure to stressful life experiences and victimisation during adolescence (Cole, Nolen-Hoeksema, Girgus, & Paul, 2006; Shields & Cicchetti, 2001) which can additionally increase the risk of substance abuse as a way of emotion regulation and tension reduction (Edalati & Krank, 2016; Shields & Cicchetti, 2001).

Another important risk factor for vulnerability to substance use among youth involved in child welfare system is parental substance use. Parental substance use not only plays a direct role in child's involvement in the welfare system, but also creates several risk factors for adolescents' substance use, such as genetic risk factors, impact on neurocognitive development, inappropriate modeling, impaired parental control, neglect, lower socio-economic status and increased opportunities for access to substances (e.g., Dick et al., 2007; Enoch, 2013; Fisher et al., 2011; Van Der Vorst et al., 2013; Wekerle, Wall, Leung, & Trocme, 2007). In addition, parents with substance use problems are more likely to maltreat their children (Walsh et al., 2003) and these children tend to show more substance use problems (J. A. Stein, Leslie, & Nyamathi, 2002). Ultimately, all the factors that put children in contact with the child welfare system may create increased vulnerabilities to substance use and misuse in youth involved in child welfare system, and require additional attention and support to address these risk factors for substance use problems.

Protective Factors

While adolescents involved in child welfare system often demonstrate higher risk for substance use problems, many build and develop resilience. In this context, resilience is defined as effective adaptation in the face of adversity, maltreatment, and trauma and often characterised as showing age-appropriate developmental competencies, effective self-regulation, and low rates of externalising (e.g., substance use, conduct problems) and internalising (e.g., anxiety, depression) problems (e.g., Afifi & Macmillan, 2011; Jaffee, Caspi, Moffitt, Polo-Tomas, & Taylor, 2007). A study of an adolescent sample in an out-of-home care service in Ontario, Canada revealed that having a higher-quality relationship with the female caregiver, a greater number of close friendships, and a higher self-esteem are positively associated with better psychological adjustment defined as lower levels of anxiety and physical aggressive behaviours. Lower level of physical aggression was additionally related to having a smaller number of primary caregivers, and using more approach coping strategies (e.g., problem-solving skills), and less avoidant coping strategies (Legault, Anawati, & Flynn, 2006). In young adults who had been placed in out-of-home care as children, a better social support system, a sense of competence, setting goals for the future, and involvement in community service activities were related to increased resilience, measured by levels of caring relationships, autonomy, and social competence (Hass & Graydon, 2009). Few studies, however, have investigated resilience in the context of substance use outcomes in this population. It has been found that avoiding foster care placement and connectedness to caregiver (Traube et al., 2012), and perceived quality of the youth–caregiver relationship and participation in extracurricular activities (Guibord, Bell, Romano, & Rouillard, 2011) are important protective factors for substance use in youth involved in child welfare system. However, a notable and concerning finding from these studies was the small impact of protective factors on the growth of substance use and use of hard substances in this population (Traube et al., 2012) which requires further investigations.

Interventions for Substance Use Prevention and Treatment in Adolescents Involved in Child Welfare Services

There is an enormous gap between the needs and availability of intervention for youth with substance use problems with less that 10% of adolescents and young adults in need receiving such interventions (Substance Abuse and Mental Health Services Administration, 2009). Although it may appear that involvement in child welfare system would provide access to substance abuse intervention services for at-risk adolescents, some studies have shown that these adolescents do not have adequate access to intervention resources and support services for these problems (Geenen & Powers, 2007; Wells, Chuang, Haynes, Lee, & Bai, 2011). For example, one study, which followed up the use of mental health and substance use services for 5–7 years among 1400 adolescents (aged 11–15 years at baseline) involved in child welfare system who reported using illicit substances, showed that by the last follow-up, only 21.5% of young adults using illicit substances received outpatient specialty services compared to the 69.1% who received these services at baseline (Casanueva et al., 2011). In addition, in contrast to the beginning of the study when illicit substances users were more likely to receive outpatient and inpatient specialty services compared to non-user adolescents, no significant

difference in receiving specialty services was found between two groups by the last follow-up when transiting to adulthood (Casanueva et al., 2011). There are several reasons for this gap between the needs and receipt of the intervention programs in this group. Many adolescents involved in child welfare services are not willing to share information regarding their substance use for fear of negative consequences for themselves and their families, or lack of trust and connections to service providers or case managers (Braciszewski, Moore, & Stout, 2014). In addition, most child welfare services do not provide interventions for substance use and behavioural problems and refer adolescents to other service providers, such as outpatient or residential substance abuse treatment services, which may additionally result in barriers in receiving treatment (Burns et al., 1995; Wells et al., 2011). Moreover, substance abuse intervention services for at-risk adolescents involved in child welfare system are not often properly tailored and targeted to this age group and toward their specific needs (Wekerle et al., 2009). It is not surprising that the negative impact of adverse childhood experiences on social, emotional, and behavioural outcomes persists in this population even after receiving mental health services (Garcia, Gupta, Greeson, Thompson, & DeNard, 2017). The gap between the need and access to intervention services for substance use problems is even broader for foster youth who age out and leave the system (Casanueva et al., 2011). We are not aware of any intervention programme which specifically addresses the risk of substance use among this group. It is particularly important as leaving care has been shown to be associated with increased substance use in these youth, especially in the year after leaving care (Narendorf & McMillen, 2010).

Trauma-focused Interventions

There are several interventions designed to reduce the emotional and behavioural problems and to improve the outcomes of adolescents involved in child welfare system (for review, see (Fratto, 2016; Leve et al., 2012). Some examples include Trauma-Focused Cognitive Behavioral Therapy (TF-CBT) (Cohen, Mannarino, & Deblinger, 2006), Cognitive Behavioral Intervention for Trauma in Schools (CBITS) (Kataoka et al., 2003; B. D. Stein et al., 2003), Eye Movement Desensitization and Reprocessing (EMDR) (Adler-Tapia & Settle, 2009), Structured Psychotherapy for Adolescents Responding to Chronic Stress (SPARCS) (Habib, Labruna, & Newman, 2013), Prolonged Exposure Therapy for Adolescents (PE-A) (Foa, Chrestman, & Gilboa-Schechtman, 2009), Trauma Affect Regulation: Guide for Education and Therapy (TARGET) (Frisman, Ford, Lin, Mallon, & Chang, 2008; Marrow, Knudsen, Olafson, & Bucher, 2012), and Attachment, Self-Regulation, and Competency (ARC) (Blaustein & Kinniburgh, 2010). Most of these interventions focus on improving the process of exposure to traumatic memories, alleviating the symptoms of complex trauma, and learning how to cope with negative emotions associated with the traumatic experience. However, a group of epidemiological studies have indicated that externalising behaviours are the primary problems of youth involved in child welfare system, while posttraumatic stress disorder (PTSD) had the lowest prevalence (4%) of all mental health problems of these youth (see a systematic review and meta-analysis by Bronsard et al., 2016). Although, externalising problems and substance misuse may, in part, appear in responding to the histories of maltreatment and trauma, interventions that specifically target a range of externalising behaviours as well as problems with substance misuse in this group are vastly lacking.

Interventions to Reduce Substance Use and Externalising Behaviours

Among few promising approaches to reduce substance use and externalising behaviours, ARC intervention has been shown to reduce externalising and internalising behaviours and PTSD symptoms, and use of restraints post-treatment in traumatized youth in residential treatment settings (Hodgdon, Kinniburgh, Gabowitz, Blaustein, & Spinazzola, 2013). The ARC framework is designed based on the effects of trauma on each stage of development of children and adolescents (e.g., intellectual, social, psychological/emotional, and physical) (Blaustein & Kinniburgh, 2010).

Another intervention called Multidimensional Treatment Foster Care for Adolescents (MTFC-A) is a multicomponent programme which includes delivering coordinated services to adolescents, foster parents, and adolescent long-term placement resources. MTFC-A consists of 6 to 9 months placement with community foster parents who are intensively trained, supervised, and supported to provide positive adult support and mentoring, close supervision, and setting consistent limits (Leve, Fisher, & Chamberlain, 2009). The results from MTFC-A trials in the USA and Sweden have indicated its effectiveness in reducing internalising and externalising behaviours in high-risk youth involved in child welfare services (e.g., Kerr, Leve, & Chamberlain, 2009; Leve et al., 2009; Westermark, Hansson, & Olsson, 2011). In addition, boys with serious and chronic delinquency problems who received MTFC-A (14.9 years old on average at baseline:) reported lower levels of drug use at 12-month and lower levels of tobacco, marijuana, and other drug use at 18-month follow-ups (Smith, Chamberlain, & Eddy, 2010).

A third intervention, called 'Middle School Success (MSS)', is a derivative of 'Keeping Foster Parents Trained and Supported (KEEP)' and involves both foster caregivers and youth for 6 sessions over the summer prior to middle school entry and ongoing weekly sessions over the first year of middle school, and is oriented toward behaviour management for caregivers and skill building for youth (Kim & Leve, 2011). Adolescent girls in foster care (11.54 years old on average at baseline) receiving MSS indicated decreased externalising and internalising problems at a 6-month follow-up (Smith, Leve, & Chamberlain, 2011) and at 12- to 24-month follow-ups (Kim & Leve, 2011). The lowered symptoms then served as a mediating pathway to reduced substance use (specifically tobacco and marijuana use) assessed at 36-month follow-up (Kim & Leve, 2011) compared to those in foster care services-as-usual control group. Finally, a novel technology-driven intervention for preventing problematic substance use seeks to facilitate service delivery among youth receiving foster care services (Braciszewski et al., 2016): iHeLP (Interactive Healthy Lifestyle Preparation) and consists of a specific computerized screening and brief intervention (SBI) (Ondersma, Chase, Svikis, & Schuster, 2005; Ondersma, Svikis, & Schuster, 2007) targets substance misuse by incorporating components from Motivational Interviewing (MI) (Miller & Rollnick, 2013) and the FRAMES approach to brief interventions (Miller & Sanchez, 1994). iHeLP extends the utility of this computerized SBI by adding a text message-based booster which is dynamically tailored to each participant's level of motivation to reduce or change their substance use behaviour. This approach can be particularly beneficial for youth who leave foster services; however, the efficacy of this intervention has not been reported

yet (Braciszewski et al., 2016). In addition, previous studies have indicated that the effects of computerized SBIs decrease over time, even after adding the booster sessions (Moore, Fazzino, Garnet, Cutter, & Barry, 2011; Rooke, Thorsteinsson, Karpin, Copeland, & Allsop, 2010).

Despite these efforts, there are significant limitations in the current research and practice of substance use prevention for adolescents involved in child welfare system. Results from several of these intervention studies show generally small effect sizes with effects that do not last over time (Leve et al., 2012). Other important limitations include the lack of evidence of generalizability to other outcome measures and populations, limited baseline (pre-intervention) and long-term follow-up data, and methodological issues regarding the study design and blindness to study conditions (see (Leve et al., 2012). In addition, these interventions generally require substantial resources, efforts, and time in many cases, their impact are affected by the experience, training, and supports of foster caregivers in the research process (Dorsey et al., 2008). Finally, trauma-focused interventions are rarely evaluated for the impact on substance use outcomes – and drawing from the literature on trauma-focused therapies for adults with PTSD and substance use disorders, interventions must integrate a dual focus on both sets of issues in order to dually impact on substance use and mental health outcomes (Conrod & Stewart, 2006).

There is a pressing need for evidence-based targeted substance use prevention strategies that address the special needs and risks of these adolescents at earlier ages before their vulnerabilities become severe. The current universal approach for substance use prevention, such as school drug education programs, targets substance use behaviours in all adolescents and is based on delivering intervention components (e.g., knowledge and skills) that are more generic and suitable for the general populations of adolescents. Several literature reviews and meta-analyses have shown that most universal approaches have small or no effects in reducing substance use among adolescents (e.g., Cuijpers, 2002; Foxcroft & Tsertsvadze, 2011; Tobler et al., 2000). These approaches may be less effective for those most at risk of transitioning to substance use disorders, and those who have already started using substances. Moreover, current universal approaches are not sufficient to address the needs of adolescents who have been maltreated and live in vulnerable context and are most at risk of engaging in substance use and transitioning to substance use disorders. Shifting the focus of prevention efforts away from the universal approaches to more selective and indicated intervention programmes which target the potential risk factors underlying substance misuse in at-risk adolescents would also benefit adolescents living in vulnerable context or exposed to maltreatment, but are not involved in child welfare services. These programmes not only aim at reducing the risk of substance misuse, but also improve decision-making capacity, promote better coping and problem-solving strategies, and enhance self-esteem and positive peer interactions in order to enhance resilience (see (Brochu, 2007).

Personality Risk Profiles as Targets for Reducing Substance Use Problems in Adolescents Involved in Child-welfare System

Specific personality profiles have been identified as strong risk factors for substance use disorders, to mediate the genetic predisposition to substance misuse, to predict specific

patterns of substance misuse and psychiatric comorbidity, and to explain the motivation for substance misuse (see Conrod & Nikolaou (2016) for review). These findings suggest that personality risk profiles are potentially suitable targets for prevention and treatment of substance misuse (Conrod, 2016).

Exposure to adverse childhood experiences and trauma is associated with development of maladaptive personality patterns (Kim, Cicchetti, Rogosch, & Manly, 2009; Nakao et al., 2000). The relationship between childhood adversity and clinically important aspects of personality factors, including neuroticism, negative affect, and behavioural inhibition, has been indicated in a longitudinal study of 7485 individuals in the age ranges of 20–24, 40–44 and 60–64 years (Rosenman & Rodgers, 2006). Cross-sectional (Edalati & Krank, 2015) and longitudinal (Oshri, Rogosch, & Cicchetti, 2013) studies have indicated that personality risk profiles mediate the association of childhood maltreatment with subsequent substance use and psychopathology in adolescents. A recent longitudinal study of a large sample of adults (N = 2947) aged 18–65 indicated that the severity of childhood maltreatment predicts higher initial levels of psychological distress and that this effect was mediated by maladaptive personality types characterized by a high neuroticism in combination with low extraversion, agreeableness and conscientiousness. Moreover, individuals with varying levels of childhood maltreatment showed significant differences in trajectories of distress over time (Spinhoven, Elzinga, Van Hemert, de Rooij, & Penninx, 2016). Similarly, personality traits, such as impulsivity and sensation seeking, mediate the relationship between adverse childhood experiences (e.g., violence, sexual abuse) and alcohol and drug misuse in community samples of adolescents (Bailey & McCloskey, 2005; Edalati & Krank, 2015).

In adolescents receiving child protection services, personality traits of hopelessness, sensation seeking, and impulsivity were all associated with higher drinking levels and more alcohol problems, whereas, anxiety sensitivity was positively correlated with difficulties at stopping drinking (Stewart, McGonnell, Wekerle, Adlaf, & et al., 2011). Personality risk profiles also explain the motivation underlying substance use behaviours in youth receiving child protection services. For example, Using the Substance Use Risk Profile Scale (SURPS) (Woicik, Stewart, Pihl, & Conrod, 2009), Hudson and colleagues (2015) demonstrated that personality traits of hopelessness and impulsivity were related to drinking to cope with negative emotions, whereas, anxiety sensitivity was linked to drinking to conform in a sample of at-risk youth receiving child protection services. These findings suggest that these at-risk youths may primarily drink alcohol for negative reinforcement (e.g., to cope with negative feelings, to relieve stress). Individuals who grow up in an unfavorable environment (e.g., exposure to abuse and neglect, dysfunctional family environment) are more sensitised to the effects of stress, show more negative self-concept, use more dysfunctional tension reduction behaviours, and struggle to effectively regulate emotions and to cope with negative affects (see (Edalati & Krank, 2016). Their negative experiences and ongoing trauma symptoms may excessively activate negative reinforcement and encourage compulsive substance use in response to stressful context in vulnerable adolescents (see Edalati et al., in press).

The observed links between anxiety sensitivity and difficulties at stopping drinking, and sensation seeking and enhancement motives for drinking (i.e., drinking to enhance positive mood) in other studies with adolescents receiving child welfare services (Stewart

et al., 2011) might be explained by external motivations, such as overcoming social anxiety for adolescents with high anxiety sensitivity (Gilles, Turk, & Fresco, 2006) and affiliating with deviant peer groups in youth with high sensation seeking (Wang et al., 2016). If specific personality profiles predict the subsequent substance misuse and its underlying motivation in child welfare-involved adolescents, then efforts to prevent the emergence of substance use problems in this population will be more effective if they include targeted interventions toward these personality profiles.

The Preventure programme is a selective substance use prevention programme which was designed to target known personality risk factors for substance misuse based on the evidence from cross-sectional and longitudinal studies which connect these personality risk factors to early initiation and escalation of substance misuse in adolescents (for a review of Preventure trials and their results, see Conrod 2016). This personality-targeted approach targets four personality-specific motivational pathways to substance misuse: Hopelessness, Anxiety Sensitivity, Impulsivity and Sensation Seeking. After selection on personality scales (often using the SURPS (Woicik et al., 2009)), those who scored one standard deviation above the mean on one of the SURPS measures (i.e., high-risk individuals) are invited to participate in brief individual- or group-based intervention sessions which target their dominant personality profile. Interventions generally involve two 90-minutes sessions, with one week separating sessions. The interventions are conducted using manuals that incorporate psycho-educational, motivational enhancement therapy (MET) and cognitive behavioural therapy (CBT) components and include real life 'scenarios' shared by local youth with similar personality profiles (see Conrod 2016). This personality-targeted approach has been evaluated in eight randomised trials in Canada, United Kingdom, and Australia, with additional trials in progress. The findings from these trails have indicated that the Preventure programme is successful in reducing the rates of illicit drug use and binge drinking by approximately 50% in high-risk adolescents, with the effects last for up to three years (Conrod, 2016). In addition, these interventions were associated with a 25% reduced likelihood of transitioning to significant mental health problems, such as anxiety, depression, suicidal ideation and conduct problems (O'Leary-Barrett, Castellanos-Ryan, Pihl, & Conrod, 2016). Figure 1 (following page) displays the logic model developed for the Preventure programme.

We suggest that the Preventure programme can help reducing the substance use and mental health problems in adolescents involved in child welfare services by targeting these four specific personality risk profiles. It offers multiple advantages over more traditional universal prevention or generic intervention approaches which target substance use behaviours more directly. It helps reducing existing barriers in delivering effective substance use services to adolescents involved in child welfare system in several ways; first, within Preventure approach, substance use is not directly discussed. It has been shown that adolescents involved in child welfare system may not be willing to share information regarding their substance use for fear of negative consequences for themselves and their families, or general mistrust of service providers and institutions (Braciszewski et al., 2014). In addition, within Preventure approach, participants are primarily selected based on their personality profiles. Preventure uses psycho-educational strategies to teach participants

Table 1: Implications of the Review for Research, Practice, and Policy.

• Additional research is needed in relation to the assessment, prevention, and treatment of substance use disorders and related problems among adolescents involved in child welfare system.
• Researchers should explore the mediating and moderating processes in the link between the history of adverse childhood experiences and the risk of subsequent substance use disorders and further identify risk and protective factors of substance use patterns among adolescents involved in child welfare system.
• Additional work is needed to develop and implement evidence-based targeted substance use prevention strategies that address the special needs and risks of these adolescents at earlier ages before their vulnerabilities become severe.
• Delivering early-targeted prevention is particularly critical for youth involved in child welfare system before they exit care. There is also a need for access to intervention services which specifically address the risk of substance use among youth who age out and leave the system.
• It is essential to integrate substance use prevention programmes with trauma-focused interventions in order to have a dual impact on substance use and mental health outcomes.
• There is a need for widespread implementation of selective and targeted intervention programmes, such as personality-targeted approach, at school level to benefit both youth involved in child welfare system and those living in vulnerable context or exposed to maltreatment, but are not known to child welfare services as well as those most at risk of transitioning to substance use disorders, and those who have already started using substances.
• Additional education and training is required for child welfare workers, health practitioners, foster parents, group home staff, and school personnel to better identify vulnerable youth at-risk for substance use disorders.
• There is a need to support and promote the early screening for substance use problems in child welfare system, and to improve efficient communication and collaboration among services.
• Additional research is required for investigating the effectiveness of substance use intervention programmes with youth involved in child welfare system in Canadian context.

about the target personality profile and associated problematic coping behaviours, such as avoidance, interpersonal dependence, aggression, risky behaviours and substance misuse. Thus, substance use is only discussed as one of the problematic coping behaviours within a personality-focused context. Second, Preventure is generally delivered in group format with adolescents with similar personality profiles which can help increasing the bond and empathy among adolescents and providers, as many adolescents involved in child welfare system have difficulties or are reluctant to make close relationships and bond with others (Braciszewski et al., 2014). Third, sensitivity to the developmental needs, cultural values, and attitudes of the target group applied to every new implementation of the Preventure programme and intervention materials, it is more effective and relevant as reported by adolescents (Comeau et al., 2005; Midford, Munro, McBride, Snow, & Ladzinski, 2002). Forth, adolescents involved in child welfare system also suffer from a range of concurrent psychiatric symptoms and disorders (Bronsard et al., 2016; Oswald, Heil, & Goldbeck, 2010). The cognitive–behavioural strategies used in the Preventure programme are designed based on the evidence-based therapeutic approaches for major psychiatric disorders relevant to each of the personality traits (e.g., CBT for depression in the case of Hopelessness (e.g., Beck & Young, 1985), CBT for panic disorder in the case of Anxiety Sensitivity (e.g., (Barlow, 1985; Barlow & Craske, 1988) or CBT for ADHD in the case of Impulsivity (e.g., Kendall & Braswell, 1985). Thus, this Programme can also be helpful in reducing other psychiatric symptoms that are common in adolescents receiving child welfare services, as it has proven effective in preventing mental health problems in youth attending mainstream schools (O'Leary-Barrett et al., 2016). Fifth, because Preventure targets personality traits that are associated with risk for substance use initiation and escalation of substance misuse, it can be helpful in the context of both prevention and early intervention for those who have already started using substance, so can be delivered to heterogeneous groups of youth, at different developmental stages. Such trials

also include substance use onset as an additional eligibility criterion and showed that the programme was effective in reducing such use (e.g., Conrod, Stewart, Comeau, & Maclean, 2006; Lammers et al., 2015). Three studies involving secondary analyses of Preventure trials reported that the programme is particularly effective for youth with more significant risk profiles, such as youth attending vocational schools in the Netherlands (Lammers et al., 2017), youth reporting clinically significant levels of externalising problems at baseline (Perrier-Menard, Castellanos-Ryan, O'Leary-Barrett, Girard, & Conrod, 2017) and youth reporting previous victimization experiences (Edalati et al., 2017). Finally, the Preventure programme is very brief and inexpensive compared to many previously used approaches for substance use problems of these populations, which can reduce the burden regarding the program delivery on resource-strapped systems. While the Preventure programme is primarily designed to reduce the risk of substance misuse and related problems within the general populations of at-risk youth, it can be easily modified and adapted for populations with larger and more specific needs, such as youth involved in child welfare services and foster care system, and to fill the gap in service delivery for these vulnerable populations.

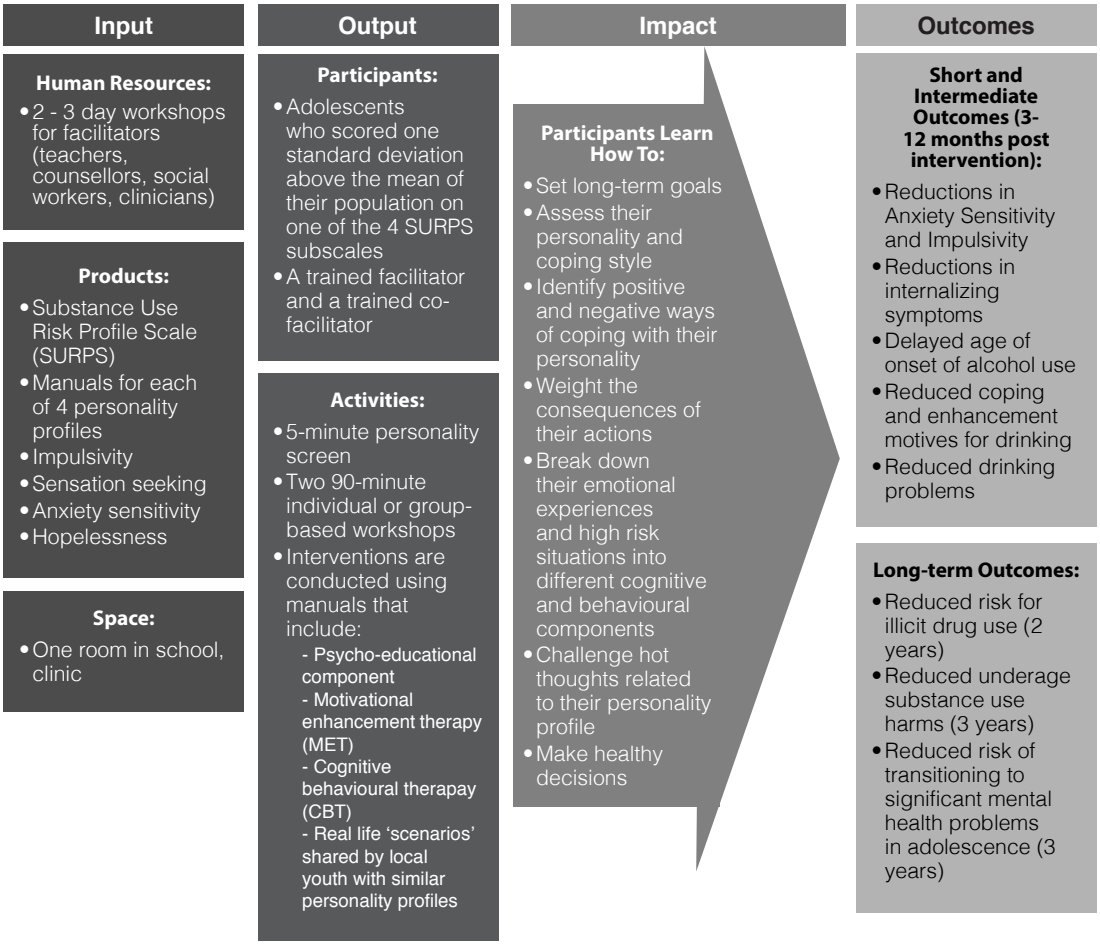
Collectively, these findings point to the importance of targeted interventions for improving personality risk profiles associated with higher risk of initiation and development of substance use disorders in adolescents who have experience childhood adversity and trauma, including those involved in child welfare system.

Conclusion

Table 1 summarises the gaps in research, practice, and policy for substance use disorders among at-risk adolescents involved in child welfare system. Adolescence is a critical period for the prevention of substance use disorders in this population. Despite evidence of elevated risk of substance use during this period, few systematic studies have been performed on the patterns of substance use and the unique environmental and social context of adolescents involved in child welfare system across development. There is also a pressing need to study the substances mostly used by this population (e.g., cannabis, hard drugs) and further identify risk and protective factors of substance use patterns among adolescents involved in child welfare system. A better understanding of biological, social, environmental, and psychological factors underlying substance use problems in this population will largely benefit the intervention efforts.

The findings reviewed here suggest that additional work is needed to develop and implement evidence-based interventions tailored to the specific needs of adolescents involved in child welfare system at risk for substance abuse. Interventions should start with services aimed at substance use prevention and extend beyond existing substance use prevention designed for general populations of adolescents (e.g., universal approaches). Delivering early targeted prevention is particularly critical for youth involved in child welfare system before they exit care. Selective and targeted prevention programmes for reducing the risk of substance use in at-risk adolescents offer great advantages over universal approaches and create the opportunity for more widespread implementation at schools to benefit both youth involved in child welfare system and those living in vulnerable context or exposed

Figure 1: The Logic Model for Preventure Programme



to maltreatment, but are not known to child welfare services. Moreover, it is essential to integrate substance use prevention programmes with trauma-focused interventions in order to have a dual impact.

In Canada, practitioners working for child welfare system have reported that they struggle to address the needs of this population (Smyth & Eaton-Erickson, 2009). In addition, evaluation of service effectiveness has been identified as the main priority for child welfare research in Canadian context (Flynn & Bouchard, 2005). Additional research investigating the effectiveness of evidence-based substance use intervention programmes with pre-specified outcome measures is required with youth in Canadian child welfare system. The child welfare system is an important gateway for providing early screening, targeted prevention, and multi-level treatment services for substance use problems of at-risk youth. Findings suggest the need for additional education and training for child welfare workers, health practitioners, foster parents, group home staff, and school personnel for a better understanding of the youth involved in child welfare system with substance use problems,

to support the early screening for substance use, to promote and develop selective and tailored substance use prevention programmes, and to improve efficient communication and collaboration among services.

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Schools Reporting Child Welfare Concerns in Ontario

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Abstract:

Objectives: Currently, there is a dearth of literature surrounding what the profile looks like of a child referred to child welfare services by a school professional.

Methods: The Ontario Incidence Study of Reported Child Abuse and Neglect was the first provincial incidence study to track cases of child abuse and neglect (Trocmé, McPhee, & Hay, 1994). The past five cycles (OIS-1993, OIS-1998, OIS-2003, OIS-2008, and OIS-2013), spanning twenty years, offer a unique opportunity for comparisons to be made over time. This study conducted a secondary analysis of the OIS to examine the profile of cases referred by school personnel to child welfare agencies across twenty years.

Results: Physical abuse is consistently the most commonly reported type of maltreatment by school professionals. Substantiated investigations resulting from school referrals have remained relatively low across all of the OIS cycles.

Discussion: The relatively low percentage of substantiated school referrals across the cycles of the OIS further validate the literature that shows school referrals to be significantly more likely to be unsubstantiated than other professional referrals (King, 2011; King & Scott, 2014; U.S. Department of Health and Human Services, 2007). Substantiation rates have not been above 30% for the past 10 years, and have never been higher than 40%. Further research is needed to offer concrete explanations for this trend.

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Child maltreatment; child protection; child welfare; education.

Introduction

School professionals have a unique vantage point for identifying signs of child maltreatment (Gilbert et al., 2009; Hawkins & McCallum, 2001; Hinkelman & Bruno, 2008; King & Scott, 2014).This distinct perspective comes with the professional responsibility to report any suspicions of child abuse and neglect (Hawkins & McCallum, 2001). In North America, almost every jurisdiction has an extensive legislative framework that place school professionals under the duty to report suspected child abuse or neglect (Gallagher-Mackay, 2014). For example, in Ontario, section 72 of the Child and Family Services Act requires that anyone who has reasonable grounds to suspect that a child may be in need of protection must report the information to a Children's Aid Society (CFSA, 1990).

In addition to these legal requirements, educators often feel a moral obligation to report due to their personal loyalties to the safety of their students; consequently, school professionals contribute a large portion of reports to child-protection agencies (Gallagher-Mackay, 2014; Gilbert et al., 2009; King & Scott, 2014). For example, King and Scott noted that educators represented 35.8% of all total child maltreatment referrals, reported by the Canadian Incidence Study of Reported Child Abuse and Neglect – 2003 (Fallon et al., 2005).

Reporting Practices by Teachers and School Personnel

There are studies that show the reluctance of professionals to report suspected child maltreatment (e.g., Tufford, Mishna & Black, 2011). Despite the higher frequency of reports made by school professionals compared to other sources of referral, there is evidence that this group may be underreporting abuse and neglect worldwide (Gallagher-Mackay, 2014; Gilbert et al., 2009; Greco, Guilera, & Pereda, 2017; Cerezo & Pons-Salvador, 2004; Webster, O'Toole, O'Toole & Lucal, 2005). For example, one third of the teachers in Webster et al.'s

study (2005) underreported incidences of child abuse in their responses to vignettes and interview questions about child maltreatment cases. Moreover, in an interview-based study of educators' noncompliance to duties to report, Gallagher-Mackay (2014) found that most of the informants explained that teachers often avoided reporting cases of suspected child maltreatment on a regular basis. These trends, therefore, fit with past studies' findings that teachers often fail to uphold their responsibility to report suspected child maltreatment (Abrahams, Casey, and Daro, 1992; Gallagher-Mackay, 2014; National Center on Child Abuse and Neglect, 1992).

Understanding the various barriers that affect educators' reporting of child maltreatment can help explain underreporting. In Gilbert et al.'s (2009) review of professional practices and policies in sectors that contribute to the recognition of child maltreatment, they found that school professionals receive inadequate training and therefore have limited awareness of signs of child maltreatment and reporting procedures. Left feeling unprepared and uncertain about what defines reasonable grounds for suspicion, teachers are sometimes hesitant to report suspected child maltreatment cases (Gilbert et al., 2009; Hinkelman & Bruno, 2008; Kenny, 2004; King & Scott, 2014; Webster et al., 2005). In a review of the critical components of professional interventions, Hinkelman and Bruno (2008) reported that teachers feel unprepared to intervene effectively and appropriately as a result of unclear guidelines for reporting the alleged maltreatment. This lack of understanding also applies to a general confusion surrounding maltreatment indicators, as indicators for psychological abuse and neglect are also characteristics of other childhood dysfunctions (Gilbert et al., 2009). A further barrier to reporting is the fear amongst school professionals about damaging the teacher-child relationship, or the teacher-parent relationship (Gilbert et al., 2009; Hinkelman & Bruno, 2008; Webster et al., 2005). Finally, there is a lack of support available to teachers who are making allegations (Gallagher-Mackay, 2014; Gilbert et al., 2009). Gallagher-Mackay (2014) found that teachers require advice and moral support before and after making a call to child welfare services. However, this vital support depends on school culture and resources, such as regular access to a social worker which over a third of Ontario schools do not have (Gallagher-Mackay, 2014).

Characteristics of School Referrals

When school professionals do report maltreatment concerns, common characteristics have been identified. In comparison to cases reported by other professionals, those reported by educators are found to contain more child risk factors, such as child emotional or behavioural problems, and fewer caregiver and family risk factors, such as caregiver mental health problems (King & Scott, 2014). This confirms the theory that professionals are more likely to report cases of maltreatment that contain risk factors consistent with their vantage point (King, 2011).

Educators are also over-represented in referrals for physical abuse, with approximately two-thirds (61.6%) of all professional referrals originating from school staff (King & Scott, 2014). In contrast, they are less represented in referrals for neglect, sexual abuse, emotional maltreatment, and exposure to intimate partner violence (King & Scott, 2014). School professionals struggle to identify indicators of maltreatment and fear the consequences

of misreporting, therefore it has been suggested that educators are most comfortable in reporting maltreatment that is visible and not subjective in nature (Cooper, 2000).

Studies also show that school referrals are significantly less likely to be substantiated during an investigation (King, 2011; King & Scott, 2014; U.S. Department of Health and Human Services, 2007). In King and Scott's (2014) study of suspected maltreatment referrals in Canada in 2003, they found that maltreatment referrals by educators were not substantiated 45.3% of the time, while referrals from other professionals were not substantiated 28.4% of the time (King, 2011).

Research Objectives

Currently, there is a dearth of literature surrounding what the profile looks like of a referral to child welfare services by a school professional. The Ontario Incidence Study of Reported Child Abuse and Neglect was the first provincial incidence study to track cases of suspected child abuse and neglect (Trocmé, McPhee, & Hay, 1994). The past five cycles (OIS-1993, OIS-1998, OIS-2003, OIS-2008, and OIS-2013), spanning twenty years, offer a unique opportunity for comparisons to be made over time. This study conducted a secondary analysis of the OIS to examine the profile of suspected maltreatment cases referred by school personnel to child welfare agencies across twenty years.

Methods

Each Ontario Incidence Study of Reported Child Abuse and Neglect used a multi-stage sampling design. First a representative sample of child welfare sites was selected from a sampling frame that includes all mandated child welfare organizations in Ontario. The second sampling stage involved selecting cases opened in the study sites during the three-month period from October 1 to December 31 in the year the study took place. A three-month duration was considered optimal to ensure high participation rates and good compliance with study procedures. Screened-in investigations were evaluated by study staff to ensure that they met the OIS definitions of maltreatment and in 2008 and 2013 the definition of maltreatment was expanded to include risk of maltreatment. See Table 1 for the number of agencies and investigations in each study year.

Table 1. Ontario Incidence Study of Reported Child Abuse and Neglect Sites and Sample Sizes

	OIS-1993	OIS-1998	OIS-2003	OIS-2008	OIS-2013
Site Selection	15/51	13/53	16/53	23/53	17/46
Case Selection	1898	2193	4175	4415	3118
Investigated Children	2447	3053	7172	7471	5265
Number of Children per Family	1.29	1.39	1.72	1.69	1.69
Estimate of Child Maltreatment Investigations	46,683	64,658	128,108	128,748	125,281

Weighting

In each OIS cycle, the sample was weighted with regionalization and annualization weights to derive estimates of the provincial annual rates and characteristics of maltreatment investigations in Ontario. Data were weighted for bivariate analysis. The weighting process derived provincial annual incidence estimates from the OIS data. The regionalization weight includes three components: (1) a sample weight that adjusts for the disproportional selection of agencies from the province, (2) a subsampling weight that accounts for random subsampling of investigations within agencies that investigated more than 250 cases during the three-month data collection period, and (3) an agency size correction, designed to adjust for variations in the size of agencies within a stratum. The annualization weight is used to estimate annual investigation volume based on the investigation volume during the three month data collection period. The annualization weight is the ratio of all investigations conducted by a sampled agency during 2008 to investigations conducted by the sampled agency during the case selection period (Fallon et al., 2015).

Data collection instruments

In each cycle, the data were collected using a three-page data collection instrument consisting of an Intake Face Sheet, a Household Information Sheet and a Child Information Sheet. This data collection instrument was completed by the investigating worker or the worker with primary responsibility for the investigation. The Intake Face Sheet collected information about the report or referral, and partially identifying information about the child and household relationships. The Household Information Sheet collected detailed information on up to two caregivers living in the home, caregiver functioning, housing situation, and referrals to other services. The Child Information sheet documented up to three different forms of maltreatment and gathers information on child functioning, court activity, and out-of-home placement.

Because of changes in investigation mandates and practices over the last fifteen years, the OIS-2008 was redesigned to separately track maltreatment investigations versus cases opened only to assess the risk of future maltreatment. Following the 2003 cycle of the OIS, validation tests demonstrated that child welfare workers were coding cases that did not involve specific incidents of abuse or neglect as "maltreatment investigations", because of the risk of future maltreatment (Fallon, et al., 2011). This led to the inclusion of a "risk investigation only" category in the 2008 cycle, under which 26% of all investigations fell (Fallon, et al., 2012). For cases involving maltreatment investigations, workers described the specific forms of maltreatment that were investigated and whether the investigation was substantiated. While this change provides important additional information about risk only cases, it has complicated comparisons with early cycles of the study.

In each cycle for each investigation, workers were asked about several decisions they routinely make at the conclusion of child maltreatment investigation: substantiation, transfers to ongoing services, placement in out of home care, use of child welfare court, and whether there was police involvement in the investigation. Although there have been some minor changes, the definitions of these service dispositions have been relatively consistent. The decision to substantiate maltreatment meant that the balance of evidence indicated that abuse

or neglect has occurred. Investigating workers were asked whether the investigated case would remain open for further child welfare services after the initial investigation. Placement in out of home care included: informal kinship care (kinship out of care and customary care), foster care (kinship in care and non-family foster care), and group home/residential (group home and residential/secure treatment). For the purposes of this analysis, only formal care was assessed. Use of child welfare court meant that an application to child welfare court was submitted. Workers indicated whether police were involved in the investigation regardless of whether or not charges were laid. Workers also indicated whether they had made a referral for any family member to an additional community based service (e.g., parent support group, in-home family or parent counselling, drug or alcohol counseling, etc.).

Analytic Plan

SPSS Statistics version 24 was used to conduct the analysis. Incidence rates of child maltreatment-related investigations were calculated by first dividing the child maltreatment estimate by the population of children 15 years of age and under in Ontario using Census Canada counts and multiplying by 1000 to produce a rate per 1,000 children. For incidence rates based on age category, the same process was followed but the estimates were divided by the population of children in the given age group. Although each cycle of the OIS produced estimates that are based on a relatively large sample of child maltreatment-related investigations, sampling error is primarily driven by the variability between the participating agencies. Sampling error estimates were calculated to reflect the fact that the survey population had been randomly selected from across the province. Sampling errors were calculated by determining the sampling variance and then taking the square root of this variance. The sampling variance and sampling error calculated were an attempt to measure this variability. The sampling variability that was calculated was the variability due to the randomness of the cluster selected. Thus, the measured variability is due to the cluster.

Analyses focused on the rates of children referred to the child welfare system by school professionals, the profiles of the children and families referred, and the associated service decisions and referrals made across cycles of the OIS. Statistical tests of significance were used to assess differences in school referral investigations for the variable of interest. Statistical significance was calculated to examine whether there had been a change in the incidence for the variable of interest from the previous OIS cycle.

Results

Referral Sources

Table 2 presents information on incidence of investigations by referral source in Ontario. Between 1993 and 2013, the incidence of professional referrals more than doubled (from 16.78 per 1000 children in 1998 to 37.93 per 1000 children in 2003), and the incidence of school referrals increased significantly at this time (from 6.51 per 1000 children in 1998 to 13.42 per 1000 children in 2003). Between 2003 and 2008, the incidence rate for school-initiated investigations remained relatively stable. However, between 2008 and 2013, there was a smaller, yet still significant, increase (from 13.6 per 1000 children in 2008 to 16.3 per 1000 children in 2013).

Table 2: Incidence of Referral by Referral Sources in Ontario: 1993, 1998, 2003, 2008 & 2013

	OIS-1993			OIS-1998			OIS-2003			OIS-2008			OIS-2013		
	Esti-mate	%	Rate per 1,000	Esti-mate	%	Rate per 1,000	Esti-mate	%	Rate per 1,000	Esti-mate	%	Rate per 1,000	Esti-mate	%	Rate per 1,000
Professional	--	--	--	39,563	61.2	16.78	90,685	70.8	37.93	91,517	71.1	38.42	93,802	74.9	39.92
School	10,939	23	5	15,336	23.7	6.51	32,071	25.0	13.42	32,372	25.1	13.6	38,284	30.6	16.3
Non-Professional	--	--	--	18,493	28.6	7.85	26,610	20.8	11.13	29,722	23.1	12.5	25,465	20.3	10.84
Anonymous / Other	--	--	--	7,893	12.2	3.35	7,409	5.8	3.1	10,937	8.5	4.6	9,104	7.3	3.87
Total				64,658		27.43	128,108		53.59	128,748		54.05	125,281		53.32

^ Based on samples of 2,463 (OIS-1993), 1,822 (OIS-1998), 4,159 (OIS-2003), 6,506 (OIS-2008), and 5,798 (OIS-2013) investigations with information about referral sources.

Child Functioning Concerns and Referrals

Table 3 presents information on the top three child functioning concerns each year for investigations involving schools as the source of referral. Data was not collected on child functioning concerns in the 1993 OIS cycle and direct comparisons over time are difficult since the classifications of functioning concerns differed between cycles. However, there are similarities among the subsequent four cycles. In 1998 and 2003, behavioural problems were the most common concern. In 2008 and 2013, academic difficulties were the most common concern. Academic difficulties was defined as including learning disabilities that are usually identified in school as well as any special education program for learning difficulties, special needs, or behaviour problems. In 2003, learning disability and special education services were the second and third most common concerns. Similarly, ADD/ADHD and intellectual/ developmental disability were the second and third most common concerns in 2013. Depression/ anxiety, and negative peer involvement were the second and third most common in 1998. This is paralleled in 2008, when aggression and depression were the second and third most common concerns.

Table 3: Incidence of Top 3 Most Frequent School Referrals by Child Functioning Concerns in Ontario: 1993, 1998, 2003, 2008 & 2013*

	OIS-1993			OIS-1998			OIS-2003			OIS-2008			OIS-2013		
	Concern	Freq	%	Concern	Freq	%	Concern	Freq	%	Concern	Freq	%	Concern	Freq	%
1st	--	--	--	Behav-oural Problem	5203	33.9	Other Behav-oural / Emotional problems	8435	26.3	Academic difficulties	8858	27.4	Academic difficulties	9254	24.2
2nd	--	--	--	Depression Anxiety	2244	14.6	Learning Disability	7210	22.5	Aggession	5709	17.6	ADD/ ADHD	6239	16.3
3rd	--	--	--	Negative Peer Involve-ment	2064	13.5	Special Educ. Services	6166	19.2	Depression	5532	17.1	Intellect-ual / Develop-mental disabilities	5601	14.6

* Rates are not included because child functioning is not a population measure.

Maltreatment & Services Profile

Table 4 provides incidence rates for school referrals by allegation type. Physical abuse is consistently the most commonly reported type of maltreatment by school professionals. Among the 1993, 1998 and 2003 cycles, the estimated number of physical abuse investigations steadily increased, rising from 6564 cases in 1993, to 9045 cases in 1998, finally to 18292 cases in 2003. In 2008, this number dropped to 12247 cases but increased to 17118 cases in 2013. A large proportion of school referrals to child welfare in 2008 and 2013 were based on suspected risk of future maltreatment, although the incidence decreased in 2013. This shift caused a decrease in incidence rates of physical abuse, neglect, and emotional maltreatment between 2003 and 2008. From 1993 to 2003, physical abuse represented almost two-thirds of investigations (62% of cases in 1993, 59% of cases in 1998, and 57% of cases in 2003). The percentage of school referrals regarding physical abuse decreased to 38% in 2008, and increased slightly in 2013 to 45%. However, it has been significantly higher than other forms of maltreatment every year, followed distantly by neglect.

Table 4: Incidence of School Referrals by Allegation Type in Ontario: 1993, 1998, 2003, 2008 & 2013

	OIS-1993			OIS-1998			OIS-2003			OIS-2008			OIS-2013		
	Estimate	%	Rate per 1,000	Estimate	%	Rate per 1,000	Estimate	%	Rate per 1,000	Estimate	%	Rate per 1,000	Estimate	%	Rate per 1,000
Physical Abuse	6564	72	3	9045	59	3.84	18292	57	7.65	12247	38	5.14	17118	44.7	0.73
Sexual Abuse	1955	19	0.89	790	5.2	0.34	1444	4.5	0.6	1211	3.7	0.5	1448	3.8	0.06
Neglect	1589	15	0.73	3909	25.5	1.65	8110	25.3	3.39	5832	18	2.45	6865	17.9	0.29
Emotional Maltreatment	350	3.3	0.16	1593	10.4	0.68	2621	8.2	1.1	1808	5.6	0.76	3816	10	0.16
Other Maltreatment	133	1.3	0.06	--	--	--	--	5	--	--	--	--	--	--	--
Exposure to Domestic Violence	--	--	--	--	--	--	1604	--	0.67	--	--	--	--	--	--
Exposure to Intimate Partner Violence	--	--	--	--	--	--	--	--	--	1523	4.7	0.64	2796	7.3	0.12
Risk	--	--	--	--	--	--	--	--	--	9749	30	4.09	2476	16.3	0.27

The proportions of school referrals regarding neglect increased from 15% of total investigations in 1993 to 25% in 1998. It did not change significantly between 1998 and 2003. In 2008, the percent of neglect investigations dropped to 18% and remained there in 2013. The incidence of school referrals based on other forms of maltreatment, such as sexual abuse, emotional maltreatment, or exposure to intimate partner violence, are far less common. In 1993, sexual abuse represents 19% of school referrals but drops to 5% or lower for every subsequent OIS cycle.

Service Decisions and Referrals

Table 5 provides information on the service dispositions made at the conclusion of the child investigation. Substantiated investigations resulting from school referrals have remained relatively low across all of the OIS cycles. The proportions of school referrals

that were substantiated increased from 30% in 1993 to 35.8% in 1998, with no significant change in 2003. In 2008, it decreased slightly to 24%, but went back up to 29.5% in 2013. The incidence rate for cases transferred to ongoing services steadily increased from 1993 to 2013, from 1.33 per 1000 children in 1993 to 2.75 per 1000 children in 2013. The greatest increase was between 1998 and 2003, when the rate increased from 1.6 per 1000 children to 2.55 per 1000 children. Incidence rates of formal placements decreased over time, from 0.28 per 1000 children in 1993 to 0.11 per 1000 children in 2008. However, by 2013, the rate was back up to 0.27 per 1000 children.

Table 5: Incidence of School Referrals by Service Decisions in Ontario: 1993, 1998, 2003, 2008 & 2013

	OIS-1993			OIS-1998			OIS-2003			OIS-2008			OIS-2013		
	Estimate	%	Rate per 1,000	Estimate	%	Rate per 1,000	Estimate	%	Rate per 1,000	Estimate	%	Rate per 1,000	Estimate	%	Rate per 1,000
Substantiation	3121	30	1.43	5484	35.8	2.33	11558	36	4.83	2497	24	1.05	9455	29.5	4.02
Transfer to Ongoing Services	2903	27	1.33	3765	24.8	1.60	6089	19	2.55	6078	19	2.55	6458	17.2	2.75
Placement (formal)	612	5.6	0.28	528	3.4	0.22	421	1.3	0.18	262	0.8	0.11	632	1.7	0.27

Discussion

Several important findings emerge from the OIS data concerning school referrals to Ontario child welfare services in the past twenty years. The increase in incidence rates for school-initiated investigations for nearly all variables between 1998 and 2003 is consistent with the near doubling of investigated maltreatment rates between these cycles of the OIS (Fallon et al., 2015). Changes in legislation and shifts in investigation standards likely led to this increase more so than an increase in the rate of maltreatment (Fallon et al., 2015). However, the incidence of school referrals remained stable.

In 2008, the OIS was modified so that it could capture cases of both maltreatment and risk of future maltreatment. The risk of future maltreatment stream allowed workers to identify cases in which the child had not yet been maltreated, but where there was significant concern for future maltreatment due to risk factors in the household. This introduction of risk only cases shifted the profile of school referral investigations as risk became a highly common maltreatment concern in 2008 (see Table 4). However, physical abuse and neglect are still the primary maltreatment concerns for every year.

The finding that, for school referrals, the most commonly reported child functioning concerns are education-related is consistent with the theory that professionals are more likely to report cases of maltreatment that contain risk factors consistent with their profession (King, 2011). Academic difficulties were the primary child functioning concern in OIS-2008 and 2013 (see Table 3). Other common concerns from school referrals include behavioural problems, learning disabilities, and depression. Given school professionals'

unique relationship with their students, they are able to identify these kinds of concerns more frequently. Furthermore, the OIS data indicates that the incidence rates of physical abuse are significantly higher than any other maltreatment type (see Table 4). This reinforces past findings that educators are over-represented in referrals for physical abuse, and are less represented in referrals for neglect, sexual abuse, emotional maltreatment, and exposure to domestic violence (King & Scott, 2014).

The relatively low percentage of substantiated school referrals across the cycles of the OIS confirms the findings that school referrals are significantly more likely to be unsubstantiated than other professional referrals (King, 2011; King & Scott, 2014; U.S. Department of Health and Human Services, 2007). Substantiation rates have not been above 30% for the past 10 years, and have never been higher than 40%. One possible explanation for these findings is that educators have a broader definition of child maltreatment than other professional groups, and therefore may report more subtle and chronic forms of maltreatment that fall below the threshold for formal child welfare involvement (King 2011). Further research is needed to offer concrete explanations for this trend.

Recommendations

There may be benefits to reporting suspected child maltreatment: according to rates of recurrence in a sample of Ontario child protection agencies, approximately 88% of investigations do not recur within 12 months (Fallon, Filippelli, Black, Trocme & Esposito, 2017). However, given that investigations referred by school personnel are rarely substantiated, it is understandable why school professionals are reluctant to report. Put in the context of the damaging effects that referrals can have on a child's relationships (McTavish et al., 2016; Gilbert et al., 2009; Hinkelman & Bruno, 2008; Webster et al., 2005); low substantiation rates may further deter school professionals from taking the risk associated with reporting. Also for those referrals that are substantiated, there is a paucity of evidence linking mandatory referrals and child protection contact to improved child well-being (Afifi et al., 2018; McTavish et al., 2016). Overall, these deliberations demonstrate the ways in which low substantiation rates can further reinforce teachers' hesitancy to report.

Granted, these considerations do not change the legal obligations that school professionals have to report. However, by developing a broader understanding of why some school professionals choose not to report, it is possible to envision solutions that will improve the school referral process more generally. For starters, there is a clear need to develop strategies to mitigate the risk of harm to children and families caused by the referral process (McTavish et al., 2016; Gilbert et al., 2009; Hinkelman & Bruno, 2008; Webster et al., 2005). Likewise, low substantiation rates indicate the need for initiatives to promote increased communication between the education and child welfare systems. One option could be that the child welfare sector implement a true differential response model or better screening; whereby referrals from schools could be redirected to other resources in the community instead of being investigated. However, it is important to note that schools are consistently reporting suspected physical abuse, which may make it difficult to implement a differential response model.

Further possible steps include the provision of additional strategies for teachers to address perceived barriers (King & Scott, 2014; King, 2011). Suggested solutions include standardized training for recognizing maltreatment and clear, concise guidelines for reporting (Kenny, 2004; Crenshaw, Crenshaw & Lichtenberg, 1995; Webster et al., 2005). Mathews et al. (2017) conducted a randomized control trial with a sample of 762 childcare providers. They found that, compared to the control group, participants in the online educational program displayed significantly higher overall knowledge of the duty to report child abuse and neglect and improved attitudes towards reporting (Mathews et al., 2017). More attention, therefore, should be paid to educating school professionals within Ontario about identifying signs of child maltreatment that warrant substantiation.

While there is extensive research indicating school professionals' lack of support when making allegations (Kenny, 2004; Crenshaw, Crenshaw & Lichtenberg, 1995; Webster et al., 2005), greater attention should be paid to understanding what this support would look like. Gallagher-McKay explains that a possibility could be to ensure that schools connect school professionals to social workers, and other resources, when in need of advice and support related to the reporting process (2014). Likewise, Gallagher-McKay points to the need to develop a culture within the school that provides contextualized support for the school professional. Further effort should be attributed to understanding and developing these needed structural changes to Ontario's education system.

Limitations

There are several limitations of this study. For one, this study is specific to child maltreatment investigations in Ontario, and has limited generalizability for populations outside of this Canadian province. With that being said, these results are consistent with other research, including findings from the United States (U.S. Department of Health and Human Services, 2007) and the Canadian Incidence Study of Reported Child Abuse and Neglect (King, 2011; King & Scott, 2014). The Ontario Incidence Study also has specific limitations as a data set. In particular, there are several variations between the OIS-2013 and the OIS-2003, OIS-1998, and OIS-1993 data sets, such as changes in reporting procedures and maltreatment definitions. For this reason, the OIS-2013 report advises researchers to avoid making direct comparisons between these reports (Fallon et al., 2015). As this article does make these comparisons, it is worth taking caution when interpreting the comparisons made between these cycles in this article. Other limitations of this data set include the fact that data is limited to the initial stage of investigations and only tracks decisions made within the first 30 days. In addition, data relies on assessments provided by the investigating child welfare workers, and these assessments are not independently verified.

Conclusion

This paper offers a comprehensive profile of school referrals to child welfare services. Using the OIS data, we were able to establish a preliminary outline of which child-related concerns are most prevalent among school professionals and how these referrals are processed within the system. Teachers play an extremely formative role in the lives of every

child in Ontario and are capable of identifying maltreatment that would have otherwise gone unnoticed. Not only are teachers legally mandated to report suspected maltreatment, they care deeply about their students and are invested in their lives. However, results suggest that despite their unique vantage points, their referrals are less likely to be substantiated than other professional referrals. To improve the child welfare and education system, attention should be paid to the recommendations listed above. Children referred to child welfare services represent one of the most vulnerable populations in Ontario, and school professionals' roles in connecting at-risk youth to the services they need are essential to this population's safety and future success.

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Health Service Use of Sexually Abused Adolescents Aging Out of Care: A Matched-Cohort Study

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Abstract:

Objectives: While sexual abuse during childhood is a known risk factor of adult physical and mental health problems, little is known about the relationship between CPA services and healthcare use for these problems. This study aimed to assess whether sexually abused youth seek more medical services than their peers in the general population and whether those aging out of CPA's care at the age of 18 use health services differently than those still receiving CPA service (those under the age of majority, e.g. 18).

Method: A prospective matched-cohort study was used to assess the healthcare use of 481 sexually abused youth and 481 matched controls. Using administrative databases from a Canadian provincial public health insurance and from an urban child protection agency, healthcare use at 17 and 18 years of age was compared according to past childhood sexual abuse and to whether those receiving CPA services had aged out of care or not.

Results: Results revealed that sexually abused youth were 5 times and 1.6 times more likely to use in- and outpatient services for a mental health and physical health problem, respectively, than youth from the general population. Furthermore, adolescents' healthcare use for mental health problems remained the same at 17 and 18 years of age, regardless of age at CPA service termination, while healthcare use for physical health problems increased at 18 years of age when compared to 17 when aging out of care only.

Conclusion and Implications: These results suggest that offering CPA services beyond 18 years of age could help sexually abused youth transitioning out of care, and who exhibit more physical health problems, make this transition more easily or with more resources.

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The authors have no conflicts of interest to disclose.

Keywords:

Childhood sexual abuse, transition to adulthood, physical health, mental health

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Introduction

It has been well established that sexual abuse during childhood and adolescence is associated with a variety of adverse consequences with regards to short and long-term mental health (Chen et al., 2010; Maniglio, 2009; Tyler, 2002). A growing number of studies suggest that being exposed to sexual abuse during childhood is also associated with an increased risk for physical health problems in adulthood (Irish, Kobayashi, & Delahanty, 2010; Ratnani et al., 2016). Physical health problems such as pain, inflammation, and autoimmune disorders (e.g. migraine, Crohn's disease, irritable bowel syndrome, type 1 diabetes, and rheumatoid arthritis)(Anda et al., 2010; Severson, 2012); disordered eating leading to obesity or other nutrition disorders (Chartier, Walker, & Naimark, 2007; Gustafson & Sarwar, 2004; Neumark-Sztainer et al., 2000); as well as cardiovascular disease, such as arteriosclerosis and ischemic heart disease have been associated with childhood sexual abuse (Goodwin & Stein, 2004; Wilson, 2010).

Not all health problems of children who experienced sexual abuse manifest in adulthood. Youth in care have an increased risk of reporting a number of health problems up to ten-fold compared with those in care who did not experience childhood sexual abuse (Ratnani et al., 2016). For example, adolescent girls are up to six times more likely to report poor general health after being exposed to sexual or intimate partner violence than their non-exposed peers (Decker et al., 2014). While for male youth in particular, problematic placement trajectories are linked with childhood sexual abuse as these experiences increase the likelihood of out-of-home placement settings, placement instability, and placement in locked care facilities, and these outcomes have been linked with mental health and clinical problems in the period directly following aging out (Esposito et al., 2014, 2017; Hickey, McCrory, Farmer, & Vizard, 2008; Leathers & Testa, 2006). Children and youth involved in the justice system who report more general physical health problems, injuries, and hospitalizations are more likely to have increased exposure to partner violence, physical and sexual abuse during childhood (Odgers, Robins, & Russell, 2010). Compared to the general pediatric population, a prospective matched-cohort study has also revealed that sexually abused children and adolescents had an increased annual incidence rate of in- and outpatient consultations for physical and mental health problems that persisted up to five years after the abuse was reported to child protection agencies (CPA) (Daigneault, Vézina-Gagnon, Bourgeois, Esposito, & Hébert, 2017). This seems to indicate that abused children's physical as well as mental health problems persist into emerging adulthood, although this transition period has not been fully documented with regards to healthcare use and its correlates.

Youth aging out of care, i.e. those becoming adults while in care and ceasing to receive CPA services because they've reached the age of majority[1], not because they no longer require services, often make this transition to autonomy without financial resources and little or no family support (Lee & Morgan, 2017; Lopez & Allen, 2007), which can put them at risk for unfavorable behavioral and health outcomes in young adulthood (Courtney Mark & Dworsky, 2006; Kang-Yi & Adams, 2017). Because young adults aging out of care often do so without the continued family support that non-served children have, this phase represents a difficult time generally described by out-of-home care alumni as one marked by anxiety, insecurity, loneliness, financial difficulty, un/underemployment, homelessness/housing insecurity, and other outcomes that have deleterious effects on health (Kang-Yi & Adams, 2017; Kovarikova, 2017; Mickleborough; Children's Aid Society; Office for the Provincial Advocate, 2016). Health services typically facilitated by CPA, such as mental and physical health specialists, therapeutic groups, one-on-one counseling, and other interventions may become remote to out of home care alumni as there may be less support for accessing these services on a regular basis. Indeed, alumni have noted that they often do not have the know-how for managing basic life skills because CPA agency workers do so much for them (Kovarikova, 2017; Mickleborough; Children's Aid Society; Office for the Provincial Advocate, 2016).

The existing literature indicates that aging out of care youth's healthcare needs may be

1 For most Canadian children reciving CPA services, the age of 18 is the cut off point for eligibility for service. However this can vary across jurisidiction and agency on a case-by-case basis depending on the needs of served children and resources of the jurisdiction and agency.

increased during the transitioning phase towards adulthood. However, research results are inconclusive regarding whether transitioning youth have reduced access to healthcare or not (Ahrens, Garrison, & Courtney, 2014; Courtney Mark & Dworsky, 2006), while some results indicate that mental health service use declines (McMillen & Raghavan, 2008). Lack of health insurance has been suggested to explain why youth transitioning out of care do not receive the healthcare services they need (Council on Foster Care, Adoption and Kinship Care and Committee on Early Childhood, 2012) in some contexts, but other explanations for reduced access may be relevant in a Canadian context with universal healthcare.

Goals

The goals of this study are to assess: (1) if the use of these services varies between 17 and 18 years of age, which is one year preceding and following the legal adulthood threshold of 18 years in the province, i.e. the age at which CPA services can no longer be offered; and, (2) whether the age at which youth cease to receive child protection services is associated with the frequency of services received for physical and mental health problems. Our hypothesis is that sexually abused youth will report more health problems than those from the general population at 17 and 18 years of age. However, because previous study results were inconclusive, no hypothesis is made regarding the second goal of the study.

Methods

The ethics committee of the participating child protection agency (CPA), the first author's institutional review board and the provincial Commission for access to information issued an ethical certificate of conformity and granted authorization to obtain the data used in this prospective study using a matched-cohort design.

Procedures and participants

Participants were selected in the context of a larger study documenting 17 years of healthcare use and physical and mental health diagnoses of 1764 children and adolescents (see 1 reference for more details on the larger study). Sexual abuse was defined as any gesture of a sexual nature, with or without physical contact, committed by an individual without consent from the person or, in some cases, particularly that of children, through emotional manipulation or blackmail (MSSS, 2001).

Recruitment procedures and inclusion criteria were as follows (See Figure 1). First, all children and adolescents with a substantiated report of sexual abuse between January 1st, 2001, and December 31st, 2010, in one large Canadian city's CPA were eligible and selected for the study. Second, identifying information (health insurance number, name, date of birth, etc.) from the CPA's databases for the 955 children who met the first criteria was matched with identifying information from administrative databases from the province's public health insurance agency based on a 100% identical deterministic data linkage strategy. That second criterion was met for 92% of the initial sample (n = 882/955) (see Daigneault, Vézina-Gagnon, et al., 2017 for a comparison of included and excluded participants). Their ages varied between less than 1 year and 17 years at the time of the sexual abuse report (M =

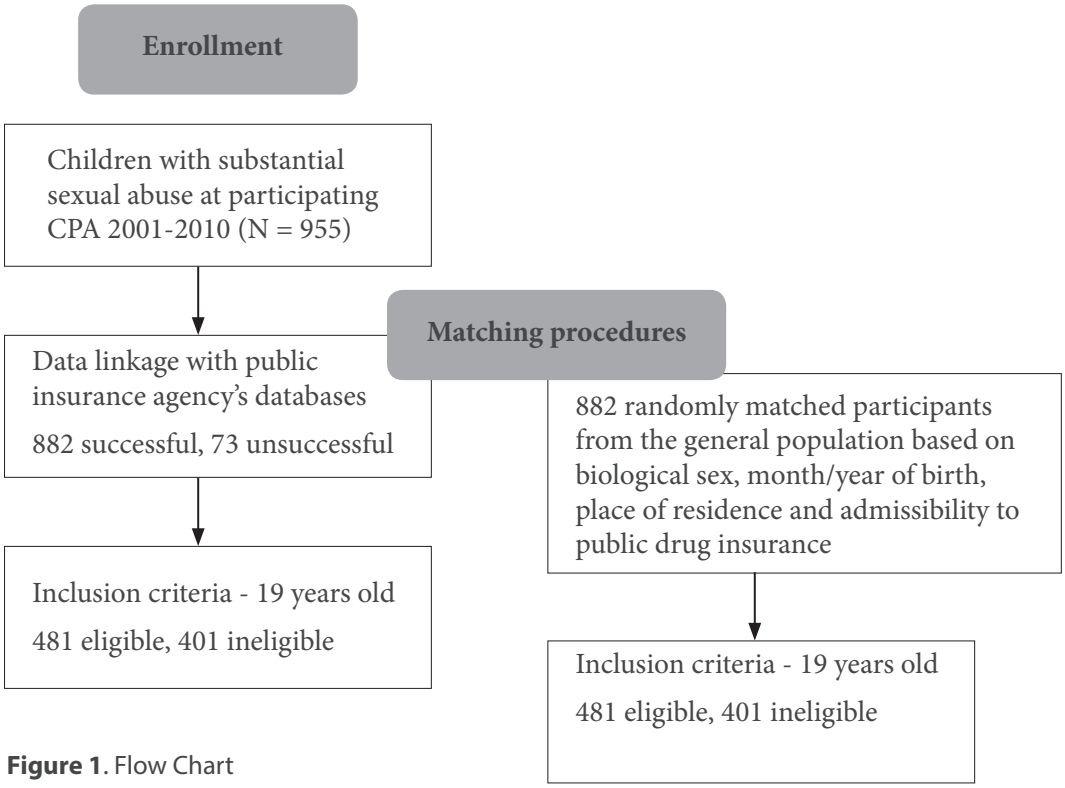

Figure 1. Flow Chart

11.11, SD = 4.18). Because the current study focused on sexually abused youth aging out of care, a third criterion was applied to retain only participants who reached their 19th birthday before the end of the study's data extraction period or March 31, 2013, i.e., who were born before March 31, 1994.

Sexually abused males and females that met the third inclusion criteria (n = 481; 55%) were compared to those who did not (n = 401; 45%) on gender and CPA services received. Group comparisons reveal that excluded participants comprised more males than included participants (30% vs. 22%; $\chi 2 = 7.51$, $p < .01$), which is concordant with the fact that males entered the study younger than females did (Daigneault, Bourgeois, et al., 2017; Daigneault, Vézina-Gagnon, et al., 2017), i.e., fewer of them may have reached their 19th birthday before the end of the data extraction period. Furthermore, excluded participants started receiving CPA services at various age periods (2-5 years old = 20%, 6-9 years old = 29%, 10-13 years old = 24% and 14 years or older = 27%), whereas included participants started when they were older (2-5 years old = 0%, 6-9 years old = 3%, 10-13 years old = 19% and 14 years or older = 78%; $\chi 2 = 290.2$, $p < .001$), which was also expected due to the third inclusion criteria and time frame of the study. Excluded participants' security and development were more often deemed compromised and in need of CPA intervention (70%), compared to included

participants (54%; $\chi 2 = 22.17$, $p < .001$). Also, fewer excluded participants were receiving services as young offenders (9%) or were placed in out-of-home care (20%) compared to included participants (22%; $\chi 2 = 26.18$, $p < .001$ and 30%; $\chi 2 = 13.06$, $p < .001$), respectively. Finally, the number of substantiated reports was similar for excluded ($M = 3.05$, $SD = 2.64$) and included participants ($M = 3.18$, $SD = 3.06$; $t = -0.65$, $p > .05$).

A control group was created using databases of the public health insurance agency covering all Canadian citizens residing in the province. Each abused child included in the study (n = 481) was individually matched to another child (n = 481) from the province's general population pool according to four criteria: (a) biological sex; (b) birth year and month; (c) place of residence at the time of the sexual abuse report; and (d) admissibility to the province's public drug insurance at the time of the sexual abuse report (proxy for socio-economic status). Each participant selected from the general population was matched only once to a participant from the sexually abused group. Furthermore, every child with a substantiated report of child sexual abuse selected in the study was excluded from the pool of children who were selected as matched controls. Therefore, children from the matched cohort did not have a substantiated report of sexual abuse between 2001 and 2010 at the same CPA. However, because not all sexual abuses are reported and substantiated, the absence of sexual abuse prior to or during the study could not be ascertained in the control group. For the main analyses, only the 481 matched participants that reached their 19th birthday during the study were retained to create the current study's control group.

Independent Variables

A sexual abuse report must follow a series of steps in order to be considered substantiated by the CPA. Once the report is retained for an evaluation, a social worker makes a clinical judgment regarding the level of corroboration of the sexual abuse. The sexual abuse report could be: 1) substantiated (sufficient evidence that sexual abuse has occurred), 2) suspected (suspicion of sexual abuse but insufficient evidence to substantiate the presence or absence of abuse), or 3) unsubstantiated (sufficient evidence to the absence of sexual abuse) (MSSS, 2016). For the current study, every child who had at least one substantiated report of sexual abuse between 2001 and 2010 at the participating CPA was selected. If there was more than one substantiated report during the study for a specific child, the first report was used to match a control participant according to criteria (c) and (d) described above. The study population is thus divided into two groups, i.e. those that have a substantiated report of childhood sexual abuse between 2001 and 2010 at the participating CPA and who reached their 19th birthday before the end of the study's data extraction period and those individually matched from the general population. These two groups represent the two levels of the independent variable used in analyses to test the first goal of the study.

Based on the age at which CPA service termination occurred for participants in the sexually abused group, two subgroups were created to test the third goal of the study. Sexually abused youth who were 17.51 years or more at CPA service termination were included in the aging out of care group ($n = 106$; 22%), meaning that their services were terminated because they legally reached adulthood and could not receive CPA services anymore. The

second group, not aging out of care, comprised those who were 17.5 years and less when they ceased to receive services from CPA (n = 375; 78%), indicating another reason for service termination, usually because CPA assessed their security and development were no longer compromised (e.g. improvement in the family situation, adoption). The average age at CPA service termination of those aging out of care was 18.38 (SD = 1.34), and it was 15.11 (SD = 2.00) for those not aging out of care. These two groups represent the two levels of the independent variable used in analyses to test the second goal of the study.

Dependent Variables

Administrative databases from the province's Ministry of Health (inpatient healthcare) and Health Insurance Agency (outpatient healthcare) were used to document healthcare use for physical and mental health problems of both groups. First, mental and behavioral disorders (category V, e.g.–) from the 10th revision (World Health Organization, 2011) of the International Classification of Diseases (ICD) were documented (except Mental Retardation codes F70 to F79 – see control variables) Two dependent variables were computed for mental health consultations using the total number of physical health disease diagnoses related to in/outpatient consultations for each participant at 17 and 18 years of age, i.e. between the 17th and 18th birthday and the 18th and 19th birthday, respectively. Each represents the total number of mental health consultations one year prior and one year after the legal age of adulthood (i.e. 18 years of age). Second, two other dependent variables were computed representing the total number of physical health diseases related consultations (the first fourteen ICD categories except V – Mental health; e.g. III diseases of the blood, XIII diseases of the musculoskeletal system and connective tissue) at 17 and 18 years of age, i.e. between the 17th and 18th birthday and the 18th and 19th birthday, respectively, for each participant.

Control Variables

Because of their link with physical and mental health disorders, and sexual abuse, confounding variables were also controlled in the analyses (Euser, Alink, Tharner, IJzendoorn, & Bakermans-Kranenburg, 2015; Hussey, Chang, & Kotch, 2006). These are: material and social deprivation at the time of the first substantiated sexual abuse report (derived from the postal code) (Pampalon & Raymond, 2000); the ICD 10 categories; Mental retardation; Certain conditions originating from the perinatal period (e.g., low birth weight or premature birth, fetal acidosis, birth trauma); and, Congenital malformations and chromosomal abnormalities (e.g., Down syndrome, fetal alcohol syndrome).

Analyses

To determine whether participants from the sexually abused group had a more frequent in/outpatient healthcare use than those from the matched-control group at 17 and 18 years

of age, two conditional, negative, binomial general linear mixed models were used, which controlled for the confounding variables described above. An interaction term was also added to determine if groups differed over time (17 years vs. 18 years) in the frequency of their healthcare use. To determine whether, at 17 and 18 years of age, the frequency of in/outpatient consultations for mental and physical health problems of sexually abused youth aging-out of care was different from those who did not age out, we performed two negative binomial general linear mixed models using the dichotomized age at CPA service cessation variable described above as an independent variable.

Results

First Study Goal

The results presented in Table 1 reveal that healthcare use for mental and physical health problems did not vary over time for the entire sample, which means that the frequency of in/outpatient consultations was similar at 17 and 18 years of age for all participants. Significant group effects indicated that in/outpatient consultations for mental and physical health problems of participants from the sexually abused group were 5.0 times and 1.6 times more frequent, respectively, than those of the general population group. The Time x Group interactions were not significant, indicating that time was similarly unrelated to the outcomes in both groups, or that sexually abused youth and those from the general population showed no increase in mental and physical healthcare use at 18 years of age (i.e. their first year of legally defined adulthood) when compared with 17 years.

for mental health problems for those aging-out of care when compared to those not aging out (Group effect: Wald $\chi 2 = 16.75$, $p < .05$). However, the frequency of in/outpatient consultations for mental health problems did not change between 17 and 18 years (Time

Table 1. Results from Two Corrected Conditional, Inverse, Binomial GLMM Using Time, Group, and Time x Group Interaction to Predict In/Outpatient Consultations for Mental Health and Physical Health[a] ($n = 962$).

	Mental Health					Physical Health			
	Coefficient (SE)	*t*	RR	*95%* CI		Coefficient (SE)	*t*	RR	*95%* CI
Time	0.17 (.35)	0.50	1.19	-0.51-0.84		0.15 (.10)	1.45	1.16	-0.05-0.34
Group	1.74 (.34)	5.11*	5.70	1.07-2.4		0.46 (.11)	4.04*	1.58	0.24-0.62
Time x Group	-0.09 (.44)	-0.21	0.91	-0.96-0.78		-0.23 (.15)	-1.56	0.79	-0.51-0.06

Abbreviations: SE, standard error; RR, relative risk; CI, confidence interval

[a] Controlling for material and social deprivation, mental retardation and congenital malformations.

Second Study Goal

Among the subgroup of abused participants, average healthcare use for those aging out and those not aging out is described in Table 2. Results of the negative binomial general linear model analyses reveal that, on average, there was a slightly higher rate of consultations

Table 2. Average Number of Uncorrected In/Outpatient Consultations for Mental Health and Physical Health Problems at 17 and 18 Years of Age According to Whether Sexually Abused Participants Aged out of CPA Services or not (*n* = 481).

		Mental Health		Physical Health	
		17 years	18 years	17 years	18 years
Aging out	n	*M (SD)*	*M (SD)*	*M (SD)*	*M (SD)*
Yes	106	1.51 (3.73)	1.89 (5.30)	5.41 (6.85)	8.63 (16.72)
No	375	1.22 (5.94)	1.04 (5.51)	5.27 (7.46)	5.13 (8.07)

Note. Aging-out: yes = CPA service termination at 17.51 or more, and no = CPA service termination at 17.50 or less

effect: Wald $\chi2 = 1.55$, $p > .05$) and this was true for both groups (Time x Group interaction effect: Wald $\chi2 = 3.51$, $p > .05$). Analyses for physical health problems reveal that there was also, on average, a higher rate of consultations for those aging-out of care (Group effect: Wald $\chi2 = 18{,}40$, $p < .05$), that there was a slight increase in the frequency of in/outpatient consultations for physical health problems between 17 and 18 years (Time effect: Wald $\chi2 = 9.17$, $p < .05$) and that this change was not the same for those aging-out of care when compared to those who did not (Time x Group interaction effect: Wald $\chi2 = 8.07$, $p < .05$). The average number of consultations per year and group presented in Table 4 indicates that youth aging out of care whose CPA services ceased on or close to their 18th birthday had an increased number of in/outpatient consultations for physical health problems between 17 and 18 years of age (average of 3.22 consultations more), while the rates were similar for those who did not age out of care.

Discussion

The purpose of this study was twofold. First, to determine if the use healthcare services varied between the year preceding and following legal adulthood for sexually abused youth and those from the general population and second, whether CPA service termination at 18 was associated with changes in healthcare service use one year before and after legal adulthood. The results of the current study reveal that youth sexually abused during childhood or adolescence had more in/outpatient consultations than youth from the general population for physical and mental health problems at 17 and 18 years of age. However, in general, there was no difference in the frequency of in/outpatient healthcare consultations between 17 and 18 years of age.

For sexually abused youth aging out of care, there was an increase in the frequency of in/outpatient consultations for physical health problems between 17 and 18 years, compared to those still receiving CPA services. This increased health service use was not found for mental health problems, with frequency of service remaining similar at 17 and 18 years of age for both groups of CPA involved youth, regardless at the age when services ceased.

These results are consistent with those of other studies that suggest sexual abuse survivors are at higher risk for mental and physical health problems. A longitudinal study

spanning 30 years found that adults sexually abused in childhood had a higher frequency of visits to physicians over the lifespan (Fergusson, Boden, & Horwood, 2008). Others have found an increased outpatient service use in adult populations exposed to childhood sexual abuse for autoimmune and inflammatory diseases, chronic pain and pain disorders, as well as eating disorders, addictions and mental health services, when compared with non-exposed populations (Fergusson et al., 2008; Irish et al., 2010; Sachs-Ericsson, Blazer, Plant, & Arnow, 2005; Severson, 2012; Wilson, 2010).

The observed difference between abused youth aging out of care and not aging out of care with regard physical healthcare use is also similar to other studies indicating increased health problems following CPA service termination when aging out (Courtney Mark & Dworsky, 2006). This increase indicates that sexually abused youth transitioning out of care may be living in conditions which put their physical health at risk, such as homelessness and other high stress living situations (Courtney Mark & Dworsky, 2006; Yen, Hammond, & Kushel, 2009). It also underlines the fact that CPA services or some form of support may still be needed after 18 years for abused youth. It is important to assess the need for, and ensure, ongoing or transition services. For those under pediatric care, ongoing or transition pediatric healthcare services may also be necessary to prevent transitioning youth to simultaneously fall out of two systems of care and have no one familiar to turn to. The increase also indicates that physical healthcare remains accessible following CPA service termination in a context where healthcare coverage is free and universal, as it is throughout Canada. The fact that mental health service use has also remained stable over the adulthood transition period, regardless of whether or not CPA involved abused youth were aging out of care, may be an indication that services remain accessible. This may be contrary to previous results indicating reduced access to mental healthcare for aging out youth after reaching adulthood (McMillen & Raghavan, 2008) and may be due to the different medical insurance accessibility between the US and Canada. This study would need to be replicated in both these contexts.

This study's results should be interpreted in light of some limitations. The use of administrative data limits the studied variables to those collected by the CPA and public health agency, which precludes considering other intervening variables or outcomes such as perceived health (Brownell & Jutte, 2013). Also, information collected in administrative databases is subject to procedure changes and inconsistencies in data entry (Leach, Baksheev, & Powell, 2015). Participating youth may have experienced physical or mental health problems without consulting their physicians, which might underestimate the physical or mental health problems described in this study. Also, it is possible that some of the children and adolescents in the matched-cohort group were sexually abused but never disclosed it to anyone. However, this last bias tends to underestimate the differences between our two samples, which strengthens our results. The current study used very broad diagnostic categories, which precluded identifying specific physical health outcomes that could be the focus of prevention efforts. Finally, other co-occurring maltreatment may have been associated with the outcome variables but were not systematically assessed in both groups and could not be controlled for in analyses.

These limits are counterbalanced by a number of study strengths, namely the matched-

cohort design using longitudinal administrative data. The use of de-identified administrative data is a reliable way to obtain information about sensitive issues, such as sexual abuse and health problems, while protecting the privacy of the participants (O'Donnell et al., 2010). It also allows for the constitution of larger samples and the prospective documentation of many variables over long periods of time, which helps understand the complex consequences of child maltreatment (Belsky, 1993; Brownell & Jutte, 2013). To our knowledge, this is the first study to prospectively assess the physical and mental health problems of sexually abused youth aging out of care.

Future studies should additionally assess whether the increased healthcare use for physical health problems observed in the current study is specifically associated with aging out of CPA or, more generally, with CPA service termination. This could be determined by assessing healthcare use pre- and post CPA termination at various ages at which CPA services cease and not solely at 18 years of age. Indeed, those not aging out of care may have had an increase in healthcare use at the time of CPA termination, at 15 years of age on average, rather than at 18 years. Further investigations should also ascertain mediators and moderators of the association between sexual abuse and healthcare use for physical and mental health issues, especially for youth aging out of care, such as healthcare insurance (Council on Foster Care, Adoption and Kinship Care and Committee on Early Childhood, 2012), gender, time receiving CPA services or other co-occurring child maltreatment. This could shed light on factors fostering youth's resilience through this transitioning period (Daining & DePanfilis, 2007) and indicate what type of transitioning services should be put in place when CPA services cease (Lee & Morgan, 2017).

Implications

In conclusion, these results suggest that healthcare workers, involved with children and adolescents, especially those in charge of CPA, should assess for exposure to sexual abuse and other forms of maltreatment, not only when confronted with possible mental health problems but also recurring physical health conditions or complaints. Identifying sexual abuse victims could help prevent or decrease the impact of further mental or physical health problems. Results also indicate that continuation of CPA services beyond 18 years of age with a transitioning period may be beneficial, and that the physical health of abused youth aging out of care should be preventively assessed. Such results also call for prevention strategies against sexual abuse. Campaigns inviting and helping children and adolescents to disclose sexual abuse would also be beneficial in order to intervene earlier, foster resilience and decrease the negative consequences on their health.

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Brief Report
The Role of Technology in Evidence-informed Practice: Uniting the Human and the Digital in Child Welfare

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Abstract:

In response to increasing demand for ethical practice, transparency, improved accountability, and critical thinking, the child welfare field is moving towards a model of evidence-informed practice (EIP). The use of research evidence to guide practice in child welfare has become progressively important given the limited resources and pressures for efficiency and accountability in services outcomes. This paper will discuss a Canadian organization's experiences of promoting EIP, using information and communication technologies. Information and communication technologies (ICT) may play an integral role in the implementation of EIP among child welfare practitioners; as important as technology in this endeavor, is the human element.

Introduction

In response to increasing demand for transparency and accountability, and improved child, youth, and family outcomes, the child welfare field is moving towards a model of evidence-informed practice (EIP). EIP is an ethical approach to child welfare practice to promote conscious decision making, particularly given the availability of research evidence and evaluation strategies that prevent harm for both children, youth, and families (Littell & Shlonsky, 2010). Existing literature, however, demonstrates that many interventions in child welfare are not supported by rigorous evidence and may have unintended, negative consequences, or little impact at all, and that research evidence is not widely used in every day decision making (Horwitz et al., 2013; Littell & Shlonsky, 2010). As stewards of public tax dollars and in the interest of bettering the lives of children, youth, and families, child welfare practitioners have an ethical mandate to inform decisions by critically incorporating the best available research evidence (Gambrill, 2005). Information and communication technologies (ICT) have the potential to play an integral role in the implementation of EIP among child welfare organizations. As a Canadian knowledge translation and implementation organization we will discuss our experience in promoting EIP using ICT.

EIP encourages decision-making that draws on multiple sources of evidence, including case context, practitioner experience, service user preferences and values, and research evidence (Nevo & Slonim-Nevo, 2011). The use of EIP demands critical thinking to effectively assess research methodology and findings, and to integrate multiple perspectives and sources of evidence (Littell & Shlonsky, 2010). The judicious use of best evidence in making practice decisions is an honest, transparent avenue for managing uncertainty (Gambrill, 2007).

Information and Communication Technologies (ICT) have the potential to effectively facilitate the development of EIP. The growing popularity of EIP in recent years has been facilitated by the rise of ICT, which contributes to collaboration between the domains of research, policy, and practice (Gambrill, 2007). ICT can provide opportunities to connect with a wider audience to share information and strategies for sustaining this philosophy of practice.

The Role of Technology in Supporting Evidence-informed Practice

There is a dearth of literature that explores the impact of technology on supporting and promoting EIP in child welfare. Several studies, however, have examined the role of technology in teaching and promoting the use of research evidence in healthcare (Doran et al., 2009; Institute of Medicine, 2001; Leung, 2002). Leung (2002) explored the use of information technology (IT) as a means of facilitating the use of research evidence among student nurses and found that the use of technology enhanced quality of learning and application to practice.

IT has been noted as helping to promote access and use of relevant research among nurses and thereby fostering safe, high-quality care with tools that can make more extensive information accessible to frontline clinicians at the point of decision making (Bates &

Gawands, 2003) and improvement in research values and awareness (Doran et al., 2009).

The use of ICT may help to overcome this gap in knowledge through tools to "enhance the translation, implementation, and dissemination of important research findings in clinical practice." (Ortiz & Clancy, 2003, para. 23) Health care, and indeed child welfare, is behind many other fields in "harnessing the capabilities of ICT to improve services, knowledge, communication, outcomes, quality, and efficiency" (Ortiz & Clancy, 2003, para. 13).

Practice and Research Together (PART)

The overriding mission of PART is the promotion and implementation of EIP in child welfare organizations. There are two major processes that drive this mission: 1) Knowledge translation; and 2) Promoting the organizational implementation of EIP. Without ICT, PART would be unable to effectively and efficiently engage in knowledge mobilization. The use of ICT allows for frequent, quality support and information to be provided to member organizations in a cost-effective manner that surmounts geographical challenges. Furthermore, by using ICT to creatively mobilize knowledge, PART is striving to improve services, knowledge, communication, outcomes, quality, and efficiency, between efficiency and a primary capability of how ICT can be used in health and social services to improve outcomes (Ortiz & Clancy, 2003).

ICT are critical to the dissemination of research by PART to practitioners within the field. PART resources vary in terms of format as well as interactivity, drawing on the variety of medium ICT allows. Firstly, the majority of text-based resources are topical literature reviews, crafted to be accessible to non-academics, while maintaining an emphasis on research methodology as it relates to practice questions. Similar in focus but much larger in scope, are Guidebooks, which synthesize research findings on wider topics and engage the reader in critical thought and application to practice. Lastly, an electronic library houses a database of peer and non-peer reviewed articles for direct access to research. Given the time constraints experienced by child welfare practitioners, audio resources allow content to be presented in an engaging fashion while addressing the needs of various learning styles; literature reviews are offered in audio-based format to provide flexibility in consumption.

Video resources are comprised of storyboards, webinars, and recorded videos. PART webinars are presentations by researchers and provide a means through which practitioners can connect with researchers in real-time. Video resources provide another means for practitioners to engage with research evidence. Finally, PART offers an interactive resource that guides practitioners to think critically through a case decision. This resource has utility as both an individual and small group exercise. The variety of technologies used to present evidence offers access to a wide audience, no matter their location, and multiple formats to accommodate various learning styles. ICT permit ease in sharing of resources, as well as quick search functions to promote the efficient use of research in practice.

The variety of utilized media formats reflect adherence to adult learning principles, which espouse the use of multiple methods for knowledge acquisition and exploration (Coffield, Moseley, Hall, & Ecclestone, 2004; Walter, Nutley, & Davis, 2003). This variety in

formats allows flexibility in meeting diverse needs and overcomes geographical limitations inherent to dissemination through other forms. This flexibility also provides individuals and organizations a level of convenience by being able to connect to resources at any time and from any location with Internet access. Team utilization of ICT (e.g., viewing an archived webinar) provides an opportunity for group critical discussion about evidence and its application. In using ICT in this way, PART can address geographical and temporal challenges.

Lessons Learned

People and Relationships

PART's primary method of distilling research knowledge and evidence is the program website where all resources are housed. While the PART website acts as the portal to its resources, there remains the challenge of driving people to access, explore, and utilize the website to support practice. This challenge is where the critical nature of interpersonal relationships with formal and informal leaders comes to the fore. In the context of successes and challenges it has become evident that relationships are a vital factor in building and maintaining momentum for implementing and promoting the use of PART and EIP.

During the implementation of EIP within child welfare organizations, several member organizations have embraced the idea of developing an EIP Committee, versus a single liaison who acts as a conduit between PART and the member agency. Within an organization, an EIP Committee may: 1) Provide an organizational strategy for integrating and implementing EIP; 2) Create 'buy-in' at all levels of the organization; 3) Leverage resources to ensure that EIP becomes a sustainable model of practice and decision-making; and 4) Promote transfer of knowledge following all learning opportunities. To be most effective, these committees include representation from different geographic areas (e.g., staff from different geographical branches within an organization) and different organizational levels and roles (e.g., practitioners, supervisors, senior leaders IT department) to ensure that activities reach a broad cross-section of the organization's staff and serve to share the work of implementing the program. EIP also serves as a way of actively engaging those informal leaders within an organization who may be experienced in ICT and/or EIP and may play a key role in promoting utilization.

Supportive Technological Infrastructure

To effectively utilize ICT an organization's technological infrastructure is an important factor. So often organizational leaders have good intentions of promoting utilization of information through ICT, yet neglect the most basic practical, and crucial, technological factors. During the process of supporting member organizations to implement and promote EIP via the PART website, we have found that one of the critical ingredients has been to ensure the availability of appropriate technological infrastructure. This capacity includes access to computers and networks with the requisite bandwidth, speakers, and flash video plug-ins, the most commonly neglected technological factors. While over time with

the increased availability of technology this has become less of an issue, it is not uncommon to hear from staff from member organizations that they are unable to access information due to technological limitations. Depending on the organization, needs may include access to semi-private computers in quiet spaces where people can watch webinars with minimal distraction or access to a shared space where staff can gather to watch a webinar and discuss the evidence and its potential application. Support and commitment from senior leaders is a key factor in the successful implementation and utilization of EIP through ICT. The ability of leaders to model behaviour and continually assess organizational barriers and facilitators to successful utilization of EIP through ICT promotes the continual development of the use of EIP and the success of the organization.

Conclusion

Providing ongoing and tangible support for staff to use resources and apply them to practice is crucial when using ICT. Commitment to supporting the implementation of EIP using ICT and allowing the necessary time and technological infrastructure that this involves is crucial. Without this commitment, basic endeavours like attending webinars are made difficult and the process of utilizing ICT and integrating EIP into everyday work can be difficult. It is imperative to consider the role of human relationships that act in tandem with the resources available via ICT that will be used when implementing and promoting the use of evidence in practice. The importance of developing, nurturing, and sustaining supportive relationships based on open channels of communication cannot be overstated. Our experience demonstrates that ICT is a valuable medium for promoting EIP in the field of child welfare; however, ensuring that the human touch and interpersonal relationships are attended to is pivotal to the success of this endeavour.

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Brief Report: Data Sharing and Resilience: Turning Lemons into Lemonade

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Abstract:

Sharing and reusing data is an important aspect of research in the United States. When done well, it has the potential to improve research by reducing duplicate data collection, improving statistical analysis techniques and software implementation through low- or no-cost opportunities, and increasing researchers' incentive to minimize errors by encouraging no-cost replication of analyses. Sharing data also allows students and trainees the opportunity to pursue research that would not be otherwise feasible. However, sharing data that was not intended for research purposes is a complex undertaking. The authors recently engaged in a data sharing agreement that, while useful for both research and future research management purposes, was challenging in many ways. This article describes their experiences with a data sharing agreement process, the issues with the agreement, and lessons learned by the authors.

Introduction

Sharing and reusing research datasets has become an important part of research in the United States since the National Institutes of Health started requiring sharing for data that resulted from projects with more than $500,000 in direct costs per year (National Institutes of Health, 2003). Data sharing has many potential benefits, including reduced burden on agencies/organizations to collect or recollect data (Tenopir et al, 2011) and improved coordination across agencies for shared clients, while reducing the data collection burden for individuals served by the agencies (Kingsley & Goldsmith, 2013). For research, data sharing may lead to more efficient use of funding through reduced duplicate data collection, improved methods and statistical analysis techniques, and software implementation through low- or no-cost opportunities to pursue these activities, and increased incentive to minimize errors in research by encouraging no-cost replication of analyses (Piwowar & Chapman, 2010). In addition, data sharing creates additional opportunities for substantive and methods training for students, trainees, and professions (Piwowar & Chapman, 2010; Tenopir et al., 2011).

Several data archives exist to facilitate data sharing between researchers. One of the largest data archives, the Inter-university Consortium for Political and Social Research, houses more than 250,000 research files and 21 discipline-specific collections (Institute for Social Research, 2018). Some large studies also self-archive and manage the data sharing process, including The National Longitudinal Study of Adolescent to Adult Health. This nationally-representative cohort study has resulted in more than 6,000 journal articles, presentations, books, books chapters, and dissertations on many aspects of social, behavioral, mental, and physical health for adolescents (Carolina Population Center, 2017). However, in this type of data sharing, the data were created for research and managed by organizations with extensive experience with sharing, which reduces the complications associated with data sharing. Some data created for non-research purposes, such as data available from the National Child Abuse and Neglect Data System (NCANDS), has been used for many years and so specific data security and ethics processes have been established (National Data Archive on Child Abuse and Neglect (NDACAN), 2018).

Other non-research sources of data, such as social media data, have not been used extensively for child maltreatment studies (Schwab-Reese, Hovdestad, Tonmyr, and Fluke, 2018). As such, there are several ethical and practical concerns that must be considered when exploring novel data sharing agreements. First, data sharing requires careful consideration of the expected privacy and confidentiality by participants and legal and institutional regulations around privacy and confidentiality, which may differ across disciplines and institutions (UK Data Service, 2017). Second, different computer science and statistical analysis skills and expertise are often needed to construct and use data from these different platforms, which increases potential for data management and analysis errors if not conducted by individuals with adequate expertise and skills (boyd & Crawford, 2012). Finally, data sharing processes and agreements that develop without specific, well-conceived guidelines may cause difficulties for both the original owner of the data and the recipient of the data.

A Real-World Example of Data Sharing and Resilience

The authors recently engaged in a data sharing agreement with a technology-based organization that engages adolescents and young adults. While the research findings that resulted from this data sharing agreement are worthwhile, the data sharing process substantially complicated the research process.

Several years ago, one of the authors realized young victims of child maltreatment were likely to seek the support provided by the organization as the platform provided support while allowing users to remain anonymous. Subsequently, she contacted the organization to determine if they collected information on child maltreatment. At the time, they were not collecting or aggregating information on child maltreatment disclosures, but they concluded it would be possible to add a "child abuse/neglect" tag to summaries completed by the workers after the conversation, which would allow identification of trends across time and geographical location. Unexpectedly, they contacted the authors many months later indicating that they would like to share deidentified message-level data. The organization was in the process of hiring an individual who would manage the data agreements, related protocols, and data sharing process, with the intent of piloting the process with a small number of researchers, then expending the sharing process to screened and qualified researchers. Soon after, we sought IRB approval for the analyses, which were determined to be non-human subjects research by the local institutional review board because they were deidentified in such a way that identification of the participants was impossible.

Over the course of nine months, many aspects of the initial data sharing arrangement were altered from the initial agreement. For example, data were initially to be downloaded by the authors through a secure process but were ultimately moved to a secure server with multi-step security protocols and processes. Researchers were not allowed to download or use the data outside of the secure server environment. This change posed a challenge to the researchers who had intended to conduct analyses through statistical and qualitative software, which was not available on the secure server environment. In addition, proficiency in computer language tools, which the authors did not possess, became necessary for data manipulation.

The data agreement process was finalized approximately nine months after the initial data sharing discussion, however the authors experienced ongoing difficulties accessing the new platform. Approximately four months after finalizing the data sharing agreement, one author gained consistent access to the platform and data analysis began. For the next three months, the researchers worked with the open data agreement manager and other personnel on creating data coding dictionaries, understanding the data from both the texter and the crisis counselor, and developing an analytical strategy. Three potential manuscripts were outlined with preliminary data analyses and each paper was discussed with the open data manager. Approximately three months into data analysis, the organization announced that they were terminating all data sharing agreements effective in sixty days. The data sharing agreement was a pilot project to assess if the open data process was feasible so it was possible that the organization determined continued open data sharing was not feasible. The reasons for terminating the data sharing agreement program were not shared.

Lessons Learned: Lemons to Lemonade

The cancellation of the data sharing agreement was not anticipated and posed numerous challenges. First, the analyses and data checks for reliability had to be completed quickly, and additional data analyses often completed during the publication revision process were not possible. Setting up reliability and validity checks throughout the analysis process was instrumental to being able to complete rigorous analyses. Second, the end of the data sharing agreement required all data-related information be destroyed, except for completed results and tables. As a result, when the authors were finalizing the coding and analysis framework, they created a content analysis coding and analysis framework that included specific text examples. Prior to the data sharing agreement termination, the authors complied with the request to destroy all data-related information, but the information available in the content analysis framework may reduce the negative impact on publishing the papers.

Although the data sharing agreement had a disappointing end, the process and outcome of the agreement were important to future research projects with data sharing arrangements and agreements. From a research perspective, the authors developed a coding scheme for analyzing text-based data and wrote several papers based on this work for publication. From a management perspective, the authors learned to include additional assurances in any signed data sharing agreements to minimize the disruptive nature of shifting organizational priorities. While every organization has its reasons for changing agreements from time-to-time, researchers may find it useful to include specific agreement language that protects their ability to conduct and disseminate high quality research, including an agreed upon process for terminating the data sharing agreement and a clearly defined process for organization input in dissemination efforts.

This data sharing agreement was valuable, from both a research and process improvement perspective. Overall, future research may be improved by having an established coding and analysis framework. In addition, the authors will have more informed discussions with future partners on their data sharing agreements, expectations, and commitments. Finally, the experiences from this project, both the positive and negative, may be helpful to other researchers who are embarking on data sharing agreements.

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