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Research article

Childhood maltreatment and adolescent sexual risk behaviors: Unique, cumulative and interactive effects

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ABSTRACT

Child maltreatment has been associated with sexual risk behaviors. Previous investigators have typically studied only one form of maltreatment, preventing them from exploring interrelations between forms of maltreatment and their impact on sexual risk behaviors. Thus, this study aims to examine the unique, cumulative, and interactive effects of four maltreatment forms (sexual abuse, physical abuse, neglect, and witnessing interparental violence) on sexual risk behaviors. The sample comprised 1940 sexually active adolescents (M_{age} = 15.6; 60.8% girls) attending [Blinded = Quebec (Canada)] high schools. Regression results showed that all maltreatment forms were associated with having a higher number of sexual partners, casual sexual behavior, and a younger age at first consensual intercourse. Physical abuse and witnessing interparental violence were associated with inconsistent condom use, and physical abuse was associated with sexually transmitted infections. After controlling for all forms of maltreatment (unique effects), analyses showed that sexual abuse, physical abuse, neglect or witnessing interparental violence remained statistically associated depending on the sexual risk behavior. A greater number of forms of maltreatment was associated with more sexual risk behaviors (cumulative effect). When sexual abuse was not experienced, neglect was associated with a higher number of sexual partners (interactive effects). In general, associations between maltreatment and sexual risk behaviors were similar for both genders. The magnitude of the relationship between a specific form of child maltreatment and sexual risk behaviors may be inaccurately estimated when not controlling for other forms of maltreatment.

1. Introduction

Child maltreatment (CM) is now recognized as a major public health concern worldwide (Finkelhor, Ormrod, & Turner, 2007; Stoltenborgh, Bakermans-Kranenburg, Alink, & van Ijzendoorn, 2015; Tourigny, Hébert, Joly, Cyr, & Baril, 2008). CM is associated with multiple short-term and long-term effects, such as sexual risk behaviors (SRBs). Indeed, studies suggest that CM namely neglect, physical abuse, and sexual abuse is associated with a higher risk of sexually transmitted infections (STIs), a higher number of sexual partners, younger age at first intercourse, unprotected sex, and casual sexual behavior (Fergusson, McLeod, & Horwood, 2013; Negriff, Schneiderman, & Trickett, 2015; Norman et al., 2012; Senn & Carey, 2010; Ulloa, Salazar, & Monjaras, 2016). These findings are troubling, especially for adolescents who are in a period characterized by an increase in SRBs (Fergus, Zimmerman, & Caldwell, 2007). In fact, along with emerging adults, adolescents belong to the most at-risk group for STIs in the United States and Canada (Centers for Disease Control and Prevention, 2015; Government of Canada, 2014). The present study will examine the association

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between CM and adolescent SRBs while attempting to delineate the unique, cumulative, and interactive effects. We investigated two types of SRBs: nature of sexual partners (i.e., number of sexual partners and casual sexual behavior) and sexual health risks (i.e., age at first consensual intercourse, condom use, and STIs). Having a casual sexual behavior is understudied among the adolescent population. Yet, an understanding of risk factors associated may inform prevention practices.

Past studies that have investigated the consequences of CM have often been limited by their focus on one or two particular forms of CM, such as sexual abuse and physical abuse (Littleton, Radecki Breitkopf, & Berenson, 2007). Although these studies contributed greatly to our understanding of the *independent* effects of specific forms of CM on SRBs, they did not take into account other potential forms of CM experienced. Thus, results must be interpreted with caution, given that the scholarly literature shows that forms of CM rarely occur in isolation of others (Cyr et al., 2013; Finkelhor, Vanderminden, Turner, Hamby, & Shattuck, 2014; Higgins & McCabe, 2000; Tourigny et al., 2013). Finkelhor, Ormrod, and Turner (2009) found in a nationally representative survey in the United States that children experienced in their lifetime an average of 3.7 forms of victimization out of 26 (e.g., sexual abuse, physical abuse, property crime or witnessing interparental violence). Consequently, studies examining one or two forms of CM not only fail to provide information on the total effect of exposure to cumulative abuse but also lead to an overestimation of the consequences of a single form of CM (Turner, Finkelhor, & Ormrod, 2010). For example, Senn & Carey (2010) found that sexual abuse, physical abuse, neglect, and psychological abuse were all *independently* associated with adult SRBs among women. However, when considering all forms of CM in the same analysis (*unique effects*), only sexual abuse was significantly associated with SRBs. The present study will add to Senn & Carey (2010) study in three ways. First, it will explore those associations among a representative sample of adolescents from the general population rather than an adult clinical population. Second, our sample will include boys, in order to explore possible gender differences. Finally, while Senn & Carey (2010) only explored two types of SRBs (i.e., the number of sexual partners and unprotected sex), the present study will add the following: casual sexual behavior, age at first consensual intercourse, and STIs.

A recent literature review produced clear guidelines for future research on cumulative abuse (Scott-Storey, 2011). First, Scott-Storey highlighted the importance of controlling for other potential abuse that may have been experienced when studying the consequences of a specific form of CM (testing *unique effects*). In fact, one of the two lines of thought influencing research on CM outcomes, the differential effects theory, posits that specific forms of CM are associated with specific outcomes (Davis & Petretic-Jackson, 2000; Senn & Carey,2010). This model is supported by a large body of research that consistently shows, for instance, that sexual abuse is associated with SRBs (Senn, Carey, & Vanable, 2008). However, most of these studies did not adequately control for other forms of CM, restricting our ability to draw the conclusion that sexual abuse is uniquely associated with SRBs. Few studies have attempted to address this issue. Among these studies, Jones et al. (2010) have demonstrated that other forms of CM (i.e., physical and emotional abuse) contribute to the explanation of SRBs over and above the effect of sexual abuse. Though this study was one of the few on adolescents, it only explored age at first intercourse as a SRB. Negriff et al. (2015) investigated a wider range of CM (sexual, physical, emotional, and neglect) and of SRBs (e.g., condom use, age at first intercourse, number of sexual partners, casual sexual behavior). Nevertheless, the reliance on a clinical sample of adolescents hinders the generalization of results to the general population. Other studies demonstrated, but only for adult women, that physical abuse contributed to the explanation of SRBs over and above the effect of sexual abuse (Lacelle, Hébert, Lavoie, Vitaro, & Tremblay, 2012; Littleton et al., 2007). These results emphasize the importance of carrying out research to clarify the unique effects of different forms of CM on SRBs.

Next, the cumulative dose-response relationship between the number of forms of CM experienced and poorer physical and mental health outcomes cannot be ignored (Scott-Storey, 2011). A multitude of studies has demonstrated the *cumulative effects* of different forms of CM on health (Álvarez-Lister, Pereda, Abad, & Guilera, 2014; Finkelhor et al., 2007) and women' SRBs (Hahm, Kolaczyk, Lee, Jang, & Ng, 2012; Rodgers et al., 2004). These findings are consistent with the second line of thought on CM outcomes: the general effect theory. This theory holds that increasing the number of forms of CM experienced is associated with more adverse outcomes (Davis & Petretic-Jackson, 2000; Senn & Carey,2010). The general effect theory, unlike the differential effects theory, posits that there is no specific outcome associated with specific forms of CM. It has been supported by Arata, Langhinrichsen-Rohling, Bowers, & O'Brien (2007) and others in the contexts of physical abuse and sexual abuse. However, Senn & Carey (2010) rejected this theory and concluded that the association between CM and adult SRBs is driven by sexual abuse, which is consistent with the differential effects theory.

Finally, Scott-Storey (2011) and Senn & Carey (2010) highlighted an important limitation to typical approaches examining CM. The first approach allows for the examination of the *unique effects* of particular forms of CM, and the second approach examines the *cumulative effect* of CM using a summary score of the number of forms of CM experienced. However, these approaches do not allow for the examination of the potential *interactive effects* of CM. The examination of interactive effects informs if some forms of CM are more strongly associated with greater involvement in SRBs and if specific forms of CM interact to result in greater involvement in SRBs. Some empirical studies have demonstrated that certain combinations of CM would be associated with worst outcomes. For example, Arata et al. (2007) found that a) the combination of sexual abuse and neglect, or b) the combination of sexual abuse, physical abuse and neglect, result in a greater number of sexual partners among adolescents. Other combinations (sexual abuse and physical abuse, or physical abuse and neglect) were not associated with a greater number of sexual partners than in the case of individuals without any forms of CM. Luster & Small (1997) found that female adolescents who experienced both sexual abuse and physical abuse reported more sexual partners than those who were not abused. Senn & Carey (2010) did not find an interaction between sexual abuse, physical abuse, psychological abuse, and neglect on the report of the number of sexual partners among their sample of adult women.

In sum, there is a need to simultaneously address the unique, cumulative, and interactive effects of CM. To the best of our knowledge, in studies addressing sexual health outcomes, only Senn & Carey (2010) have done so. Given that their sample included adult women with high rates of SRBs attending a publicly funded STI clinic, their results cannot be generalized to the general