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Linking Patterns of Substance Use With Sexual Risk-Taking Among Female Adolescents With and Without Histories of Maltreatment

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A B S T R A C T

Purpose: This study aimed to determine the associations between patterns of substance use and sexual risk-taking among female adolescents with and without histories of maltreatment.
Methods: Data are from a prospective cohort study examining the impact of maltreatment on subsequent female adolescent sexual health (N = 504). Participants averaged 18.24 years in age (SD = 1.12), and approximately 63% had substantiated incidences of maltreatment filed with Child Protective Services prior to age 18. The present study used latent class analysis to examine patterns in adolescent substance use, and negative binomial regression models to examine the links between patterns of substance use and sexual risk-taking and to determine whether these associations were moderated by adolescents' maltreatment status.
Results: Six classes emerged from latent class analysis labeled as follows: abstainers (25% of sample); polysubstance users—early initiators (13%); polysubstance users—late initiators (23%); alcohol and cannabis users—late initiators (9%); alcohol users—late initiators (18%); and tobacco users (12%). Patterns of adolescent polysubstance use were associated with the highest levels of sexual risk-taking, and patterns of late-initiated polysubstance use, late-initiated alcohol use, and tobacco use were more strongly related to sexual risk-taking for female adolescents with histories of maltreatment.
Conclusions: This study is the first to determine the specific patterns of substance use that are more strongly related to sexual risk-taking for maltreated female adolescents. By doing so, this study demonstrates how a person-centered approach can facilitate our understanding of how to best leverage sexual risk-taking prevention efforts.

IMPLICATIONS AND CONTRIBUTION

This study addresses a critical gap in our understanding of substance use and sexual risk-taking among female adolescents. Findings extend past evidence linking patterns of substance use to sexual risk-taking by identifying specific patterns of use that are more strongly related to sexual risk-taking for maltreated female adolescents.

Substance use poses a serious public health concern for adolescents within the United States [1,2]. Early initiation of substance use and polysubstance use (i.e., concurrent use of two or more substances) during adolescence increases the risk of experiencing a number of negative outcomes, including participating in

sexual risk-taking [3–5]. The health consequences associated with sexual risk-taking during adolescence may be most prominent among female adolescents, who have a higher risk of acquiring a sexually transmitted infection (STI) than their male counterparts when condoms are not used during sex [6]. Adolescent pregnancy is also linked to sexual risk-taking and is a concern for females as it is related to premature birth, poor prenatal care, and educational achievement [7,8]. In an attempt to facilitate the development of more targeted interventions that can assist with preventing such outcomes, researchers employing person-centered methods have uncovered subgroups of adolescents characterized by individual differences in patterns of substance use [9]. Critically, early evidence suggests that these groups diverge in their sexual risk-taking behavior [10,11]. However, research has yet to determine whether or not these relationships vary across etiologically meaningful variables, such as child maltreatment (i.e., experiences of neglect, physical, sexual, and/or emotional abuse). In line with transactional models of maltreatment, evidence indicates that experiences of maltreatment have the potential to interact with risk factors and enhance their effects in nonadditive ways [12,13]. Given that maltreatment has been linked to both adolescent substance use [14] and sexual risk-taking [15–17], it follows that the relationships between specific patterns of adolescent substance use and sexual risk-taking may be more pronounced for adolescents who have been maltreated. The present study addresses this hypothesis and uses latent class analysis to determine if specific patterns of substance use are more strongly related to sexual risk-taking for female adolescents with histories of maltreatment.

Substance use and sexual risk-taking

Evidence indicates that earlier initiation [18,19] and use of substances [4,20,21] have the potential to impact adolescents' sexual health by increasing their risk of participating in sexual risk-taking. Among female adolescents, tobacco use is related to decreased condom use during sex [22,23] and a greater number of sexual partners [5]. Studies have also linked earlier initiation of alcohol to less condom use [18] and earlier initiation of cannabis use to a greater number of lifetime sexual partners [19]. Although these studies contribute to our understanding of the substance use and sexual risk-taking relationship, evidence indicating that a great deal of heterogeneity exists within adolescent substance use [24] points to a need for person-centered research that considers the links between varying patterns of substance use and sexual risk-taking.

Latent classes of adolescent substance use

A growing area of research uses latent class analysis to address the heterogeneity in adolescent substance use [9]. Compared with variable-centered approaches that attempt to describe relationships between variables across individuals, person-centered methods aim to describe population heterogeneity by identifying homogenous and mutually exclusive subgroups (i.e., classes) that are differentiated by patterns across variables within individuals. This approach is preferred over simple cross-tabulation methods because it is able to account for measurement error in responses to questions and because the items used to model the latent categorical variable may be derived from different domains [25]. Studies using this approach have most often used indicators of substance use types to identify classes of adolescent users,

and have most consistently found patterns characterized by (1) low probabilities of any substance use; (2) alcohol use; (3) concurrent use of alcohol and cannabis use; and (4) concurrent use of alcohol, tobacco, and cannabis use [9].

Only two studies have examined the links between latent classes of adolescent substance use and sexual risk-taking. Bohnert et al.'s (2014) study of adolescents from urban community health clinics examined correlates of adolescent substance use classes and found that those comprising a class characterized by concurrent alcohol, tobacco, and cannabis use reported the greatest number of sexual partners within the last year, followed by cannabis users, and abstainers [10]. More recently, Swartzendruber et al.'s (2016) study of African-American adolescent females found that those engaging in concurrent alcohol and cannabis use were at greater risk of acquiring an STI or unplanned pregnancy than alcohol users or cannabis users [11]. These studies demonstrate the utility of a latent class approach by identifying patterns of adolescent substance use that are associated with the greatest levels of risk for participating in sexual risk-taking. To build upon these efforts, research is now needed that determines for whom these relationships are the most salient.

The case for considering adolescents' history of maltreatment

Past research underscores the importance of considering adolescents' history of maltreatment when investigating relationships between maladaptive behaviors. First, maltreatment is linked to substance use [26] and sexual risk-taking [27], and therefore should be considered when investigating the relationship between substance use and sexual risk-taking to avoid confounding results. Second, elevated levels of co-occurring symptomatology exist among maltreated individuals [12], underscoring the importance of considering this at-risk population when investigating the substance use and sexual risk-taking link. Third, rather than potentiating the effects of risk factors in an additive manner, researchers have found complex transactions between maltreatment and risk factors [28]. Given the heterogeneity underlying adolescent substance use, it is possible that maltreatment may interact with varying patterns of substance use in unique and meaningful ways that have implications for the prevention of sexual risk-taking.

The Current Study

The present study uses latent class analysis to determine the patterns of substance use that are more strongly related to sexual risk-taking for female adolescents with histories of maltreatment. The insight gained from this study will inform more targeted prevention programming for an underserved and high-risk population. Drawing on data from a longitudinal cohort study examining the impact of maltreatment on sexual development, we address the following research questions: What are the patterns of substance use among female adolescents, and can these patterns be distinguished by their sexual risk-taking? Are the associations between patterns of substance use and sexual risk-taking moderated by female adolescents' maltreatment status?

Methods

The sample comprised maltreated (n = 275) and nonmaltreated (n = 239) female adolescents between 14 and 17 years of age at study entry. These participants were drawn from the catch-