



Exploring child maltreatment and its relationship to alcohol and cannabis use in selected Latin American and Caribbean countries[☆]

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ARTICLE INFO

Article history:

Received 13 August 2012

Received in revised form 31 October 2012

Accepted 2 November 2012

Available online 7 January 2013

Keywords:

Child maltreatment

Substance use

Religiosity

University students

Latin America

Caribbean

ABSTRACT

Objectives: Research from developed countries shows that child maltreatment increases the risk for substance use and problems. However, little evidence on this relationship is available from developing countries, and recognition of this relationship may have important implications for substance demand reduction strategies, including efforts to prevent and treat substance use and related problems. Latin America and the Caribbean is a rich and diverse region of the world with a large range of social and cultural influences. A working group constituted by the Inter-American Drug Abuse Control Commission and the Center for Addiction and Mental Health in June, 2010 identified research on this relationship as a priority area for a multinational research partnership.

Methods: This paper examines the association between self-reported child maltreatment and use in the past 12 months of alcohol and cannabis in 2294 university students in seven participating universities in six participating countries: Colombia, El Salvador, Jamaica, Nicaragua, Panama and Uruguay. The research also considers the possible impact of religiosity and minimal psychological distress as factors contributing to resiliency in these samples.

Results: The results showed that experience of maltreatment was associated with increased use of alcohol and cannabis. However, the effects differed depending on the type of maltreatment experienced. Higher levels of religiosity were consistently associated with lower levels of alcohol and cannabis use, but we found no evidence of an impact of minimal psychological distress on these measures.

[☆] The opinions expressed in this article are the sole and exclusive responsibility of the authors and do not represent the opinions of the organizations and the administration where they are employed.

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Conclusions: This preliminary study shows that the experience of maltreatment may increase the risk of alcohol and cannabis use among university students in Latin American and Caribbean countries, but that higher levels of religiosity may reduce that risk. More work to determine the nature and significance of these relationships is needed.

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Introduction

Child maltreatment is any 'act of commission or omission', whether intended or unintended, that results in harm to a child (Gilbert, Cathy Spatz Widom, et al., 2009). This definition incorporates physical, sexual and emotional abuse as well as neglect. Child maltreatment is of great concern within developed nations (Gilbert, Kemp, et al., 2009; Kessler et al., 2010; Westby, 2007), however, its seriousness has not received equivalent significance within Latin American (LA) and Caribbean countries. In LA and the Caribbean over 40 million children are exposed to violence, abuse and neglect (UNO, ECLAC, & UNICEF, 2009), and efforts have been made by the United Nations to prevent child maltreatment in this region (United Nations, 1989). Nevertheless, cultural, economic and other factors may continue to influence rates of maltreatment in the region. For example, although disciplining children through corporal punishment is not necessarily maltreatment, high levels of acceptance of the use of corporal punishment for disciplining have been observed in these countries (UNO, ECLAC, & UNICEF, 2009).

Research in developed nations has established that child maltreatment has long term effects on behavior and health (e.g., Finkelhor, Ormrod, & Turner, 2007; Garbarino, 2009; Kessler, Davis, & Kendler, 1997; Perry, 2009; Widom, 1999). One long term effect that has been suggested is increased use of alcohol and drugs, and increased substance-related problems (Adlaf & Smart, 1985; Hartzler & Fromme, 2003; Johnson & O'Malley, 1986; Leventhal & Schmitz, 2006; Medrano, Zule, Hatch, & Desmond, 1999; Rohsenow, Corbett, & Devine, 1988); with the more severe form of child maltreatment, sexual abuse, being associated with a higher risk of substance dependence (Kendler et al., 2000). Tonmyr, Thornton, Draca, and Wekerle (2010) reported a comprehensive review of population-based studies examining the relationship between maltreatment and adolescent substance abuse. Their findings demonstrated substantial agreement across studies in finding that maltreatment increased the likelihood of substance abuse. Hovdestad, Tonmyr, Wekerle, and Thornton (2011) identified three theoretical pathways by which maltreatment might increase substance use. The post-traumatic stress disorder model posits that maltreated adolescents have experienced trauma as a result of maltreatment, and find that alcohol and other drugs may reduce the stress created by this trauma. Another model links maltreatment to subsequent low self-esteem, with these adolescents using substances more in an effort to escape emotional pain. A third theoretical pathway suggests that maltreatment can create relationship issues which may predispose the individual to substance use and other problems.

Substance use is currently a significant concern within LA and Caribbean countries as some of these countries are major producers and also consumers of licit and illicit substances (Longman-Mills et al., 2011). Countries in this region are susceptible to drug production, distribution and use, due to their economic, political and social climate (Thoumi, 2005), as well as their geographic positioning. Furthermore, substance use and distribution are associated with increased crime and social disintegration. However, the likelihood that child maltreatment may also be a contributing factor to substance abuse in these regions has not yet been explored.

The relationship between child maltreatment and adverse outcomes, however, is not a direct one (Mrazek & Mrazek, 1987), as there may be protective factors that may influence this relationship and enhance the child's resilience. Resilience after child maltreatment is aided by biological, social, environmental and psychological factors (Tonmyr, Wekerle, Zangeneh, & Fallon, 2011).

Religion has been identified as an important factor that may enhance resilience (Doxey, Jensen, & Jensen, 1997). The primary religion that is practiced in LA and Caribbean countries is Christianity, and religious beliefs are considered to be particularly strong in the region (Central Intelligence Agency, 2012). Religious beliefs have been found to enhance resilience after trauma (Chu, Pineda, DePrince, & Freyd, 2011; Doxey et al., 1997) and also act as a protective factor against substance use (Jang & Johnson, 2010). Because strong religious beliefs are characteristic of this region, religious beliefs may be particularly salient as a factor that may promote resilience in these countries.

Psychological distress has been identified as both a negative outcome of child maltreatment as well as a mediating factor between child maltreatment and other serious adverse outcomes such as substance use (Afifi & MacMillan, 2011; Hamilton, Paglia-Boak, Wekerle, Danielson, & Mann, 2011). The severity of maltreatment experienced is directly related to the severity of psychological distress experienced in later life (Medrano, Hatch, Zule, & Desmond, 2002) with sexual abuse being associated with a greater risk factor for psychological distress (Whiffen & Macintosh, 2005). While not all children who have experienced maltreatment experience significant psychological distress, nonetheless it appears that the greater the psychological distress experienced, the greater the likelihood of later substance use (Medrano et al., 2002). Therefore, if distress increases likelihood of adverse reactions after maltreatment, then lack of distress may act to enhance a child's resilience after maltreatment (Afifi & MacMillan, 2011). Similar relationships are expected to be observed within the LA and Caribbean population.

This study seeks to investigate the relationship between child maltreatment and drug use within the Latin American and Caribbean countries of Colombia, El Salvador, Jamaica, Nicaragua, Panama and Uruguay while exploring the resilience

afforded by religious beliefs and the absence of psychological distress. These countries exhibit substantial social, cultural and economic differences. However, they may be more similar with regards to their drug use. The most extensively and frequently used licit and illicit substances in this region tend to be alcohol and cannabis, respectively (Longman-Mills et al., 2011). These nations also differ in terms of the legal protection afforded to their children and the also their rates of maltreatment.

Colombia

In 2006, the Code for Children and Adolescents Act, was created to legally enshrine the protection of children and adolescents in accordance with international human rights. However, Botero (2010) has noted that rates of child maltreatment in Colombia remain high, particularly in areas such as the Pacific Coast (Botero, 2010).

El Salvador

On March 26, 2009 the new Law of Integral Protection of Childhood and Adolescence was enacted and became effective April 16, 2010. The objective of this law was to guarantee protection and human rights to all children and adolescents in El Salvador (Asamblea Legislativa de El Salvador, 2009). The most frequently reported types of maltreatment in El Salvador are physical abuse and psychological/emotional abuse. However, only severe or extreme cases tend to be reported. Child maltreatment has been recognized as a significant concern in El Salvador and its impact needs further investigation (OCAVI, 2009). During the period 2004–2007, reported cases of child abuse increased from 1,818 cases reported in 2004 to 4,403 reported in 2007.

Jamaica

The physical disciplining of children is widely used in Jamaica even though The Jamaican Child Care and Protection Act 2004 declared that persons under eighteen years old should be protected from abuse, neglect, harm or even threat of harm. Between 2007 and 2011 approximately 7245 cases of sexual abuse and 6276 cases of physical abuse were reported (Office of the Children's Registry, 2012). The Jamaican child protection laws are inconsistent with the cultural treatment of children. The parenting style employed by parents or caregivers tends to be authoritarian with the consequences for any type of disobedience being a flogging (Smith & Mosby, 2003). However, children are brought up to believe that they are flogged because they are loved, with flogging by the mother usually being tempered by affection afterwards (Leo-Rhynie, 1997).

Nicaragua

Nicaragua has enacted legislation to prevent the violation of the human rights of children and adolescents. One example is Act 287: *Code of childhood and adolescence*, approved March 24, 1998. This Act identifies in Article. 5 Paragraph 1 that, "...no child or adolescent will be subjected to any form of discrimination, exploitation, illicit transfer within or outside the country, violence, abuse or physical, psychological and sexual violence, inhumane treatment, terrorizing, humiliating, oppressive, cruel, attack or negligence, by act or omission of their rights and freedoms." However government entities, especially the Ministry of the Family, do not have the budget required for implementation and enforcement. The main risk factors associated with child maltreatment in Nicaragua are poverty, low educational level and also a culture of violence (Plan Nicaragua, 2004). These factors are serious barriers to the prosecution of offenders and to tracking and monitoring cases of abuse (Plan Nicaragua, 2004). According to the Legal Medicine Institute, among cases of Domestic Violence, 4.54% were classified as Child Abuse in 2006 and 2.87% involved girls under 10 years old (CEPAL, UNICEF, & UNICEF TACRO, 2009). In cases of sexual abuse, the perpetrators are typically men between 18 and 30 years old, and are most commonly a father, step-father, neighbor, uncle, cousin, or brother (Plan Nicaragua, 2004).

Panama

In 2002, the Committee of the Rights of the Child reported 1,465 cases requiring the protection of children against child abuse; of these 758 (14.2%) cases involved girls and 691 (13.2%) involved boys. One of the goals of the National Plan of Action of Childhood and Adolescence 2003–2006 was to reduce the number of child abuse and child abandonment cases by 25%. However, police statistics for 2003–2006 indicate that cases of child abuse increased by 38% over that period (Panamá Government, National Plan of Action of the Childhood and the Adolescence, 2007).

Uruguay

In September 2004 Uruguay approved the Code of Children and Adolescents (Act No. 17.823). This act sets out the principles for the protection of the rights of children and adolescents. Article 117 of the Code establishes protection rights for threatened or violated children and adolescents by providing rapid intervention by judicial procedure. However, in 2008, a national study identified the rates of physical abuse among children less than 17 years to be 55% and neglect to be 86% (Ministerio de Desarrollo Social, 2008).

Thus, child maltreatment appears to be a significant issue in LA and Caribbean countries (UNO, ECLAC, & UNICEF, 2009). There is evidence that large numbers of children are maltreated, and in spite of legal efforts directed at the issue the resources to understand and address child maltreatment in these countries may be lacking. Addressing maltreatment in the region will also require an understanding of how it affects other problems, such as substance use and abuse. In this research we report preliminary information on the relationship of child maltreatment with the reported use of alcohol and cannabis among university students in six LA and Caribbean countries. We also explore the impact of two potential resilience factors, religiosity and low levels of psychological distress, on use of these two substances.

Methods

This research was conducted as part of a multicountry study of child maltreatment and associated factors among university students in LA and Caribbean countries (Longman-Mills et al., 2011). The project was initiated by a multinational working group in 2010 under the auspices of the Government of Canada (Department of Foreign Affairs and International Trade); the International Drug Abuse Control Commission (CICAD) of the Secretariat for Multidimensional Security (SMS) of the Organization of American States (OAS), and the Center for Addiction and Mental Health (CAMH). Participating investigators represented Colombia, El Salvador, Jamaica, Nicaragua, Panama and Uruguay.

Sample

University student volunteers from selected universities in Colombia, El Salvador, Jamaica, Nicaragua, Panama and Uruguay participated in the research. A total of 1167 female and 1127 male students participated, from one university within each country (with the exception of Columbia where two universities participated). The sample was predominantly in late adolescence and early adulthood, with 42.4% being under 20 years of age and 49.4% between 20 and 24 years old (the remaining 8.2% were 25 years and older).

Procedures

The study was approved by Research Ethics Boards of each participating institution. The sampling was purposive, since a random sample representative of the university populations in participating countries was not feasible at this early stage of research. The investigators at participating universities first identified those classes that were available to participate in the research. Next, each investigator selected from among accessible classes those that best represented the population of the participating university and would provide a sample size of approximately 300. Next, course instructors of selected classes were approached to approve in-class administration of the survey at an agreed-upon date between October 2010 and March 2011.

In classes where the instructor approved participation in the research, a member of the study team was introduced by the class instructor. The study team member then provided a brief description of the project, and invited students to participate. Participation was completely voluntary, and those who did not wish to participate simply left the class and incurred no penalty for doing so. Those who remained completed a consent form, and then were provided with the questionnaire to fill out. Participation was anonymous and no name-related information was linked to responses. Information on mental health resources was available for students who may have been affected by the nature of the questions.

Measures

The questionnaire obtained information on basic demographic variables, including age, sex and year in program, as well as alcohol and cannabis use, the experience of maltreatment as a child, psychological distress and religiosity. Alcohol and cannabis use in the past year were measured with questions drawn from the CICAD drug use questionnaire (Organisation of American States, Inter-American Drug Abuse Control Commission, 2010; CICAD is the acronym based on the Spanish translation of Inter-American Drug Abuse Control Commission – Comisión Inter-Americana para el Control del Abuso de Drogas). The CICAD questions have been used extensively in survey research in LA and Caribbean countries and have demonstrated their reliability and validity in these populations (Organisation of American States, Inter-American Drug Abuse Control Commission, 2010).

The Adverse Childhood Experiences (ACE; Felitti et al., 1998) questionnaire was included to obtain measures of maltreatment. The questionnaire is a 28-item self-report instrument that yields five measures of maltreatment during childhood (sexual, physical, emotional and two scales reflecting neglect). The ACE questionnaire has been used in many studies in a variety of cultural settings and has been found to demonstrate adequate reliability and validity (e.g., Dube, Williamson, Thompson, Felitti, & Anda, 2004; Rothman, Edwards, Heeren, & Hingson, 2008). We report on the three maltreatment measures in this work, and the neglect scales will be discussed elsewhere. Neglect may be reflective of adverse socioeconomic conditions, and thus consideration of scores on these measures from developing countries that may have higher poverty rates than found in developed countries need to address this issue.

Psychological distress was measured with the 10-item version of the Kessler Psychological Distress Scale (K10 – Kessler et al., 2003). The K10 is a widely used self-report screening measure of psychological distress experienced in the preceding

Table 1
Logistic regression models predicting past 12 months alcohol use.^a

Variables	Wald Chi-square	p	Odds ratio	Lower 95% confidence limit for odds ratio	Upper 95% confidence limit for odds ratio
Analyses including physical abuse					
Gender	15.386	<0.0001	0.686	0.568	0.828
Age	0.691	0.406	0.986	0.955	1.019
K10 scale	0.060	0.807	1.002	0.989	1.015
Religiosity	42.336	<0.0001	1.415	1.274	1.571
Physical abuse	16.117	<0.0001	1.514	1.236	1.853
Analyses including emotional abuse					
Gender	16.226	<0.0001	0.680	0.564	0.821
Age	0.351	0.554	0.990	0.959	1.023
K10 scale	0.371	0.542	1.004	0.991	1.017
Religiosity	44.232	<0.0001	1.421	1.282	1.577
Emotional abuse	5.670	0.017	1.295	1.047	1.601
Analyses including sexual abuse					
Gender	17.013	<0001	0.673	0.557	0.812
Age	0.185	0.667	0.993	0.961	1.026
K10 scale	0.785	0.376	1.006	0.993	1.019
Religiosity	44.990	<0001	1.428	1.287	1.584
Sexual abuse	1.633	0.201	1.290	0.873	1.907

^a Controlling for the effects of country/institution.

30 days. It has been used cross-culturally in epidemiological surveys and has been translated into numerous languages, and is utilized in [World Health Organization \(2008\)](#) mental health surveys ([Kessler et al., 2003](#)). It consists of questions that screen for anxiety and depressive symptoms which are associated with many other psychological disorders. The K10 has been validated across cultures and has also been found to be related to a range of psychological diagnoses ([Andrews & Slade, 2001](#)).

Religiosity was assessed with a single item (“How important are religious beliefs to you”) with response options very important, important, somewhat important, and not important. This item was based on one of the religiosity items suggested by [Gorsuch and McFarland \(1972\)](#), who found that it had similar psychometric characteristics (reliability and validity) to longer scales.

Data preparation and analyses

Data from each site were collected by the site investigator and entered into an Excel file. The Excel files were then forwarded to the first author (S.L.) for combining and cleaning. Data were then forwarded to Toronto for analyses conducted using SAS.

To investigate the impact of maltreatment on alcohol and cannabis use, logistic regression analyses were conducted. Separate analyses were conducted for the use of alcohol and cannabis. We also entered age and sex in these analyses to control for their impact on substance use. Religiosity and psychological distress were entered to provide an initial consideration of their potential resilience-enhancing effects. Since we observed substantial associations between measures of maltreatment, we conducted separate analyses for these as well, resulting in a total of six logistic regression analyses conducted. Country/university effects were also controlled for in each analysis, but not reported because of agreements with participating institutions not to identify their results in any comparative manner.

Log-regression models were built using as the outcome variables any use of alcohol and any use of cannabis in the past 12 months. In the models shown in [Table 1](#) (alcohol use models, with separate models for each maltreatment measure) and [Table 2](#) (cannabis use models, with separate models for each maltreatment measure) the outcome measure is a binary variable with values 0 = No, 1 = Yes. The explanatory variables are gender, age, country/university, religiosity (coded 1 = very important, 2 = important, 3 = somewhat important, 4 = not important), K10 (psychological distress measure) and abuse (emotional, physical or sexual).

The log regression models can be expressed with the following equation:

$$\text{Logit}[P(Y = 1)] = c_0 + c_1X_1 + c_2X_2 + c_3X_3 + c_4X_4 + c_5X_5 + c_6X_6 \quad (1)$$

where Y corresponds to use of alcohol or cannabis in the past 12 months, X_1 , X_2 , X_3 , X_4 , X_5 are the variables gender, country/university, age, K10 scale, and religiosity, respectively. X_6 denotes the “abuse” variable (emotional, physical or sexual) and it has values 0 = “No abuse”, 1 = “Abuse”. The exponentials of the coefficients c_1 , c_2 , c_3 , c_4 , c_5 , and c_6 associated to the independent variables are interpreted as the Odd Ratio of the use of alcohol or cannabis in the past 12 months for each increase in the independent variable, controlling for the remaining independent variables.

Table 2Logistic regression analyses predicting cannabis use in the past 12 months.^a

Variables	Wald Chi-square	p	Odds ratio	Lower 95% confidence limit for odds ratio	Upper 95% confidence limit for odds ratio
Analyses including physical abuse					
Gender	3.224	0.073	0.786	0.604	1.022
Age	2.931	0.087	1.039	0.995	1.085
K10 scale	0.133	0.715	1.003	0.986	1.021
Religiosity	70.385	<0.0001	1.766	1.546	2.016
Physical abuse	7.711	0.005	1.491	1.125	1.977
Analyses including emotional abuse					
Gender	3.358	0.067	0.783	0.603	1.017
Age	3.796	0.051	1.043	1.000	1.089
K10 scale	0.337	0.562	1.005	0.988	1.023
Religiosity	71.134	<0.0001	1.769	1.550	2.020
Emotional abuse	3.402	0.065	1.324	0.983	1.783
Analyses including sexual abuse					
Gender	3.105	0.078	0.790	0.608	1.027
Age	4.612	0.032	1.049	1.004	1.096
K10 scale	0.889	0.346	1.009	0.991	1.026
Religiosity	70.714	<0.0001	1.768	1.548	2.019
Sexual abuse	0.187	0.665	0.879	0.490	1.576

^a Controlling for the effects of country/institution.

Logit [$P(Y = 1)$] equals to $\log [P(y = 1)/1 - P(y = 1)]$, or the log of the odds ratio. The expression $P(Y = 1) = [P(y = 1)/1 - P(y = 1)]$ corresponds to the “odds ratio”. This ratio measures the ratio between the odds of “Use of alcohol or cannabis in the past 12 months” and the odds of “No use of alcohol or cannabis in the past 12 months”.

Thus a university student with gender x_1 , country x_2 , age x_3 , K10 scale x_4 , religiosity x_5 and abuse (emotional, physical or sexual) x_6 has the probability of abusing alcohol or cannabis in the past 12 months calculated at particular predictor values using the equation:

$$P(y = 1) = \frac{e^{c_0 + c_1 X_1 + c_2 X_2 + c_3 X_3 + c_4 X_4 + c_5 X_5 + c_6 X_6}}{1 + e^{c_0 + c_1 X_1 + c_2 X_2 + c_3 X_3 + c_4 X_4 + c_5 X_5 + c_6 X_6}}$$

where c_0 , c_1 , c_2 , c_3 , c_4 , c_5 and c_6 are estimates from the log regression models. The odds ratios (ORs) are shown in Tables 1 and 2 for each of the independent variables in the alcohol and cannabis use models (for example, in the OR estimation for the independent variable X_1 , the coefficients c_2 , c_3 , c_4 , c_5 and c_6 are equal to 0).

Results

Past 12-month use of both alcohol and cannabis was found to be relatively common in the sample. Alcohol use was reported by 59.8% of the students and cannabis use was reported by 19.1%. Sexual abuse was the least common form of maltreatment (reported by 6.1% of the sample) while physical abuse and emotional abuse were each reported by about a third of respondents (33.9% and 30.4%, respectively).

Alcohol use

The three logistic regression analyses examining predictors of alcohol use are summarized in Table 1. As can be seen, the results for physical abuse and emotional abuse are very similar. Females are significantly less likely to report using alcohol than males (OR = 0.686 and 0.680, respectively). Age and psychological distress did not significantly affect whether or not respondents reported drinking in these analyses. Religiosity was associated with drinking status in both analyses, with higher levels of religiosity being associated with not using alcohol (OR = 1.415 and 1.421, respectively). Both measures of maltreatment were also strongly associated with drinking as well. Experiencing physical abuse and experiencing emotional abuse significantly predicted using alcohol among student respondents (OR = 1.514 and 1.295, respectively).

The results for sexual abuse were somewhat different. Females were significantly less likely to use alcohol (OR = 0.673). Similarly, age and psychological distress did not predict alcohol use, while religiosity did (OR = 1.428). However, in contrast to physical and emotional abuse, experiencing sexual abuse did not significantly predict drinking status.

Cannabis use

Table 2 summarizes the results of logistic regression analyses predicting cannabis use. Across all three analyses, gender did not significantly predict cannabis use. The effects of age were mixed depending on the analysis; when the analyses included experience of sexual abuse, older respondents were significantly more likely to report using cannabis (OR = 1.049),

but no significant relationship was observed between age and physical or emotional abuse. Psychological distress did not significantly predict cannabis use in any of the analyses. Religiosity was a strong predictor of cannabis use, with higher levels of religious involvement predicting not using the drug in each analysis (ORs = 1.766, 1.769 and 1.768). Effects of maltreatment depended on the measure considered. Experiencing physical abuse significantly predicted cannabis use (OR = 1.491). However, experiencing emotional abuse and sexual abuse did not.

Discussion

The limitations of this research must be kept in mind when interpreting these results. First, the sample cannot be considered to be representative of university students in the participating countries, and thus the results should not be generalized to this population. Nevertheless, these data provide a significant first look at potentially important factors that may influence substance use by young people in LA and Caribbean countries. Second, the data are based on self-report, and could be subject to associated forms of bias, e.g., in not wanting to disclose potentially sensitive personal information. Third, our outcomes are restricted to measures of alcohol and cannabis use, and do not consider use of other substances or measures of abuse or dependence. A related point is that it is important to recognize that use of alcohol, and cannabis are common and do not necessarily reflect maltreatment.

Child maltreatment has been identified as a significant public health problem internationally (Kessler et al., 2010; Longman-Mills et al., 2011). In developed countries a substantial body of research links experience of maltreatment to substance use and substance problems in adolescence and later (Rothman et al., 2008; Tonmyr et al., 2010). However, while there is evidence to suggest similar links in the developing world (Kessler et al., 2010), much less research from these countries has appeared. The existence in the developing world of very different cultures and social practices with regards to alcohol and drug use, on one hand, and with regards to the treatment of children, on the other, suggest that simple extrapolation of results from developed countries to developing countries is unwise.

In this research we examined the relationship between self-reported experience of physical, emotional and sexual abuse in childhood and the use of cannabis and alcohol in students from selected universities in six LA and Caribbean countries. The results show an impact of maltreatment on alcohol and cannabis use in these samples, consistent with expectations derived from research in developed countries (Hovdestad et al., 2011; Tonmyr et al., 2010). While the nature of the samples does not permit generalization of these findings to the general student population in the region, the findings support the hypothesis that, as in developed countries, experience of childhood maltreatment in developing countries may increase the likelihood of alcohol and cannabis use in adolescence and young adulthood.

The prevalence, nature and strength of religious belief vary substantially internationally. Evidence from studies in developed countries suggests that strong religious beliefs may contribute to resilience and help individuals cope with adversity. Religiosity may mitigate the effects of maltreatment (Doxey et al., 1997; Kim, 2008). Our findings provide support for this suggestion. Stronger religious beliefs were associated with reduced likelihood of using both cannabis and alcohol across all analyses. These effects may be particularly salient in some LA and Caribbean countries, where strong religious beliefs may be common.

Interestingly, we found no evidence for a beneficial impact of minimal psychological distress, as measured by the K10, on alcohol and cannabis use. Some evidence suggests that both stress and maltreatment may predict alcohol and drug use (e.g., Young-Wolff, Kendler, & Prescott, 2012) and that minimal levels of stress could counteract the effects of maltreatment on substance use (Medrano et al., 2002). However, we found no significant relationship between the K10 measure and substance use in any of the analyses. One possible interpretation of these results is that the relationship of stress to substance use in this region is different than it is in developed countries where this relationship has been reported previously.

While we observed that measures of maltreatment were associated with alcohol and cannabis use, this relationship was not uniform across measures of maltreatment. Specifically, physical abuse was associated with increased use of both alcohol and cannabis, emotional abuse was associated with increased alcohol use but not cannabis use, and sexual abuse was not significantly associated with either alcohol or cannabis use. These results are similar to studies from developed countries that find consistent associations with physical abuse measures (e.g., Rothman et al., 2008), but may differ from studies that find similarly consistent relationships of emotional and sexual abuse with alcohol and cannabis use (Rothman et al., 2008). This possible variance of effects of the differing forms of maltreatment could reflect methodological factors. For example, these differing relationships may result in part from the differing prevalence of physical, emotional and sexual abuse, and also consistent relationships might emerge with a larger sample. However, they may also reflect culturally influenced differences in how maltreatment affects substance use.

These preliminary data provide an important look at the effects of maltreatment on substance use in university students in LA and Caribbean countries. The results show important effects of maltreatment on substance use, consistent with other studies, but also suggest that relationships seen in this region may differ from results seen in other parts of the world. Another important finding was the strong effect of religiosity on substance use in these university students, suggesting that this measure could act to reduce maltreatment effects. Further work is needed to understand the relationships of maltreatment with substance use in this region, and to examine how religiosity and other possible protective factors may affect this relationship. Future research in LA and Caribbean countries should examine other sectors of the population and consider the impact of maltreatment on use of a wider range of substances, and also on measures of substance problems, including

abuse and dependence. Additionally, the impact of experiencing multiple forms of maltreatment needs to be considered, and additional research on factors that promote resilience in the face of these adversities is necessary (Garbarino, 2009).

Acknowledgements

The authors are grateful for valuable input, support and encouragement from Drs. D.A. Wolf, N. Giesbrecht, C. Strike, L. Simich, Ms. K. Lo, Mr. R. Chung and Ms. G. Stoduto. The Inter-American Drug Abuse Control Commission, the Centre for Addiction and Mental Health, and the Department of Foreign Affairs and International Trade of Canada supported the work reported here. The authors acknowledge the support of their home institutions for this initiative, and Drs. Hamilton, Erickson and Mann also acknowledge ongoing funding support from the Ontario Ministry of Health and Long-Term Care. The authors also express their appreciation to three anonymous reviewers whose valuable comments have helped to improve and clarify this work substantially.

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