Early Adolescent Substance Use in a National Sample of Mexican Youths: Demographic Characteristics that Predict Use of Alcohol, Tobacco, and Others Drugs

Alejandro L. Vázquez  
*Utah State University*

Melanie M. Domenech Rodríguez  
*Utah State University*

Sarah E. Schwartz  
*Utah State University*

Nancy G. Amador Buenabad  
*Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz*

Marycarmen N. Bustos Gamiño  
*Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz*

María de Lourdes Gutierrez López  
*Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz*

See next page for additional authors

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Utah State University

Nancy G. Amador Buenabad, Marycarmen N. Bustos Gamiño,

María de Lourdes Gutierrez López, and Jorge A. Villatoro Velázquez

Instituto Nacional de Psiquiatría Ramón de la Fuente Muñíz

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Abstract

The United States and Mexico have seen significant increases in the prevalence of substance use among Latinx adolescents in the last 20 years. Research is needed to address rising national rates of substances use to inform the development of policies and intervention programs targeting Latinx youth. Our primary aim was to identify demographic factors associated with substance initiation and use among elementary age Latinx youth. Data for the present study include 52,171 elementary students in 5th and 6th grades, who participated in the National Survey of Drug Use Among Students (ENCODE) in Mexico. Youths reported demographic information, rates of substance use for alcohol, tobacco, marijuana, inhalant, and other substances, or intention to initiate in first time substance use. Findings suggest that Latinx youth who were boys, of indigenous heritage, non-religious, and overage for their grade were especially at risk for reporting lifetime alcohol, tobacco, marijuana, inhalant, and other substance use. Boys and youth with indigenous heritage were more likely to report intentions to try alcohol, tobacco, and other substances for the first time. High subjective economic status was associated with lower risk for reporting lifetime tobacco use and substance use intentions in general. Efforts are needed to disseminate accessible substance use prevention programs during early adolescence to encourage positive developmental trajectories among Latinx youths at an elevated risk for substance initiation and use. Clinical and research implications are discussed.

Keywords: substance use, intentions, early adolescence, elementary, indigenous, Mexico

Public statement: Substance use results in significant costs to society through immediate impacts (e.g., medical costs, reduced school performance) and long-term shifts in developmental outcomes. Rates of use and intentions to use are increasing. These national findings provide important risk factors associated with substance initiation during a pivotal developmental period.
Resumen

Los Estados Unidos y México han visto aumentos significativos en la prevalencia del consumo de sustancias entre adolescentes Latinxs en los últimos 20 años. Se necesita investigación para abordar las crecientes tasas nacionales para informar el desarrollo de políticas públicas y programas de intervención dirigidos a los jóvenes Latinxs. Nuestro objetivo principal fue identificar los factores demográficos asociados con el inicio y el uso de sustancias entre los jóvenes Latinxs de primaria. Nuestra muestra incluye a 52,171 estudiantes de 5° y 6° grado, que participaron en la Encuesta Nacional de Consumo de Drogas entre Estudiantes (ENCODE) en México. Los jóvenes proporcionaron información demográfica, las tasas de consumo de alcohol, tabaco, marihuana, inhalantes y otras sustancias, o la intención de iniciar en el consumo de sustancias por primera vez. Los hallazgos sugieren que los jóvenes Latinx varones, de origen indígena, no religioso, y sobre la edad promedio para su grado corrieron un riesgo especial de informar consumo prolongado de alcohol, tabaco, marihuana, inhalantes, y otras sustancias. Los jóvenes varones y de herencia indígena tenían más probabilidades de informar intenciones para probar alcohol, tabaco, y otras sustancias por primera vez. El alto estatus económico subjetivo se asoció con un menor riesgo de informar consumo de tabaco alguna vez en la vida y las intenciones de uso de sustancias en general. Se necesita diseminar programas de prevención del consumo de sustancias durante la adolescencia temprana para fomentar trayectorias de desarrollo positivas entre los jóvenes Latinxs con un riesgo elevado de iniciación y consumo de sustancias.

Discutimos las implicaciones clínicas y de investigación.

*Palabras clave:* consumo de sustancias, intenciones, adolescencia temprana, primaria, indígena, México
Substance Use in a National Sample of Mexican Youths: Demographics Characteristics that Predict Use of Alcohol, Tobacco, and Other Drugs

The US and Mexico have seen significant increase in the prevalence of substance use among Latinx adolescents in the last 20 years (Johnston et al., 2018; Villatoro Velázquez et al., 2016), in addition to increased rates of substance use in cities along Mexico’s northern border with the US (Becerra & Castillo, 2011). Latinx youth may be especially vulnerable to the negative consequences of substance use due to greater cultural acceptability of use (i.e., alcohol; Parsai, Voisine, Marsiglia, Kulis, & Nieri, 2009), and limited access to intervention programs in both the US and Mexico (Borges et al., 2009; Saloner & Cook, 2013). Research in the US has documented the negative impact of substance use prior to the age of 13, which is associated with an increased risk for school avoidance, fighting, and substance dependence (King & Chassin, 2007; Sales-Wright, Hernandez, Maynard, Saltzman, & Vaughn, 2014). Furthermore, US-based researchers have found that the consequences of adolescent substance use can persist into adulthood, contributing to the development of mental and medical health disorders (10.1% Latinx; Wymbs et al., 2014). Despite the negative impact of early substance use, much of the current literature between the US and Mexico has focused predominantly on middle to late adolescence (i.e., ages 12-18; Benjet et al., 2007; Johnston et al., 2018; Villatoro Velázquez et al., 2013; Villatoro Velázquez et al., 2017), suggesting a potential dearth of knowledge on factors that predict substance use in the preadolescent period. Identifying factors associated with the emergence of substance use during the years leading into adolescence may provide valuable information needed to aid the development of prevention programs targeting Latinx youth. This knowledge may be useful for prevention efforts in Mexico and in contexts like the US, where there are a sizeable number of Latinx immigrants.
Previous research in the US suggests that Latinx boys are at greater risk for alcohol, tobacco, and marijuana use relative to girls during adolescence and early adulthood (Evans-Polce, Vasilenko, & Lanza, 2015). Findings among adult populations in Mexico suggest that men between 18 and 34 years of age report the highest percentages of consumption of illicit drugs (Villatoro Veláquez et al., 2013). US-based researchers have posited that elevated rates of substance use among Latinx boys and men may be explained by greater cultural acceptability of alcohol use among boys relative to girls (Parsai et al., 2009) and alignment with a cultural value of *machismo* that may contribute to a greater likelihood of substance initiation and use (Unger et al., 2002). Thus, it is possible that cultural risk factors (e.g., acceptability of alcohol use, *machismo*) among Latinx boys may contribute to an elevated risk for substance use that may persist into adulthood. Yet, further inquiry is needed to determine if this gender-based difference in risk for substance use is present among elementary age Latinx youth.

In the US, increases in age are associated with increases in risk for substance use across genders (Aspy, Tolma, Oma, & Vesely, 2014). In Mexico, the age of initiation for alcohol and tobacco use is approximately 13 years-old for both boys and girls (Villatoro Veláquez et al., 2016), with the risk for substance use increasing significantly after age 15 (Benjet et al., 2007). These finds are consistent with prior research that has observed a rapid escalation in rates of substance use from childhood to adolescence among Mexican-origin youth in the US (Atherton, Conger, Ferrer, & Robins, 2015). In Mexico, this trend is reflected in significant increases in the rates of substance use from middle school (i.e., 24.2%) to high school (i.e., 54.3%; Villatoro Veláquez et al., 2016). Researchers in the US have also noted the impact of age and grade on substance initiation. Dudovitz and colleagues (2015) examined higher rates of risky behavior among youth above the developmentally appropriate age for their grade. Their findings suggest
that pubertal stage may explain increases in risk for substance initiation among overage youth (i.e., youth above the typical age for their grade), which may be attributed to increases in sensation seeking associated with advanced pubertal stage. Given that risk for substance use initiation escalates with each subsequent developmental stage, there is a need to identify risk factors implicated in substance use during earlier developmental periods (i.e., early adolescence, prior to age 12), in addition to factors that promote positive developmental trajectories.

Substance use may vary depending on substance and socioeconomic status (SES). Ortiz-Hernandez, Lopez-Moreno, and Borges (2007) found that patterns of substance use varied across SES in Latin American countries. High SES adolescent were more likely to engage in alcohol use, smoking, and prescription drug use relative to low SES youth. In contrast, adolescents with low SES were more likely to develop mental health problems and alcohol abuse/dependence relative to high SES youth. Thus, while high SES youth may have greater prevalence of substance use, low SES Latinx youth may be especially vulnerable to the detrimental effects of substance use. Adolescents perceptions of SES may also impact their risk for substance use. Previous research in Mexico suggests that high perceived socioeconomic status among youth was associated with greater risk for initiating in substance use (Ritterman et al., 2009). Thus, it is possible that SES and adolescents’ perceptions of their economic status may impact substance use during early adolescence.

Rates of substance use may be impacted by the type of communities youth reside in. In a sample of Mexican students (i.e., 5th and 6th grade, middle school, high school), the prevalence of alcohol consumption among youth did not significantly differ between urban (i.e., 17.1%) and rural (i.e., 16.1%) communities (Villatoro Veláquez et al., 2016). However, urban youth experienced significantly greater prevalence of tobacco and illegal substance use relative to rural
youth. Therefore, characteristics of the adolescent’s community may increase their risk for utilizing different substances. These findings suggest a need to further examine whether community status predicts early adolescent substance use across a broad range of substance (i.e., alcohol, tobacco, marijuana, inhalants, other drugs).

Another potential factor impacting substance initiation and use among Latinx adolescents is religiosity. Greater religiosity among Central American (i.e., Panamá, Costa Rica, Guatemala) youths and their parents may contribute to a reduced risk for lifetime substance use and dependence (Kliwer & Murrelle, 2007). These findings appear to be consistent across context as religiosity is associated with a reduced risk for adolescent substance use among Latinx youth residing in the US and Mexico (Benjet et al., 2007; Hodge, Marsiglia, & Nieri, 2011).

Researchers in the US have documented that spirituality may increase abstinence from marijuana and hard substances (84% Latinx; Hodge, Cadenas, & Montoya, 2001), and can act as a buffer against the negative impact of life stressors that may promote substance initiation (3% Latinx; Wills, Yaeger, & Sandy, 2003). No known research has extended these findings to earlier developmental stages.

Many Mexican youths belong to indigenous ethnic groups. The United Nations Children’s Fund (UNICEF; 2011) estimates that 9.8% (i.e., 10 million) of Mexico’s population belong to an indigenous ethnic group. Indigenous Mexicans experience marginalization, low income, poor education, and limited access to public services at disproportionate rates. This is of concern since exposure to poverty and community-based stressors (i.e., disadvantaged neighborhoods, crime, sale of drugs) are associated with the development of mental illness (i.e., depressive disorder) and substance use initiation among native populations in the US (Nails, Mullis, & Mullis, 2009). Given that Mexican indigenous youth experience high rates of social
DEMOGRAPHIC PREDICTORS OF EARLY SUBSTANCE USE

(i.e., marginalization, poor education) and community (i.e., poverty, limited access to services) stressors, further research is needed to determine whether indigenous heritage in Mexico represents a risk factor for substance use.

The current study examined demographic predictors of substance initiation and use among 5th and 6th graders who participated in a national survey on substance use in Mexico. Our primary aim was to identify demographic factors that may contribute to an increased risk for substance initiation and use within a large sample of elementary age Latinx youth. Based on previous research, we hypothesized that factors such as being a boy, of indigenous heritage, low religiosity, and high perceived economic status would be associated with an elevated risk for reported lifetime substance intent and use in our sample. Furthermore, we expected that 6th graders would be more likely to engage in substance use, while 5th graders would be more likely to report intent to use substances for the first time. Youth that were above the developmentally appropriate age for their grade (i.e., 5th = ages 10-11 and 6th = ages 11-12), were expected to be more likely to report lifetime substance use relative to their age appropriate peers. Finally, youth residing in urban communities were expected to be at greater risk for tobacco and illegal substance use, while alcohol use was not expected to differ across community types.

Method

The present study drew from the National Survey of Drug Use Among Students (Encuesta Nacional de Consumo de Drogas en Estudiantes; ENCODE), a national survey on substance use that included 191,880 elementary, middle, and high school students. Data for the present study included 52,171 elementary students (5th and 6th grade) that participated in the ENCODE survey. Self-report data on adolescents included: Age ($M_{age} = 10.40; SD_{age} = .82$), gender (26,477; 50.8% boys), grade (31,219; 59.8% 5th), indigenous heritage (7,682; 14.7%), and
the type of community that they resided in (36,401; 69.8% urban). Of the participants included in the current study, 1,488 (2.9%) adolescents were above the typical age for their grade. Additionally, 46,583 (89.3%) participants reported that religion was important to them. Students qualified for the study if they were enrolled in a selected school and were present during the period the survey was administered. The non-response rate was 18.4% within the elementary school sample, primarily due to absences.

**Procedures**

The present study used extant data. ENCODE representatives were granted permission by the Secretary of Public Education in Mexico to survey students and train school staff in the administration of the national survey on substance use. Parents did not provide active consent as the Secretary of Public Education granted the consent; students provided assent at the outset of the survey and students that did not wish to participate could elect to do so. Approval was sought for the current study from the Institutional Review Board and the Ethics Committee of the [masked for peer review]. ENCODE collected data utilizing a cross-sectional design. The original sample was gathered using a stratified sampling approach so that each of the 32 states of the nation and each educational level (elementary, middle, and high school) within each state were sufficiently represented in the final sample, specifically, there were 1,560 students per each educational level within each state. Within this strategy, schools were randomly selected for participation in the national survey. Participants completed paper surveys in a 70 min group session. Survey questions were read out loud to the elementary age students in their classrooms to reduce developmental language barriers. The ENCODE team conducted validity checks (e.g., zig zags, inconsistent responses between lifetime and 30-day use) of outcome variables (i.e., lifetime use and intentions) and removed inconsistent responders \( n = 476; 0.009\% \) from the
original sample \((n = 52,647)\). The current study confirmed the validity of lifetime use and intention outcomes by examining response consistency across a variety of indicators (e.g., last year, 30 days use, lifetime use for first time substance intentions). Responses were consistent for all outcomes with the exception of other substance use intentions. Inconsistent responders were removed from analysis examining other substance use intentions \((n = 1,450, 2.8\%)\). Detailed methodological information is found in Villatoro Veláquez et al. (2016).

Measures

**Youth characteristics.** Youth self-reported data on individual items for age, gender, and grade. An “overage” variable was generated to represent participants who were above the typical age for their respective school grades (i.e., 5\(^{th}\) = ages 10-11 and 6\(^{th}\) = ages 11-12; Dudovitz et al., 2015).

**Ethnicity.** Previous research has utilized household language as a proxy for measuring acculturation and ethnicity among Latinx populations (Wallace, Pomery, Latimer, Martinez, & Salovey, 2010). Within the current study, participants were queried regarding their indigenous heritage with a single item (“Of the people that live in your home does anyone speak an indigenous language?”). Youth responded *yes* (1) or *no* (0).

**Substance intent and use.** Participants were asked to report on lifetime substance use on five items that queried alcohol, tobacco, marijuana, inhalant, and other substance use individually. Participants indicated whether they had past use, *yes* (1) or *no* (0), for each substance. Intention to use substances was measured using substance specific items. Participants who had not previously initiated in substances use were asked to rate the likelihood that they would engage in alcohol, tobacco, or other substances use (e.g., marijuana, inhalants) on a 4-point scale: *not likely* (1), *likely* (2), *very likely* (3), *I already consume alcohol* (4). A
dichotomous substance use intentions variable was created by coding responses for those who reported that they were “likely” or “very likely” to use substances as probable (1), while those who reported that it was “not likely” were coded as not probable (0).

**Subjective economic status.** A scale was created by the ENCODE team to assess youth’s perceived economic status. This measure consisted of 11-items asking participants to endorse whether they had access to basic necessities (e.g., buying food, clothes, parents ability to pay bills). Responses were in the form of a 3-point scale: always (1), sometimes (2), and never (3). Items were averaged with higher scores reflecting greater perceived economic status. The scale had good internal consistency within the current sample ($\alpha = .855$).

**Community.** Participants reported on the type of community they resided in across five categories: large urban area or city (1), medium city (2), small city (3), village (4), ranch (5). Responses were recoded into dichotomous categories: urban (1) and agricultural (0). Large urban area, medium, and small cities were coded as urban.

**Religiosity.** Participants reported on how important religion was to them on a single item with a 3-point scale: not important (1), somewhat important (2), very important (3). Youths who reported that religion was somewhat or very important were coded as being religious (0), otherwise they were considered nonreligious (1).

**Data Analysis**

In the overall dataset, 11,697 participants were missing at least one covariate. Chi-square tests of independence were used to determine whether there was a relationship between incomplete (i.e., missing at least one variable) and complete cases for each variable (e.g., grade, gender, subjective economic status items). Results showed statistically significant relationships between observed and missing cases for all variables ($p < .001$). When observed values for
variables are related to missing values they are said to be missing conditionally on other variables (Enders, 2010). As patterns of missingness were related to observed cases for all variables, multiple imputations can be used to estimate missing values based on information provided by observed values (Donders, van der Heijden, Stijnen, & Moons). Analysis was conducted in two steps using SPPS. First, in the imputation stage, five datasets were created with missing responses filled differently with generated values in each dataset. Items were imputed individually, as this method improves estimate accuracy when missingness exceeds 10% (Eekhout et al., 2014). Second, in the analysis stage, binary logistic regression analyses were conducted independently in each of the five datasets and results were pooled to examine predictors of substance intent and use. Results are interpreted in the same manner as standard logistic regression.

**Results**

Within the current sample, lifetime alcohol use was the most frequently endorsed substance (n = 8,954; 17.2%), followed by tobacco (n = 3,626; 7%), marijuana (n = 1,435; 2.8%), inhalants (n = 1,130; 1.9%), and other substances (e.g., cocaine, methamphetamine; n = 1,002; 1.6%). Among youth who denied lifetime substance use, rates of intentions to engage in future use were highest for tobacco (n = 5,369; 10.3%) and other substances (3,094; 6.1%), followed by alcohol (2,841; 5.4%).

**Substance Use**

**Alcohol.** Most demographic variables yielded statistically significant differences between comparison groups suggesting they were predictors of elevated risk for alcohol use (see Table 1 for model statistics, odds ratios [ORs], and 95% confidence intervals [CIs]). Boys were more than twice as likely to report trying alcohol during their lifetime relative to girls. Youths in
the 6th grade were more likely to endorse alcohol use relative to their 5th grade peers. Youth who were overage for their grade were more likely to report alcohol use relative to those who were the appropriate developmental age. Indigenous youth were more likely to use alcohol than their non-indigenous peers. Youths who reported that religion was not important to them were also more likely to use alcohol relative to those who endorsed religion as being important. Subjective economic status and community type were not related to adolescent report of alcohol use.

**Tobacco.** Boys were two times and a third more likely to report tobacco use relative to girls (see Table 1). Furthermore, 6th graders were more likely than 5th graders to report trying tobacco. Individuals who were overage for their grade were two and half times more likely than their age appropriate peers to report that they had used tobacco. Indigenous youth were also more likely to report use as compared to non-indigenous youth. Religious youth were less likely to report tobacco use relative to their non-religious peers. Of the lifetime substance use indicators examined, tobacco use was the only substance associated with subjective economic status. Unit increases in subjective economic status were associated with reductions in risk for reporting lifetime tobacco use. Community type was not significantly associated with adolescent report of tobacco use.

**Marijuana.** Marijuana had the largest gender difference in odds of use. Boys were nearly three times more likely than girls to report using marijuana (see Table 1). Unlike alcohol and tobacco, participants in the 5th grade were more likely to report use relative to 6th graders. Yet overage students were twice as likely to report use relative to their age appropriate peers. Non-indigenous youth were less likely than indigenous youth to report use. Lastly, non-religious youth were twice as likely to use marijuana relative to religious youth. Community type and subjective economic status were not significantly related to lifetime marijuana use.
Inhalants. Inhalant use was nearly three times more likely among boys relative to girls (see Table 1). Fifth graders were at greater risk for use relative to 6th graders. Overage youth were two times more likely to report inhalant use relative to their age appropriate peers. Indigenous youth were more likely to report use relative to non-indigenous youth. Non-religious youth were twice as likely to report use as compare to their religious peers. Community type and subjective economic status were not related to reported use of inhalants.

Other substances. Use of other substances was higher among boys, such that girls were nearly three times less likely to report use (see Table 1). Participants in the 5th grade were more likely to report other substance use relative to 6th graders. Overage youths were especially at risk with nearly three times greater likelihood of use than their age appropriate peers. Indigenous heritage was associated with a greater likelihood of use as compared to non-indigenous youth. Residing in an urban community was associated with greater risk for reporting trying other substances. Lastly, non-religious youth were two times more likely to report use relative to their religious peers. Subjective economic status was not related to lifetime use of other substances.

Substance Initiation

Alcohol. Intention to initiate in alcohol differed between gender. Specifically, boys who had not previously tried alcohol were more likely to report that they would “probably” initiate in alcohol use relative to girls (see Table 2 for model statistics, odds ratios [ORs], and 95% confidence intervals [CIs]). Unit increases in subjective economic status were associated with a reduced likelihood of reporting alcohol intentions. Indigenous youth were more likely to report alcohol intentions relative to their non-indigenous peers. Overage, community, grade, and religiosity were not related to intentions to initiate in alcohol use.
Tobacco. Adolescent intentions to initiate in tobacco use were greater among boys (see Table 2). Youth in the 5th grade were more likely than 6th graders to report that they would initiate tobacco use. Unit increases in subjective economic status were associated with reduced odds of reporting tobacco intentions. Moreover, indigenous youth were more likely to report that they would try tobacco as compared to non-indigenous youth. Adolescent community, overage, and religiosity were not associated with intent to initiate tobacco use.

Other substances. Boys were more likely to report intent to use other substances relative to girls (e.g., cocaine, methamphetamine; see Table 2). Intentions to initiate in other substance use were more likely among 5th graders. Furthermore, unit increases in adolescent subjective economic status were associated with a lower likelihood of intentions to initiate in use. Indigenous youth were more likely to report that they would initiate in use relative to non-indigenous youth. Community type, being overage, and religiosity were not related to adolescent intentions to initiate in other substances use.

Discussion

The current study extends previous literature by identifying demographic factors implicated in substance use and intentions in a nationally representative sample of Mexican youth. Little research has addressed youths at this pre-adolescent developmental level and the data may be very useful in informing prevention programming for countries with sizeable Latinx populations. Some of our findings are powerful for their consistency. Boys, of indigenous heritage, and nonreligious youths were consistently at increased risk for intentions and use of all substance in relation to their comparison group. Consistent with previous research, gender was associated with greater probability of substance use, with boys being more likely to use all substances (i.e., alcohol, tobacco, marijuana, inhalants, other substances) relative to girls (Evans-
Polce et al., 2015). It appears the paths that lead to differential risk across gender are established prior to 5th grade. It is possible that greater cultural acceptability and machismo values may contribute to higher rates of early alcohol use among Latinx boys (Parsai et al., 2009; Unger et al., 2002), which may contribute to initiation in other substance use (e.g., tobacco, marijuana, illicit substances; Kirby & Barry, 2012). Indigenous heritage youth in Mexico may face common risk factors associated with substance use (e.g., marginalization, disadvantaged neighborhood, crime, proximity to drugs; Nalls et al., 2009; UNICEF, 2011). It is possible that Mexican children with indigenous heritage may be more likely than non-indigenous youths to live in disadvantaged neighborhoods where they may be more likely to encounter risk that increase the probability of substance use initiation (e.g., presence of deviant peers; Gilliard-Matthews, Stevens, Nilsen, & Dunaev, 2015; Kliwer & Murrelle, 2007). Findings also suggest that religiosity among Latinx youth may protect against the use of a variety of substances (i.e., alcohol, tobacco, marijuana, inhalants, and other substances; Benjet et al., 2007; Hodge et al., 2001).

Findings were less consistent for age, which appeared to differentially impact substance use among elementary age youth. In contrast to previous findings, younger students (i.e., 5th graders) were more likely to report engaging in illegal substance use (i.e., marijuana, inhalants and other substances), while their older peers (i.e., 6th graders) were more likely to report the use of legalized substances (i.e., alcohol and tobacco; Aspy et al., 2014). However, overage students may be at the greatest risk for substance use in general, potentially due to a rapid escalation of substance use associated advanced pubertal age, which may contribute to greater sensation seeking (Dubovitz et al., 2015). Consistent with previous findings, adolescents living in urban communities may be at an elevated risk for other substance use relative to youth in agricultural
communities (Villatoro Veláquez et al., 2016). However, findings suggest that community status risk factors for alcohol, tobacco, marijuana, and inhalant use and intentions did not significantly differ among rural and urban Mexican youth during early adolescences. While higher SES youth may have greater financial resources to access substances (Andrabi et al., 2017), youth across economic levels were largely at equal risk for reporting lifetime alcohol, marijuana, inhalant, and other substance use during early adolescence. However, substance intentions and use may vary across economic levels for specific substances. Specifically, higher subjective economic status was associated with lower odds of reporting lifetime tobacco use and intentions for engaging in first time use of a variety of substances (i.e., alcohol, tobacco, other substances). These findings suggest that youth with high subjective economic status may be at a reduced risk for use intentions relative to peers with lower economic status.

**Implications**

Findings of the current study indicate that elevated rates of substance use and associated risk factors are present at significant levels during early adolescences (i.e., $M_{age} = 10.40$). Prevention efforts may focus on developing early screening methods/procedures to identify high risk youth before patterns of substance use escalate. Demographic risk factors outlined in the current study may be of clinical utility for elementary school staff and mental health providers seeking to identify vulnerable Latinx youth in need of referral for preventative services in Mexico and in the US with Mexican-origin youth. Indigenous youth may be an especially vulnerable population needing further clinical and research attention to address elevated rates of perceived intent for and use of substances. It is critical that this information not be used to advance stereotypes about marginalized populations but rather to understand the needs of a particular group that likely experience these risks partly because of social processes, such as
institutional racism, that have led to marginalization and have increased risk for negative outcomes. Recent manuscripts have pointed to the importance of attending to social justice when conducting research (Baumann et al., in press; Domenech Rodríguez et al., in press).

Accessible substance use prevention services are needed to encourage positive developmental trajectories among Latinx youth exposed to factors that contribute to elevated risk for substance initiation during early adolescence. Yet, obstacles to mental health services persist in both the US and Mexico for Latinx populations, necessitating further efforts to disseminate substance use prevention/treatment programs and educational initiatives to inform the general public of the detrimental effects of substance use (Saloner & Cook, 2013; Borges et al., 2009). Additionally, efforts are needed to adapt evidence based interventions to work within Mexico’s unique cultural and economic context to improve access to effective preventative services (Atilola et al., 2012).

**Limitations**

Despite the strengths of the current study, findings should be viewed within the context of several limitations. The large nationally representative Mexican sample was a strength of this study, yet findings may not generalize to Latinx youth living in the US or other countries. Furthermore, findings may not generalize to other age groups within Mexico.

The current study utilized child report of demographic and substance use factors. It is possible that students lacked accurate knowledge regarding their SES, and community status, which could affect the accuracy of their responses. It is also important to note that indigenous heritage was measured with a single variable utilizing spoken language at home as a proxy for ethnicity. Future research should utilize more comprehensive forms of measuring ethnicity to
examine differences in risk for substance use between youth of indigenous and non-indigenous heritage.

While questions were read out loud to students to ensure comprehension, it is possible that students did not accurately understand what was being asked. Researchers might attempt to seek multiple sources of information including parent and teacher report of early adolescent substance use in future research. Relatedly, the examination of age-related risk within the current study was limited to differences between 5th and 6th grade, which may represent small developmental differences. Thus, interpretation of these findings is cautioned as findings may not represent developmental risk trajectories given the restricted age range. Research is needed to examining the impact of substance use initiation among elementary youth on developmental trajectories. Further research is also needed to identify individual, contextual, familial, and social risk factors to better understand the nature of early adolescent substance use among Latinx youth.

Conclusions

Findings of the current study suggest that elevated rates of alcohol and tobacco use are present during early adolescence. Latinx youth who were boys, of indigenous heritage, nonreligious, and overage for their grade were especially at risk for alcohol, tobacco, marijuana, inhalant, and other substance use. Mental health researchers and policy makers in both the US and Mexico should consider prioritizing the development and dissemination of evidence-based programs to target early substance use to promote positive developmental trajectories among Latinx youth. Thus, further research is needed to examining factors implicated in early adolescent substance use among Latinx youth to inform the development of policies and intervention programs to address rising national rates of substances use. Additional research is
also needed to determine whether demographic risk factors differ between Latinx youth residing in the US and Mexico.

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Instituto para la Atención y la Prevención de las Adicciones, Administración Federal de los Servicios Educativos para el Distrito Federal. México, Ciudad de México.


Table 1

Demographic Predictors of Lifetime Substance Use from Aggregated Logistic Regression Analysis on Multiple Imputations Datasets (N = 52,171)

<table>
<thead>
<tr>
<th></th>
<th>Alcohol OR [95% CI]</th>
<th>Tobacco OR [95% CI]</th>
<th>Marijuana OR [95% CI]</th>
<th>Inhalants OR [95% CI]</th>
<th>Other OR [95% CI]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boys^1</td>
<td>2.05* [1.96-2.15]</td>
<td>2.36* [2.19-2.54]</td>
<td>2.89* [2.56-3.26]</td>
<td>2.70* [2.36-3.09]</td>
<td>2.72* [2.35-3.13]</td>
</tr>
<tr>
<td>6th Grade^2</td>
<td>1.19* [1.13-1.24]</td>
<td>1.16* [1.08-1.24]</td>
<td>.85* [.76-.94]</td>
<td>.74* [.65-.84]</td>
<td>.81* [.71-.93]</td>
</tr>
<tr>
<td>Overage^3</td>
<td>1.62* [1.43-1.82]</td>
<td>2.57* [2.23-2.96]</td>
<td>2.36* [1.91-2.91]</td>
<td>2.28* [1.80-2.89]</td>
<td>2.76* [2.19-3.48]</td>
</tr>
<tr>
<td>Subjective SES^4</td>
<td>1.05 [.98-1.12]</td>
<td>.89* [.81-.98]</td>
<td>1.02 [.88-1.19]</td>
<td>.98 [.82-1.16]</td>
<td>.97 [.81-1.16]</td>
</tr>
<tr>
<td>Indigenous^5</td>
<td>1.26* [1.19-1.34]</td>
<td>1.44* [1.32-1.58]</td>
<td>1.78* [1.55, 2.04]</td>
<td>1.77* [1.52-2.05]</td>
<td>1.79* [1.54-2.10]</td>
</tr>
<tr>
<td>Urban community^6</td>
<td>.98 [.93-1.03]</td>
<td>1.00 [.92-1.08]</td>
<td>1.13 [1.00-1.29]</td>
<td>1.08 [.93-1.24]</td>
<td>1.23* [1.06-1.44]</td>
</tr>
<tr>
<td>Non-religious^7</td>
<td>1.49* [1.38-1.62]</td>
<td>1.58* [1.40-1.78]</td>
<td>2.23* [1.88-2.66]</td>
<td>2.13* [1.76-2.58]</td>
<td>2.06* [1.69-2.51]</td>
</tr>
</tbody>
</table>

Note: OR = odds ratio; 95% CI = 95% confidence interval. Table presents pooled results from five analyses performed on the five multiply imputed datasets. *includes substances such as cocaine, methamphetamine, etc. *relative to girls, *relative to 5th graders, *relative to appropriate age for grade, *relative to high perceived income, *relative to non-indigenous, *relative to agricultural communities' relative religious. *p < .05.
### Table 2

**Demographic Predictors of Perception of Intent to Initiate in Substance Use from Aggregated Logistic Regression Analysis on Multiple Imputations Datasets**

<table>
<thead>
<tr>
<th></th>
<th>Alcohol</th>
<th>Tobacco</th>
<th>Othera</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Boys</strong>1</td>
<td>1.14*</td>
<td>1.37*</td>
<td>1.24*</td>
</tr>
<tr>
<td>6th Grade2</td>
<td>.94 [.87-1.02]</td>
<td>.90* [.85-.96]</td>
<td>.82* [.76-.89]</td>
</tr>
<tr>
<td>Overage3</td>
<td>1.03 [.80-1.32]</td>
<td>1.07 [.90-1.27]</td>
<td>1.17 [.95-1.44]</td>
</tr>
<tr>
<td>Subjective SES4</td>
<td>.72* [.64-.81]</td>
<td>.68* [.63-.74]</td>
<td>.62* [.56-.69]</td>
</tr>
<tr>
<td>Indigenous5</td>
<td>1.13* [.101-1.26]</td>
<td>1.30* [.121-1.40]</td>
<td>1.28* [.116-1.42]</td>
</tr>
<tr>
<td>Urban community6</td>
<td>1.02 [.93-1.11]</td>
<td>.96 [.90-1.02]</td>
<td>.92 [.85-.99]</td>
</tr>
<tr>
<td>Non-religious7</td>
<td>1.15 [.93-1.36]</td>
<td>1.11 [.99-1.25]</td>
<td>1.15 [.99-1.34]</td>
</tr>
</tbody>
</table>

Note: OR = odds ratio; 95% CI = 95% confidence interval. Table presents pooled results from five analyses performed on the five multiply imputated datasets. a includes substances such as marijuana, inhalants, cocaine, etc. 1 relative to girls, 2 relative to 5th graders, 3 relative to appropriate age for grade, 4 relative to unit increase in subjective SES, 5 relative to non-indigenous, 6 relative to agricultural communities, 7 relative religious. *p < .05.