Does high family support protect against substance use in adolescents who perceive high disordered neighborhood stress, border community and immigration stress or normalization of drug trafficking at the US-Mexico border? Analysis of the BASUS survey

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ABSTRACT

Background: Adolescent substance use is a significant issue which occurs during a critical period of life of youth. Perceived stress is a risk factor for adolescent substance use, and life events such as low family support, and community and familial turmoil often lead to ongoing feelings of stress and uncertainty. Similarly, structural factors such as poverty, local neighborhood disinvestment and disrepair, and exposure to racism and discrimination are linked to feelings of stress. The US-Mexico border region is favorable for drug smuggling. Such a context exacerbates stressful life events during adolescence and increases the risk of adolescent substance use. This study aims to investigate the impact family support has on substance use in adolescents living on either side of the U.S./Mexico border who self-reported high perceptions of disordered neighborhood stress, border community and immigration stress, or normalization of drug trafficking.
Methods: This study used data from the cross-sectional BASUS survey. Logistic regression was used to study the association between family support and past 30-day use of alcohol, tobacco, marijuana, and any substance in a sample restricted to students who self-reported high perceptions of disordered neighborhood stress, border community and immigration stress, or normalization of drug trafficking.
Results: Participants with low family support were at higher risk of using any substance compared to participants with high family support (aOR= 1.58, 95% CI: 1.02; 2.45). Similar results were found for alcohol (aOR= 1.79, 95% CI: 1.13, 2.83). While the odds of using tobacco were higher for those with low social support as compared to participants with higher social support, this association was not statistically significant (aOR = 1.74, 95% CI: 0.93, 3.27)
Conclusion: Prevention programs tailored to the U.S.-Mexico border region should emphasize strengthening family support as a preventive factor against adolescent substance use. Family support should be considered in school counseling assessments, healthcare screenings and other social services.

1. Introduction

Adolescent substance use is a significant issue. It occurs during a critical developmental stage accompanied by major changes to the body, brain, and identity formation. (Carlos Andres Trujillo and Trujillo, 2019; Drug Use Among Youth: Facts and Statistics 2021; Crews and Boettiger, 2009) In the United States, by their final year in high school, 46.7% of youth have tried illicit drugs. (Drug Use Among Youth: Facts and Statistics 2021) Substance use during this time can have both short and long-term adverse effects. (Carlos Andres Trujillo and Trujillo, 2019;

Drug Use Among Youth: Facts and Statistics 2021; Crews and Boettiger, 2009; Cohen et al., 2007; Swadi, 1999) Certain life stressors can put some youth at higher risk for engaging in risky behaviors and developing substance use disorders. Adolescents who live in Mexican-American border towns are especially at risk for stressors as a result of structural and socio-cultural issues on both sides of the border. (Carlos Andres Trujillo and Trujillo, 2019; Cohen et al., 2007; Swadi, 1999; Borges et al., 2018; Joseph Sirgy et al., 2013; Allen and Cancino, 2012; Cardozo et al., 2004; Kristine et al., 2016; Reitz-Krueger et al., 2015) On the surface, the U.S. Southern borders are bustling thoroughfares that are economically, socially, and culturally interdependent; however, communities on either side of these borders struggle with social disorganization, decreased access to healthcare and education resources, and high rates of crime. (Borges et al., 2018; Joseph Sirgy et al., 2013; Allen and Cancino, 2012; Cardozo et al., 2004; Newcomb and Harlow, 1986) Family members live close by, but are often separated by a national border. Although Southern border towns are home to nearly 19 million people (18% age 18–29), this population remains significantly understudied in the literature (The Southern Border Region At a Glance 2021).

Transnational youth and youth living in and moving fluidly across border towns face unique challenges due to mobility across national borders and the issues that accompany border towns (Mazzucato and Haagsman, 2022; Paat, 2013). The border is a main thoroughfare for drug smuggling, human trafficking, and those engaging in such activities. (Cohen et al., 2007; Joseph Sirgy et al., 2013; Atherton et al., 2015) Research suggests that mobility affects adolescent identities, educational resilience, sense of belonging and sense of self. (Atherton et al., 2015) These social and environmental factors increase the risk of high stress, including perceived stress which is a well-known risk factor for adolescent substance use. (Carlos Andres Trujillo and Trujillo, 2019; Cohen et al., 2007; Joseph Sirgy et al., 2013; Reitz-Krueger et al., 2015; Newcomb and Harlow, 1986; Atherton et al., 2015) Low family support, and community and familial turmoil often lead to ongoing feelings of stress and uncertainty. [(Carlos Andres Trujillo and Trujillo, 2019) (Cohen et al., 2007-Joseph Sirgy et al., 2013; Reitz-Krueger et al., 2015; Newcomb and Harlow, 1986; Atherton et al., 2015; Weiss et al., 2011; Ross, 1999; Valdez et al., 2021; Sale et al., 2005)] Structural factors at the border, including poverty, local neighborhood disinvestment and disrepair, health and education disparities, and exposure to discrimination have also been linked to feelings of stress. (Borges et al., 2018; Joseph Sirgy et al., 2013; Ross, 1999; Valdez et al., 2021) However, a study of Hispanic youth living in homes with higher family protective factors found that they were less likely to use alcohol. (Sale et al., 2005) In another study, low levels of family functioning was significantly associated with higher risk of alcohol and marijuana use in adolescents of four ethnic groups (White, African American, Hispanic, and Asian Pacific islanders) from Los Angeles County schools. (Weiss et al., 2011)

This study aims to investigate the impact family support has on substance use in adolescents living on either side of the U.S.-Mexico border. We apply Bronfenbrenner's Ecological Systems Theory to understand the impact of the complex systems at play in border towns and the interrelated and integrated relationships on both sides of the border impacting a child's development. (Paat, 2013) Bronfenbrenner identified five interrelated bi-directional systems impacting a child's development: Individual, Microsystem, Mesosystem, Exosystem, and Macrosystem. Chronosystem represents internal and external changes over time to a child's environments. (Paat, 2013) Fig. 1 explains Bronfenbrenner's five systems levels that directly and indirectly impact a child's development. (Paat, 2013) Within this ecological systems context, individual and community risk factors, such as poverty, attitudes about family-involvement in illegal activity, lower enforcement of drug and alcohol restrictions, high neighborhood crime, and decreased access to healthcare may cause or exacerbate stressful life events during adolescence and increase the risk of adolescent substance use along the U.S.-Mexico border. (Carlos Andres Trujillo and Trujillo, 2019; Kristine et al., 2016; Reitz-Krueger et al., 2015) A potential mitigator to
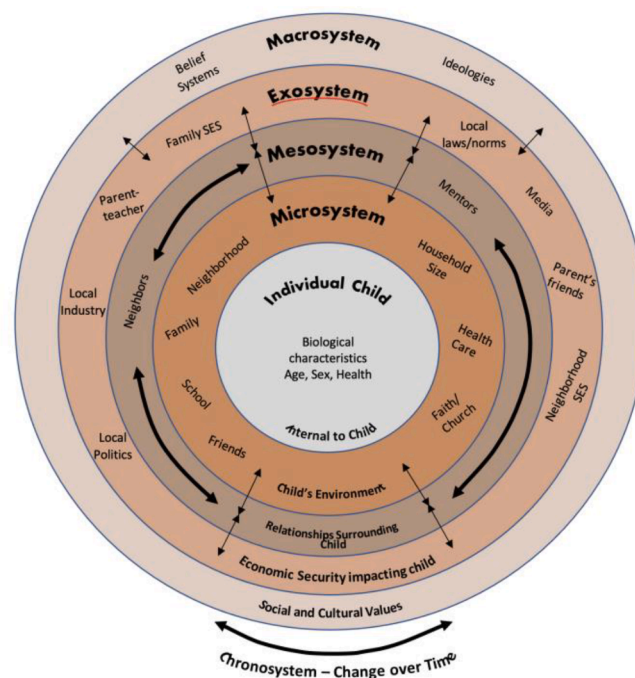

Fig. 1. Visual Representation of Bronfenbrenner's Ecological Systems Theory.

substance use initiation is positive family support, a protective factor often valued in Mexican heritage families (Weiss et al., 2011; Ross, 1999; Valdez et al., 2021; Sale et al., 2005; Paat, 2013; Kopak et al., 2012; Aneshensel and Sucoff, 1996). In this study of high school students living on the U.S.-Mexico border, we examine if family support is associated with substance use among a sample of students who self-report high perceptions of disordered neigtohborhood stress, border community and immigration stress, and normalization of drug trafficking.

2. Methods

We conducted a secondary analysis on a cross-sectional study of high school students located on both sides of the U.S./Mexico border. Participants responded to the Border Adolescent Substance Use survey (BASUS), which included measures of perceived disordered neighborhood stress, perceived border community and immigration stress, and perceived normalization of drug trafficking. We measured perceived disordered neighborhood stress using the Perceived Disordered Neighborhood Stress scale for which participants responded to 15 questions on a Likert scale (1=strongly disagree, 4=strongly agree) on neighborhood environment, graffiti, community stress, and drug and alcohol activity. (Valdez et al., 2021) We assessed this scale's internal validity and found a high internal consistency for this sample (Cronbach α= 0.87). To measure perceived border community and immigration stress, we used a modified Border Community and Immigration Stress scale where participants responded to 10 questions on a Likert scale (1=not stressed at all, 5=very stressed) about stress related to racial/ethnic discrimination and border militarization and law enforcement in their community. (Valdez et al., 2021) We found this scale to be internally reliable within this sample (Cronbach α=0.68). Normalization of drug trafficking was measured using a scale created by BASUS researchers that consisted of answers on a Likert scale (1=strongly disagree, 4=strongly agree) to questions about community norms regarding drug trafficking. (Valdez et al., 2021) The scale showed an internal consistency of Cronbach α=0.65.

Recruitment of participants and survey procedures have been previously described in a study approved by the University of Arizona

Human Subject's Protection Program (approval #1708726591R001). (Valdez et al., 2021) Recruitment occurred in a local high school in a border town in the U.S. and its sister border city in Mexico (n = 445). The sample included students aged 14–18 who were recruited from grade-specific math courses to ensure appropriate stratification by grade and age. Inclusion criteria ensured students were bilingual and had resided in the border communities for at least 12 months. All students assented and were consented by guardians prior to filling out the survey. To allay any fears some students may have had regarding immigration status or association with illegal activity, the principal investigator obtained a Certificate of Confidentiality from National Institutes of Health to protect the participants from the investigators being legally mandated to disclose potentially incriminating information collected during the study. Within the sample of 445 high school students, this study included data from adolescents who perceived high disordered neighborhood stress, high border community and immigration stress, or high normalization of drug trafficking (n = 396). Adolescents who reported an above-median score on any of these three scales were included in the final analytical sample.

2.1. Measures

2.1.1. Primary outcome

We examined four substance use outcomes: use of 1) alcohol, 2) tobacco, 3) marijuana, and 4) any substance in the last 30 days. All four outcome variables were binary (yes or no).

2.1.2. Exposure variable

The primary exposure was family support that we measured using a 5-point scale. We combined the five variables which had a range of 6 to 25, with higher values indicating greater social and family support. We dichotomized this variable into a low versus high family support based on the observed median value (median value= 19) and considered participants in the upper half as having high family support.

2.1.3. Covariates

Based on the literature, (Valdez et al., 2021) the covariates that we included in adjusted models were: gender (male, female and other), age (possible range 14–18), country of residence (USA and Mexico) and parents' education used as proxy for socioeconomic status (high school, college or university, don't know).

2.2. Statistical analysis

We used Pearson Chi-square, Fisher exact and t-tests to evaluate differences between variables across the categories of family support. We used unadjusted and adjusted logistic regression models to estimate odds ratios (ORs) and 95% confidence intervals (CIs) for the association between outcomes and exposure variables. To test the robustness of our results, we also conducted a sensitivity analysis using a different categorization of family support. We divided the scale into thirds to examine outcomes by low, moderate, and high family support, and considered participants with scores below 13 as having low family support, within 13 and 19 as having moderate family support and beyond 19 as having high family support. We analyzed the data using STATA version 17.0 (College Station, TX) and considered $P<0.05$ to be statistically significant. All statistical tests were two-sided.

3. Results

3.1. Participants

There were 445 high students who initially completed the BASUS survey. After we restricted the study sample to students with high perceived disordered neighborhood stress, community and immigration stress, or normalization of drug trafficking, there remained 396

participants. As shown in Table 1, the mean age of all participants was 16.3 years (SD= 1.3). Most participants resided at the US side of the border (91.7%) and were female students (58.6%). Nearly a third of participants had two parents who attended a university (26.5%). More than half of the participants reported using any substance (41.2%), while 35.6%, 12.1% and 13.6% reported using alcohol, marijuana, and tobacco in the last 30 days, respectively.

3.2. Differences across categories of family support

Mean ages of participants were the same across family support categories. We did not find significant differences across baseline characteristics based on the perceived family support, except for gender (p value = 0.011) and alcohol use (p value = 0.032).

3.3. Regression analysis

Unadjusted and adjusted estimates were similar, as shown in Table 2. We report adjusted odds ratios (aOR) in the text. Participants with low family support were at higher risk of using any substance compared to participants with high family support (aOR= 1.58, 95% CI: 1.02; 2.45). Results were similar for alcohol (aOR= 1.79, 95% CI: 1.13, 2.83). While the odds of using tobacco were higher for those with low social support as compared to participants with higher social support, this association was not statistically significant (aOR = 1.74, 95% CI: 0.93, 3.27). The adjusted odds ratio for marijuana use was close to 1 and not statistically

Table 1

Baseline characteristics of BASUS study participants (n = 396).

Participant's characteristics	All participants	Perceived family support, n (%)		P - value
		Low, *n* = 233	High, *n* = 163	
Age, mean (± SD)	16.3 ± 1.3	16.2 ± 1.3	16.3 ± 1.3	0.44[a]
Gender, n (%)				**0.01**[b]
Male	163 (41.2)	83 (35.6)	80 (49.1)	
Female	232 (58.6)	149 (64.0)	83 (50.9)	
Other	1 (0.2)	1 (0.4)	0 (0.0)	
ome location, n (%)				0.56[c]
US	363 (91.7)	212 (91.0)	151 (92.6)	
Mexico	33 (8.3)	21 (9.0)	12 (7.4)	
Parents' education, n (%)				0.60[b]
Both father & mother high school	100 (25.2)	54 (23.2)	46 (28.2)	
Both father & mother university	105 (26.5)	69 (29.6)	36 (22.1)	
Both father & mother don't know	28 (7.1)	16 (6.9)	12 (7.4)	
Father university & mother high school	50 (12.6)	29 (12.4)	21 (12.9)	
Father don't know & mother high school	32 (8.1)	21 (9.0)	11 (6.7)	
Father high school & mother university	56 (14.1)	28 (12.0)	28 (17.2)	
Father high school & mother don't know	3 (0.8)	2 (0.9)	1 (0.6)	
Father don't know & mother university	17 (4.3)	10 (4.3)	7 (4.3)	
Father university & mother don't know	5 (1.3)	4 (1.7)	1 (0.6)	
lcohol use	141 (35.6)	93 (39.9)	48 (29.4)	**0.03**[c]
Marijuana use	48 (12.1)	28 (12.0)	20 (12.3)	0.90[c]
Tobacco use	54 (13.6)	36 (15.4)	18 (11.0)	0.21[c]
Any substance use	163 (41.2)	104 (44.6)	59 (36.2)	0.09[c]

Abbreviations: SD, Standard Deviation; n, sample size.

[a] Two-sample t-test was used to determine p-value.

[b] Fisher's Exact Test was used to determine p-value.

[c] Chi-square Test was used to determine p-value.

Table 2
Association between family support and substance use among BASUS study participants ($n = 396$).

Outcome	Unadjusted OR (95% CI)	P - value	Adjusted[a] OR (95% CI)	P – value
Any substance				
High family support	Ref.		Ref.	
Low family support	1.42 (0.94, 2.14)	0.094	1.58 (1.02, 2.45)	**0.042**
Alcohol				
High family support	Ref		Ref	
Low family support	1.59 (1.04, 2.44)	**0.033**	1.79 (1.13, 2.83)	**0.013**
Tobacco				
High family support	Ref		Ref	
Low family support	1.47 (0.80, 2.70)	0.210	1.74 (0.93, 3.27)	0.085
Marijuana				
High family support	Ref		Ref	
Low family support	0.98 (0.53, 1.80)	0.940	1.05 (0.56, 1.98)	0.880

Abbreviation: 95% CI, 95% Confidence Interval, OR: Odds ratio.
[a] Adjusted for age, gender, parents' education and home location.

significant (aOR = 1.05. 95%CI: 0.56, 1.98).

4. Discussion

The interrelated and integrated systems at play in border towns may increase risk factors for teen substance use. (Valdez et al., 2021; Paat, 2013) Some of these systems include familial attitudes and beliefs toward drug use and drug trafficking, increased exposure to alcohol due to lower age-restrictions on the Mexican side of border, increased migration and mobility across the borders, disenfranchised family members, and disorganized and disinvested neighborhoods, often with higher rates of poverty and lower access to healthcare. (Swadi, 1999; Borges et al., 2018; Joseph Sirgy et al., 2013; Allen and Cancino, 2012; Cardozo et al., 2004; Kristine et al., 2016; Reitz-Krueger et al., 2015; Valdez et al., 2021) However, some of the predominant systems also include potential protective factors, such as close-knit families, strong sense of nativity, and faith and attendance at church. Bronfenbrenner's Ecological Systems Theory demonstrates the importance of the bidirectional and interrelated nature of such systems that directly and indirectly impact the developing child. Given the border's complex systems on both sides, factors in the systems impacting a child's development have the propensity to be amplified, which highlights the value of investigating protective factors within the various systems. This study examined the effect of family support as a protective factor for substance use among 396 border adolescents on both sides of the U.S.-Mexico border who reported risk factors of perceived high disordered neighborhood stress, border community and immigration stress, and normalization of drug trafficking. Our findings suggest that adolescents with low family support were at higher risk of any substance use, alcohol use and possibly tobacco use; however, we did not find significant association between family support and marijuana use. Our results suggest the importance of family support in mitigating factors in border communities that may put adolescents at higher risk for substance use. Family support falls within the microsystem of adolescents and directly impacts the developing youth. Focusing on improving family support to potentially mitigate risk factors for substance use in teens is imperative and consistent with literature suggesting family support is a protective factor for at-risk youth.

4.1. Strengths and limitations

The large sample size, absence of missing data, and use of established border community and immigration stress and perceived disordered neighborhood stress scales that allowed us to conduct reliable accurate analyses were among the study's strengths. This study also has some limitations. First, we cannot infer causality in this study because of its cross-sectional design. For example, even though we found that low family support was significantly associated with any substance or alcohol use, we cannot determine whether low family support preceded these substance use. A longitudinal study could help clarify the nature of this association. Second, the absence of standardized cutoffs in the scales did not allow us to compare our findings with other studies. Third, participants' responses were self-reports of their perceived stresses, family support, and substance use. Even though participants were assured about the confidentiality of their responses, they could have under-reported substance use or family support. Interpreting self-reported data should be done with caution. Finally, generalizability of this study is limited because the sample was restricted to one border community.

5. Conclusion

This study demonstrates that family support may prevent substance use among adolescents exposed to high perceived border community and immigration stress, disordered neighborhood stress, and normalization of drug trafficking. The results highlight the importance of emphasizing a holistic programming approach that not only targets individual youth but also family involvement. They also emphasize the need for families to support their teens to prevent adolescent substance use, particularly in the border region where youth may be differentially exposed to stressful situations. Families that talk with adolescents about their problems, help them make decisions, allow them to count on parents and other relatives such as uncles and aunts for important life decisions may increase the likelihood of their teen not engaging in substance use. Prevention programs tailored to the U.S.-Mexico border region in consideration of the complex systems border teens live within should emphasize strengthening family support as a protective factor against adolescent substance use. Family support should be considered in school counseling assessments, healthcare screenings and other social services. As this is an understudied population that is greatly affected by border policies, studies should be conducted at multiple border town locations along the U.S.-Mexico border and include more non-U.S. nationals living in the Mexican sister city.

Declaration of Competing Interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.jmh.2023.100164.

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