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Drug use and suicidality among Asian American women who are children of immigrants

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Abstract

This study investigates the association between drug use and lifetime suicidal behaviors among Asian American women ($n = 720$) residing throughout Massachusetts, using data collected from 2010 to 2011. Logistic regression models identified that a history of hard drug use alone or in combination with soft drug use has a significant association with both suicidal ideation and suicide attempts among Asian American women, adjusting for demographic covariates, history of psychiatric diagnosis, and family communication. These findings highlight the importance of addressing hard drug use when designing suicide prevention programs for Asian American women.

Keywords

Asian Americans; Asian American women; API women; suicidal ideation; suicide attempt; suicidality comorbidity; mental health; substance use; drug use

1. Introduction

A mental health crisis exists among young Asian American women in the United States. Asian American women aged 15-24 had an alarming increase in suicide mortality rate, rising from 2.8 deaths per 100,000 in 2004 to 5.3 deaths per 100,000 in 2009, and the second highest rate of suicide among same-aged women of all racial groups next to their Native American counterparts in 2009 (National Center for Health Statistics [NCHS], 2012). However, rates of completed suicide among Asian American women aged 15-24 rose the most rapidly of all races and both sexes in the same age group, increasing by 96.3% from 2000-2009. Native American women had the second largest increase (81.08%) (NCHS, 2012).

Among Asian Americans as a group, Asian American women who were born in the United States showed a higher prevalence of suicidal ideation and suicide attempts (15.9% and 6.3%, respectively) than foreign-born Asian American women (7.9% and 2.7%), US-born Asian American men (8.5% and 2.1%), and foreign-born Asian American men (7.1% and 1.6%) in a recent study (Duldulao, Takeuchi, & Hong, 2009). In addition, progress has been made in understanding risk factors associated with suicidal behaviors among Asian Americans in general (Cheng et al., 2010; Choi, Rogers, & Werth Jr, 2009; Duldulao, Takeuchi, & Hong, 2009; Ibrahim, 1995; Lau, Jernewall, Zane, & Myers, 2002; Leong & Lau, 2001; Noh, 2007). These studies found that being born in the United States (Duldulao, Takeuchi, & Hong, 2009), high levels of family conflict (Cheng et al., 2010; Lau et al., 2002), history of lifetime psychiatric illnesses (Cheng et al., 2010), and high levels of discrimination (Cheng et al., 2010) were all associated with lifetime suicidal ideation and suicide attempts among Asian Americans.

However, the majority of these studies have analyzed both men and women (Duldulao, Takeuchi, & Hong, 2009; Cheng et al., 2010), and their samples' ages ranged from 18-95 years old and included first-generation Asian Americans as well as subsequent generations. Because gender has been included in these studies as a covariate or used as a demographic factor to represent a segment of the Asian American population, it is still uncertain how relevant these risk factors among the general Asian American population are for understanding suicidal behaviors specifically among young Asian American women who are children of immigrants. Furthermore, risk factors for suicide have been found to differ somewhat by gender (Agerbo, 2005; Canetto & Sakinofsky, 1998; Hawton, 2000; Yip & Liu, 2006). Thus, this study will fill the gap in the literature by focusing on young Asian American women and examining the specific risk factors for both suicidal ideation and suicide attempts among this subgroup.

1.1 Asian American women who are children of immigrants and suicide

Although no study has directly tested the factors associated with suicidal behaviors among Asian American women who are children of immigrants, several reasons have been offered to describe why these women are particularly vulnerable to poor mental health functioning. First, poor family communication has been highlighted as an important factor in poor mental health among Asian American women (Ying & Han, 2007). Poor family communication stems from differential cultural gender role expectations between parents and daughters (Rumbaut, 1996). As children, Asian American girls are expected to not only excel academically, but also fulfill cultural ideals as a daughter, and as a future wife and a future mother (Choi, 2009; Goyette & Xie, 1999). According to traditional gender norms, Asian immigrant parents often expect their daughters to assume the brunt of household chores (Pyke & Johnson, 2003), preserve an image of chastity by pressuring their daughters to limit socializations with men until they get married (Kim, 2009; Zia, 2001), and only date men who the family approves of as suitable for marriage (Chung, 2001). However, since young Asian American women are likelier to endorse more egalitarian attitudes toward gender roles than their male counterparts, they face higher levels of conflicts with their parents when these two opposite cultural expectations clash (Hahm, Lahiff, & Barreto, 2006). In addition to the communication problems rooted in cultural gender norms, Asian American women also face communication problems with their parents due to language barriers. These language barriers can strain the parent-child relationship by limiting the development of a deep connection, articulation of emotions, and cultivation of mutual understanding of each other's differences in values (Lee, 1997).

Second, high suicide rates among Asian American women who are children of immigrants may be strongly associated with existing psychiatric illness or untreated mental disorders among this subgroup. Despite an alarming prevalence of mental disorders among young

Asian American women (Kawahara, 2007), they are reluctant to use mental health services due to cultural shame and stigma related to mental health service utilization (Abe-Kim, 2007; Chu, Hsieh, & Tokars, 2011; Leong & Lau, 2001; Sue, Cheng, Saad, & Chu, 2012). The problems of both premature treatment dropout and high rates of missed follow-up appointments in mental health care among Asian Americans are persistent and pervasive (Leong & Lau, 2001). Thus, psychiatric illness, especially when untreated, may increase risks of suicidality (Leong & Lau, 2001; McKenzie, Serfaty, & Crawford, 2003).

A third factor that may be associated with suicidal behavior among young Asian American women is substance use and abuse. Asian American children of immigrants have significantly higher substance use rates compared to the rates of first-generation Asian American immigrants (Gfroerer, 2003; Takeuchi et al., 2007). For instance, the prevalence of Diagnostic and Statistical Manual of Mental Disorders fourth edition alcohol abuse among young Asian American women (aged 18-29) rose significantly from 0.74% in 1991-1992 to 3.89% in 2001-2002 (Grant et al., 2004). Based on the 1999 Treatment Episode Dataset, the average age for Asian American substance abuse treatment admission for marijuana was 16.2 years, the youngest average age of admission compared to other racial groups (Substance Abuse & Mental Health Services Administration, 2002). Cheng, Lee, & Iwamoto (2012) also found that Asian American heavy drinkers had three to four times higher likelihoods of suffering from lifetime anxiety disorder compared with light drinkers.

Indeed, mounting evidence demonstrates links between substance use and suicidal behaviors among White, Black, and Hispanic populations (Borges, Walters, & Kessler, 2000; Brener, Hassan, & Barrios, 1999; Clay, 2009; Fergusson, Woodward, & Horwood, 2000; Kelly, Cornelius, & Lynch, 2002). In fact, overwhelming evidence shows that the most important set of risk factors for completed and attempted suicide among young people in the general population is psychiatric illness and substance abuse (Brent, 1995). However, the association between substance use and suicidal behaviors among Asian Americans has not been a focus of study in existing literature. This may be due to the “model minority myth,” including the perception that Asian Americans rarely experience substance use problems (O'Hare & Van Tran, 1998; Uba, 1993). Thus, our current study aims to elucidate the link between substance use and suicidal behaviors among Asian American women who are children of immigrants.

1.2 The Current Study

In this study, we examine three research questions:

(1) What is the prevalence of drug use in our study population?—In answering this question, we focused on both soft and hard drugs and excluded alcohol use (see Study Limitations for further explanation). Similar to previous studies, our study defined cigarettes and marijuana as soft drugs (Deas, 2008; McCuller, Sussman, Dent, & Teran, 2001) and other substances such as cocaine, heroin, inhalants, and lysergic acid diethylamide (LSD) as hard drugs (Andrews, Tildesley, Hops, & Li, 2002; Kilpatrick et al., 2000).

(2) To what magnitude is drug use associated with suicidal ideation and suicide attempts among young Asian American women?—In answering this question, we controlled for factors that have been found in previous studies to be associated with suicidality among both the general population and Asian Americans. Studies focusing on the general population overwhelmingly indicate that the co-occurrence of psychiatric disorders and substance use is linked to attempted suicide (Borges et al., 2000; Kelly et al., 2002; Rossow & Lauritzen, 1999). According to the National Institute on Drug Abuse

(NIDA) research report in 2008, a person diagnosed with a substance use disorder is twice as likely to have a comorbid mental disorder as a person without a substance use disorder. Comorbidity between substance use disorders and mental disorders does not assume a simple causal relationship: drug abuse could lead to mental illness, and, conversely, mental illness could lead to drug abuse (NIDA, 2008). However, both disorders could be linked to similar risk factors, making causality difficult to determine.

We also controlled for level of family communication. Family plays a central role in Asian American psychological health (Phinney, Ong, & Madden, 2000; Tseng, 2004; Ying & Han, 2007). As indicated earlier, research has identified that poor family communication driven by intergenerational conflicts, emotional disconnection, and gaps in English proficiency between children and parents contributes to poor mental health among Asian American women who are children of immigrants. Another study found that Asian American youths who experience high levels of intergenerational conflict had a 30-fold increased risk for suicidal ideation and self-harm (Lau et al., 2002). These findings indicate that family communication is an important confounder in the association between suicidality and history of psychiatric diagnosis. Thus, controlling for a history of psychiatric diagnosis and level of family communication is critical for understanding the independent roles of both soft and hard drug use in suicidality among Asian American women.

Finally, we also controlled for country of birth. The rationale for controlling for country of birth is because Duldulao and colleagues (2009) found that being foreign born was a protective factor in association with suicidality, particularly among the Asian American women. Specifically, compared to Asian American women who were born in the United States, foreign-born women had 55% lower odds of having suicidal thoughts and 86% lower odds of suicide attempts.

(3) Given the absence of published evidence regarding the role of substance use in suicidal behavior among young Asian American women, what kinds or combinations of substance use have the greatest association with both suicidal ideation and suicide attempts in this population?—Specifically, we examined if either history of hard drug use alone or history of hard drug use combined with soft drug use (such as tobacco or marijuana) was associated with suicidal ideation and suicide attempts in these women's lifetime. The present study seeks to make a unique contribution in documenting the role of substance use in suicidal ideation and suicide attempts among young Asian American women who are children of immigrants, which may aid in designing effective suicide interventions for this high-risk population.

2. Materials and Methods

2.1 Samples

Data for this study were derived from the Asian American Women's Sexual Health Initiative Project (AWSHIP). AWSHIP is a five-year study, funded by the National Institute of Mental Health (NIMH), which examines substance use, mental health, and sexual health of Chinese, Korean, and Vietnamese women who are children of immigrants. We chose to solely focus on these ethnic groups because they come from cultures that are greatly influenced by Confucianism, which values strict moral and social conduct, supports sexual modesty, and restrains open discussion of sexuality (Okazaki, 2002; Zhang & Beck, 1999).

In addition, these ethnic groups are among the five most prevalent Asian ethnic populations in the study's location, Massachusetts. Among Asians in Massachusetts in 2010, 35.8% were Chinese, 13.2% were Vietnamese, and 7.5% were Korean, with populations of 122,957, 42,915, and 24,110, respectively. Japanese women were excluded from the study because of

their small population size compared to other Asian racial groups. In 2010, Japanese individuals counted for only 1.9% of the Asian population in Massachusetts, with a population of 9,224 (US Census Bureau, 2011).

To be eligible for the study, each participant had to be: (1) a single (unmarried) woman; (2) between ages 18-35 years; (3) self-identified as Chinese, Vietnamese, Korean, or a mix of these ethnicities; (4) a child of immigrants (1.5 and second generation); and (5) a current resident of the greater Boston area. Special efforts were made to achieve a diversity in socioeconomic status (SES) and a balance between 1.5 generation immigrants (those who were born in a foreign country but immigrated to the United States as a child) and second-generation immigrants (those who were born and raised in the United States). AWSHIP also made efforts to obtain a balanced sample of both current college students and women in the community. AWSHIP college participants were recruited from eight local universities. Community samples were recruited from 20 community resources, including various health centers, community centers, and ethnic supermarkets. We recognize that college samples may have higher SES than community samples, which potentially plays a role in mental health differences between the two samples (National Commission on Asian American and Pacific Islander Research in Education, 2008). Thus, an analysis was conducted to identify if there were significant differences between our college sample (those who were currently in college) versus our community sample (those who were currently not in college) in the predictors and outcomes (not shown in the tables). There was no statistically significant difference between the college and community samples in prevalence of suicidal ideation, suicide attempt, drug use, or other predictors including history of psychiatric diagnosis.

Even though we targeted children of immigrants whose language of choice would be predominantly English, the majority of our outreach workers were bilingual and bicultural Chinese, Korean, and Vietnamese women. Our intention was to be sensitive to the practices and beliefs of Asian cultural heritage and upbringing during the recruitment and interview process (Kreuter, Lukwago, Bucholtz, Clark, & Sanders-Thompson, 2003; Levkoff, Levy, & Weitzman, 2000). Furthermore, previous studies have indicated gender matching between interviewer and interviewee to be beneficial for easing the discomfort of discussing sensitive topics such as sexual practices (Padfield & Procter, 1996; Tang, 2002). AWSHIP data were collected from January 2010 to August 2011, and of the 820 women screened, about 2% ($n=17$) were ineligible for the study and about 10% ($n=83$) never followed through with the survey appointments after initial contact, thus resulting in a total of 720 women who completed surveys.

2.2 Design and Procedure

Trained research assistants brought laptop computers to each research participant and demonstrated how to use the computer-assisted survey interview (CASI), which has been shown to effectively elicit answers to highly sensitive questions, such as those involving substance use and HIV risk-related behaviors (Brown & Vanable, 2009). Participants were free to choose a convenient interview location, such as the research institution, community-based sites, libraries, coffee shops, or the participant's home. A total of 12 translators and back translators (2 translators and 2 back translators each for Chinese, Korean, and Vietnamese) developed consent forms and CASI survey questions for each of the designated Asian languages, thus making the survey available in five different languages (English, traditional and simplified Chinese, Korean, and Vietnamese) to accommodate potential language barriers. However, the majority of participants chose to take the English CASI; only 2% used a multilingual CASI. The survey took approximately 45–60 minutes to complete and participants received \$20 as compensation. Boston University's Institutional Review Board (IRB) approved all protocols and procedures.

2.3 Measurements

Outcome measures

Lifetime suicidality: *Lifetime Suicidal Ideation* was ascertained by asking how many times the participant had ever seriously thought about committing suicide, and *lifetime suicide attempt* was measured by asking how many times the participant had ever actually attempted to commit suicide. If the participant responded “zero times” to answer either the *lifetime suicidal ideation* or the *lifetime suicide attempt* question, then the item was coded as *No*. If the participant responded “1 or more times” to answer either question, the item was coded as *Yes*. These measurements have been successfully administered in previous studies using data from the National Latino and Asian American Study (NLAAS), the first national epidemiological survey of Asian Americans in the United States (Cochran, Mays, Alegria, Ortega, & Takeuchi, 2007; Duldulao et al., 2009; Fortuna, Perez, Canino, Sribney, & Alegria, 2007).

Explanatory variables

Covariates: *Age* at the time of the interview was categorized into 2 groups: (1) 18 to 27 years and (2) 28 to 35 years. *Level of Education* was measured and divided into 3 groups: (1) high school diploma or less; (2) some college or college degree; and (3) some graduate/professional school or graduate degree. *Country of birth* was coded as dichotomous variables: US born (second generation) versus foreign-born (1.5 generation—those who immigrated to United States as children). *Ethnicity* was categorized as Chinese, Korean, Vietnamese, or Other, which indicated a mix of any of these ethnicities. *History of psychiatric diagnosis* was measured by asking if the participant had ever been diagnosed with a psychiatric disorder by a psychiatrist or psychologist. Finally, *Level of family communication* was measured by a self-report assessment scale developed from the Circumflex Model of Marital and Family Systems 4 (Olson & Gorall, 2003) to quantify levels of family communication. We asked 10 five-point Likert scale questions related to family communication satisfaction, capability to express affection and honest opinions in a positive manner, and capacity to understand other family members’ feelings. High reliability of the family communication scale was indicated by a Cronbach’s coefficient alpha of 0.9. These 10 questions were added up to a maximum score of 50 and divided into three levels of family communication: low, medium, and high. Scores between 31 and 50 indicated a high level of communication within the family, scores between 21 and 30 indicated a medium level, and scores below 21 indicated a low level of family communication.

Substance use: *History of cigarette use* was coded *Yes* if the participant had ever smoked an entire cigarette; otherwise, the answer was coded *No*. Previous studies have used a similar measure for cigarette use (Lerman et al., 2001; Trinidad & Johnson, 2002). *History of marijuana use* was coded *Yes* if the participant had ever used marijuana; otherwise, *No* was the coded answer. *History of hard drug use* was coded *Yes* if the participant had ever used prescription medicines that had not been prescribed to her or any illegal drugs (except for marijuana), including crystal meth, cocaine, LSD, phencyclidine, ecstasy, mushrooms, inhalants, ice, and heroin. *No substance use* was coded *Yes* if the participant reported never using any type of the above substances including cigarettes, marijuana, or hard drugs. These measurements have been successfully administered in previous studies using the NLAAS dataset (Appel et al., 2011; Duldulao et al., 2009).

Types of multiple substance use: *History of cigarette use, marijuana use, or both* indicates that the participant reported ever having smoked an entire cigarette, used marijuana, or both (a, b and c in Figure 1). *History of hard drug use plus other substances* includes cases where the participant reported ever having used hard drugs or a combination of hard drugs and soft

drugs (d, e, f and g in Figure 1). *None* indicates that the participant reported no history of ever having used any hard or soft drugs.

2.4 Statistical Analysis

To test whether the three independent variables measuring multiple substance use (none; history of cigarette use, marijuana use, or both; and *history of hard drug use plus other substances*) were differently associated with lifetime suicidal ideation and suicide attempts, we performed Pearson chi-square tests. We developed three logistic regression models to provide odds ratios (ORs) and confidence intervals (CIs) for lifetime suicidal ideation and suicide attempts to study how models and odds ratios of the substance use variables changed when adding history of psychiatric diagnosis and level of family communication to the models (while controlling for demographic variables). Model 1 included the following variables: substance use, age, education, country of birth, and ethnicity. Then sequentially we added a variable for history of psychiatric diagnosis to examine the association between substance use and suicidality (model 2), and finally we controlled for level of family communication (model 3). A threshold of 0.05 was used as the significance level for all statistical tests that were applied.

3. Results

3.1 Sample Characteristics

Table 1 describes the demographic characteristics of our sample. Among the 720 study participants, Chinese ethnicity (51.7%) was the majority in this study, followed by Korean, Vietnamese, and Other. Most of women in the sample (92.2%) were between 18 and 27 years old and approximately 13% reported a history of psychiatric diagnosis. In terms of suicidality, approximately 18% of participants reported having had suicidal thoughts in their lifetime and 7% reported having attempted suicide in their lifetime.

3.2 Prevalence of substance use among young Asian American women

In terms of the prevalence of substance use among the 720 Asian American women in our sample, we found that approximately half (45.3%) reported a history of using either soft or hard drugs. Approximately one third of the sample (34.7%) reported a history of using soft drugs: cigarettes, marijuana, or a combination of both. Approximately 10.6% of the sample had a history of hard drug use alone or in combination with soft drug use (see Table 1).

To more fully understand differences among participants who reported a history of substance use, we created Figure 1. Among those with a history of substance use, approximately 1 in 4 (23.3%) women reported a history of hard drug use alone or in combination with soft drugs [(d-g) in Figure 1]. Specifically, history of using all three substance types—cigarettes, marijuana, and hard drugs—was more prevalent [16.0%, Figure 1(g)] than history of hard drug use alone [3.1%, Figure 1(d)], history of hard drug plus cigarette use [0.6%, Figure 1(e)], and history of hard drug plus marijuana use [3.7%, Figure 1(f)].

3.3 Bivariate association between substance use and suicidal ideation and suicide attempts

We examined the proportions of suicidal ideation and suicide attempts in 3 groups of women (Table 2): (1) women who had never used soft or hard drugs, (2) women who had a history of soft drug use, and (3) women who had a history of hard drug use alone or in combination with soft drugs. Those who had no history of substance use had the lowest reports of lifetime suicidal ideation (13.1%) and suicide attempts (4.6%), whereas those who

had a history of strictly soft drug use had higher suicidal ideation (19.3%) and higher suicide attempts (7.2%). Reports of lifetime suicidal ideation (35.5%) and suicide attempts (20%) were highest among those who had a history of hard drug use alone or in combination with soft drugs.

3.4 Multivariate models examining associations between types of substance use and lifetime suicidal ideation and suicide attempts

To examine the unique contribution of substance use to lifetime suicidal ideation and suicide attempts, we developed three sequentially built models for lifetime suicidal ideation (Table 3) and suicide attempts (Table 4). The models for Tables 3 and 4 have similar patterns: sequentially moving by adjusting for demographic covariates only, then additionally adjusting for history of psychiatric diagnosis, and finally adjusting for level of family communication.

Multivariate model for suicidal ideation—The logistic regression model with the dependent variable for lifetime suicidal ideation (Table 3), while controlling for demographic characteristics, indicated that soft drug use alone showed a weak but positive association with suicidal ideation (OR=1.6, CI: 1.0-2.5). However, hard drug use alone or in combination with soft drug use substantially increased the odds of suicidal ideation (OR=3.7, CI: 2.1-6.6). None of the demographic characteristics were associated with suicidal ideation. In the second model for suicidal ideation, to which the variable for history of psychiatric diagnosis was added, hard drug use alone or in combination with soft drug use continued to be strongly associated with increased odds of suicidal ideation (OR=2.8, CI: 1.5-5.1). Furthermore, having a history of psychiatric diagnosis significantly increased the odds of suicidal ideation. In the final model (in which we adjusted for demographic covariates, history of psychiatric diagnosis, and level of family communication), hard drug use alone or in combination with soft drug use continued to have a robust association with increased odds of suicidal ideation (OR=3.0, CI: 1.6-5.6). Both low and medium levels of family communication were also positively associated with suicidal ideation (OR=2.6, CI: 1.6-4.1; OR=3.4, CI=1.8-6.6, respectively).

Multivariate model for suicide attempts—All three multivariate models for suicide attempts (Table 4) showed similar patterns to the models for suicidal ideation (Table 3). The model for suicide attempts that only adjusted for demographic characteristics (model 1) showed that soft drug use was positively associated with suicide attempts, but was not statistically significant (OR=1.6, CI: 0.8-3.2). However, hard drug use alone or combination with soft drug use had a substantial association with lifetime suicide attempts (OR=5.4, CI: 2.5-11.8). In the second model, history of psychiatric diagnosis was associated with suicide attempts. Also, this model showed that hard drug use alone or combination with soft drug use continued to be strongly associated with increased odds of suicide attempts (OR=3.9, CI: 1.7-8.8), even after controlling for history of psychiatric diagnosis. The final model for suicide attempts showed that medium levels of family communication were associated with suicide attempts (OR=3.3, CI: 1.6-6.7), and hard drug use alone or in combination with soft drug use consistently had a robust association with increased odds of suicide attempts (OR=4.3, CI: 1.8-9.8). Moreover, history of psychiatric diagnosis continued to be a significant factor associated with lifetime suicide attempts.

4. Discussion

Our analysis identified three key study findings concerning Asian American women: (1) a high prevalence of suicidal ideation, suicide attempts, and multiple drug use; (2) a robust relationship between hard drug use (alone or in combination with soft drugs) and suicidal

ideation and suicide attempts; and (3) strong significant associations of suicidal ideation and suicide attempts with levels of family communication and history of psychiatric illness.

High prevalence of suicidal ideation and suicide attempts

Our study found that the prevalence of lifetime suicidal ideation and suicide attempts (17.5% and 7.1%, respectively) among young Asian American women is substantially higher than the prevalence among the US adult population in general (8.4% and 2.4%) and US adult women specifically (7.1% and 3.0%), based on data from the National Epidemiological Survey on Alcohol and Related Conditions (NESARC) (Baca-Garcia et al., 2008). This prevalence among Asian American women in our study is strikingly similar to the NLAAS findings on US-born Asian American women's suicidal ideation (15.9%) and suicide attempts (6.3%) (Duldulao et al., 2009). This similarity corroborates our finding that Asian American women have a substantially higher prevalence of suicidal ideation and suicide attempts compared to the national prevalence, and therefore should be considered an urgent public health issue and receive both clinical and research attention.

High prevalence of multiple drug use among Asian American women

We also identified that approximately one third of the sample (34.7 %) reported a history of soft drug use (either cigarettes or marijuana). This prevalence is lower than the national prevalence of reported lifetime cigarette use (57.9%) and lifetime marijuana use (46.4%) among females aged 18-25 years. Our results also show that 1 in 10 (10.6%) of the study sample reported a history of hard drug use alone or in combination with soft drugs, which is, again, lower than the prevalence of lifetime hard drug use, excluding marijuana, for the US adult population (31.2% for ages 18-20 and 39.6% for ages 21-25) (Substance Abuse and Mental Services Administration, 2011). However, despite a lower prevalence of overall drug use compared to other ethnic groups (McCabe et al., 2007), young adult Asian American women appear to remain at risk for multiple drug use, as approximately 1 in 2 (51.8%) participants who had ever used substances reported a history of multiple drug use (history of cigarette and marijuana use [Figure 1, (c), history of hard drug plus cigarette use (e), history of hard drug plus marijuana use (f), and history of hard drug, cigarette, and marijuana use (g)]. These findings suggest that Asian American women are engaging in unhealthy risk behaviors and it may be inaccurate to label them as a “model minority,” as it undermines the need to target this underserved population for prevention and treatment programs (Sue, Sue, & Takeuchi, 1995).

Robust relationship between hard drug use (alone or in combination with soft drugs) and both suicidal ideation and suicide attempts

This study found a significant association between drug use and prevalence of suicidal ideation and suicide attempts. Specifically, when we examined the proportions of suicidal ideation and suicide attempts among participants grouped by their substance use history based on level of drug use, those who had never used substances had the lowest reports of lifetime suicidal ideation (13.1%) and suicide attempts (4.6%), whereas those who had a history of soft drug use alone had higher suicidal ideation (19.3%) and higher suicide attempts (7.2%). Finally, among participants who had a history of hard drug use alone or in combination with soft drugs, reports of lifetime suicidal ideation (35.5%) and suicide attempts (20%) were most prevalent. Similarly, findings from three sequentially built logistic regression models indicate that even after controlling for history of psychiatric diagnosis and level of family communication, the association between hard drug use and suicidal behaviors was robust: Asian American women with a history of hard drug use alone or a combination with soft drugs were three times more likely to have had suicidal ideation and 4.3 times more likely to have had suicide attempts compared to their counterparts. Our

findings call for both further investigation of factors that explain hard drug use among Asian American women and development of new interventions targeting this at-risk population.

Strong significant associations of suicidal ideation and suicide attempts with levels of family communication and history of psychiatric illness

It is worthwhile to note that the magnitude of the relationship between hard drug use alone and in combination with soft drug use and suicidal ideation and suicide attempts somewhat diminished after we adjusted for history of psychiatric diagnosis and level of family communication, suggesting that drug use overlaps with family communication and history of mental illness (3.7 to 3.0 from model 1 to model 3 for suicidal ideation and 5.4 to 4.3 from model 1 to model 3 for suicide attempts). The change in magnitude of association between drug use and suicidal ideation and suicide attempts after controlling for level of family conflict supports previous research on intergenerational family conflict (Lau et al., 2002), in that Asian American women with severe family conflict have been found to use alcohol and drugs as a form of self-medicating behavior in an effort to manage or avoid distressing symptoms and to relieve emotional pain caused by unsolved family conflicts.

A similar pattern of strong relationships between family conflicts and suicidal behaviors has been found in other studies focusing on Asian American adolescents (Catalano, Hawkins, Krenz, & Gillmore, 1993), as well as samples of White, Black, and Hispanic counterparts: after controlling for other factors, poor communication with parents was a significant risk factor for suicide among 120 children and adolescents who completed suicide in New York state (Gould, Fisher, Parides, Flory, & Shaffer, 1996).

In addition, after controlling for the history of psychiatric diagnosis, hard drug use alone or in combination with soft drug use was strongly associated with suicidal ideation (OR = 3.3) and suicide attempts (OR = 4.3). Moreover, the odds of psychiatric diagnoses consistently remained statistically significant in both of the final models predicting suicidal ideation and suicide attempts. This finding indicates that history of psychiatric diagnosis remains an important risk factor along with family communication and hard drug use (alone or in combination with soft drug use).

In our study, being born in the United States was not a significant risk factor associated with suicidal ideation and suicide attempt. This may be due to the fact that our study only sampled children of immigrants (aged 18-35 years) and that differences between our second-generation participants (born in the United States) versus 1.5-generation participants (born in a foreign country and immigrated to the United States as a child) in terms of suicidal ideation and suicide attempts were not detectable. Thus, our finding is similar to that of Breslau and Chang's (2006) study, which demonstrated no differences between 1.5-generation and second-generation Asian Americans in exhibition of all classes of mental disorders, although they did find that those who were born in the United States were significantly more likely to suffer from various mental disorders compared to those who immigrated to United States as an adult. This finding suggests that being born in a foreign country is only protective of mental health among those who immigrated to the United States as adults, not as children.

4.1 Study Limitations

Several limitations of this study should be considered. First, AWSHIP data are cross sectional, and as such, the relationship between substance use and suicidality should be cautiously interpreted as association rather than causality. A clear picture of a causal relationship dynamic between substance use and suicidality could not be captured, especially since both suicidality and substance use were measured across each participant's

lifetime. Given the design of our study, it is difficult to conclude whether a history of substance use triggered women to have suicidal thoughts and suicide attempts or whether having had suicidal thoughts and suicide attempts triggered substance use. Thus, our study findings do not disentangle the relationship between substance use and suicidal behavior. A follow-up longitudinal study that further compares substance users to nonsubstance users in terms of suicidality would help elucidate the causal mechanisms of these relationships. Second, we excluded alcohol use from our analyses because the scope and interest of our study was to focus just on history of soft and hard drug use rather than history of alcohol use, as the majority of our sample (regardless of substance use level) reported having used alcohol in the past 12 months (82.7%). Third, the AWHIP data only sampled four ethnic subgroups of Asian American women, which is relatively small considering that there are more than 20 Asian American subgroups existing today (U.S. Census Bureau, 2012). This may be the reason why we did not find subgroup differences for either suicidal ideation or suicide attempts. Future studies should include more ethnic subgroups in order to possibly uncover important disparities among specific subpopulations regarding suicidal behavior. These efforts would lead to a more precise and comprehensive understanding of the relationships between drug use and suicidality among Asian American women. In the future, qualitative studies on suicidality should be conducted within the most vulnerable groups: those who use hard drugs alone or in combination of soft drugs. This could provide further insight into the context in which these women become involved in substance use and the process of how drug use affects their likelihood to engage in suicidal behavior.

4.2 Conclusion and Implications

The essential contribution of this study is the discovery that not all types of drug use are associated with suicidal ideation and suicide attempt; specifically, use of hard drugs alone or in combination with soft drugs has a robust association with both suicidal ideation and suicide attempts among Asian American women who are children of immigrants. An important clinical implication suggested from this finding is that mental health clinicians should not adhere to the model minority myth and thereby underestimate the impact of substance use when treating young Asian American women, especially those with suicidal risk. Rather, they should assess these patients' drug use (with particular attention to the type and combination of drugs) in order to better predict or recognize suicidal behaviors. Additionally, standard substance use assessment instruments should be used as routine practice in clinical and college mental health settings. Noting that Asian Americans are the fastest growing sector of United States college students and increased from 0.8 percent of the United States college student population in 1971 to 8.8 percent in 2005 (U.S. Department of Education, National Center for Education Statistics, 2011), implementation of substance use assessment for Asian American college students may impact future suicidal rates.

In addition, by developing sequential logistic regression models, we were able to discern the overlapping roles of family communication level, history of psychiatric diagnosis, and substance use in suicidal ideation and suicide attempts among young Asian American women. Hence, this study adds new evidence to the literature that, similar to what has been demonstrated in other racial groups, suicide is a multidetermined outcome for young Asian American women. Specifically, those who have low to moderate levels of family communication have increased susceptibility to suicidal ideation and suicide attempts. These findings highlight the need to design and test interventions that respond to comorbid mental health and substance use problems while also improving family communication in this population. For instance, suicide reduction intervention programs for young Asian American women should include not only strategies to assess and reduce substance use but also family components to improve family bonding, validation of children's emotions, and

understanding of each other's cultures across generations. It may be beneficial for suicide interventions to also include a mental health component that will reduce cultural shame and stigma related to seeking help and breaking the silence of private suffering. Future studies should replicate our findings with clinical samples as well as nationally representative samples of young Asian American women in order to provide solutions to the growing public health threat of suicidal behaviors.

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Biography

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L. Melissa Alexander, B.A., is a Research Fellow with Dr. Hahm in the School of Social Work at Boston University. She graduated from Harvard College with a Bachelor of Arts degree in Psychology in 2010. Along with her interest in clinical psychology, Melissa is passionate about mental health advocacy and awareness. Her other research interests include women's health, prenatal health, substance use, and self-harm.

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Dr. Lena Lundgren, Ph.D. Professor, Director, Center for Addictions Research and Services, and Associate Dean of Research, Boston University School of Social Work is a nationally and internationally recognized addiction treatment researcher. Her research area is often described as "Real World Research" and she conducts a number of research studies in collaboration with community-based organizations. Dr. Lundgren has together with her community-based collaborators brought more than 18 million dollars in HIV prevention and addiction treatment funds to the Commonwealth of Massachusetts. Currently, Dr. Lundgren has a 5- year guest professorship with Umea University Sweden where she conducts national longitudinal studies on addiction treatment access/use and outcomes.

Glossary

Family communication	Family communication is the degree of understanding and openness among family members. For Asian American who are children of immigrants, family communication can also depend on agreement between parent-child cultural values. Family communication was measured by a self-report assessment scale developed from the Circumflex Model of Marital and Family Systems 4 (Olson & Gorall, 2003) to quantify levels of family communication. Participants were asked 10 five-point Likert scale questions relating to family communication satisfaction, capability to positively express affection and opinions, and understanding other family members' feelings.
Cultural shame	Cultural shame implies that adherence to cultural values causes avoidance, shame, and embarrassment in certain behaviors or activities that are not traditionally accepted. Specifically, for Asian Americans, cultural values may dictate their views towards mental health help-seeking behaviors or sharing of personal problems (Kim & Omizo, 2003).
Model minority myth	The model minority myth posits that because of strong cultural and family values, Asian Americans are specifically poised for success in education, income, and socioeconomic status while also maintaining low risk factors, such as decreased mental health and crime. However, the myth creates social isolation, discrimination, and ignores group diversity. The myth can also create psychological burden for Asian Americans to constantly achieve high goals (Li & Wang, 2008).
Intergenerational conflict	Intergenerational conflicts are struggles between parents and their children that become especially common during early adolescence through young adulthood. Intergenerational conflict can usually attributed to children's greater autonomy and independence as they establish their own personal identities, value systems, and social relationships. In relation to Asian Americans, intergenerational conflicts are also attributed to assimilation. Asian parents and U.S. born children may have conflicts with maintaining traditional family and cultural values while also absorbing Western mainstream values, culture, language, and lifestyle. (Chung, 2001; Lee, Su, & Yoshida, 2005)

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(a) History of cigarette use only	(e) History of hard drug plus cigarette use
(b) History of marijuana use only	(f) History of hard drug plus marijuana use
(c) History of cigarette plus marijuana use	(g) History of hard drug, cigarette, and marijuana use
(d) History of hard drug use only	

Figure 1.
Substance Use Types Among Those With a History of Soft and/or Hard Substance Use

Table 1

Number and Prevalence of Asian American Women by Demographic Characteristics, Substance Use, and Suicidality (n = 720)

Demographic Variables	n	Prevalence (%)
<i>Age (yr)</i>		
18-27	664	92.2%
28-35	47	6.5%
<i>Education</i>		
High school diploma or less	111	15.4%
Some college or college degree	521	72.4%
Graduate/professional school or graduate degree	88	12.2%
<i>Country of Birth</i>		
Born in Asia (1.5 generation)	254	35.3%
Born in US (2 nd generation)	465	64.6%
<i>Ethnicity</i>		
Chinese	372	51.7%
Korean	157	21.8%
Vietnamese	140	19.4%
Other	51	7.1%
<i>Family Communication Level</i>		
High	461	64.0%
Medium	189	26.3%
Low	60	8.3%
<i>Psychiatric Diagnosis</i>		
No	622	86.4%
Yes	94	13.1%
<i>Substance Use</i>		
None	390	54.2%
[†] Soft Drug Use	250	34.7%
^{††} Hard Drug Use (alone or in combination with soft drugs)	76	10.6%
<i>Lifetime Suicidal Ideation</i>		
No	589	81.8%
Yes	126	17.5%
<i>Lifetime Suicide Attempt</i>		
No	666	92.5%
Yes	51	7.1%

Note: Percentages are weighted, and may not total 100 because of rounding. For explanation of family communication level, psychiatric diagnosis, substance use, lifetime suicidal ideation, and lifetime suicide attempt, see text on this page.

[†] Soft Drug Use indicates a history of cigarette use, marijuana use, or a combination of both.

^{††} Hard Drug Use (alone or in combination with soft drugs) indicates a history of hard drug use alone or a combination of soft and hard drug use.

Table 2

Proportion of Suicidality According to Type of Substance Use (n = 720)

Substance Use Types	<i>Lifetime Suicidal Ideation</i>		<i>Lifetime Suicide Attempt</i>	
	n	%	N	%
None	51	13.1%	18	4.6%
[†] Soft Drug Use	48	19.3%	18	7.2%
^{††} Hard Drug Use (alone or in combination with soft drugs)	27	35.5%	15	20.0%

Note: * p-value < 0.05 **p-value < 0.01 ***p-value < 0.001[†] Soft Drug Use indicates a history of cigarette use, ever marijuana use, or a combination of both.^{††} Hard Drug Use (alone or in combination with soft drugs) indicates a history of hard drug use alone or a combination of soft and hard drug use.

Table 3

Logistic Regression of Lifetime Suicidal Ideation on Substance Use Types (n = 720)

Substance Use Types	With Substance Use Model 1		With Substance Use and Psychiatric Diagnosis Model 2		With Substance Use, Psychiatric Diagnosis and Family Communication Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
<i>Age (yr)</i>						
18-27 (<i>R</i>)	1.0		1.0		1.0	
28-35	0.8	(0.4, 1.9)	0.7	(0.3, 1.7)	0.6	(0.2, 1.5)
<i>Education</i>						
High school diploma or less (<i>R</i>)	1.0		1.0		1.0	
Some college or college degree	0.6	(0.4, 1.1)	0.7	(0.4, 1.2)	0.7	(0.4, 1.2)
Graduate/professional school	0.9	(0.4, 2.0)	1.0	(0.5, 2.2)	0.9	(0.4, 2.1)
<i>Country of Birth</i>						
Born in Asia (1.5 generation)	1.0		1.0		1.0	
Born in US (2 nd generation)	1.4	(0.9, 2.2)	1.4	(0.9, 2.1)	1.4	(0.9, 2.3)
<i>Ethnicity</i>						
Chinese	1.0		1.0		1.0	
Korean	1.0	(0.6, 1.7)	1.0	(0.6, 1.7)	1.2	(0.7, 2.1)
Vietnamese	1.2	(0.7, 2.0)	1.3	(0.7, 2.1)	1.2	(0.7, 2.0)
Other	0.6	(0.3, 1.4)	0.6	(0.3, 1.5)	0.6	(0.3, 1.5)
<i>Family Communication Level</i>						
High	.		.		1.0	
Medium	.		.		2.6	(1.6, 4.1) ***
Low	.		.		3.4	(1.8, 6.6) ***
<i>A History of Psychiatric Diagnosis</i>						
No	.		1.0		1.0	
Yes	.		2.9	(1.8, 4.9) ***	3.0	(1.8, 5.2) ***
<i>Substance Use</i>						
None	1.0		1.0		1.0	
[†] Soft Drug Use	1.6	(1.0, 2.5) *	1.6	(1.0, 2.5) *	1.6	(1.0, 2.5)
^{††} Hard Drug Use (alone or in combination with soft drugs)	3.7	(2.1, 6.6) ***	2.8	(1.5, 5.1) ***	3.0	(1.6, 5.6) ***

Note:

** p-value < 0.01

* p-value < 0.05

*** p-value < 0.001

[†] Soft Drug Use indicates a history of cigarette use, marijuana use, or a combination of both.^{††} Hard Drug Use (alone or in combination with soft drugs) indicates a history of hard drug use alone or a combination of soft and hard drug use.

Table 4

Logistic Regression of Lifetime Suicide Attempt on Substance Use Types (n = 720)

Substance Use Types	With Substance Use Model 1		With Substance Use and Psychiatric Diagnosis Model 2		With Substance Use, Psychiatric Diagnosis and Family Communication Model 3	
	OR	95% CI	OR	95% CI	OR	95% CI
Age (yr)						
18-27 (<i>R</i>)	1.0		1.0			
28-35	1.2	(0.4, 4.0)	1.0	(0.3, 3.6)	1.1	(0.3, 3.7)
Education						
High school diploma or less (<i>R</i>)	1.0		1.0			
Some college or college degree	0.7	(0.3, 1.6)	0.8	(0.4, 1.8)	0.8	(0.4, 1.8)
Graduate/professional school	0.5	(0.1, 1.6)	0.5	(0.1, 1.8)	0.5	(0.1, 1.6)
Country of Birth						
Born in Asia (1.5 generation)	1.0					
Born in US (2 nd generation)	1.3	(0.7, 2.5)	1.2	(0.6, 2.4)	1.2	(0.6, 2.3)
Ethnicity						
Chinese	1.0					
Korean	1.5	(0.7, 3.2)	1.5	(0.7, 3.3)	1.9	(0.8, 4.3)
Vietnamese	1.9	(0.9, 4.1)	2.1	(1.0, 4.5)	2.1	(1.0, 4.5)
Other	2.1	(0.8, 5.8)	2.4	(0.9, 6.5)	2.5	(0.9, 7.0)
Family Communication Level						
High	.		.			
Medium	.		.		3.2	(1.6, 6.3) ***
Low	.		.		2.3	(0.9, 6.1)
A History of Psychiatric Diagnosis						
No	.					
Yes	.		3.1	(1.6, 6.2) **	3.3	(1.6, 6.7) **
Substance Use						
None	1.0					
[†] Soft Drug Use	1.6	(0.8, 3.2)	1.6	(0.8, 3.2)	1.5	(0.7, 3.0)
^{††} Hard Drug Use(alone or in combination with soft drugs)	5.4	(2.5, 11.8) ***	3.9	(1.7, 8.8) **	4.3	(1.8, 9.8) ***

Note: * p-value < 0.05**
p-value < 0.01***
p-value < 0.001[†]Soft Drug Use indicates a history of cigarette use, marijuana use, or a combination of both.^{††}Hard Drug Use (alone or in combination with soft drug use indicates a history of hard drug use alone or a combination of soft and hard drug use.