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Racial Misclassification Masks True Prevalence of Suicide in South Asian Americans

Aruna Jha[1], Manik Ahuja[2], Rajvi J. Wani[3], Anil Methipara[4], Jennifer Anderson[5]

Abstract

This research study is the first U.S effort to quantify and describe suicide among South Asian Americans (SAAs), an underrepresented group in mental health research. Since the creation of the Illinois Technology and Research Corridor, an important economic center, DuPage County, IL is home to a large SAA population. Following federal recommendations for disaggregating Asian American data and studying small minority populations at a granular level, 4 SAA researchers collaborated on this project. Name recognition identified 38 SAAs classified as suicides in the DuPage County coroner's database from 2001-2017. Coroner's reports were analyzed for contextual details and correlating factors specific to each suicide. We found errors in racial classification of SAAs with most cases listed as "White" or "Other." After correction of race and ethnicity, age-adjusted suicide rates for SAAs in Du Page County, IL were higher than the Centers for Disease Control's national suicide rates for Whites, Blacks and Asian Americans. Methods of suicide, contextual triggers, and familial responses to the suicides reflected a preference for cultural patterns common in South Asia.

Keywords: suicide, South Asian American, acculturative risk factors, mental health.

1. Introduction

It is impossible to ignore the seriousness of the suicide epidemic in the US and globally. The deaths of Robin Williams, Anthony Bourdain, and Kate Spade among many others brought suicide out of the closet and positioned it center stage among public health issues that command our attention. Whereas the suicides of the incredibly successful people mentioned above, leave one bewildered about the dark realities that were masked by a bright and positive persona; they also challenge us to take stock of countless others who struggle with and succumb to suicidal ideation but are not included in the national discourse on rising suicide rates. The term, "model minority" reflects "a perception that Asian Americans (AAs) achieve higher degrees of economic and educational success and has fewer health problems than the overall population." (Chou & Feagin, 2015, p.87; Esperat et al., 2004, p.140). If one were to accept published data AAs are also at a lower risk of suicide.

According to the Centers for Disease Control (CDC), Asian Americans consistently show the lowest rates of suicide among all races (Stone et al., 2017). The reported rate of 6.8 per 100,000, is less than half the overall U.S. rate of 14.5 and suicide does not appear among the 10 leading causes of death, underscoring the assumption of a low risk of suicide in Asian Americans (WISQUARS, 2019). On the other hand, a more careful examination of the CDC data presents a complex picture that prompts caution with any such assumptions. For example, in 2017, suicide was the leading cause of death for Asian Americans aged 15-24, whereas it was the second leading cause of death for all other races.

Additionally, Asian American females demonstrated a greater risk of a death by suicide at a much younger age than females from other races. Suicide was the leading cause of death for Asian American females aged 10-14 and 15-

[1] School of Social Work, University of Wisconsin, Whitewater, WI, United States
[2] Brown School of Social Work, Washington University in St. Louis, St. Louis, MO, United States
[3] University of Nebraska Medical Center, Omaha, NE, United States
[4] South Asian American Policy and Research Institute
[5] School of Social Work, University of Wisconsin, Whitewater, WI, United States.

24. In comparison, suicide was the 3rd leading cause of death for females aged 10-14 in all races, and the 2nd leading cause of death for females in the age group of 15-24 (WISQUARS, 2019). Whereas this analysis highlights the vulnerability of Asian American youths to suicide, it also suggests the possibility of a flaw in the CDC data, one that is not immediately apparent when comparing suicide rates between races at a population level.

2. Literature Review

2.1 Aggregate Asian American Suicide Data

Several authors have suggested that aggregation of Asian Americans into one group may mask differences between Asian American sub-groups as data is aggregated across more than 16 ethnicities (Holland & Palaniappan, 2012). These concerns extend to any data related to suicide risk (Duldulao et al., 2009) or true prevalence and context of suicide in Asian Americans (Lai & Arguelles, 2003), due to their tremendous diversity including ethnicity, languages, and immigration histories. Furthermore, racial misclassification is known to underestimate death counts among Asian Americans. Some work indicates the possibility of Asian Americans being misclassified or misidentified in hospital settings, most often as "Other" or "Unknown" race (Boehmer et al., 2002; Kressin et al., 2003). One study found the rates underestimated by as much as 7% with 10-14% of the sample classified as White (Arias et al., 2008).

Based on these concerns about data quality, the Institute of Medicine (2009) released a report in 2009 highlighting the importance of collecting granular ethnicity data – defined as a person's ethnic origin or descent, roots, heritage, or the place of birth of the person or the person's ancestors. The report also recommended that when directly collected race and ethnicity data are not available, entities should use indirect estimation strategies – for example geocoding or surname analysis. Therefore, this study used name selection to focus on one sub-group of Asian Americans, namely South Asian Americans.

2.2 Suicide in South Asian Americans (SAAs)

South Asian Americans are one of the fastest growing populations in the US. This ethnic group includes individuals who trace their ancestry to Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan, and Sri Lanka. The community also includes members of the South Asian diaspora, past generations of South Asians who originally settled in other parts of the world, including Africa, Canada, the Caribbean, Europe, the Middle East, and other parts of Asia and the Pacific Islands (SAALT, 2012). A conservative estimate of the major ethnic sub-groups among South Asians totaled 4.7 million individuals, comprising 27 percent of the population and the third largest ethnicity among Asian Americans.

The true prevalence of suicides among specific Asian American subgroups, such as the emerging South Asian American community, is not known (Lane et al., 2016). To illustrate, Kuroki (2018) disaggregated suicide mortality among the 6 largest Asian American groups: Chinese, Filipino, Indian, Japanese, Korean, and Vietnamese, and showed significant variation in the rates of suicide between groups; Japanese and Korean American suicide rates were significantly higher than those for Indian Americans. High suicide rates in Japanese and Korean American men and women have also been shown previously (Hastings et al., 2015; Kalish, 1968; Lester, 1994).

Notably, Kuroki (2018) based his study on National Center for Health Statistics (NCHS) data, which does not account for racial misclassification on death records. Furthermore, the National Committee of Health and Vital Statistics records the identification of Chinese, Japanese, Hawaiian, and Filipinos in all 50 states, but identify the other ethnic groups—including Vietnamese, Asian-Indian, Korean, Samoans, and Guamanians—in only nine states, which contain about two-thirds of the U.S. population in each of these groups (Waksberg et al., 2000) raising the possibility of errors in the rates of the under-identified ethnic groups.

On the other hand, Patel and Gaw (1996) found that suicide rates among South Asian females in the US were higher than the general population. Anecdotal evidence and ethnic newspaper articles (Elias, 2015) report that South Asian adolescents and young adults in the US are at an elevated risk for mental health disorders, along with suicide thoughts, behavior, and many incidents of completed suicides. The probability of racial misclassification and systematic undercount in federal data underscore the need for examining suicide in South Asian Americans.

Rates of major mental disorders in a community sample have not been examined for SAAs (Masood et al., 2009) and the scant US research that exists does not adequately address suicide, suicidal behaviors, or mental health disorders associated with suicide risk.

Whereas prior research had neglected to examine how suicidal ideation and its correlates may vary among specific South Asian American ethnic groups (Hoeffel et al., 2012), more recent research (Lane et al.,2016) showed that young adult Asian Indian Americans are at greater risk of suicidal ideation than their Bangladeshi American and Pakistani American peers, suggesting that there may be some influence of religious beliefs (Hinduism vs. Islam) in the difference in rates. Masood (2009) cites the growing perception among South Asian American community leaders that mental health problems within the community are going untreated as few mental health services meet their communities' needs. Recent newspaper reports show that South Asians in the US may be at an elevated risk for mental health disorders, along with suicide thoughts, behavior, and many incidents of completed suicides. Researchers caution that several suicides among South Asianadolescents and young adults have been overlooked or not made public due to privacy and the social stigma associated with suicides (Radhakrishnan & Andrade, 2012).

The abovementioned concerns in the U.S., are underscored by emerging suicide data from South Asia and countries that have high Southern Asian populations. In a scoping review, Jordans et al. (2014) found that suicide rates in South Asia were higher than the rest of the globe. Further analyses of demographic trends show that South Asian males are at a higher risk for suicide than South Asian females (Jordans et al., 2014), Hindu males are at higher risk for a suicide attempt than those practicing Christianity (Leong et al., 2013) and, age is a risk factor, with females being at higher risk between 15–29 years, whereas 30–44 years is high risk for males (Aggarwal, 2015). Additional research identifies several well-known risk factors associated with suicidal ideation and behaviors in South Asian Americans (Inman, 2007, Sharma, 2000, Patel & Gaw, 1996).

2.3 Acculturative Stress

One of the most frequently cited risk factors for suicidal ideation and behavior in SAAs is acculturative stress. Because the SAA community is foreign-born, adjustment to the norms and values of the dominant culture may be stressful and related to depression and suicide (Leong et al., 2013). Prior research suggests the clash of two cultures creates stress among adolescents and young adults (Inman, 2007). Jha (2001) documented 4 different sources of acculturative stress, namely social, attitudinal, familial, and environmental. Of these, family stress—often described within a context of parental pressure to maintain cultural values and identity while simultaneously needing to develop an American identity, was a major trigger for suicidal ideation in Indian American college students. Some authors have previously hypothesized that the co-occurrence of depression, anxiety, and domestic violence may contribute to the high rates of suicide in South Asian American women (Patel & Gaw, 1996), although this was not empirically tested. A recent study (Nath et al., 2018) found that South Asian Americans with higher education scored lower on the Reasons for Living Inventory, a robust measure of protection against suicide, as did those who were younger, had lower incomes, or were immigrants from India. The authors concluded that their findings were consistent with U.K-based studies. Numerous studies from the U.K have shown that South Asian women had high rates of suicide, the rate was higher among the upper middle class, and a large proportion of male suicides were doctors and dentists (Raleigh, 1996).

2.4 Mental Health Stigmas

South Asian cultures have traditionally not utilized mental health services and many of the immigrants from these countries may have little to no understanding of mental illness. Additionally, there is a stigma of mental health in South Asian cultures that has harmful effects on individuals (Kishore, 2011). Consequently, South Asians are less likely to seek outside intervention or counseling due to cultural stigma. Driven by the tradition of keeping family matters private (Sharma, 2000), South Asian Americans refrain from sharing problems with outsiders, including mental health providers (Conrad & Pacquiao, 2005, Kreps, 2017). This puts South Asians at risk for internalizing behaviors, which are a risk factor for anxiety and depression (Tandon et al., 2009). As can be seen, due to these beliefs regarding mental illness, accessing mental health services does not come easily to South Asian Americans and may be a barrier to timely suicide prevention.

2.5 Summary

In sum, the published rate of suicide in Asian Americans cannot be applied uniformly to every ethnic subgroup. There is a substantial gap in the suicide literature on South Asian Americans. Further research on prevalence and risk factors for suicidal thoughts and behavior would improve suicide screening, prevention, and intervention with this emerging and growing population (Lane et al., 2016).

Thus, the aim of the present paper wasto compare our corrected SAA suicide rates with the published rates of suicide in all racial groups, provide an overview of key contextual factors for the deaths as recorded in coroner's reports, and highlight inaccuracies and deficiencies in the coroner's reports. To our knowledge, this is the first study based on completed suicides among South Asians in the US.

3. Research Methodology

3.1 Research Design and Methodology

This study is based on the death records of 38 (29 males, 9 females) South Asian Americans (SAA) who died by suicide in Du Page County, IL, during the years 2001-2017. We examined familial and individual-level risk factors that may have contributed to the deaths by suicide. All members of the research team are of South Asian descent, from different parts of the Indian sub-continent, and hence familiar with South Asian first and last names and the common contexts of suicide in this community. We used a multi-step process to ensure adherence to HIPAA rules of confidentiality. First, with permission of the coroner, the first author acquired the names of all individuals that died by suicide in the years 2001-2017 in Du Page County, IL. The first and last names were used to select 41 cases from these lists. The coroner's staff printed hard copies of the coroner's final reports, redacted the identifiers such as name, address, and family members' names using black permanent markers, and converted the records into pdf format. We received these redacted records as secure email attachments with no possibility of specific names being connected to any of the records.

Each researcher reviewed the redacted coroner's report for each decedent and qualitatively identified the relevant variables for our study. Thereafter, we thoroughly discussed the information for each decedent to reach a consensus on the contexts and information in the coroner's reports. Based on this discussion, 3 cases were deemed as false positives and rejected from further analysis. Hence, our sample consisted of 38 cases that all researchers agreed were South Asian. The original South Asian name list was destroyed.

The information was organized in a comprehensive taxonomy table for further analysis. The variables we studied included year of death, age, gender, marital status, race on record, employment, method of death, cause of death, premeditated vs. impulsive suicides, mental health diagnoses, prior mental health treatment, prior suicide attempts, substance abuse history, and family support. Finally, we retrieved population estimates for South Asian Americans and all races in Du Page County for the years 2001 to 2017 from the American Community Survey (ACS) and Census data and averaged the population into 3-year bands to account for suicide being a low incidence event.

3.2Research Subjects

The research subjects consisted of South Asian decedents that were identified as suicides in the "Cause of Death" column in the coroner's database for the years 2001-2017. Subjects ranged in age from 16 to 71 years (Mean=44.2 years, SD = 17.2). Basic demographic information of the subjects is shown in Table 1 below.

3.3 Data Analysis

We analyzed these data to identify the frequency of racial misclassification, rates of suicide by age and gender, suicide trends over time, suicide ratios for genders, and methods of death. Further analyses assessed the prior history of behavioral symptoms and treatment, drug, and alcohol use prior to death by suicide, and probability of planned suicides. Finally, we calculated age-adjusted suicide rates for SAAs in DuPage County and compared them to suicide rates for different races published by CDC for 2001-2013. ACS population estimates for 2014-2017 were not released at the time of study and those comparisons are omitted from our comparisons of suicide rates.

4. Research Results

4.1. Age, Gender, Marital and Employment status of Decedents

From 2001 to 2017 DuPage County, IL reported 38 deaths by suicide among SAAs. As shown in Table 1 there was an increase in the percentage of suicide cases from 2010, which corresponds with an increase in the population of SAAs in the County. Over the 17-year study, it was seen that 34.2% (n=13) of suicides among SAAs were by those aged between 51-64 years, followed by 23.7% between 36-50-year (n=9). Together these age groups (36-64 years) accounted for 58% of the suicide deaths among South Asian Americans. Males accounted for 76% of the suicides making the rate of male suicide 3 times that of women.

Per the coroner's reports, 45 % (n= 17) of the decedents were married, 21% (n=8) were divorced or separated, and 34% were listed as single. The educational qualifications of most decedents were unknown. Only 53% of the decedents had a known employment status with 21% employed, 16% unemployed or retired, 13% business owners, and 3% shown as working for a religious institute.

Table 1: Descriptive characteristics of suicide in DuPage County, IL, 2001-2017.

Characteristics	Number	%
Age		
≤19 years	4	10%
20-35 years	9	24%
36-50 years	9	24%
51- 64 years	13	34%
≥65 years	3	8%
Classified race		
American Indian	1	3%
Asian	13	34%
Asian (East Indian)	3	8%
Indian	1	3%
White	5	13%
Other	15	39%
Gender		
Male	29	76%
Female	9	24%
Marital Status		
Married	17	45%
Single	13	34%
Divorced or separated	8	21%
Education level/status		
Doctorate	2	5%
Student status	5	13%
Unknown	31	82%
Employment status		
Business owner	5	13%
Employed	8	21%

Unemployed/retired	6	16%
Worked for a religious institute	1	3%
Student	5	13%
Unknown	13	34%
Year of Death *		
2001-2004	4	11%
2005-2007	7	18%
2008-2010	6	16%
2011-2013	9	24%
2015-2017	12	32%

4.2 Classification Errors for Race and Ethnicity

Only 11% (n=4) of our sample had any mention of South Asian ethnicity, with 1 case among the 38 (3%) referenced as "Indian", and 3 (8%) listed as 'East Indian'. 'Indian' and 'East Indian' are not recognized categories of race or ethnicity in the US. SAAs were misclassified as various races. Overall, 'Other' (n=15, 39%), 'White' (n=5, 13%) and 'American Indian' (n=1, 3%) accounted for 55% misclassification in race followed by "Asian" (34%, n=13).

4.3 Methods of Suicide

In Table 2, we present our assessment of the cases of pre-meditated vs. impulsive suicides based on the lethality of intent, method of choice, and contextual factors as presented in the coroner's reports. Many suicides (76%, n=29) were pre-meditated and among these, some were well-planned and executed. Only 24% (n= 9) appear to have been impulsive suicides triggered by immediate circumstances. Among the impulsive suicides, the methods of death were hanging (13 %), blunt force by vehicle or train (8.0%); and overdose (2.6%). The planned suicides reflect a higher lethality of intent to die in the methods chosen, with decedents choosing asphyxiation by hanging(29%, n=11); blunt force by vehicle or train (13%, n=5); self-immolation (8%, n=3) and gunshot (5.3%, n=2). Among the 29 pre-meditated suicides 11 (38%) left suicide notes. Overall, the most common method of suicide was hanging (42%) followed by blunt force from collision with vehicle or train (21%).

Table 2: Premeditated vs. Impulsive Suicides among South Asian Americans in DuPage County, IL, 2001-2017 as assessed by Method of death and living arrangement.

Characteristics	Type of Suicide					
	Pre-meditated (n=29)		Impulsive (n=9)		Total (n=38)	
	Number	Percent	Number	Percent	Number	Percent
Method of death						
Hanging	11	38%	5	56%	16	42%
Blunt force from vehicle/train	5	17%	3	33%	8	21%
Self-immolation	3	10%	0	0%	3	8%
Overdose	3	10%	0	0%	3	8%
Gunshot	2	7%	0	0%	2	5%
Chemical poisoning	1	4%	1	11%	2	5%
Drowning	2	7%	0	0%	2	5%
Jumping from a height	1	3%	0	0%	1	3%
Electrocution	1	4%	0	0%	1	3%
Location of death						
Home	17	59%	5	56%	22	58%
Outside	12	41%	4	44%	16	42%
Living arrangement*						
Alone	5	17%	2	22%	7	11%
With family	21	72%	7	78%	28	79%
With roommates	1	4%	0	0%	1	3%
Unknown	2	7%	0	0%	2	8%

- Total percentage adds to 101 percent due to rounding.

4.4 Location of Deaths

A higher prevalence (58%) of the suicides occurred at home whereas 42% occurred elsewhere. Although 63% had a previous history of mental illness, a mental health diagnosis (58%), or symptoms of a behavioral disorder (71%), only 34 % of the decedents had received psychiatric care. Very few of the decedents had a previous history of suicide attempts (21%), visited the emergency room for psychiatric conditions (13%); or made suicidal statements (3%) prior to suicide. Substance abuse prior to suicide death was indicated in only 21% of the cases.

4.5 Age-Adjusted Rates of Suicide among South Asian Americans

Table 3 compares the age-adjusted suicide rates for South Asian Americans in DuPage County, IL. to the suicides rates for all races derived from WISQUARS tables for the same year bands (2001-2004, 2005-2007, 2008-2010, 2011-2013) published by the Centers for Disease Control (CDC). As can be seen, the suicide rate for South Asian Americans is significantly higher than the published national suicide rates for White, Black, Asian/Pacific Islander, and Native American populations for each of the time periods shown. Due to the small sample size, we did not calculate rates by gender.

Table 3: Comparison of age-adjusted suicide rates in SAAs in DuPage County with national rates by race.

Year	Age-Adjusted Suicide Rates (95% Confidence Intervals)				
		National suicide rates by Race			
	South Asians in DuPage County	White	Black	Asian/ Pacific Islander	Native American/ American Indian
2001-2004	17.8 (2.2-33.3)	11.9 (11.8-12.0)	5.3(5.3-5.7)	5.5 (5.3-5.7)	10.3 (9.8-10.9)
2005-2007	24.0 (8.3-39.6)	12.3 (12.2-12.3)	5.1 (4.9-5.2)	5.5 (5.2-5.7)	10.4 (9.8-11.0)
2008-2010	15.4 (3.1-27.8)	13.2 (13.1-13.3)	5.2 (5.1-5.3)	5.9 (5.6-6.1)	10.3 (9.8-10.9)
2011-2013	20.1 (6.2-33.9)	14.1 (14.0-14.1)	5.4 (5.3-5.5)	5.9 (5.7-6.1)	11.0 (10.5-11.6)

**The numerator consisted of the total number of suicides for each period, whereas denominators were calculated by using population data for intercensal years in the American Community Survey. Suicide rates per 100,000 were based on total suicide cases (men and women) due to the small cell counts. Suicide rates for White, Black, A/PI and NA were derived from the CDC_WISQUARS database (retrieved 4-16-2019).

5.Discussion

Research data on South Asian Americans arescattered at best as they have frequently been overlooked in mental health literature (Lubin &Khandai, 2016). For example, several mental health studies based on the National Latino and Asian American Study data set (Cheng et al., 2010; Duldulao et al., 2009; Kuroki & Tilley, 2012) did not report any findings on South Asian Americans. It was, therefore, of great importance to conduct this study to address the lack of research on this growing problem. The National Committee on Vital and Health Statistics recommended that the Departmentof Health and Human Services (HHS) move toward gathering microdata, defined as non-aggregated data containing variables that make the respondents potentially identifiable, and not overlook small Asian American and Pacific Islander subpopulations scattered inconsistently throughout the United States (Ghosh, 2009).

Furthermore, in 2009, the Institute of Medicine recommended that when directly collected race and ethnicity data are not available, entities should use indirect estimation strategies such as surname analysis to assess race or ethnicity. Our investigation implemented these recommendations in developing a methodology to identify South Asian Americans by name on coroner's death records. Our results showed that racial misclassification caused a gross undercount of South Asian American suicides. Whereas Arias et al (2008) had found as much as a 7% undercount of Asian Americans, our study found that 89% of our sample was marked as something other than South Asian. After correcting for racial misclassification, our results showed that South Asian Americans in DuPage County had the highest rates of suicide among all racial categories for the year-bands that we studied.

Our findings underscore the importance of meticulously disaggregating Asian American population data when studying various health outcomes. Wong and colleagues (2014) found that among Asian American subgroups suicidal ideation was highest among Korean Americans and lowest among Indian Americans. Similarly, Kuroki (2018) disaggregated NCHS data to publish the rates of suicide in Japanese Americans (9.6/100,000) and Korean Americans (12.9/100,000) in 2010. Our study (Table 3) found that the age-adjusted suicide rate for South Asian Americans in DuPage County in 2010 was 15.4/100,000, significantly higher than the published rate for Korean Americans. This is a function of adjusting for misclassification of race, which was an emphasis in the methodology we used whereas the Kuroki (2018) study does not include mention of any corrections for race.

Our findings suggest caution with assumptions about gender and age-based vulnerability to suicide in South Asian Americans. U.S suicide data suggests that 3.5 men die by suicide for 1 female suicide, and the group most likely to die by suicide are White, middle-aged men (Drapeau & McIntosh, 2018). Our study found a similar ratio in male to female suicides, and in the age-related trends; with our sample being predominantly male (76%) and middle-aged (30-64 years, 58%). This finding is important because it contradicts prior research suggesting Asian American women and young Asian Americans areat greater risk of suicide. A small sample size did not permit us to calculate age-adjusted suicide rates separately for men and women.

It would be very important to do such a study in the future with a larger sample so that we may validate or refute previous reports that suggested high suicide rates in young South Asian women (Patel & Gaw, 1996).

The suicide deaths in our study suggest a lethality of intent to die in the sample that is noteworthy. Most suicides were pre-meditated as opposed to impulsive. The context that most of the decedents (82%) were living with their families or had support from friends, highlights the fact that these individuals were keeping their suicidal ideation private, along with their struggles with mental health issues. Our finding supports previous research suggesting that South Asians are reluctant to seek mental health services (Kreps, 2017); due to stigma (Kishore, 2011) or lack of awareness of resources. The pre-meditated suicides had a preponderance of hanging deaths, followed by blunt force from stepping in front of a train or vehicle, overdose, and self-immolation, all common choices on the South Asian sub-continent. Hanging is among the most frequently used methods in South Asia (Jordans et al., 2014; Wu et al., 2012); and the 'quickest' and 'easiest' method for a death by suicide (Biddle et al., 2010). Most of the suicides occurred in the decedent's home followed by public places (i.e., roads, railroad tracks), indicating a cultural preference that is consistent with prior reported studies from South Asia (Rabi, 2017).

Self-immolation is a uniquely horrific method of suicide that is common in South Asia but is seldom practiced by non-Asian individuals. We had 3 cases (8%) of suicide by self-immolation in our sample of 38. These suicides demonstrated a significant amount of planning as gasoline must be purchased to complete the suicide. What made these victims choose such a painful way to die? The contexts of psychological distress and emotional conflict in vulnerable South Asian Americans needs to be further explored. On the other hand, very few of the decedents in our study (n=2; 6%) chose to die by gunshot - the most common method of suicide in the US (51%, AFSP, 2019). Gun ownership is not popular in South Asia, and it would have taken careful planning to acquire a weapon. Our findings show that, despite residing in the US, our subjects chose culturally sanctioned methods of suicide, suggesting a cultural vulnerability in SAAs that elevates suicide risk, and needs careful examination in the research.

Families reported that a majority (63%) of our subjects had a prior history of mental illness (primarily depression), behavioral disorders (71%), or mental health diagnoses (58%). Our numbers are consistent with US data, as depressive symptoms are highly correlated with suicide. Both adults and youth in our study were impacted by mental health diagnoses. Whereas psychiatric illness consistently emerges as the most prominent cause of suicide (Conwell et al., 2011) among adults, South Asian American youth are affected by other factors such as family stress, shame, relationship issues, and terminal illness. Testing this hypothesis was beyond the scope of our study. Yet only 34% of our sample had ever undergone mental health treatment, and only 13% had been to an emergency room. Numerous factors inhibit Asian Americans'access to mental health treatment and should be studied further. Efforts need to be in place for developing culturally specific psychiatric services, outreach, and engagement in the community to educate families on resources available and address deep-rooted mental health stigmas.

Asis evident from our results many of the suicides we studied were married or lived with family or friends. It is not known, though, if the victims had expressed loneliness or social isolation. Prior research finds that loneliness is a large contributor to suicide, has been considered a major source of psychological stress (Beutel et al., 2017), and is a contributor to suicide thoughts and behavior (Stickley & Koyanagi, 2016). Our source documents did not elaborate on the strength of the family relationships, quality of social support, and other possible mediators. The individuals chose to die by suicide while amid family and friends suggesting the possibility of family stress being a precipitant.

South Asian suicides are often underreported or misclassified; for example, in this study, a large percent of decedents (89%) were misclassified, most often as 'Other'; and the rest were given a non-specific "Asian" designation. The absence of correctly identified demographic characteristics such as race and ethnicity havesignificant public health implications. First, it minimizes the problem of suicides and mental illnesses among the South Asian American population and increases the perception that there is no need for suicide prevention in this high-risk community. Consequently, no public health funding is targeted to develop interventions, collect data, and provide evidence-based findings to policymakers. Moreover, owing to the lack of substantial data and evidence, the South Asian American community does not understand the scope of the problem, fails to internally monitor trends, notice the signs within their social groups, or undertake the responsibility of offering timely psychiatric care. In fact, the lack of data encourages the inherent cultural tendency of South Asian Americans to suppress their awareness of suicide, to avoid public engagement with this issue, and thus prevents any efforts to mobilize the community in prevention efforts.

Finally, and importantly, our study highlights several errors and data omissions in coroner's reports. Whereas racial and ethnic misclassification is the most obvious and easily corrected error, the lack of data on contextual factors prevents a thorough understanding of the context of these suicides. It would be imperative to gather such information if future efforts in suicide prevention are to succeed.

6. Conclusions

Aggregate Asian American data and significant racial /ethnic misclassification mask the high rate of suicide in South Asian Americans. After correction of racial classification, the age-adjusted suicide rate for South Asian Americans in DuPage County, IL was higher than the published national rates for all other races. Although a high percentage of victims had previous mental health diagnoses or symptoms of behavioral disorders, very few had received mental health treatment. Further research to accurately classify South Asian Americans and identify cultural risk factors for suicide could lead to targeted interventions and prevention programs.

More work is needed to elucidate the social and environmental factors underlying suicide among South Asians. Such knowledge will be critical for the development and implementation of evidence-based and culturally adapted suicide prevention strategies, including increasing awareness, expanding mental health and culturally specific counseling, as well as education and outreach in the communities. Further studies need to be conducted which are comprehensive and examine risk and protective factors at the family and individual levels.

This study highlighted the advantages of partnering with coroners and medical examiner's staff on data collection to gather accurate information from South Asian Americans and other ethnic minorities. It also underscored the need to educate mental health providers and other first responders (police and coroners' staff) on the cultural factors that influence South Asian Americans' struggles with mental illness and their preferred methods for completing suicides. Such awareness could increase timely intervention to prevent suicide. Standardizing the nomenclature for race and ethnicity and educating first responders on the importance of correct classification of the race could yield significant dividends in improving the accuracy of national mortality data.

The importance of disaggregating ethnic minority health data and engaging minority scholars in the research has been demonstrated in this research. This study was possible because the team consisted of SAA researchers who were familiar with South Asian names and the culturally specific contexts of suicide among SAAs. Such approaches can be replicated by other researchers who are from minority and immigrant communities to address health disparities and advance the mission of suicide prevention.

7. Limitations and Future Directions

This study has some limitations, mainly related to ostensibly small numbers as found in previous studies of suicide, that suggest caution while interpreting the results. Our sample was limited to one county in Illinois that tends to attract a highly educated, middle-class South Asian population. Although our sample included individuals who were unemployed or in financial difficulties, it didnot represent the total picture of ethnic and socio-economic diversity in the South Asian population. Hence, the findings may not be generalizable to the rest of the U.S.

The coroner's reports offered limited details on financial and employment status and medical history, along with incomplete interview reports from family or significant others, thereby preventing us from drawing accurate conclusions about the exact precipitating factors or trigger events for the suicides. Key elements of information required to understand the phenomenology of suicide in ethnic minorities include family dynamics, income and educational levels of immediate family members, professional status, duration in the U.S., mental and physical health history, etc. These should be emphasized in future studies.

The age-adjusted suicide rates in South Asian Americans had relatively large confidence intervals and were being compared with more robust national samples in other racial categories with smaller confidence intervals. This limited our ability to draw a definitive conclusion of higher suicide rates in South Asian Americans. Although we offset this limitation by conservatively selecting well-recognized South Asian names and by omitting victims with atypical ethnic or Caucasian names, we may have erred toward an underestimate of the true prevalence of suicide in South Asian Americans. These limitations can and must be addressed in future studies with larger and more representative samples.

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