Article

Examining the Contributions of Disability to Suicidality in the Context of Depression Symptoms and Other Sociodemographic Factors

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Abstract

We examined the contribution of disability status to suicidality when accounting for depression and sociodemographic risk factors in 438 American adults, 82 (18.7%) of whom identified as having disabilities. Participants with disabilities had significantly higher depression scores and were more likely to be unemployed and unpartnered, all of which were also associated with increased suicidality. However, disability remained a significant predictor of suicidality even when depression and sociodemographic risk factors were accounted for in a linear regression. Other significant predictors of suicidality in this regression were female gender, depression symptoms, and family and friend suicide history; identifying as a member of a religion was a significant protective factor against suicidality. Our findings suggest that the

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contribution of disability to suicidality goes beyond that which can be explained by increased depression symptoms and sociodemographic vulnerability.

Keywords
suicide, suicidality, disability, depression, sociodemographic factors

Suicide is responsible for more than 44,000 deaths in the United States each year, and for each death by suicide, there are an estimated 25 additional attempts (Drapeau & McIntosh, 2016). Thus, suicide is a major public health issue and one of considerable concern to counselors and other health professionals. People with disabilities have been found to be particularly at risk for suicide (Lund, Nadorff, & Seader, 2016); this increased risk has been consistently found across disabilities, including multiple sclerosis (Giannini et al., 2010; Pompili et al., 2012), autism spectrum disorders (Segers & Rawana, 2014), spinal cord injury (Giannini et al., 2010), and Huntington's disease (Wetzel et al., 2011). However, despite this increased risk within and across populations, relatively little research has examined the factors that relate to suicidality in people with disabilities.

Depression is considered a major risk factor for suicidality (American Foundation for Suicide Prevention [AFSP], 2015), and suicidal thoughts and actions are considered a symptom of major depressive disorder (American Psychiatric Association, 2013). As with suicide, people with disabilities have been consistently found to experience elevated and increased rates of depression relative to the general population (Giannini et al., 2010; Lunsky, Raina, & Burge, 2012; Pompili et al., 2012; Wetzel et al., 2011). Thus, this raises the question of if the elevated rates of suicidality seen in people with disabilities can be accounted for by the higher rates of depression in this population. However, only a few studies have examined suicidality among people with disabilities when controlling for depression. Dennis et al. (2009) found that controlling for anxiety and depressive disorders accounted for some, but not all, of the impact of activity limitations on suicidality. Similarly, Authors (2016) found that after controlling for depressive symptoms in the present sample—a stricter test, given that depression is often undiagnosed in suicidal individuals (AFSP, 2015)—disability status still significantly predicted suicidality. These studies, although a few in number, appear to suggest that increased rates of depression or depressive symptoms do not fully account for the elevated rates of suicidality among those with disabilities.

Sociodemographic Factors and Suicidality

Income and Employment Status

Although depression is a major risk factor for suicidality, sociodemographic factors have also been found to impact suicide risk (Fiedorowicz, Weldon, & Bergus, 2010).

Chief among these are the factors that make up socioeconomic status, primarily income, education, and employment. For example, in a large study of Canadian adults, McConnell, Hahn, Savage, Dube, and Park (2015) found that unemployment, lower educational obtainment, and lower personal income were all significantly correlated with both past year and lifetime suicidal ideation. Similarly, Wetherall, Daly, Robb, Wood, and O'Connor (2015) found that both absolute and relative income were significantly associated with suicidal thoughts and attempts, with lower income and income-rank serving as risk factor for increased likelihood of suicide thoughts and attempts. As McConnell et al. (2015) and Wetherall et al. (2015) write, the association between lower socioeconomic standing and suicidality likely represents a greater marginalization from, and devaluation by, society. Similarly, unemployment has also been shown to be a risk factor for suicidality. In a study of 1,167 individuals who died by suicide in Northern Ireland, for example, O'Neill, Corry, McFeeters, Murphy, and Bunting (2016) found that only 50.3% of the sample was employed at the time of their deaths. Likewise, in a large, national sample of American adults, Kalist, Molinari, and Siahaan (2007) found that individuals who reported having thought about or attempted suicide had both significantly lower incomes and significantly lower employment rates. The association between educational attainment and suicidality has been more mixed. For example, Pompili et al. (2013) found that higher educational attainment was associated with higher risk of death by suicide; conversely, Abel and Kruger (2005) found that suicide rates were significantly negatively related to educational attainment. However, it appears that, in general, lower social status, at least as measured by income and employment status, tends to increase the risk of suicidality, in the forms of ideation, attempts, and death.

The link between suicidality and lower income and employment is of particular interest to those studying suicidality in people with disabilities. People with disabilities tend to have dramatically lower incomes and employment rates compared with those without disabilities; the United States Census Bureau (2013) reported that people with disabilities were one third as likely to be employed as people without disabilities. Furthermore, people with disabilities who were employed made significantly less money than those without disabilities, with more than half of the employed individuals with disabilities making less than $25,000 per year (United States Census Bureau, 2013). This trend of low employment and low income has been seen in even highly educated samples of people with disabilities. In a sample of 213 women with disabilities, for instance, Robinson-Whelen, Hughes, Gabrielli, Lund, and Schwartz (2014) reported a median income of just more than $10,000 a year and a mean income of $19,126 a year, despite 58.6% of the sample reporting having completed some college and more than a quarter (26.8%) having earned a bachelor's degree or higher. Furthermore, they reported that approximately 40% of their sample lived below the poverty line, as measured by income and household size. Likewise, Mitra et al. (2015) found that women with disabilities were

significantly more likely to live below the poverty line than women without disabilities (45.0% vs. 24.9%). The fact that low income and unemployment appear to be almost inescapable in people with disabilities is concerning, especially given the well-established link between low income, unemployment, and suicidality. Furthermore, employment may be protective against depression in people with disabilities; for example, Kalpakjian and Albright (2006) found that employment was significantly predictive of a lower likelihood of depression in men and women with spinal cord injuries. Thus, employment may interact with depression in contributing to one's risk for suicidality.

Gender, Ethnicity, and Age

In addition to the relationships between suicidality and income and employment, it is typical to consider basic demographic variables of age, gender, and race/ethnicity. Data from the Centers for Disease Control and Prevention (CDC, 2015) and Drapeau and McIntosh (2016) suggest that suicidal ideation and attempts are higher among females than males but that deaths by suicide are more common among males. This may be because men tend to choose suicide methods that are more likely to result in death, such as shooting oneself with a firearm, while females choose methods, such as poisoning oneself with medication or other substances, that they are more likely to survive (CDC, 2015). Similarly, the CDC reports that White individuals are less likely than Native American, Alaskan Native, Native Hawaiian, and other Pacific Islanders to report having suicidal thoughts; however, they are more likely than African-Americans, Hispanics, and Asians to report having suicidal thoughts. However, White Americans have a higher age-adjusted suicide rate than any other American racial or ethnic group (Drapeau & McIntosh, 2016). In regard to age, the CDC reports that suicidal ideation in adults tends to decrease with age, although deaths by suicide tend to increase with age, suggesting that older individuals are more likely to choose suicide methods that result in death.

Relationship Status

In general, being married or partnered has been found to be protective against suicidality; for example, Aschan et al. (2013) found that being unmarried or not cohabiting was predictive of a higher likelihood of both suicidal ideation and suicide attempts in a large British sample. Likewise, McConnell et al. (2015) found that individuals who were not currently married were more likely to report both past year and lifetime suicidal ideation than those who were currently married. Furthermore, Kalpakjian and Albright (2006) found that being married was protective against major depression in people with spinal cord injuries. Women with disabilities tend to be married at lower rates than those without disabilities (Mitra et al., 2015) and report more difficulty finding sexual and romantic partners

(Nosek, Howland, Rintala, Young, & Chanpong, 2001), thus making single or unmarried relationship status another sociodemographic risk factor by which people with disabilities may be disproportionately adversely affected.

Religion

Religious beliefs and participation may also affect suicidality. This may occur either via religious beliefs or teachings that discourage or condemn suicide (Dervic et al., 2004; Fiedorowicz et al., 2010), or through the social support created by participation in religious communities (Robins & Fiske, 2009). Because religious affiliation, by way of moral beliefs about suicidality, has been found to be protective against suicidality even in people who were hospitalized due to psychiatric disability (Dervic et al., 2004), religious affiliation and participation should be included in sociodemographic models of suicidality, including those which account for psychiatric disability.

Suicide Exposure

A final sociodemographic factor that may impact suicidality is friend and family history of suicide attempts and death by suicide. Familial patterns of suicide have been well documented (Fiedorowicz et al., 2010; Qin, Agerbo, & Mortensen, 2002), with family history of suicide attempts or deaths increasing one's risk for own suicidal behavior. In addition, suicide can tend to cluster among peer groups (Kleiman, 2015). Thus, participants' experiences with suicide and suicide attempts by friends and family members should also be considered in sociodemographic models of suicidality.

Depression and Sociodemographic Variables in the Context of Other Theories of Suicidality

The symptoms of depression, such as chronic low mood, apathy, and feelings of guilty or worthlessness, coincide with many theories of suicidality. For example, Beck, Kovacs, and Weissman (1975) found that hopelessness was a key contributor to suicide attempts, and chronic, severe, and seemingly immutable feelings of depression, apathy, and worthlessness could indeed make an individual feel trapped and hopeless. Similarly, in his interpersonal-psychological model of suicidality, Joiner (2005) proposes that perceived burdensomeness is a major contributor to suicidality, and it is clear how chronic low mood and worthlessness could create or enhance such feelings. In addition, through a behavioral lens, the experience of depression—rife with extreme sadness, little pleasure, guilt, and general malaise—could cause the experience of life itself to be seen as aversive and potentially something to try escaping via suicide. Thus, the experience of depression is a key part of many conceptualizations of suicide.

As with the depression model of suicide, the sociodemographic model of suicide can also fit in well with a variety of theoretical conceptualizations of suicide. For example, one could conceptualize employment as a means by which to decrease burdensomeness and increase social belonging, two key components of Joiner's (2005) interpersonal-psychological model of suicide. Similarly, religious faith could be seen as a means of decreasing hopelessness through beliefs in a benevolent deity or universe, consistent with Beck et al.'s (1975) model of hopelessness and suicidality; alternately, religious faith could be seen as a means by which an individual could access community and thus increase social belongingness, as in Joiner's model of suicide. However, as an applied model, the sociodemographic model can also stand independent of any particular theory of suicide; given the consistent and well-documented links between the targeted sociodemographic factors and suicide, one can examine if and how they account for increased suicidality in a high-risk population, such as individuals with disabilities.

Previous Studies Assessing Sociodemographic Risk Factors and Suicidality in People With Disabilities

Most existing studies of sociodemographic factors in the context of disability have been conducted with individuals with severe psychiatric disabilities. For example, Rahman, Alexanderson, Jokinen, and Mittendorfer-Rutz (2014) examined the sociodemographic and medical risk factors for suicidality in a large sample of Swedish adults who were receiving a disability pension due to psychiatric disability. They found that younger age, specifically being between 18 and 24 years of age; lower educational obtainment; and being single and living alone were predictive of greater risk of suicide attempt. They also found that men were at greater risk of death by suicide but that females were at slightly greater risk of suicide attempt. In a contrary finding, Agerbo (2007) found that higher educational attainment, employment, higher income, and being married were actually associated with higher suicide risk among individuals who received inpatient treatment for psychiatric disorders. However, subsequent loss of these things (e.g., loss of income, loss of employment, and loss of partnership) did increase suicide risk in Agerbo's sample. Thus, this unusual finding may reflect the sociodemographic consequences of new or worsening disability rather than a completely different sociodemographic pattern of suicidality people with psychiatric disabilities.

Studies of the sociodemographic context of suicidality in people with diverse or nonpsychiatric disabilities are limited. McConnell et al. (2015) found that food insecurity—a proxy measure of socioeconomic status—and community belonging partially explained suicidal ideation in a sample of Canadian adults with disabilities. However, likelihood of suicidal ideation remained significantly higher among people with disabilities even after controlling for diagnosed mood and anxiety disorders, age, marital status, community participation, and

ethnicity, suggesting that sociodemographic variables and psychiatric comorbidity do not fully account for the relationship between disability and suicidal ideation. Russell, Turner, and Joiner (2009) examined the relationship between lifetime suicidal ideation and physical (i.e., nonpsychiatric, nondevelopmental) disability in a large sample of American adults. They found that the link between suicidal ideation and disability remained significant in all sociodemographic subgroups, with the exception of married people and older adults. They also found that stress exposure explained the most variance in suicidal ideation in participants with disabilities. Interestingly, they did not find that depressive symptoms were related to suicidal ideation.

Gaps in the Literature and the Present Study

As discussed earlier, the literature on relationships between sociodemographic characteristics and suicidality as they relate to disability is limited. This is particularly true in nonpsychiatric or mixed disability samples. In addition, as Russell et al. (2009) and McConnell et al. (2015) both note, the common issue of dichotomous classifications of suicidality (e.g., yes/no measures of suicidal ideation) may fail to capture the continuous and multifactorial nature of suicidality. Thus, the purpose of the present study is to analyze the combined contributions of depressive symptoms, disability status, and sociodemographic factors to a multi-item measure of suicidality in a large American sample. The research question are as follows:

1. What sociodemographic factors are related to increased suicidality in our sample?
2. Do people with disabilities more frequently experience sociodemographic risk factors for suicide, when compared with those without disabilities?
3. Do the combined contributions of sociodemographic factors and depressive symptoms account for the relationship between disability status and increased suicidality in a sample of American adults?

Method

Recruitment and Procedures

Participants were part of a larger study on suicide acceptability and disability (Lund, Nadorff, Winer, & Seader, 2016). This study was approved by a university institutional review board prior to data collection. Participants were recruited via Amazon Mechanical Turk (MTurk) and were paid $25 (USD) for their participation. To protect participant anonymity, all data collection took place on a secure, university-sponsored Qualtrics server outside of MTurk. After completing the survey on Qualtrics, participants were given a code to enter into MTurk to automatically be compensated through the site. This ensured that participant

responses were never linked to identifying information, such as participant name or MTurk identification number. Given the sensitive nature of the survey, participants were given information on crisis and suicide hotlines, both during the informed consent process and at the end of the survey.

MTurk. MTurk is an online recruitment source via which participants are paid small amounts (microcompensation) to complete surveys and other tasks. Researchers have generally found that MTurk samples produce valid and reliable data and are fairly demographically similar to the general population in terms of age and gender (Buhrmester, Kwang, & Gosling, 2011; Shapiro, Chandler, & Mueller, 2013; Thomas, Lund, & Bradley, 2015). MTurk samples have been shown to have higher rates of some psychopathology than those seen in the general population (Shapiro et al., 2013), but this may actually be advantageous when examining a relatively rare phenomenon such as suicidality. In addition, we are accounting for this increased rate of clinical depressive symptoms by including depressive symptoms as a predictor in our analyses (see also Authors, 2016). When compared with national statistics, we found our sample in the present study to be roughly demographically similar to the U.S. population in terms of gender, proportion of participants identifying as White, geographic distribution, and disability status; individuals who identified as Hispanic did appear to be underrepresented in our sample, however. For more information on the representativeness of our sample, please see Lund, Nadorff, & Seader, 2016 or Lund, Nadorff, Galbraith, & Thomas, 2018.

Participants

The present analyses involve 438 participants who had complete data on all items of interest. This excludes participants who answered *prefer not disclose* or *other* on items related to disability status, family and friend suicide history, income, ethnicity, or religious participation as well as those who skipped demographic items that were included in regression analysis. In total, 62 participants (12.4%) from the original sample were excluded from the present analyses. Demographic information on the 438 included participants is presented here.

The majority of the participants were female ($n = 264$; 60.3%) and represented 48 states and Puerto Rico; the two states not represented were Wyoming and South Dakota. Twenty-one participants (4.8%) did not provide data on their state of residence. The mean age was 35.97 years ($SD = 13.65$; range = 18–73). The sample was 76.7% White ($n = 336$) and 51.4% employed ($n = 225$). Approximately half of the sample reported being married or in a relationship (52.7%; $n = 231$). More than a quarter of the sample (29.5%; $n = 129$) identified as atheist or agnostic, with the remaining 309 participants identifying as adherents to some religion or faith. Complete demographics for the sample are available in Table 1.

Table 1. Sample Demographics.

Variable	Percent (*n*) of sample (*n* = 438)
Gender	
Male	39.7% (174)
Female	60.3% (264)
Race/Ethnicity	
White	76.7% (336)
Black/African-American	10.5% (46)
Hispanic	4.8% (21)
Asian/Pacific Islander	6.8% (30)
Other	1.1% (5)
Disability	
Yes	18.7% (82)
No	81.3% (356)
Employment status	
Working full time	37.7% (165)
Working part time	13.7% (60)
Homemaker	7.1% (31)
Student	17.8% (78)
Unemployed	13.9% (61)
Retired	3.9% (17)
Disabled, cannot work	5.9% (26)
Education	
Grade school	0.2% (1)
Some high school	0.9% (4)
GED	3.9% (17)
High school diploma	10.7% (47)
Some college	30.6% (134)
Two-year college	11.6% (51)
Four-year college	29.0% (127)
Advanced degree	13.0% (57)
Annual income	
<$10,000	11.4% (50)
$10,000–$14,999	6.6% (29)
$15,000–$24,999	14.8% (65)
$25,000–$34,999	15.1% (66)
$35,000–$49,999	16.4% (72)
$50,000–$74,999	18.3% (80)

Table 1. Continued

Variable	Percent (n) of sample (n = 438)
$75,000–$99,999	9.6% (42)
$100,000–$149,999	5.5% (24)
$150,000–$199,999	0.9% (4)
$200,000+	1.4% (6)
Religious preference	
Protestant Christian	23.5% (103)
Roman Catholic	13.7% (60)
Evangelical Christian	6.4% (28)
Jewish	2.1% (9)
Muslim	0.9% (4)
Hindu	0.7% (3)
Buddhist	2.1% (9)
Other	21.2% (93)
Atheist/agnostic	29.5% (129)
Religious participation	
Never	49.3% (216)
Once every 6 months	19.4% (85)
Once a month	8.2% (36)
Every 2 weeks	6.6% (29)
Once a week or more	16.4% (72)
Relationship status	
Single	34.5% (151)
In a relationship	20.8% (91)
Married	32.0% (140)
Separated	2.1% (9)
Divorced	9.1% (40)
Widowed	1.6% (7)
Friend or family member who attempted or died by suicide	
Yes	41.3% (181)
No	58.7% (257)

Note. GED = general equivalency diploma.

Just fewer than one fifth (18.7%; $n = 82$) of the sample identified as having a disability or disabilities; participants could identify multiple disabilities and types of disabilities. The most common disabilities were psychiatric disabilities ($n = 25$), physical disabilities ($n = 20$), and chronic health conditions ($n = 19$).

Less commonly reported disabilities included speech disabilities ($n = 3$), learning disabilities ($n = 3$), hearing impairment ($n = 3$), visual impairment ($n = 2$), and autism ($n = 1$). Ten participants did not state their type of disability or provided an answer that could not be coded by disability type.

Measures

Demographics. Demographic information was collected on religious preference, religious participation, age, gender, disability status, relationship status, income, education, race/ethnicity, and employment status. Participants were also asked a dichotomous (yes/no) question regarding if they had a friend or family member who attempted or died by suicide. The options provided for each item can be seen in Table 1.

For the purpose of these analyses, employment (working full or part time vs. not working), ethnicity (White vs. non-White), relationship status (i.e., married or in a relationship vs. single, separated, widowed, or divorced), disability status (disabled vs. not disabled), and religious preference (atheist/agnostic vs. any religious preference) were coded into dichotomous variables. Although this has the potential to obscure some differences within groups, such as potential differences between single, never-married participants and divorced separated, or widowed participants, it also allows for the preservation of statistical power by avoiding the use of multiple variables with small cell sizes. In addition, such dichotomous classifications are frequently used for regression analysis in suicide research, even that with large samples (e.g., Dervic et al., 2004; McConnell et al., 2015; O'Neill et al., 2016; Rahman et al., 2014) due to the statistical assumptions of regression analysis. Age, income, educational status, and religious participation could be measured in continuous ways and thus were not dichotomized.

Depressive symptoms. Depressive symptoms were measured using the Center of Epidemiological Studies Depression Scale (CES-D; Radloff, 1977). The CES-D consists of 20 items asking about participants' experiences of common symptoms of depression over the last 7 days; each item is scored on a 4-point scale from 0 (1 day or less than 1 day) to 3 (5–7 days). A total score of 16 is commonly used as the cutoff for marking clinically significant depressive symptoms (Radloff, 1977). The CES-D has been shown to be a valid screening measure for detecting depressive symptoms (Weissman, Sholomskas, Pottenger, Prusoff, & Locke, 1977) and has demonstrated acceptable internal consistency for both general ($\alpha = .85$) and clinical ($\alpha = .90$) samples (Radloff, 1977). Reliability of the CES-D was acceptable in the current sample ($\alpha = .953$). CES-D scores for the present sample ranged from 0 to 57, with a mean of 16.67 ($SD = 13.11$). Slightly less than half of the present sample (45.4%; $n = 199$) scored at or above the cutoff of 16. As noted earlier, this elevated rate of psychopathology is not

uncommon in MTurk samples (Shapiro et al., 2013) and will be statistically accounted for in analyses.

Suicidality. The Suicidal Behaviors Questionnaire - Revised (SBQ-R; Osman et al., 2001) was used to measure suicidality. The SBQ-R is a revised version of the SBQ (Linehan, 1981) and is a self-report measure designed to assess levels of suicidal risk. The first item assesses past suicidal thought, plans, and attempts; the second and third items inquire about past year suicidal ideation and previous disclosure of suicidal thoughts; and the fourth item assesses respondents' assessment of their likelihood of future suicide attempts. The SBQ-R has previously demonstrated good internal consistency in both clinical ($\alpha = .88$) and nonclinical ($\alpha = .87$) samples (Osman et al., 2001) and in people with disabilities (Authors, in press). Raw scores can range from 3 to 18; a raw score of 7 or higher may be used to determine clinically significant levels of suicide risk (Osman et al., 2001) in nonclinical samples. Because scores on the SBQ-R are nonnormally distributed, they were logarithmically adjusted to better fit the assumptions of our statistical tests; such logarithmic adjustment is common in suicide research (e.g., Khazem, Jahn, Cukrowicz, & Anestis, 2015; Nadorff, Anestis, Nazem, & Winer, 2014).

The mean raw SBQ-R score in the present sample was 6.03 ($SD = 3.22$; range $= 3$–17). More than one third of the sample (36.5%; $n = 160$) had raw SBQ-R scores at or above 7. The mean logarithmically adjusted SBQ-R score was 1.67 ($SD = .497$; range $= 1.10$–2.83). The SBQ-R demonstrated acceptable reliability in the current sample ($\alpha = .756$).

Analyses

The analysis occurred in two steps. First, the relationships between disability status and targeted sociodemographic factors (i.e., gender, age, educational attainment, employment status, relationship status, income, race/ethnicity, depressive symptoms, religious affiliation, religious participation, and friend and family history of suicide) were assessed. Chi-square tests were used to assess dichotomous variables, while independent sample *t* tests were used to assess continuous variables. Cohen's *d* effect size was also used for the assessment of continuous variable differences by disability status, as it is not subject to the concerns related to obtaining falsely significant relationships over a large number of *t* tests or the vulnerability of null hypothesis statistical significance testing to sample size effects (Thompson, 2006). Per Cohen (1992), we used effect sizes of .2, .5, and .8 as rough standards for small, medium, and large differences, respectively. For chi-square tests, we also included the phi effect size, with benchmarks of .1, .3, and .5 for small, medium, and large effects, respectively (Cohen, 1992).

In addition, we examined the relationships between suicidality and sociodemographic factors (same as earlier, plus disability status). Pearson's

r correlations were used to assess relationships between suicidality and continuous variables, and independent sample t tests were used to assess relationships between suicidality and dichotomous variables. Again, Cohen's d effect sizes were also calculated in conjunction with t tests.

After initial relationships between variables were analyzed, those variables without a significant relationship to either disability or suicidality were dropped from analysis, and the remaining variables were used in a linear regression on suicidality.

Results

Initial Relationships Between Disability, Suicidality, and Sociodemographic Variables

Initial statistical analysis revealed that participants with disabilities had significantly lower income, $t(436) = -4.192$, $p < .001$, $d = -0.39$, and educational attainment, $t(436) = -2.039$, $p = .042$, $d = -0.25$, than participants without disabilities. In addition, they were significantly older, $t(111.37) = 3.164$, $p = .002$, $d = 0.40$, and had significantly higher depression, $t(104.005) = 3.712$, $p < .001$, $d = 0.49$, and logarithmically adjusted suicidality scores, $t(109.160) = 3.262$, $p = .001$, $d = 0.42$, compared with participants without disabilities. They did not significantly differ from participants without disabilities in terms of religious participation, $t(436) = .291$, $p = .771$, $d = 0.04$. Participants with disabilities were less likely to be employed (30.5% vs. 69.5%; $\chi^2(1) = 17.61$, $p < .001$, $\varphi = .20$) and less likely to be in a romantic relationship (42.7% vs. 55.1%; $\chi^2(1) = 4.09$, $p = .043$, $\varphi = .1$). Participants with and without disabilities were equally likely to be White (80.5% vs. 75.6%; $\chi^2(1) = .805$, $p = .370$, $\varphi = .04$) and female (63.4% vs. 59.6%; $\chi^2(1) = .416$, $p = .519$, $\varphi = .03$). They were also equally likely to identify as atheist or agnostic (28.0% vs. 29.8%; $\chi^2(1) = .096$, $p = .757$, $\varphi = .02$). Finally, participants with and without disabilities were equally likely have a friend or family member who attempted or died by suicide (43.9% vs. 40.7%; $\chi^2(1) = .277$, $p = .559$, $\varphi = .01$).

Suicidality, as represented by logarithmically adjusted SBQ-R scores, was significantly correlated with depressive symptoms ($r = .501$, $p < .001$), lower age ($r = -.105$, $p = .028$), and lower income ($r = -.103$, $p = .031$) but not educational attainment ($r = -.042$, $p = .376$) or religious participation ($r = -.044$, $p = .363$). Females, $t(436) = -2.907$, $p = .004$, $d = 0.28$; those who did not have a job, $t(436) = -3.660$, $p < .001$, $d = 0.35$; those who were not in a romantic relationship, $t(416.69) = -2.267$, $p = .024$, $d = 0.22$; and those who identified as atheistic or agnostic, $t(436) = -4.918$, $p < .001$, $d = 0.52$ reported significantly greater suicidality as well. Participants who reported that they had a friend or family member who had attempted or died by suicide also endorsed significantly higher suicidality, $t(436) = 2.944$, $p = .003$, $d = 0.28$. In contrast, suicidality

did not significantly differ between White and non-White participants, $t(436) = 1.164$, $p = .245$, $d = 0.14$.

Regression Analysis

Based both on the review of the literature documented earlier and the initial statistical tests described in the preceding section, we decided to conduct a linear regression analysis in which suicidality (i.e., logarithmically adjusted SBQ-R scores) was regressed on age, educational attainment, depressive symptoms, income, employment status, religious preference, gender, relationship status, friend/family suicide history, and disability status.

The results of this regression can be seen in Table 2. Overall, the regression model predicted 31.7% of the variance in suicidality as measured by adjusted R^2. The only significant predictors were depressive symptoms ($\beta = .421$, $p < .001$), religious preference ($\beta = -.216$, $p < .001$), female sex ($\beta = .155$, $p < .001$), having a friend or family member who attempted or died by suicide ($\beta = .095$, $p = .018$), and disability status ($\beta = .084$, $p = .047$).

All significant variables in the regression were also significant as sole predictors of suicidality. Alone, depressive symptoms accounted for 24.9% of the variance in suicidality ($\beta = .501$, $p < .001$). As a sole predictor, religious preference accounted for 5.0% of the variance in suicidality ($\beta = -.229$, $p < .001$). Female gender alone accounted for 1.7% of the variance in suicidality ($\beta = .138$, $p = .004$). Having a family member or friend who attempted or died by suicide also accounted for 1.7% of the variance in suicidality when analyzed

Table 2. Suicidality Regressed on Disability, and Sociodemographic Factors.

Variable	B	SE B	β	t	p
Employment status	−0.037	0.042	−.037	−0.877	.381
Religious preference	−0.235	0.044	−.216**	−5.312	.000
Depressive symptoms	0.017	0.002	.452**	10.477	.000
Age	−0.002	0.002	−.042	−0.974	.331
Income	0.016	0.010	.068	1.539	.119
Relationship status	−0.046	0.041	−.046	−1.113	.266
Friend/family suicide history	0.096	0.041	.095*	2.369	.018
Female gender	0.157	0.042	.157**	3.717	.000
Educational attainment	0.007	0.014	.019	0.460	.646
Disability	0.108	0.054	.084*	1.989	.047

*$p < .05$. **$p < .001$.

as a sole predictor ($\beta = .140$, $p = .003$). Finally, disability status as a sole predictor accounted for 2.7% of the variance in suicidality ($\beta = .171$, $p < .001$).

Discussion

This study involved an analysis of the interrelationships of various sociodemographic risk factors for suicide. The primary goal of the study was to assess the contribution of disability status to suicidality when depressive symptoms and sociodemographic risk factors were accounted for in statistical analyses. We found that disability status remained a significant predictor of suicidality even when sociodemographic factors and depressive symptoms were statistically accounted for in our analyses. As with previous research (e.g., Giannini et al., 2010; Lunsky et al., 2012), we found that participants with disabilities experienced many risk factors at higher rates than those without disabilities. For example, participants with disabilities reported higher depressive symptoms, lower rates of romantic partnership, lower income, and higher rates of unemployment than did those without disabilities. As with Russell et al. (2009) and McConnell et al. (2015), we found that the increased risk for suicidality in people with disabilities persisted even when these psychological and sociodemographic inequalities were accounted for in our analyses. Thus, our study suggests that the unique contribution of disability status to higher levels of suicidality cannot be explained by the greater sociodemographic disadvantages experienced by people with disabilities, their higher level of depressive symptoms (see also Authors, 2016b), or the combination thereof. Although depressive symptoms predicted by far the most variance in suicidality, disability status remained a significant predictor of suicidality even when this variance was accounted for in our model.

In addition to the main findings regarding disability and suicidality, the findings regarding other sociodemographic predictors of suicidality are also interesting. In the regression analysis, only disability, female gender, depressive symptoms, friend and family suicide history, and religious preference remained significant predictors of suicidality. The depression finding is unsurprising given the extremely well-established, strong link between depression and suicidality (AFSP, 2015), although it differs from Russell et al.'s (2009) finding regarding the noncontribution of CES-D scores to suicidal ideation in their sample of individuals with physical disabilities. Our finding that females were at greater risk for suicidality is in line with national data suggesting that, although females are less likely to actually die by suicide, they are more likely to experience other domains of suicidality (CDC, 2015; Drapeau & McIntosh, 2015). Our findings regarding the significant relationship between having a friend or family member who attempted or died by suicide provide additional support for the consistent finding that suicides and suicide attempts tend to cluster within family and friend groups (Fiedorowicz et al., 2010; Kleiman, 2015; Qin et al., 2002). Furthermore, our finding that religious preference—but not religious participation—was a

significant protective factor is in line with findings that the protective nature of religion tends to come from specific beliefs (Dervic et al., 2004) but not with Robins and Fiske's (2009) finding that the social support associated with religious participation is protective against suicidality. Finally, it is interesting to note that neither unemployment nor lower income were significant predictors of suicidality in our regression analysis despite the strong support for their roles as suicide risk factors in the literature (e.g., Kalist et al., 2007; O'Neill et al., 2016). It may be that the link between depression and unemployment (e.g., Kalpakjian & Albright, 2006) accounts for much of the relationship between unemployment, income, and suicidality.

Implications for Practice

As McConnell et al. (2015) note, it is important to acknowledge that even among high-risk groups, such as people with disabilities, suicidality and depression are not universal, and many individuals with disabilities live content and happy lives. On the other hand, it is also important to acknowledge the higher levels of suicidality among people with disabilities; even as a relatively rare event, suicidality presents great economic, social, and personal burden to suicidal individuals, their family and friends, and society as a whole (CDC, 2015; Drapeau & McIntosh, 2016). Thus, if researchers, advocates, and clinicians can work together to better understand, treat, and prevent suicidality, it would likely provide great benefit on both the societal and individual levels. To that end, professionals who work with individuals with disabilities, including rehabilitation counselors, may be in a prime position to notice, assess, and intervene with individuals with disabilities who are experiencing suicidality (Authors, in press). Thus, rehabilitation counselors and other health-care professionals and service providers should be aware of the heightened risk of suicidality among adults with disabilities and be ready and willing to engage in suicide screening, assessment, and referral if and when necessary.

Limitations and Directions for Future Research

As with all research, this study has some limitations that should be discussed. One limitation is the relatively small sample size and the ensuing need to dichotomize many predictor variables. This may have limited our ability to detect differences in suicidality among smaller subgroups, such as potential differences between individuals who are single but never married and those who are divorced. Similarly, the relatively small sample size required us to treat disability as a dichotomous variable for the purposes of the multivariate linear regression, which may have obscured differences in suicidality or sociodemographic risk factor patterns among different disability groups, particularly people with psychiatric disabilities (see Authors, 2016). In the future, researchers should replicate this study with a

large sample to better analyze and detect such potential differences. In addition, researchers should examine the role of other potential risk and protective factors in the context of disability. These include factors such as stress exposure (Russell et al., 2009), attitudes toward suicide acceptability in people with disabilities (Authors, 2016b), and social and community support (McConnell et al., 2015). Also, it may be helpful to collect data on other psychological constructs in addition to depression, such as anxiety, impulsivity, and emotional regulation.

Finally, it may be helpful to examine other theoretical models of suicidality in people with disabilities, such as the interpersonal-psychological model (Joiner, 2005) and the minority stress model (Meyer, 2003), given that neither depression symptoms nor sociodemographic risk factors appear to account for the contribution of disability to increased suicidality. Khazem et al. (2015) conducted a preliminary analysis of the interpersonal-psychological theory of suicide in a small ($N = 184$) sample of college students with and without disabilities and found that students with physical disabilities ($n = 49$) scored higher on measures of perceived burdensomeness but not suicidal ideation, thwarted social belongingness, or fearless about death. However, this model should continue to be explored in people with disabilities, as Khazem et al.'s study, while an interesting and useful preliminary analysis may have been limited by its small sample size, its restriction to college students, and its examination of only suicidal ideation.

Once a well-fitting model of suicidality and disability is found, researchers and clinicians could work together to develop treatments that address the factors that contribute to increased suicidality in people with disabilities. These could be combined with treatments to address depression symptoms, thus providing a more comprehensive treatment for suicidality in people with disabilities. In addition, understanding factors that underlie suicidality in people with disabilities specifically could help guide policy aimed at improving the health, well-being, and safety of people with disabilities.

Conclusion

In this study, we found that participants with disabilities tended to have more sociodemographic risk factors for suicidality as well as significantly higher levels of suicidality and depressive symptoms. Despite this, accounting for both depression and sociodemographic risk factors did not fully explain the relationship between suicidality and disability. This suggests that there are other factors beyond depression and demographic vulnerability that may explain the high rates of suicidality among those with disabilities.

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