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BRIEF REPORT

Suicidal Ideation Among Adults with Disability in Western Canada: A Brief Report

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Abstract This study investigated prevalence and risk factors for suicidal ideation among adults with self-reported disability in Western Canada. The method was secondary data analysis utilising the Canadian Community Health Survey. The odds of 12-month suicidal ideation are 3.5 times greater for adults with self-reported disability compared with non-disabled adults, controlling for age, sex, ethnicity, and psychiatric morbidity. The heightened risk of ideation among adults with self-reported disability is partially explained by social adversity, including food insecurity and low sense of community belonging. Reducing suicide risk among adults with disability requires a broad-spectrum approach, including mental health care, and strategies to ameliorate social and economic hardship.

Keywords Suicide · Ideation · Disability · Cognitive impairment · Psychiatric morbidity

Introduction

Suicide is a major public health concern. Worldwide, suicide is among the leading causes of death, accounting for over three-quarters of one million fatalities per year; a global mortality rate of 11.4 per 100,000 (WHO 2014). Over the last half century the suicide rate has increased by more than 60 % worldwide, although steady or declining rates have been reported in some high income countries, and suicide fatalities are just the tip of the iceberg (WHO 2013; Matsubayashi and Ueda 2011; Värnik 2012). In Canada, there were 3890 deaths due to suicide in 2009, and for every suicide fatality an estimated ten plus individuals attempted to take their own life (Navaneelan 2012). Similar trends are reported in the United States. Crosby et al. (2011), for example, report that there were 35,035 suicide fatalities in 2008 *and* over 400,000 suicide attempt related visits to hospital emergency departments. The social and economic cost of suicide attempts is significant, accounting for around 2 % of the global burden of disease (WHO 2013).

Suicidal ideation—including tiredness of life, death wishes and explicit suicidal thoughts—is a major risk factor for, or precursor to suicide (Pirkis et al. 2000; Bebbington et al. 2010) explain that "… such thinking forms the ground from which suicide emerges, and is thus a serious indicator" (p. 428). Pooling data from 17 developed and developing countries, Nock et al. (2008) estimate that nearly 1 in 10 people will contemplate suicide at some point in their lifetime; 1 in 3 people who contemplate suicide will formulate a plan; and, more than 1 in 2 people who formulate a plan will attempt suicide. In a recent study, Simon et al. (2013) analysed electronic record data from a large integrative health system in the US and found that daily suicidal ideation was associated with a ten-fold increase in the risk of suicide attempt and suicide death over a 1 year period. There is however substantial cross-national and within-nation variation with respect to the prevalence of suicidal thoughts, attempts and fatalities, and the strength of the association between suicidal ideation and suicidal behaviour appears to vary with age, gender, physical health and pattern of stressful life events (Crosby et al. 2011; Casey et al. 2008; Mann et al. 2005; Fairweather et al. 2006; Klonsky and May 2014; McFeeters et al. 2015; Nock et al. 2008).

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Persons with disability—defined here as activity limitations or participation restrictions associated with a long-term physical or mental condition, or health problem—may be particularly vulnerable to suicidal ideation. Many of the known risk factors for suicidal ideation cluster together with disability. Persons with disability are, for example, more likely to have been maltreated in their upbringing, and to experience economic hardship, lack of community belonging and psychiatric morbidity (Nock et al. 2008, Casey et al. 2008; Dennis et al. 2007; Johnston et al. 2009). However, population-based data on the prevalence of suicidal ideation among persons with disability is scant and further research is needed to understand the mechanisms or processes linking disability to suicidal ideation.

In Great Britain, Dennis et al. (2007) investigated risk factors for suicidal ideation using data from the second National Survey of Psychiatric Morbidity. Controlling for age and sex (but not psychiatric morbidity or other potentially confounding variables), significant associations were found between suicidal thoughts and (a) the presence of a longstanding illness, (b) limitations in activities of daily living, and (c) low verbal IQ. Similar findings are reported by Pirkis et al. (2000) who analysed data from the Australian National Survey of Mental Health and Wellbeing. These investigators found a positive association between disability, defined in terms of activity limitations and participation restrictions, and suicidal ideation, controlling for socio-demographic factors (e.g., age, marital status, unemployment) and psychiatric morbidity.

The relationship between intellectual disability (or impaired cognitive functioning) and suicidal ideation has received some research attention in Canada. Lunsky (2004) reports findings from an in-depth study involving a mixed clinical and community sample of 98 adults with borderline to moderate intellectual disability. One third of the sample reported feeling that "life is not worth living"; almost one-quarter indicated that they were thinking about killing themselves; and, 11 % reported that they had attempted to kill themselves in the past. Further analysis revealed that those with suicidal thoughts were more likely to be unemployed; reported greater stress, anxiety and depression; and, experienced lower levels of social support. These alarming data warrant urgent and dedicated attention to advance understanding of the relationship between disability (and cognitive impairment in particular) and suicide risk, and to develop effective, targeted risk reduction strategies for this potentially vulnerable group.

The purpose of this exploratory study was to investigate the prevalence of, and risk factors for suicidal ideation among adults with self-reported disability in Western Canada. One objective was to determine whether self-reported disability is a significant risk factor for suicide, independent of psychiatric morbidity. A second objective was to determine whether the relationship between self-reported disability and suicidal ideation, *assuming that such a relationship is found,* could potentially be explained by experienced social conditions (e.g., food insecurity, sense of belonging). A third objective was to investigate potential risk factors for suicidal ideation among adults with self-reported disability, including perceived general health, activity limitations due to pain, mobility limitations, impaired cognitive functioning, and 'cause/onset of condition'. Our principal hypothesis was that adults with self-reported disability are more vulnerable to suicidal thinking, and this is due, at least in part, to their greater exposure to economic hardship and low sense of community belonging.

Methods

The Canadian Community Health Survey (CCHS) is administered annually to collect cross-sectional, population-based data on the health and health care utilization of Canadians. The survey includes core content and optional modules. CCHS data is representative of Canadians aged 12 and over excluding those living on Native Reserves and on Crown Lands, institutional residents, full-time members of the Canadian Forces, and residents of certain remote regions. The data used in this study were collected between January 2009 and December 2010 in two provinces, Alberta and British Columbia, where the optional module on suicidal ideation was included in the survey. Data were collected through computer assisted personal and telephone interviewing. The overall household-level response rate was 81 %. Details about the survey, including the CCHS sampling strategy, can be found elsewhere (Statistics Canada 2013).

Variables/Measures

The CCHS gathers the usual socio-demographic data including but not limited to respondent age, sex, ethnicity (i.e., visible minority or white-European), education attainment, employment status, personal and household income, and marital status. In addition, the following variables were used in this study:

Suicidal Ideation and Happiness

Two questions were asked to obtain data on lifetime and 12-month suicidal ideation. These were (Q1) "Have you ever seriously considered committing suicide or taking your own life: (yes or no)?" And if so, (Q2) "Has this happened in the past 12 months (yes or no)?" A measure of happiness was obtained from a single item: "Would you

describe yourself as being usually: (happy and interested in life, somewhat happy, somewhat unhappy, unhappy with little interest in life, or so unhappy that life is not worthwhile)?"

Disability (Activity Limitations and Participation Restrictions)

Respondents were classified as having self-reported disability if they responded "yes, sometimes" or "yes, often" to any of the following five questions: (Q1) "Do you have any difficulty hearing, seeing, communicating, walking, climbing stairs, bending, learning or doing any similar activities?", (Q2-5) "Does a long-term physical condition or mental condition or health problem, reduce the amount or the kind of activity you can do…": (Q2) "at home?" (Q3) "at school?" (Q4) "at work?" and (Q5) "in other activities, for example, transportation or leisure?" In addition, the CCHS includes an item asking respondents about the 'cause' of their health condition: "Which one of the following is the best description of the cause of this condition: (accident at home, motor vehicle accident, accident at work, other type of accident, existed from birth or genetic,…, or use of alcohol or drugs)?"

Impairment/Functioning

The CCHS incorporates the Health Utility Index, from which measures of cognitive functioning and mobility limitations are derived (Horsman et al. 2003). Cognitive functioning is measured on a scale ranging from 1 = no cognitive issues to 6 = severe cognitive concerns (i.e., "Unable to remember or unable to think or solve problems"). Mobility is measured on a 4 point scale, with 1 = no mobility problems and 4 = requires help/cannot walk.

Psychiatric Morbidity, Perceived General Health and Limitations Due to Pain

Diagnosed psychiatric morbidity was ascertained by two questions, which are qualified by the statement, "Remember, we are interested in conditions diagnosed by a health professional". The questions are (Q1) "Do you have a mood disorder such as depression, bipolar disorder, mania or dysthymia: (yes or no)?" and, (Q2) "Do you have an anxiety disorder such as a phobia, obsessive–compulsive disorder or a panic disorder: (yes or no)?" A measure of perceived general health was obtained with a single item: "In general, would you say your health is: (excellent, very good, good, fair, or poor)?" Activity limitation due to pain was measured on a 5-point scale, with 1 = no pain or discomfort, and 5 = pain prevents most activities.

Experienced Social Conditions

A measure of household food insecurity is derived from a set of 18 questions tapping the food security situation of the household in the previous 12 months. Households are classified on a three point scale with 1 = food secure, 2 = moderately food insecure and 3 = severely food insecure. A measure of community belonging is obtained by a single item: "How would you describe your sense of belonging to your local community? Would you say it is: (very weak, somewhat weak, somewhat strong or very strong)?"

Data Analysis

The analysis was conducted using IBM SPSS v.18. Rescaled sample weights were used in all calculations. Only cases involving adults, 18–64 years of age, were included in the analyses. Up to 8 % of cases were excluded (listwise deletion) from each analysis due to missing data. Binary logistic regression analysis was employed, firstly to investigate the relationship between self-reported disability and suicidal ideation (lifetime and 12-month) controlling for potentially confounding variables (i.e., age, sex, ethnicity, psych. morbidity, marital status, and social conditions), and secondly to investigate factors associated with suicidal ideation among adults with self-reported disability. In the first case, variables were entered in blocks, producing a series of adjusted odds ratios, which are reported in Table 3.

Results

Of the 19,740 respondents, 18–64 years of age, a total of 4893 (25 %) were classified as having a self-reported disability. Differences were found between adults with and without self-reported disability on most socio-demographic and health variables (see Table 1). A greater proportion of adults with self-reported disability were older (i.e., 55–64 years), female and white. Adults with self-reported disability were also somewhat less likely to have post-secondary education and to be in paid employment, and they were more likely to have low personal incomes (<$20,000) and to experience food insecurity. Notably, the adults with self-reported disability were no less likely than their non-disabled peers to be married or living in a common-law union, but a greater proportion of singles were previously married (i.e., separated, divorced or widowed). Measures of bivariate association between self-reported

disability, socio-demographic characteristics, and other variables are presented in Table 2.

The prevalence of lifetime and 12-month suicidal ideation among adults in western Canada is 10.4 and 2.1 % respectively. The prevalence of ideation is however substantially higher among adults with self-reported disability (see Table 1). More than one in twenty adults with self-reported disability, compared with just one in one-hundred non-disabled adults reported having contemplated suicide in the 12 months prior to the survey. The heightened risk of suicidal ideation among adults with self-reported disability is however partially explained by the higher prevalence of mood and anxiety disorders in this group. Notwithstanding, the odds of having contemplated suicide in the prior 12 months were over three times greater for adults with self-reported disability compared to non-disabled adults, controlling for age, sex, ethnicity *and* psychiatric morbidity (see Table 3). The heightened risk of suicidal ideation among adults with self-reported disability was further attenuated by adding marital status, food insecurity and sense of community belonging to the logistic regression model (see Table 3)

Table 4 shows the results of two logistic regression models, one predicting lifetime ideation and the other 12-month ideation, among adults with self-reported disability. Results suggest that for each one unit increase in age (one unit = 10 years), the odds of suicidal ideation decreases by 17 %. The strongest predictor is psychiatric morbidity (i.e., mood disorder or anxiety disorder). However, holding psychiatric morbidity and all other variables in the model constant, impaired cognitive functioning, being single—previously married, experiencing food insecurity, and having only a weak sense of belonging to the community contribute to the prediction of lifetime and 12-month ideation. Notably, females (OR 0.71, 95 % CI [0.53–0.95], $p < 0.05$), and adults with a genetic condition or condition existing at birth (OR 0.58, 95 % CI [0.35–0.96], $p < 0.05$) are less likely to report ideation in the past 12 months. No statistically significant association was found between ideation and mobility limitations or limitations due to pain.

Discussion

In global context, western Canada appears to be mid-range with respect to the prevalence of lifetime and 12-month suicidal ideation among adults. The 10.4 % lifetime prevalence rate found in this study is higher than the 9.2 % cross-national average reported by Nock et al. (2008), and substantially higher than rates reported in many non-Anglophone countries, such as Italy, Spain and Belgium. However, compared to other Anglophone countries, including the United States, Great Britain, Australia and

Table 1 Descriptive statistics

	No self-reported disability % (95 % CI) n = 14,847	Self-reported disability % (95 % CI) n = 4893
Lifetime suicidal ideation	7 (6.7–7.6)	20 (18.9–21.1)
12-month suicidal ideation	1 (0.8–1.2)	6 (4.9–6.2)
Happy and interested in life	83 (81.9–83.2)	67 (65.9–68.5)
18–24 years	17	10
25–54 years	68	63
55–64 years	15	27
Sex (female)	48	53
Ethnicity (visible minority)	28	18
Education, highest level (secondary grad.)	26	31
Unemployed	11	21
Income personal (<$20,000)	21	32
Married/common-law union	64	62
Single (separated/divorced/widowed)	8	14
Single (never married)	28	24
Diagnosed mood disorder	5	18
Diagnosed anxiety disorder	3	12
Food insecure (moderate/severe)	5	16
Community belonging (*very weak sense of…*)	8	12

z test for the difference between proportions were statistically significant for all variables ($p < 0.05$)

Table 2 Bivariate associations between socio-demographic and other variables

	1	2	3	4	5	6	7	8	9	10	11
1. Self-reported disability[a]	1.0										
2. Mood disorder[a]	0.21*	1.0									
3. Anxiety disorder[a]	0.17*	0.39*	1.0								
4. Visible minority[a]	−0.11*	−0.05*	−0.05*	1.0							
5. Educational attainment	−0.05*	−0.05*	−0.04*	−0.01	1.0						
6. Personal income	−0.08*	−0.12*	−0.12*	−0.17*	0.26*	1.0					
7. Unemployed[a]	0.13*	0.12*	0.11*	0.09*	−0.14*	−0.37*	1.0				
8. Single—previously married[a]	0.10*	0.09*	0.05*	−0.07*	−0.02*	−0.02*	0.05*	1.0			
9. Food insecurity	0.16*	0.16*	0.15*	0.03*	−0.12*	−0.21*	0.10*	0.13*	1.0		
10. Community belonging	−0.06*	−0.08*	−0.08*	0.04*	0.05*	0.03*	−0.03*	−0.06*	−0.09*	1.0	
11. Lifetime ideation[a]	0.19*	0.33*	0.21*	−0.07*	−0.04*	−0.10*	0.05*	0.11*	0.17*	−0.10*	1.0
12. 12-month ideation[a]	0.15*	0.25*	0.22*	−0.02	−0.04*	−0.08*	0.06*	0.10*	0.15*	−0.08*	0.43*

The Phi coefficient is reported for the association between two nominal variables, and Spearman's rho for all other associations

* $p < 0.05$

[a] Nominal

Table 3 Self-reported disability and suicidal ideation: adjusted odds ratios

Dependent	Adjusted for age, sex, ethnicity		Adjusted for age, sex, ethnicity and psych. morbidity[a]		Adjusted for age, sex, ethnicity, psych. morbidity, marital status and social conditions[b]	
	OR	95 % CI	OR	95 % CI	OR	95 % CI
Lifetime suicidal ideation	3.3	3.0–3.6	2.4	2.2–2.7	2.1	1.9–2.3
12-month suicidal ideation	6.2	5.0–7.7	3.5	2.8–4.4	2.8	2.2–3.5

[a] Diagnosed mood and/or anxiety disorder

[b] Food insecurity and community belonging

New Zealand, the prevalence of ideation in Western Canada appears to be low (Crosby et al. 2011; Bebbington et al. 2010; Nock et al. 2008; Johnston et al. 2009).

The main finding of this study is that self-reported disability is associated with an increased risk of suicidal ideation in adulthood. Indeed, controlling for age, sex and ethnicity, we found that the odds of having contemplated suicide in the preceding 12 months are six or more times greater for adults with self-reported disability than for their non-disabled counterparts. The results of this study further suggest that the heightened risk of suicidal ideation among adults with self-reported disability is partly explained by their greater exposure to economic hardship and lack of community belonging, along with psychiatric morbidity. However, psychiatric morbidity and difficult social conditions—as measured in this study—did not fully account for the heightened risk of suicidal ideation among adults with self-reported disability. Other factors have to be considered, including unrecognised, untreated psychiatric morbidity (Deb et al. 2001; Evans et al. 1999) and exposure to maltreatment. Children and youth with disability are more likely to be exposed to familial and peer maltreatment (e.g., victimization, bullying) (Bender et al. 1999; Flynt and Morton 2004), which are well known suicide risk factors (Shtayermman 2007). Unfortunately the CCHS 2009/10 did not gather data on history of maltreatment.

The results of this study also suggest that adults with self-reported disability are not homogenous with respect to suicidal ideation: Some adults with self-reported disability are clearly more vulnerable than others. Probability of suicidal ideation among adults with self-reported disability varies as a function of age, sex, impairment/disability type and psychiatric morbidity. The probability of suicidal ideation among adults without reported disability has also been found to vary according to age and sex (i.e., negative association between age and suicidal ideation; positive association between being female and suicidal ideation) (Cooper et al. 2015). Younger adults with acquired disability/conditions (e.g., as a result of injury), and disabled adults with impaired cognitive functioning appear to be more vulnerable. Those suffering depression or other psychiatric disorders appear to be the most vulnerable of all. The probability of suicidal ideation among adults with self-reported disability also varies as a function of social and

Table 4 Logistic regression: suicidal ideation among adults with self-reported disability

	Life time suicidal ideation		12-month suicidal ideation	
	B (SE)	OR (95 % CI)	B (SE)	OR (95 % CI)
Age group	−0.08 (0.02)	0.93 (0.89–0. 96)*	−0.18 (0.04)	0.83 (0.78–0.89)*
Sex (female)	0.14 (0.08)	1.15 (0.97–1.35)	−0.34 (0.15)	0.71 (0.53–0.95)*
Ethnicity (visible minority)	−0.16 (0.11)	0.86 (0.69–1.06)	0.09 (0.18)	1.10 (0.77–1.57)
Mood disorder	1.25 (0.10)	3.50 (2.89–4.25)*	1.01 (0.17)	2.92 (2.10–4.04)*
Anxiety disorder	0.64 (0.12)	1.90 (1.51–2.40)*	0.95 (0.17)	2.59 (1.84–3.63)*
Perceived general health	−0.01 (0.05)	0.99 (0.91–1.08)	−0.28 (0.08)	0.75 (0.64–0.89)*
Pain (limitations due to)	0.03 (0.03)	1.03 (0.97–1.09)	0.05 (0.05)	1.05 (0.94–1.16)
Mobility limitations	0.04 (0.07)	1.04 (0.90–1.20)	0.13 (0.11)	1.13 (0.91–1.42)
Cognitive impairment	0.17 (0.03)	1.18 (1.11–1.26)*	0.17 (0.05)	1.18 (1.06–1.31)*
Condition existed at birth/genetic	−0.15 (0.13)	0.87 (0.67–1.12)	−0.54 (0.26)	0.58 (0.35–0.96)*
Marital status[a]				
Common law	−0.14 (0.15)	0.87 (0.65–1.16)	−0.32 (0.30)	0.73 (0.41–1.31)
Single (prev. married)	0.55 (0.12)	1.74 (1.38–2.18)*	0.93 (0.20)	2.52 (1.70–3.75)*
Single (never married)	0.15 (0.12)	1.17 (0.93–1.46)	0.26 (0.20)	1.29 (0.87–1.93)
Food insecurity	0.41 (0.07)	1.51 (1.32–1.71)*	0.44 (0.09)	1.56 (1.30–1.87)*
Community belonging	−0.10 (0.05)	0.91 (0.83–0.99)*	−0.20 (0.08)	0.82 (0.70–0.96)*
Model $\chi 2$		655.04*		445.37*

* $p < 0.05$

[a] Reference group is 'currently married'

economic resources: Adults with self-reported disability are less likely to contemplate suicide if they experience low food insecurity, and feel a strong sense of belonging to their community. Of note, the CCHS data suggest that around one in six adults with disability in western Canada experience food insecurity and have a weak sense of community belonging.

One limitation of this study is that suicidal ideation was measured categorically (i.e., yes or no) when it may be better conceptualised as a continuum (Bebbington et al. 2010). There is a continuum of suicidal ideation that may begin with a certain 'tiredness of life', progress to death wishes and suicidal thoughts, and then to planning before an attempt at suicide is made. In short, not all ideation is necessarily equal. Further research is needed to understand this continuum, including facilitating and disrupting factors. Another major limitation is that the cross-sectional survey design does not support causal inferences. Longitudinal data is needed, for example, to confirm that the relationship between disability and suicidal ideation is mediated by economic hardship and lack of community belonging, as well as psychiatric morbidity. There is some evidence that disability, psychiatric morbidity, economic hardship and lack of community belonging are causally inter-related (Van Orden and Joiner 2013; Heslop and Gordon 2014; Kwok and Cheung 2007). For example, economic hardship may be a distal cause (i.e., cause of the causes) of disability, and disability may contribute to economic hardship (Emerson and Parish 2010). Similarly, the experience of lack of community belonging is likely to be a cause *and* a consequence of psychiatric morbidity.

Conclusion

Adults with self-reported disability are more vulnerable to suicidal ideation than their non-disabled peers. However, the *absolute risk* of suicidal ideation is low: The vast majority of adults with self-reported disability are not contemplating suicide. Indeed, we found that over two-thirds of adults with self-reported disability in Western Canada report being happy and that life is worth living. Furthermore, the relationship between disability and suicidal ideation appears to be anything but direct or 'natural'. The harsh reality is that persons with disability are, to say the least, not wholly included in society. As Thomas (1999) observes, persons with disability are disadvantaged by the social imposition of restrictions of activity, and the socially engendered undermining of their psycho-emotional wellbeing.

On December 14, 2012, Bill C-300, which calls for a Federal Framework for suicide prevention, was passed into

law (Parliament of Canada 2012). This bill is momentous in acknowledging suicide as a public health issue. The results of this analysis suggest that the framework ought to include specific initiatives for people with disability. To reduce the risk of suicide among adults with disability, appropriate and timely mental health care is vital. However, it is clear that strategies are also needed to promote the full inclusion of persons with disability in all of the arenas of life: work, family and community.

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