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Suicide mortality in second-generation migrants, Australia, 2001-2008

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Abstract

Purpose

Generally, due to limited availability of official statistics on the topic, little is known about suicide mortality in second-generation migrants. A recent study from Sweden showed that these people could be at a high suicide risk. If a generalized phenomenon, this aspect would represent an important issue in suicide prevention. This paper aims to report the profile of second-generation migrants who died by suicide and the suicide risk differentials of second-generation migrants with other Australians.

Methods

Official suicide data from 2001 to 2008 were linked with State/Territory registries to collect information about the birthplace of the deceased's parents to differentiate migration status (first, second or third-plus generation). The profile and suicide risk of second-generation migrants were compared with other generations by logistic and Poisson regression.

Results

Suicide in second-generation migrants accounted for 811 cases (14.6%). These tended to be represented by younger subjects, more often never married, compared to the other cases. Second-generation males aged 25-39 years tended to have a higher suicide risk than first-generation migrants, but the risk was lower when compared with the third-plus generation. Second-generation migrants aged 60+ tended to have a lower suicide risk than first-generation migrants.

Conclusion

In Australia, second-generation migrants are not at a higher suicide risk compared to first-generation migrants or locals (third-plus-generation). In males aged 25-39, a lower suicide risk was found in second-generations compared to Australian born third generation, which may be explained by their more advantageous socioeconomic status and the flexibility and resources rendered by having grown up in a bicultural environment. The higher suicide rates found amongst older first-generation migrants requires further examination.

Keywords:

Second-generation migrant, suicide, Australia, prevention, inequality

Introduction

The suicide mortality of the second generation of migrants, unlike that of the first generation migrants, which has been widely studied [8-10, 19, 24], has received very little attention. The limited research exploring suicide risk among second-generation migrants has been mainly attributed to the prevailing practices of death registration around the world, which rarely collect information about the country of birth (COB) of parents of the deceased [8, 27]. The only study focusing on suicide mortality of second generation migrants, from Sweden, indicated that they were at a greater risk of suicide than first generation migrants [18]. The authors suggested that this vulnerability might be attributable to their more adverse living conditions in Sweden compared to those of first-generation migrants [18]. The higher risk of suicide among second-generation migrants could also be explained by the intergenerational acculturation conflict model [7, 27, 31]. Specifically, many migrant families in Western countries are made up of relatively un-aculturated parents who were born in another country residing with their children who have spent most of their time and been educated in the host country. Children in migrant families may find themselves caught between the more traditional values that their parents encourage at home and the more individualistic Western values they are exposed to at school and in the media [21, 32, 33]. The difference between the level of acculturation exhibited by parents and that of younger family members (acculturation gap) can lead to intergenerational conflicts, family stress and decreased cohesion between parents and children in migrant families. This would consequently heighten the risk of suicide and other causes of death for acculturated youth [7, 11, 27, 31] and older migrants [13, 29].

There has been a high rate of migration to Australia. In the 2011 Census, more than 27% of the population was born overseas, and a further 20% had at least one overseas-born parent [5]. Despite diversity in their origins, second-generation Australians often share the common experience of being bicultural, living with both their parents' heritage and the mainstream culture of the host country [12, 16]. This paper aims to report on the socioeconomic and demographic characteristics of second-generation migrants in Australia who died by suicide between 2001 and 2008, and examine the suicide risk among different migrant generations.

Data and methods

Identification of research subjects

Migrant generation status was determined by the birthplace of the deceased and that of their parents [27]. First-generation migrants are residents of Australia who were born overseas. Second-generation migrants are Australian-born people living in Australia, with at least one overseas-born parent. Finally, third-plus generation migrants are Australian-born people whose parents were both born in Australia [3, 5, 27].

Settings

Two geographically adjacent regions in south-eastern Australia – New South Wales (NSW) and the Australian Capital Territory (ACT) - were included in the study. These two regions have a complete set of digitalised records for all births and deaths to facilitate data linkage in identifying the COB of the parents of the suicide deceased.

Suicide mortality data source

Mortality data were obtained from the National Coroners' Information System (NCIS). The NCIS is a national database maintained by the Victorian Institute of Forensic Medicine, providing relevant information about every death reported to a coroner in Australia since July 2000 (January 2001 for Queensland) [30]. Through an online interface, authorised researchers can access individual records of death. These contain information on socio-demographic data, cause of death, classification of case type and intent [30]. In this study, intent registered as "intentional self-harm" was used to identify suicide cases.

The NCIS only includes information related to the deceased, and not about their parents or relatives. To identify second and later generations, data had to be obtained from the Registry of Births, Deaths and Marriages of the two jurisdictions. A flow-chart of the data linkage procedure is shown in Figure 1.

To safeguard data privacy, all relevant files were stored in the investigator's computer and secured with a password lock to restrict any unauthorised access. Ethics approval of the project was granted by the Griffith University Human Research Ethics Committee (GU Ref No: CSR/02/10/HREC) and the Justice Human Research Ethics Committee (CF/12/14310).

Statistical analyses

Statistical analyses were performed using SPSS for Windows version 20.0. The characteristics of suicide cases by different migrant generations were summarised using

descriptive statistics. Multinomial logistic regression analyses were used to test the profile difference between second-generation migrants and other migrant generations in terms of sex, age, marital status, economic activity, usual residence and suicide method used.

Suicide rates were calculated using only the population aged 15+ years, due to the low migrant population and occurrence of suicide in the youngest age group (0–14 years) [19]. Population figures by country of birth (COB), COB of parents, sex and age group were derived from the 2006 Census of Population and Housing [4]. About 7.2% of the population data (n=493,000) had a missing value on their COB [4]. To replace the missing data with a probable value, imputation was used, and those with a missing COB were proportionately distributed into the 3 migrant generation groups based on the observed pattern of the remaining 92.8% of population with a known COB. To examine suicide risk among the different groups, Poisson regression was used. The exponential of the regression coefficient (β) represents the incidence risk ratio (IRR), which describes the multiplicative effect of the corresponding independent variable on the risk [14]. A significant IRR indicates that there was a significant difference in the suicide risk between second-generation migrants and other migrant generations after adjustment for age and region. For all statistical analyses, a p-value smaller than 5% was considered to be statistically significant.

Results

From 2001 to 2008, 5,541 suicides were identified in the two selected jurisdictions (ACT and NSW), indicating an average rate of 10.1 suicides per 100,000 persons. Among the suicide cases, 1,481 (26.7%) were by first-generation migrants, 811 (14.6%) by second-generation

migrants (i.e., either mother or father born outside Australia), and 2,536 (45.8%) were third-plus-generation Australians. Of the second generation migrants, 40.7% (n=330) had both parents born overseas, 24.3% (n=201) had their mother and 35.0% (n=280) had their father born overseas. The remaining 713 cases (12.9%) lacked information to identify their migrant generation status and were excluded. They included 523 (9.4%) locally-born cases with missing information on parents' COB and 190 (3.4%) cases with missing information on their own COB (Figure 2).

Characteristics of suicides by second-generation migrants

The socioeconomic characteristics of suicides across different migrant generations are summarised in Table 1. Compared with first-generation migrants, suicides by the second-generation were more likely to be younger than 40 years (OR=3.26, $p<0.0001$), never married (OR=2.5, $p<0.001$) and unemployed (OR=1.40, $p=0.002$). No significant sex difference was found between suicides by second- and first- generation migrants.

Second-generation suicide deceased also showed considerable differences in terms of their socio-demographic profile compared to third-plus generation migrants. When compared with the third-plus-generation, suicides by the second-generation were more likely to be younger than 40 years (OR=1.84, $p<0.0001$) and never married (OR=1.40, $p<0.001$).

Analyses also showed that they were less likely to use firearms (OR=0.68, $p<0.001$). No significant difference was found by sex and employment status between suicides by second-generation and third-plus generation migrants.

Suicide risk ratios of second-generation migrants

Comparison between second- and first-generation migrants

In the Poisson regression analysis, it was found that the overall risk of suicide among second-generation migrants in the ACT and NSW were not significantly different from that of the first-generation over the study period (see Table 2). When separately analysed by age group and sex, a significantly higher rate of suicide was detected among second-generation males aged 25-39 at 21.4 per 100, 000 (IRR=1.230, $p=0.014$) when compared to first-generation migrants at 17.4. On the other hand, a lower risk of suicide was found among older second-generation males (aged 60+) at 13.1 (IRR=0.681, $p=0.004$) and older second-generation females at 4.5 (IRR=0.661, $p=0.043$) compared to their first-generation counterparts at 19.3 for older males and 6.8 for older females, respectively.

Comparison between second- and third-plus-generation migrants

Through Poisson regression analyses, the risks of suicide among second-generation migrants were also found not to be significantly different from that of the third-plus-generation (see Table 2). When separately analysed by age group and sex, second-generation males aged 25-39 years had a significantly lower risk of suicide at 21.4 (IRR=0.848, $p=0.021$), compared to the third-plus-generation at 25.3. No significant difference was found in other age or sex groups.

Discussion

The present analysis provides the first analysis of suicides in second-generation migrants in Australia. In contrast to earlier research findings from Sweden, which showed that second

generation migrants had a higher risk of suicide than first-generation migrants and other Swedish-born persons during the period 1990-1998 [18], our analysis did not detect any significant difference in the risk of suicide between second-generation migrants and other migrant generations. Furthermore, in certain age groups, a lower suicide rate was observed compared to third or later generation migrants. It seems that the intergenerational acculturation conflict model may not be applicable to second-generation migrants in Australia. When comparing Australian results with the Swedish study, it is important to emphasise their different migration histories. Second-generation migrants in Australia generally have higher education levels, are more likely to be professionals with a higher income level and are less likely to be unemployed compared with the third-plus-generation [3, 20]. It is possible that their higher socioeconomic status may be a protective factor, contributing to a lower risk of suicide among second-generation males aged 25-39 years compared with the third-plus-generation. In addition, the experience of second-generation migrants of growing up in a bicultural environment (that of the parents and the host, Australia) might provide a bigger repertoire of skills and different attitudes, rendering second-generation individuals (especially young adult males) more flexible and resilient.

Although having a lower risk of suicide than third-plus-generation migrants, our findings revealed that second-generation males aged 25-39 years had a higher risk of suicide compared with first-generation migrants. This pattern may be partially explained by the well-known “healthy migrant effect”, which suggests that first-generation migrants would have a lower risk of suicide, as immigration policy tends to favour individuals with high resilience and good mental health [18, 24, 28], which are protective factors of suicide. Additionally, changes in the ethnic composition of migrants during the last 30 years may

also contribute to the lower rate of suicide among first-generation migrants. Since the 1970s, there has been a large influx of Asian migrants to Australia [19]. In Asia, pesticide ingestion is one of the most commonly used method of suicide [35]. Vulnerable individuals from these countries might have limited access to their traditional highly lethal means of suicide (pesticides). It could contribute to a reduction in suicides if they use a less lethal method [17, 23]. Finally, there has been a dramatic reduction in suicide rate in NSW during the study period [22] and this epidemiological transition could have also influenced the difference in suicide rates among the first, second and third-plus generation migrants, especially for the age group (25-39) with highest rate of suicide.

Unlike younger working-aged males, our results found that older (over 60 years) second-generation migrants for both sexes had a lower risk of suicide compared with first-generation migrants. Closer examination of the suicide rates suggests that older first-generation migrants had relatively high suicide rates compared with other migrant generations. In fact, this age-specific vulnerability of older migrant people was also observed in previous studies on migrant suicides [6, 8-10, 25, 34]. Many older migrants may experience poverty and loneliness without the traditional support of family, and some are left 'childless' after their children move away for education or work [6, 25]. Further, older migrants may experience intergenerational conflicts due to different values and beliefs than their families and communities, which may also lead to a higher rate of suicide [29]. However, the specific pattern of suicide in first generation migrants is beyond the scope of this study.

Limitations

The findings of this study should be interpreted in light of its limitations. First, ethnicity could be an important factor in suicide rates [15] and have an effect on the differences in suicide rates by migrant generations. However, as the question on country of birth of parents was replaced by asking whether a person's parents were born in Australia or overseas in 2001, detailed coding on parents' birthplace was not available to differentiate second-generation migrants by different ethnic background [2]. Unlike the situation reported by Hjern et al in Sweden [18], there has been a high level of ethnic intermarriage among individuals from different countries of origin in Australia [1], which has impeded the possibility of any further analysis to estimate the specific suicide rates by ethnicity and national origin of second generation migrants. There has been no specific investigation of suicide mortality and its associated factors in inter-ethnicity groups in Australia, a fact which would deserve further attention in future research.

Secondly, due to the complex nature of the process of data linkage with the state and territory Registers of Births, Deaths and Marriages, we managed to capture information on parents' birthplace only for the suicide deceased who were born within the two jurisdictions, which means 72.9% (9.4% out of 12.9%) of suicide cases with missing migrant generation status, who were internal migrants born outside NSW and the ACT, could not be investigated further and were excluded. Inevitably, this resulted in an underestimation of the suicide risk in the second- and third-plus generations, and narrowed the risk difference of second-generation migrants compared with first generation migrants in the analysis. A limitation arising from missing values was also found in the population data, with 7.2% of census responses having no information on their COB in order to identify their migrant

generation status [4], which may affect accuracy and robustness in estimating the suicide rate for each migrant generation group in the analysis.

In conclusion, the present study demonstrates that there was no significant difference in terms of risk of suicide between second-generation migrants and other migrant generations. This would indicate a process of acculturation that ends with amalgamation in Australia. These data are reflective of the current composition of migrants to Australia by country of birth (this composition has changed quite radically in the last thirty years, with unprecedented numbers Asians migrating to Australia [19]).

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Conflict of Interest statement

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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Figure 1: Data collection and linkage and immigrant generation status definition procedure

Figure 2: Number and distribution of linked suicide cases by order of immigrant generation in the Australian Capital Territory and New South Wales, 2001-2008

Table 1: Characteristics of suicide cases in second-generation migrants and other migrant generations,
Australian Capital Territory (ACT) and New South Wales (NSW), Australia, 2001-2008

		Second generation		First generation						Third-plus generation					
		N	%	N	%	OR ^a	95% LL	95% UL	p-value	N	%	OR ^b	95% LL	95% UL	p-value
Sex	Male	634	78.2	1107	74.7	1.21	0.99	1.48	0.066	2038	80.4	0.88	0.72	1.06	0.177
Age	Below 40	493	60.8	477	32.2	3.26	2.73	3.90	<0.001	1159	45.7	1.84	1.57	2.16	<0.001
Marital status	Never married	426	52.5	456	30.8	2.50	2.08	2.97	<0.001	1124	44.3	1.40	1.19	1.63	<0.001
	Married	231	28.8	663	44.8	0.50	0.41	0.59	<0.001	829	32.7	0.80	0.69	0.98	0.025
	Divorce, separated & widowed	128	15.8	304	20.5	0.70	0.58	0.91	0.006	520	20.5	0.70	0.59	0.90	0.003
Employment status	Employed	340	42.6	584	39.4	1.10	0.93	1.32	0.245	1112	44	0.90	0.79	1.08	0.336
	Unemployed	178	21.2	246	16.6	1.40	1.14	1.75	0.002	520	19.9	1.10	0.90	1.32	0.379
	Economically inactive	241	29.7	574	38.8	0.70	0.56	0.80	<0.001	851	30	1.00	0.85	1.19	0.955
Usual residence (NSW only)	Sydney	512	65.9	1118	79.9	0.60	0.49	0.72	<0.001	1184	48.7	2.03	1.72	2.40	<0.001
	Newcastle	70	9	58	4.1	2.04	1.45	2.87	<0.001	291	12	0.75	0.57	0.98	0.034
	Rest of NSW	195	25.1	223	15.9	1.43	1.17	1.76	0.001	955	39.3	0.51	0.43	0.61	<0.001
Suicide method	Poisoning	202	24.9	322	21.7	1.19	0.98	1.46	0.085	712	28.1	0.85	0.71	1.02	0.078
	Hanging	387	47.7	701	47.3	1.02	0.86	1.21	0.86	1174	46.3	1.06	0.90	1.24	0.479
	Firearm	56	6.9	83	5.6	1.25	0.88	1.77	0.213	248	9.8	0.68	0.51	0.93	0.014
	Jumping	67	8.3	137	9.3	0.88	0.65	1.20	0.427	111	4.4	1.97	1.44	2.69	<0.001
	Drowning	9	1.1	62	4.2	0.26	0.13	0.52	<0.001	38	1.5	0.74	0.36	1.53	0.415

^a First-generation migrant as reference group (when compared to second-generation migrant)

^b Third-plus generation migrant as reference group

Table 2: Suicide rate (aged 15+) by migrant generation and incidence risk ratio of suicide of second-generation migrants when compared with other migrant generations, Australian Capital Territory (ACT) and New South Wales (NSW), Australia, 2001-2008

		Second-generation		First-generation						Third-plus-generation					
		Suicide rate		Suicide rate		95%	95%	p-		Suicide rate		95%	95%	p-	
		N	^a	N	^a	IRR ^b	LL	UL	value	N	^a	IRR ^c	LL	UL	value
Male	15-24	117	11.6	78	11.5	1.010	0.758	1.345	0.948	259	12.5	0.935	0.752	1.163	0.548
	25-39	276	21.4	284	17.4	1.230	1.042	1.452	0.014	691	25.3	0.848	0.738	0.975	0.021
	40-59	168	18.3	418	16.4	1.118	0.935	1.338	0.221	749	18.9	0.969	0.820	1.145	0.71
	60+	70	13.1	325	19.3	0.681	0.526	0.881	0.004	330	13.5	0.978	0.756	1.266	0.865
	15+	634	16.9	1,105	16.9	1.016 ^d	0.920	1.122	0.755	2,029	18.1	0.927 ^d	0.847	1.014	0.099
Female	15-24	34	3.5	25	3.7	0.937	0.559	1.570	0.805	61	3.1	1.140	0.749	1.734	0.541
	25-39	62	4.8	86	4.9	0.969	0.699	1.344	0.852	138	4.9	0.969	0.718	1.307	0.836
	40-59	50	5.4	143	5.4	0.997	0.722	1.375	0.984	198	4.9	1.105	0.810	1.507	0.529
	60+	30	4.5	118	6.8	0.661	0.443	0.987	0.043	100	3.3	1.384	0.921	2.082	0.118
	15+ ^d	176	4.6	372	5.5	0.876 ^d	0.730	1.050	0.153	497	4.2	1.122 ^d	0.943	1.334	0.194
^a per 100,000		^b First-generation migrant as reference group				^c Third-plus generation migrant as reference group				^d Represents the age and jurisdiction-adjusted IRR					