Non-suicidal self-injury in a New Zealand student population: Demographic and self-harm characteristics

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There is an established international literature on the prevalence of non-suicidal self-injury (NSSI). However, New Zealand information regarding prevalence, attitudes, motivation, co-morbidities, etc., is limited. In this study data were collected using an on-line survey from approximately 850 university students regarding self-injurious behaviour, risk and protective factors, mental health co-morbidity, help-seeking, and addiction. Our data revealed that 293 participants (38%) had engaged in NSSI on at least one occasion in their lifetime, elevated risk for females who were lesbian or bisexual, and different patterns of site and function of injury by gender. Given research suggesting that Māori (indigenous New Zealanders) are at elevated risk for suicide it was surprising that those identifying as Māori were at no greater risk of NSSI than those identifying as New Zealanders of European origin. Females were more likely to exhibit chronic self-injuring and more likely to engage in more 'covert' forms of self-injury that can be hidden or disguised (e.g., scratching and cutting on their wrists, arms or thighs) whereas males were more likely to engage in 'overt' forms of self-injury (e.g., banging or punching themselves or objects with their hands or head). Patterns of NSSI were similar to international comparisons, although prevalence was somewhat elevated. A number of factors differed by gender, including underlying reasons, forms, rates and increasing severity of self-injury, which add to the international literature.

Keywords: Non-suicidal self-injury, NSSI, university students, prevalence, self-harm, risk factors

Non-suicidal self-injury (NSSI) is defined as the deliberate, self-inflicted destruction of body tissue without suicidal intent and for purposes not socially sanctioned (ISSS, 2007; Muehlenkamp, Claes, Havertape, & Plener, 2012). Estimates of the prevalence of self-injury vary internationally and within different sectors of national populations due to the influence of a range of demographic, health, and social factors (Bergen, Hawton, Waters, Cooper, & Kapur, 2010; Hawton, Rodham, Evans, & Weatherall, 2002; Nock, 2010) as well as differences in definition and measurement strategies employed. For example, Nock (2010) cites studies reporting lifetime prevalence rates between 13%-45% for adolescents. However, Muehlenkamp and colleagues (2012), in a review of 52 international studies citing prevalence rates, suggest a stable lifetime prevalence rate of 18%.

The publication of New Zealand prevalence data has been limited. Nada-Raja, Skegg, Langley, Morrison, and Sowerby (2004) reported a lifetime self-harm prevalence rate of 13% amongst 966 26-year-olds who were part of the longitudinal Dunedin Multidisciplinary Health & Development Study. However, this report did not distinguish between behaviours enacted with or without suicidal intent. This distinction is the key difference between NSSI (self-injury without suicidal intent) and self-harm (self-injury with no limitations on suicidal intentions), and generally results in higher prevalence figures for self-harm over NSSI.

Data from the New Zealand Secondary Schools Survey (Lucassen et al, 2011) was included in the review by Muehlenkamp et al. (2012) although the researchers asked only a single 'Yes/No' question about self-injury within the previous 12 months (22.8% responding affirmatively), an approach which is likely to lead to an under-estimation of actual prevalence rates.

More recently, as part of a larger research project focused primarily on NSSI among young people in Wellington, New Zealand members of the Youth Wellbeing Study Team at Victoria University of Wellington reported a lifetime rate of NSSI amongst senior high school students (aged 16-18 years) of approximately 50% (Garisch & Wilson, 2015).

The New Zealand Ministry of Health reports data on hospitalisations attributed to intentional self-harm, although no distinction is made between suicidal behaviour and NSSI (Ministry of Health, 2015a). The most recent figures indicate that the rate of self-injury related hospitalisation (irrespective of suicidal intentionality) decreased over the decade to 2012, down to 71.0 per 100,000 of the population, although caution should be exercised regarding these figures, especially for individuals who engage in self-injurious behaviours but have no suicidal intent. That is, set against this encouraging reduction in the hospitalisation rate is the fact that a substantial proportion of those engaging in self-harm behaviours do not seek or obtain medical assistance (Evans, Hawton, & Rodham, 2005; Hawton, Saunders, & O'Connor, 2012; Nixon, Cloutier, & Jansson, 2008), and few of those who receive medical care, even at a hospital Emergency Department, would be admitted (Olfson, Marcus, & Bridge, 2012). It is generally accepted in the literature that many of those who engage in self-injurious behaviour, whether there is suicidal intent or not, do so in a way which is unobserved and unrecognised (Nada-Raja, Morrison, & Skegg, 2003; Whitlock, Eckenrode,

& Silverman, 2006).

While there is a slowly developing consensus in the literature about the prevalence rate of NSSI, there remains a complicated picture regarding other demographic and life course factors associated with NSSI behaviour. Based on their review of the best international data, Klonsky, Victor, and Saffer (2014) provide an estimate of lifetime rates in between 15% - 20% and onset typically around age 13 or 14 years. They found that about 6% of adults report a history of NSSI. Bergen et al. (2010) found that their sample of self-harm repeaters (undetermined intent) included a sizable proportion of adults in their middle age (approximately 30% in the 35-54 years age range). NSSI is often seen as predominantly the preserve of females, although recent studies show it is a behaviour also engaged in by a substantial number of males (Andover, Primack, Gibb, & Pepper, 2010). Indeed, general population studies find equivalent rates between men and women (Whitlock, Eckenrode, & Silverman, 2006; Klonsky, 2011), although there are differences in age of onset, type of self-injury, degree of medical injury, and help-seeking behaviour. Within New Zealand, Wilson et al. (2015) also report comparable rates between males and females in their sample of older high school students (16 years and older), although an earlier study by Fortune (2006) involving a random selection of clinical files of young people presenting with deliberate self-harm found significantly more females presented for assistance than males, suggesting differences in help-seeking and/or referral.

Within both the international and developing New Zealand literatures the area of ethnicity and cultural affiliation, and its association with NSSI, has not been systematically investigated. This is somewhat surprising given the data that minority cultural groups and indigenous people tend to have higher rates of mental health difficulties than dominate cultural groups (Goebert, 2014; Santiago & Miranda, 2014). Within New Zealand we might expect special attention to this issue given socio-cultural disparities in mental health status (Oakley-Browne, Wells, & Scott, 2006) and the high suicide rate for Māori youth (Ministry of Health, 2015b). Though the disparity is not as high as for completed suicide (17.8 per 100,000 Māori, compared with 10.6 per 100,000 non-Māori), the age-standardised rate for Māori self-harm hospitalisations in 2012 was 85.0 per 100,000 compared with 68.0 per 100,000 non-Māori (Ministry of Health, 2015a).

As with many areas of NSSI research the issue of cultural differences is not resolved. Martin, Swannell, Hazell, Harrison, and Taylor (2010), in a large cross-sectional study of self-injury in Australia found no significant difference based on gender, socioeconomic status, or indigeneity between those who reported self-harming during the four weeks prior to the interview. However, those born in Australia were more likely to have engaged in self-harming than those born elsewhere.

More recent research has highlighted the vulnerability of individuals within minority sexual orientation groups. Batejan, Jarvi, and Swenson (2015) report results of a meta-analysis including 15 studies which found that individuals within a sexual minority group were three times more likely to have engaged in self-injurious behaviour than those within a heterosexual group, with adolescents and bi-sexual individuals

being at particular risk. These data are consistent with studies by, for example, Liu and Mustanski (2012), and in New Zealand by Skegg, Nada-Raja, Dickson, Paul, and Williams (2003).

Lucassen, Clark, Moselen, Robinson, and the Adolescent Health Research Group (2014), reporting the latest results from the New Zealand Secondary Schools Health and Wellbeing Survey, provide data for nearly 8,000 students who responded to a question about having engaged in deliberate self-harm during the previous 12 months. Of those who identified as being sexually attracted to the opposite sex 23% disclosed that they had engaged in self-harm. This is similar to the rate for those indicating they were not sure about the focus of their sexual attraction, or were attracted to neither sex (21.7%), both were substantially lower than the rate for those attracted to the same or both sexes (59.4%).

There is a well-documented link between ever having engaged in NSSI and subsequent risk of suicidal behaviour (Glenn & Klonsky, 2009; Turner, Layden, Butler, & Chapman, 2013; Whitlock, Muehlenkamp, Eckenrode et al., 2013). While the suicide rate amongst New Zealanders appears to have plateaued at around 11.5 per 100,000 the rate continues to be highest amongst young people, so any factors which contribute to increased risk must be explored carefully (MoH, 2015b).

Despite the increase in the number of studies into NSSI conducted in New Zealand there is still little detailed information about those who engage in NSSI, how these individuals present, and what they have to say about the experience. By comparison, one of the most comprehensive overseas surveys of NSSI in young people was that undertaken by Whitlock et al. (2011) who report data collected from a web-based 'Health and Well-Being' survey conducted across eight universities in North America. Whitlock and her colleagues were able to attract over 14,000 student respondents in total, of whom 15% reported NSSI at some point in their lives, and approximately 7% had self-injured in the previous 12 months. The study found females 1.8 times more likely to report NSSI than males, while males were more likely to report anger as a factor in their self-injuring and more likely to report intoxication as an initiating factor. Whitlock et al. also report a significant relationship between sexual orientation and NSSI. From the same data set Whitlock et al. (2013) report a clear association between NSSI and concurrent or later suicidal behaviour, suggesting that NSSI may serve as a gateway to suicidal behaviour for youth and young adults. This is consistent with the Interpersonal Theory of Suicide proposed by Joiner (2005) which proposed an Acquired Capability (elimination of the fear associated with engaging in a lethal act) as one of three primary risk factors for suicidal action. To date there are few New Zealand studies primarily focused on NSSI which have attempted to provide a comprehensive review of risk factors and responses associated with NSSI (Garish & Wilson, 2015, Nada-Raja et al., 2004).

Current study

The study reported here employed a format adapted from the survey tool developed by Whitlock, Eckenrode, and Silverman (2006) and used in the Whitlock et al. (2011) survey. These authors used the Survey of College Mental Health and Wellbeing to collect general data on demographics, risk and

protective factors, co-morbidity (eating disorder, suicidality, and severe mental illness), help-seeking, self-injurious behaviour, and addiction. Our primary purpose was to examine NSSI in a sample of New Zealand university students, gaining data that would be generally comparable to Whitlock's data. There are two reasons for this, the first being the comparatively high suicide rate in New Zealand (MoH, 2015b), compared with other countries, including America (WHO, 2014). Secondly, given the over-representation of Māori and Pacific Islanders in negative mental health statistics (MoH, 2015c), it is important to explore prevalence rates for peoples indigenous to the South Pacific region.

Method

Study participants

The population from which the current sample was drawn were all domestic students studying on the main campus of one of New Zealand's six urban universities. International students (students normally resident in a country other than New Zealand) were excluded from the study because of the difficulty in anticipating and managing any complications resulting from cultural or language factors. Domestic students were only sent invitations to participate if they were studying on the main campus as it would have been impossible to ensure the availability of robust support options for those either studying on a satellite campus or those engaged in distance-learning. There were a total of 12,300 students enrolled at the target university. Of these approximately 9,000 were eligible to participate in the survey.

Survey form and procedure

The original survey form used by Whitlock et al. (2006) consisted of 201 items covering a wide range of psychological and well-being issues, including the Non-Suicidal Self-Injury Assessment Tool (NSSI-AT; Whitlock, Exner-Cortens, & Purington, 2014). The NSSI-AT contains items related to a range of NSSI factors, for example, injury type (from a list of 15 ways), functions (20 options), frequency and recency, age of onset, severity of injury, wound location (16 options), treatment experiences, and personal reflections. As we were unable to offer incentives to participants, as they did in the original American research, we maximised the likelihood of participation by removing items to shorten the survey to a maximum of 86 items. The excluded items primarily covered the areas of religiosity, parental/family demographics, computer usage, accessing therapy for issues other than NSSI, and some of the more detailed items regarding suicidal behaviour.

With the assistance of the university's Student & Academic Services Division survey information and a link to the on-line survey was sent to all local domestic students. A follow-up email, including the information sheet and survey link, was sent to all potential participants three weeks after the initial email. Participants were entered into a draw to win one of four $50 department store vouchers.

The research design, questionnaire and documentation was reviewed and approved by the university's Psychology Human Research Ethics Committee. Because this was a non-intervention study and it was assessed that completion of the survey was unlikely to cause distress, the ethics review committee was happy to allow all potential participants to give consent after having the opportunity to read a comprehensive information sheet. Participants could opt-out by simply declining to complete the whole or any part of the survey. The survey was conducted after consultation with the local Student Health & Counselling Service.

Analysis

Analysis of data was undertaken using SPSS v23.0. Logistic regressions were undertaken with NSSI as the dichotomized dependent variable indicating the presence/absence of any lifetime experience of NSSI. Other variables were entered as covariates. The analyses and reporting of results followed the general path set by Whitlock et al. (2011) so that comparisons between the data sets could be made. Where appropriate corrected confidence intervals are reported to take multiple comparisons into account.

Results

Participant characteristics

The survey was started by 862 and completed by 772 (89.6%) individuals; approximately 12% of the population to whom it was sent. Of these 549 were female (71.6%, see Table 1). The modal age band was 19-20 years (28.8%) and 63.3% participants were aged between 19-25 years. A majority of participants (70.3%) were undergraduates. Nearly three-quarters (73.5%) identified as being NZ-born of European extraction, 15.1% identified with Māori. A further 9.9% identified as European; all other ethnicity groups were each endorsed by less than 10%. Participants were able to indicate more than one ethnic affiliation. These figures are approximately in accordance with the university population, apart from the gender distribution where 55.7% of the university population were female, in contrast to 71.6% of those who completed the survey.

The most common relational categories showed participants as being single (40.0%), heterosexual (85.5%), and living off-campus in shared accommodation ('flatting', 41.1%). Of the total participants (*n*=862), 112 (13%) indicated that they had intentionally inflicted self-injury within the preceding 12 months.

Comparisons by NSSI status

Crude Odds Ratios (OR) for each variable analysed separately and Confidence Intervals (CI) for a range of demographic characteristics are reported in Table 1.

As comparisons by gender were used in subsequent analyses the five participants who declined to report their gender were excluded at this point. Of the 767 participants who completed the entire survey, 293 (38.2%; 95% CI = 34.7-41.7) reported NSSI at some point in their lives. Males were significantly less likely to report ever having engaged in NSSI (OR = 0.6, CI = 0.4-0.8). Of the females who completed the

survey 229 (41.7%) reported that they had self-injured at some point in their life compared to 64 (29.4%) males. The likelihood of participants engaging in NSSI declined as age increased. This difference was statistically significant for the groups aged 41-50 years (OR = 0.2, CI = 0.1-0.4) and 51 years and over (OR = 0.06, CI = 0.01-0.3). The group aged 18 years and under (*n*=70) was the only group where more than half of the members reported having engaged in NSSI (No = 47.1%, Yes = 52.8%).

Table 1

Logistic Regression of Self-Injury on Primary Demographic Characteristics

Characteristics	Total (*n*=767)		No-NSSI sample (*n*=474)		NSSI sample (*n*=293)			
	n	%	*n*	%	*n*	%	OR	95% CI
Gender								
Female	549	71.6	320	67.5	229	78.2	1.0	
Male	218	28.4	154	32.5	64	21.8	0.6*	0.4-0.8
Age								
18 and under	70	9.1	33	7.0	37	12.6	1.0	
19-20	221	28.8	118	24.9	103	35.2	0.8	0.5-1.3
21-22	163	21.3	98	20.7	65	22.2	0.6	0.3-1.0
23-25	101	13.2	64	13.5	37	12.6	0.5*	0.3-1.0
26-30	63	8.2	42	8.9	21	7.2	0.4*	0.2-0.9
31-35	38	5.0	26	5.5	12	4.1	0.4*	0.2-0.9
36-40	28	3.7	20	4.2	8	2.7	0.4*	0.1-0.9
41-50	49	6.4	41	8.6	8	2.7	0.2**	0.1-0.4
51 and over	34	4.4	32	6.8	2	0.7	0.06**	0.01-0.3
Year of Study [a]								
UG1	171	22.3	81	17.1	90	30.7	1.0	
UG2	193	25.2	114	24.1	79	27.0	0.6*	0.4-0.9
UG3	174	22.8	110	23.2	65	22.2	0.5*	0.3-0.8
PG1	69	9.0	45	9.5	24	8.2	0.5*	0.3-0.9
PG2	54	7.0	45	9.5	9	3.1	0.2**	0.1-0.4
PhD	48	6.3	37	7.8	11	3.8	0.3**	0.1-0.5
Ethnicity [b]								
NZ-European	564	73.5	341	71.9	223	76.1	1.9*	1.1-3.1
Māori	116	15.1	66	13.9	50	17.1	1.6*	1.0-2.5
Pacific Island	39	5.1	31	6.5	8	2.7	0.5	0.2-1.2
European	76	9.9	45	9.5	31	10.6	1.7	0.9-3.2
Asian	27	3.5	18	3.8	9	3.1	1.2	0.5-2.8
Indian	16	2.1	10	2.1	6	2.0	1.6	0.5-4.8
Americas	5	0.7	4	0.8	1	0.3	0.4	0.05-4.0
African	11	1.4	6	1.3	5	1.7	2.0	0.6-7.3
Other	34	4.4	17	3.6	17	5.8	2.7*	1.2-5.9
Sexual Orientation								
Heterosexual	656	85.5	436	92.0	220	75.1	1.0	
Gay/Lesbian	23	3.0	12	2.5	11	3.8	1.8	0.8-4.2
Bisexual	44	5.7	13	2.7	31	10.6	4.7**	2.4-9.2
Questioning	19	2.5	7	1.5	12	4.1	3.4*	1.3-8.8
Other	19	2.5	3	0.6	16	5.5	10.6**	3.0-36.7

Notes.
* *p*<.05
** *p*<.001
[a] UG=Undergraduate, PG=Postgraduate
[b] Participants were able to select multiple ethnic affiliations. Each ethnicity was treated as a separate dichotomous variable rather than categories of a more general 'ethnicity' variable.

Whitlock et al. (2011) reported significantly increased risk of NSSI associated with sexual orientation in their sample of college students. We found a similar increase in risk amongst all non-heterosexual individuals with the elevated risk being almost entirely associated with the female participants. That is, females identifying as other than heterosexual had an increased risk of also reporting a history of self-harm; lesbian/gay (OR = 1.8, CI = 0.8-4.2), an a significantly increased risk for individuals who identified as bisexual (OR = 4.7, CI = 2.4-9.2), and 'questioning' (OR = 3.4, CI = 1.3-3.4). Further multivariate

analysis in which gender was added as an independent variable suggests that females (lesbian, AOR = 4.0, CI = 1.2-13.3; bisexual, AOR = 6.0, CI = 2.7-13.6; 'questioning', AOR = 8.0, CI = 1.7-37.7) were are much higher risk than their male counterparts, and that these factors did not accounted for significant elevation of risk amongst male participants.

Participants who identified themselves as being either a New Zealander of European origin or indigenous Māori were at greater risk of NSSI than those who did not. It is of interest that the risk of reporting NSSI was not significantly greater for Māori, which is not reflective of the national suicide statistics.

It had been anticipated that potential isolation associated with living circumstances may be linked with an increased risk of NSSI, but this was not reflected in the data.

Comparisons by gender

Table 2 shows the frequency and dominant form of self-injury, and Odds Ratio and Confidence Intervals by gender. Of the 264 participants (90.1% of those who had intentionally self-injured) who indicated at what age they had first self-injured, the modal age group was 11-15 years (*n*=140, 53.0%). This was also the modal age group for females (*n*=116, 56.9% of females) with the modal age group for males being 16-20 years (*n*=29, 48.3% of males).

Table 2

Logistic Regression of Primary NSSI Characteristics by Gender

Characteristics	Total (*n*=293)		Female (*n*=229)		Male (*n*=64)		Univariate Analyses	
	n	%	*n*	%	*n*	%	OR	CI
Lifetime Frequency								
Once	25	9.1	22	10.3	3	5.0	0.9	0.8-1.0
2-5 times	61	22.3	44	20.6	17	28.3	2.8	0.8-10.7
4-5 times	45	16.4	32	15.0	13	21.7	3.0	0.8-11.7
6-10 times	34	12.4	26	12.1	8	13.3	2.3	0.5-9.6
11-20 times	32	11.7	23	10.7	9	15.0	2.9	0.7-12.0
21-50 times	27	9.9	23	10.7	4	6.7	1.3	0.3-6.4
Over 50 times	50	18.2	44	20.6	6	10.0	1.0	0.2-4.4
Dominant form [ab]								
Scratch skin	202	68.9	170	74.2	32	50.0	0.3**	0.1-0.8
Cut body	166	56.7	140	61.1	26	40.6	0.3*	0.2-0.8
Carved words/symbols in skin	97	33.1	83	36.2	14	21.9	0.8	0.3-1.8
Bitten self	51	17.4	42	18.3	9	14.1	1.1	0.4-3.2
Ripped or torn skin	50	17.1	39	17.0	11	17.2	1.8	0.6-5.6
Burned body	54	18.4	43	18.8	11	17.2	1.7	0.6-4.9
Rubbed glass into or pierced skin	58	19.8	53	23.1	5	7.8	0.2*	0.1-0.8
Banged/punched an object	104	35.5	69	30.1	35	54.7	3.2**	1.5-6.8
Banged/punched self	81	27.6	59	25.8	22	34.4	1.3	0.5-3.0
Prevented healing	50	17.1	45	19.7	5	7.8	0.3	0.1-1.1
Pulled own hair	49	16.7	38	16.6	11	17.2	0.7	0.2-2.0

Notes.
* *p*<.05
** *p*<.01
[a] Only self-injury occurring at a rate greater than 15% in the total sample is reported. [b] Participants were able to select multiple forms of self-harm. Each form was treated as a separate dichotomous variable (present/absent)

Males were at lower risk of having 'severely scratched or pinched with fingernails or other objects to the point that bleeding occurs or marks remain on the skin' (OR = 0.3, CI = 0.1-0.8), 'cut wrists, arm, legs, torso or other areas of the body' (OR = 0.3, CI = 0.2-0.8), or 'rubbed glass into skin or stuck sharp

objects such as needles, pins, and staples into or underneath the skin (not including tattooing, body piercing, or needles used for medication use)' (OR = 0.2, CI = 0.1-0.8), but were more likely than females to have 'banged or punched objects to the point of bruising or bleeding' (OR = 3.2, CI = 1.5-6.8). For all participants the mean number of different forms of self-injury experienced was 3.6 (*SD*=3.0) and while females reported a slightly higher mean number than males this was not statistically significant.

There is some evidence that the number of different forms of self-injury is a better predictor of the likelihood of further self-harm than frequency or the recent occurrence of self-harm (Latimer, Meade, & Tennant, 2013; Nock, Joiner, Gordon, Lloyd-Richardson, & Prinstein, 2006). To explore this we completed a correlation analysis of the number of different forms of self-injuring by participants' self-ratings of how likely they were to intentionally injure themselves again. We found a moderate positive correlation between the two variables, Spearman's *r* (272) = .467, *p*<0.01 (2-tailed).

Table 3 reports comparisons between male and female participants on a range of secondary characteristics of NSSI. Under all categories the table only includes those items rated as present by more than 20% of males or females[1], or which were found to be rated differently by the two gender groups. Omitted items were excluded from analyses. Females were significantly less likely than males to hurt themselves 'to get a rush or surge of energy' (OR = 0.3, CI = 0.1-1.0) or 'because of self-hatred' (OR = 0.4, CI = 0.2-0.9), but more likely to do it as a way of gaining 'control over myself or my life' (OR = 3.8, CI = 1.2-11.5) or 'to change my emotional pain into something physical' (OR = 2.6, CI = 1.1-6.2). Some of the traditionally cited functions of self-harm were frequently endorsed, for example, emotion regulation (coping with uncomfortable feelings, relieving stress, dealing with frustration and anger), but these were not selected at different rates by males and females. Items related to interpersonal influence (e.g., to cry for help, to be part of a group, to attract attention) were not selected at a high rate and also did not differentiate between males and females.

Females were more likely to injure their wrists (OR = 2.4, CI = 1.2-4.8) or thighs (OR = 3.2, CI = 1.5-6.7), but substantially less likely to cause injury to their head (OR = 0.3, CI = 0.1-0.7). The overall number of those reporting injuries (293 participants reporting injury to 716 sites) demonstrates that many participants had histories of injury to more than one site. Only three factors were identified as being substantial motivators for initial episodes of self-harm – feeling upset, feeling angry, and use of substances. Of these only "I was drunk or high" presented an increased risk by gender with females being significantly less likely to indicate this motivation than males (OR = 0.2, CI = 0.1-0.7).

Overall 50% of participants who had self-injured reported that someone knew about their behaviour and had talked with them about it. Eleven per cent reported that they believed another person knew or suspected their self-injuring, but

Table 3

Logistic Regression of Secondary NSSI Characteristics and Help-Seeking by Gender

Characteristics	Total (n=293)		Female (n=229)		Male (n=64)		Univariate Analyses	
	n	%	n	%	n	%	OR	95% CI
Function [a]								
Cope with uncomfortable feelings	192	65.5	153	66.8	39	60.9	1.0	0.5-2.1
Relieve stress	183	62.5	147	64.2	36	56.3	1.0	0.5-2.2
Self-punishment	62	21.2	45	19.7	17	26.6	0.6	0.2-1.4
Energy rush	26	8.9	17	7.4	9	14.1	0.3[*]	0.1-0.9
Self-control	73	24.9	65	28.4	8	12.5	4.1[*]	1.4-12.4
Distraction	89	30.4	72	31.4	17	26.6	0.7	0.3-1.7
Change emotional to physical pain	139	47.4	118	51.5	21	32.8	2.6[*]	1.1-6.0
Unstoppable urge	59	20.1	51	22.3	8	12.5	2.2	0.7-6.6
Deal with frustration	130	44.4	106	46.3	24	37.5	1.4	0.6-3.2
Deal with anger	105	35.8	84	36.7	21	32.8	0.8	0.3-1.7
Self-hatred	101	34.5	74	32.3	27	42.2	0.4[*]	0.2-0.9
Primary body parts affected [a]								
Wrist	127	43.3	108	47.2	19	29.7	2.3[*]	1.1-4.9
Hand	101	34.5	73	31.9	29	45.3	0.5	0.3-1.0
Arm	138	47.1	111	48.5	27	42.2	1.0	0.5-1.9
Thigh	130	44.4	114	49.8	16	25.0	3.5[**]	1.6-7.7
Head	29	9.9	15	6.6	14	21.9	0.3[*]	0.1-0.7
Initial motivation [a]								
Upset and decided to try it	126	43.0	103	45.0	23	35.9	1.1	0.6-2.1
Angry at self	105	35.8	81	35.4	24	37.5	0.8	0.4-1.5
Because of being drunk or high	12	4.1	6	2.6	6	9.4	0.1[*]	0.1-0.7
Routines and habits [a]								
Always injure in private	157	53.6	125	54.6	32	50.0	1.1	0.5-2.3
Does not feel much pain when injuring	72	24.6	54	23.6	18	28.1	0.7	0.4-1.5
Has periods of self-injury and non-injuring	75	25.6	58	25.3	17	26.6	0.9	0.4-1.7
Unintended severity [b]								
Increasing tolerance to pain	60	23.5	54	27.1	6	10.7	0.7[**]	0.5-0.9
Has trouble stopping	56	22.0	46	23.2	10	17.5	0.9	0.5-1.3
Will be able to stop when ready	137	53.7	103	51.8	34	60.7	1.1	0.9-1.4
Under the influence of alcohol of drugs	44	17.3	32	16.2	12	21.1	1.4[**]	1.1-1.7
Best way to calm self	144	56.5	87	43.9	16	28.1	0.9	0.7-1.2
Have to continually fight urge	92	36.1	75	38.1	17	29.8	0.8	0.6-1.1
Control is easy	88	34.8	64	32.7	24	42.1	1.0	0.8-1.3
Self-injury is a problem in life	56	22.0	45	22.7	11	19.3	1.1	0.8-1.5
No desire to stop	25	9.8	16	8.1	9	15.8	1.4[*]	1.0-1.8

Notes.
[*] *p*<0.5
[**] *p*<0.01
[a] Only includes responses rated by at least 20% of male or female respondents, or where differences between the gender groups was statistically significant.
[b] Only includes responses rated 'strongly agree' or 'somewhat agree' by at least 20% of male or female respondents, or where differences between the gender groups was statistically significant.

had not discussed it, and 39% reported a belief that no-one knew about their self-harming. It should be noted that while another person may have identified the participant's self-harm this does not mean that the participant displayed signs of this intentionally, or welcomed the recognition. There were no significant differences by gender. Those who had self-injured three times or less were more likely to indicate a belief that no-one knew about their behaviour, whereas those who had self-injured more than three times were most likely to indicate that someone else knew. Despite this 25% of those who had self-injured more than 50 times indicated their belief that no-one knew about their behaviour, suggesting they were actively hiding their NSSI.

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1 Omitted items are – **Function:** 'It feels good', 'Like the way it looks', 'To help me cry', 'Friends hurt themselves', 'Friend expected me to', 'Be part of the group', "Get attention/support', 'Practice suicide', 'Suicide attempt', 'Feel closer to God', 'Avoid other self-harming', 'Shock/hurt someone', 'Avoid something else'. **Initial Motivation** – 'Friend suggested it', 'Saw on internet', 'Saw on movie', 'Works for others', 'Celebrities do it', 'Accident', 'A dare', 'To fit in', 'To be noticed', "To shock others",' I was upset', 'To feel good', 'Angry at others'. "I cannot remember'. **Routines and Habits** – 'Have friends who self-harm', 'Sometimes self-injure with others', 'Let other people injure me', 'Have a regular routine of self-injuring', 'Have a particular place/room where I self-injure'.

For those who reported that they had discussed their self-harming with another person the most commonly cited people were a Significant Other (boyfriend, girlfriend, or spouse/partner, 62%), friend (55%), therapist (37%), or parent (35%). Less than 10% had discussed their behaviour with a medical practitioner.

Discussion

As indicated in many other studies NSSI is primarily, but not exclusively, a behaviour of younger females. Whitlock et al. (2011) reported, using largely the same survey items, that approximately 29% of her survey participants who engaged in NSSI were male compared with our finding of 22%, with a gender ratio of approximately 4:1. Because of the high suicide rate for young people in New Zealand (Ministry of Health, 2015b), especially Māori, it was surprising that Māori participants were at no greater risk than New Zealanders of European origin. However, our data appears consistent with the findings from Australia that immigrants may be less at risk of self-harm than those born in New Zealand (Martin et al., 2010).

The overall 12-month prevalence rate for NSSI in our sample of 13% is high, although the literature contains incidence and prevalence rates which vary widely (Swannell, Martin, Page, Hasking, & St John, 2014). Whitlock's survey results reported a lifetime prevalence rate of 15.3% and a 12-months rate of 6.8%, about half the rate found in the current study. The rates are higher than those reported in the extant literature and may reflect the more limited age range of most participants (the peak risk is in the 15-24 year age group), and the greater proportion of female participants in our survey. However, the most likely explanation is that students with a history of self-harming were more likely to complete the survey introducing a self-selection bias, whereas the availability of incentives in Whitlock's research may have supported a broader and more community-representative participation. The variation in rates is unsurprising as Bergen et al. (2010) reported that self-injuring is more common in those who are socially disadvantaged, have experienced negative life events, have co-morbid mental health problems, have consumed alcohol of other drugs immediately prior to or during a self-harm episode, or have close social contacts (including family) who also engage in self-harm. With this range of risk factors, it is not surprising that NSSI rates vary between regions and countries.

There has been a steady increase in research studies suggesting that sexual orientation is associated with NSSI (Batejan, Jarvi, & Swenson, 2014; King et al., 2008), a finding also supported by Whitlock et al. (2011). We also found that this association was primarily found for female participants and particularly bisexual females. The mechanism linking sexual orientation and self-injurious behaviour is not clear; however, Joiner (2005) posits a low sense of belonging/high social alienation as one of the three precursors of suicidal behaviour. The other two factors are perceived burdensomeness and an acquired capacity to engage in life-threatening behaviour, as exhibited in episodes of NSSI. Having a sexual orientation which may be perceived as alternative could be both isolating and perceived as potentially burdensome to others. Muehlenkamp, Hilt, Ehlinger, and McMillan (2015) also found evidence that minority (group) stress significantly increases the risk for self-injury. However, Zaki, Gross, and Pachankis (2017) report more nuanced findings with lower rates of NSSI in lesbian youth and greater willingness to seek help compared with heterosexual peers, but elevated risk and reduced help seeking in bisexual young females. While these later findings are consistent with our data the over-riding conclusion is that the relationship between sexuality and self-injury is complex and requires further investigation.

The primary characteristics analysed were those directly related to the participants' experience of self-injury. In the lower lifetime frequency bands there were a greater proportion of males with the converse being true in the highest frequency bands (21-50 or over 50 times), where females were more likely to be represented. Indeed, over 40% of females who engaged in NSSI reported having self-injured more than 10 times. While these differences were not statistically significant between genders they do generally supports the picture of self-injury as a chronic behaviour among a sub-group of individuals, and particularly amongst females.

The same forms of self-injury were present in the current survey as found by Whitlock et al. (2011). That is, females were significantly more likely to engage in scratching and cutting, whereas males were more likely to bang/punch an object with the intention of causing injury. The frequency of other self-injurious behaviours was similar across genders. Both males and females indicated that the primary reason why they engaged in NSSI was to cope with uncomfortable emotions and relieve stress, although for females this process appears more controlled and precise, and for males it is less controlled and more explosive based on the most common form of self-injury outlined above. This difference is reinforced by the analysis of secondary characteristics where females were significantly more likely to indicate that, for them, the function of self-injury was to gain control and *manage* emotions (e.g., 'self-control', 'change emotional into physical pain', 'deal with frustration'). Males were more likely to self-injure for the excitement/energy and because they were angry and did not like themselves ('energy rush', 'unstoppable urge', 'self-punishment'), that is, NSSI may provide a way to *express* emotions. These data suggest that females and males may self-injure at different rates, in somewhat different ways, and for potentially different reasons, a conclusion also arrived at by other researchers (Andover, Primack, Gibb, & Pepper, 2010; Bresin & Schoenleber, 2015; Green, Kearns, Ledoux, Addis, & Marx, 2015; Green & Jakupcak, 2016). It seems reasonable to suggest that any support/intervention strategies will need to take this into account, and difficulty in doing this may be one factor explaining the relative lack of success in reducing rates of NSSI and altering its chronic course (Collinson et al., 2014; Hatcher et al., 2015; Kerr, Muehlenkamp, & Turner, 2010; Newman, 2009).

New Zealand has a well-recognised problem with alcohol consumption amongst its young people (Lyons et al., 2014; McEwan, Campbell, Lyons, & Swain, 2013). The use of substances was generally reported to be a common factor in the origins of self-injury, particularly for males, and it is

a factor in ongoing self-injuring and when individuals injure themselves more seriously than they had intended. Although substance use was not a risk factor in our survey, it did assist in differentiating females from males. Further research is merited, focusing on alcohol-associated injuries that present at hospital Accident & Emergency Departments to identify those cases where it is not an injury following intoxication, but intoxication for the purpose of self-injury.

A further concern in our data related to the reporting by females, at significantly greater rates than males, that they had to injure themselves more severely over time to get the same effect. As indicated previously, Joiner (2005) suggested that obtaining an acquired capacity for self-inflicted harm is one precursor for suicide. The apparent increased tolerance to pain reported by nearly a third of the females in our self-injuring group indicates that this group may be at an increasing risk of transitioning from non-suicidal self-injury to suicidal behaviour.

This study is one of the largest to focus specifically on NSSI within New Zealand. However, it is limited by its focus on a student population drawn from a single university. While many students undoubtedly experience substantial social, financial, and academic stressors, especially first-year students, they have access to social and professional support, and have experienced a level of success in the educational system by virtue of their attendance at university. This is not the case for many young people, and we cannot assume our results can be generalised to other groups within New Zealand. Also, while the focus of the survey was NSSI the questions about self-injury were largely limited to cutting and forms of physical self-mutilation. There were some items which referred to ingestion of toxic substances, but this form of self-harming was not explicitly addressed in open questions. Other potential biases include the relatively low response rate (12%), self-selection of participants as is usual with anonymous web-based survey research, and the limited categorisation of gender into a traditional binary for analytical purposes. Despite these limitations the data reported here will contribute to the establishment of a robust baseline of NSSI in the student body of New Zealand which can be used to assist in the shaping of support services, and the application of overseas findings to the local environment.

Acknowledgement

References

Andover, M. S., Primack, J. M., Gibb, B. E., & Pepper, C. M. (2010). An examination of non-suicidal self-injury in men: Do men differ from women in basic NSSI characteristics? *Archives of Suicide Research, 14*, 79-88.

Batejan, K. L., Jarvi, S. M., & Swenson, L. P. (2014). Sexual orientation and non-suicidal self-injury: A meta-analytic review. *Archives of Suicide Research, 19*, 131-150.

Bergen, H., Hawton, K., Waters, K., Cooper, J., & Kapur, N. (2010). Epidemiology and trends in non-fatal self-harm in three centres in England: 2000–2007. *British Journal of Psychiatry, 197*(6), 493-498.

Bresin, K., & Schoenleber, M. (2015). Gender differences in the prevalence of nonsuicidal self-injury: A meta-analysis. *Clinical Psychology Review, 38*, 55-64.

Collinson, M., Owens, D., Blenkiron, P., Burton, K., Graham, L., Hatcher, S., & ... Farrin, A. (2014). MIDSHIPS: Multicentre intervention designed for self-harm using interpersonal problem-solving: Protocol for a randomised controlled feasibility study. *Trials, 15*, 1-14.

Evans, E., Hawton, K., & Rodham, K. (2005). In what ways are adolescents who engage in self-harm or experience thoughts of self-harm different in terms of help-seeking, communication and coping strategies? *Journal of Adolescent Health, 28*, 573–587.

Fortune, S. A. (2006). An examination of cutting and other methods of DSH among children and adolescents presenting to an outpatient psychiatric clinic in New Zealand. *Clinical Child Psychology and Psychiatry, 11*, 407-416.

Garisch, J. A., & Wilson, M. S. (2015). Prevalence, correlates, and prospective predictors of non-suicidal self-injury among New Zealand adolescents: Cross-sectional and longitudinal survey data. *Child and Adolescent Psychiatry and Mental Health, 9*, 1-11.

Glenn, C. R., & Klonsky, E. D. (2009). Social context during non-suicidal self-injury indicates suicide risk. *Personality and Individual Differences, 46*, 25-29.

Goebert, D. (2014). Cultural disparities in mental health care: closing the gap. *Psychiatric Times, 31*, 49-49.

Green, J. D., Kearns, J. C., Ledoux, A. M., Addis, M. E., & Marx, B. P. (2015). The association between masculinity and nonsuicidal self-injury. *American Journal of Men's Health*, doi: 10.1177/1557988315624508

Green, J. D., & Jakupcak, M. (2016). Masculinity and men's self-harm behaviors: Implications for non-suicidal self-injury disorder. *Psychology of Men & Masculinity, 17*, 147-155.

Hatcher, S., Sharon, C., House, A., Collins, N., Collings, S., & Pillai, A. (2015). The ACCESS study: Zelen randomised controlled trial of a package of care for people presenting to hospital after self-harm. *British Journal of Psychiatry, 206*, 229-236.

Hawton, K., Rodham, K., Evans, E., & Weatherall, R. (2002). Deliberate self-harm in adolescents: Self report survey in schools in England. BMJ: *British Medical Journal, 325*(7374), 1207-1211.

Hawton, K., Saunders, K. E. A., & O'Connor, R.C. (2012). Self-harm and suicide in adolescents. *Lancet, 379*, 2373–2382. International Society for the study of Self-Injury (2007). [http://www.isssweb.org/].

Joiner, T.E. (2005). *Why people die by suicide*. Cambridge, MA: Harvard University Press.

Kerr, P. L., Muehlenkamp, J. J., & Turner, J. M. (2010). Nonsuicidal self-injury: A review of current research for family medicine and primary care physicians. *The Journal of the American Board of Family Medicine, 23*, 240-259.

King, M., Semlyen, J., Tai, S. S., Killaspy, H., Osborn, D., Popelyuk, D., et al. (2008). A systematic review of mental disorder, suicide, and deliberate self-harm in lesbian, gay, and bisexual people. *BMC Psychiatry, 8*, 70

Klonsky, E. D. (2011). Non-suicidal self-injury in United States adults: prevalence, sociodemographics, topography and functions. *Psychological Medicine, 41*(9), 1981-1986.

Klonsky, E., Victor, S., & Saffer, B. (2014). Non-suicidal self-injury: What we know, and what we need to know. *Canadian Journal of Psychiatry, 59*, 565-568.

Latimer, S., Meade, T., & Tennant, A. (2013). Measuring engagement in deliberate self-harm behaviours: psychometric evaluation of six

scales. *BMC Psychiatry 13*, 4.

Liu, R. T., & Mustanski, B. (2012). Suicidal ideation and self-injury in lesbian, gay, bisexual, and transgender youth. *American Journal of Preventive Medicine, 42*, 221-228.

Lucassen, M. F. G., Merry, S. N., Robinson, E. M., Denny, S., Clark, T., Ameratunga, S., Crengle, S., et al. (2011). Sexual attraction, depression, self-harm, suicidality and help-seeking behaviour in New Zealand secondary school students. *Australian and New Zealand Journal of Psychiatry, 45*(January), 376-383.

Lucassen, M.F.G., Clark, T. C., Moselen, E., Robinson, E.M., & The Adolescent Health Research Group. (2014). *Youth'12, The Health and Wellbeing of Secondary School Students in New Zealand: Results for young people attracted to the same sex or both sexes.* Auckland, New Zealand: University of Auckland.

Lyons, A.C., McCreanor, T., Goodwin, I., Griffin, C., Hutton, F., Moewaka Barnes, H., O'Carroll, A.D., Samu, L., Niland, P. & Vroman, K.E. (2014). Youth drinking cultures in Aotearoa. *Sites, 11,* http://dx.doi.org/10.11157/sites-vol11iss2id265

Martin, G., Swannell, S. V., Hazell, P. L., Harrison, J. E., & Taylor, A. W. (2010). Self-injury in Australia: a community survey. *Medical Journal of Australia, 193*(9), 506.

McEwan, B., Campbell, M., Lyons, A., & Swain D. (2013). *Pleasure, Pain and Profit: Alcohol in New Zealand and the Contemporary Culture of Intoxication.* Hamilton, Waikato: University of Waikato. Available at: http://researchcommons.waikato.ac.nz/handle/10289/8035?show=full

Ministry of Health. (2015a). *Suicide Facts: Deaths and intentional self-harm hospitalisations 2012*. Wellington, New Zealand: Ministry of Health.

Ministry of Health. (2015b). *Suicide Facts: 2013 data*. Wellington, New Zealand: Ministry of Health. Available at: http://www.health.govt.nz/publication/suicide-facts-2013-data

Ministry of Health (2015c). *Annual Update of Key Results 2014/15: New Zealand Health Survey*. Wellington, New Zealand: Ministry of Health. Available at: http://www.health.govt.nz/system/files/documents/publications/annual-update-key-results-2014-15-nzhs-dec15-1.pdf

Muehlenkamp, J. J., Claes, L., Havertape, L., & Plener, P. L. (2012). International prevalence of adolescent nonsuicidal self-injury and deliberate self-harm. *Child and Adolescent Psychiatry and Mental Health, 6*, 10.

Muehlenkamp, J. J., Hilt, L. M., Ehlinger, P. P., & McMillan, T. (2015). Nonsuicidal self-injury in sexual minority college students: a test of theoretical integration. *Child and Adolescent Psychiatry and Mental Health, 9*, 1-8.

Nada-Raja, S., Morrison, D., & Skegg, K. (2003). A population-based study of help-seeking for self-harm in young adults. *Australian & New Zealand Journal of Psychiatry, 37*, 600-605.

Nada-Raja, S., Skegg, K., Langley, J., Morrison, D., & Sowerby, P. (2004). Self-harmful behaviors in a population-based sample of young adults. *Suicide and Life-Threatening Behavior, 34*, 177-186.

Newman, C. F. (2009). Cognitive therapy for nonsuicidal self-injury. In M. K. Nock (Ed.) *Understanding nonsuicidal self-injury: Origins, assessment, and treatment*, (pp. 201-219). Washington DC: American Psychological Association.

Nixon, M. K., Cloutier, P., & Jansson, M. (2008). Nonsuicidal self-harm in youth: a population-based survey. *Canadian Medical Association Journal, 178*, 306-312.

Nock, M. (2010). Self-injury. *Annual Review of Clinical Psychology, 6*, 339-363.

Nock, M. K., Joiner, T. E., Gordon, K. H., Lloyd-Richardson, E., & Prinstein, M. J. (2006). Non-suicidal self-injury among adolescents:

Diagnostic correlates and relation to suicide attempts. *Psychiatry Research, 144*, 65-72.

Oakley Browne, M. A., Wells, J. E., & Scott, K., M. (2006). *Te Rau Hinengaro: The New Zealand Mental Health Survey*. Wellington: Ministry of Health.

Olfson, M., Marcus, S.C., & Bridge, J. A. (2012). Emergency treatment of deliberate self-harm. *Archives in General Psychiatry, 69,* 80-88.

Santiago, C. D., & Miranda, J. (2014). Progress in improving mental health services for racial-ethnic minority groups: A ten-year perspective. *Psychiatric Services, 65*, 180-185.

Skegg, K., Nada-Raja, S., Dickson, N., Paul, C., & Williams, S. (2003). Sexual orientation and self-harm in men and women. *American Journal of Psychiatry, 160*, 541-546.

Swannell, S. V., Martin, G. E., Page, A., Hasking, P., & St John, N. J. (2014). Prevalence of nonsuicidal self-injury in nonclinical samples: Systematic review, meta-analysis and meta-regression. *Suicide and Life-Threatening Behavior, 44*, 273-303.

Turner, B. J., Layden, B. K., Butler, S. M., & Chapman, A. L. (2013). How often, or how many ways: Clarifying the relationship between non-suicidal self-injury and suicidality. *Archives of Suicide Research, 17*, 397-415.

Whitlock, J., Eckenrode, J., & Silverman, D. (2006). Self-injurious behaviors in a college population. *Pediatrics, 117*(6), 1939-1948.

Whitlock, J., Exner-Cortens, D., & Purington, A. (2014). Assessment of non-suicidal self-injury: Development and initial validation of the Non-Suicidal Self-Injury-Assessment Tool (NSSI-AT). *Psychological Assessment, 26*, 935-946.[2]

Whitlock, J., Muehlenkamp, J., Eckenrode, J., Purington,A., Baral Abrams, G., Barreira, P., & Kress, V. (2013). Nonsuicidal self-injury as a gateway to suicide in young adults. *Journal of Adolescent Health, 52*, 486-92.

Whitlock, J., Muehlenkamp, J., Purington, A., Eckenrode, J., Barreira, P., Abrams, G. B., … Knox, K. (2011). Non-suicidal self-injury in a college population: General trends and sex differences. *Journal of American College Health, 59*, 691–698.

Wilson, M., Garisch, J., Langlands, R., O'Connell, A., Russell, L., Robinson, K., . . . Judge, M. (2015). Adolescent non-suicidal self-injury in Aotearoa New Zealand. *Psychology Aotearoa, 7*, 130-133.

World Health Organization (2014). *Preventing suicide: A global imperative*. Geneva, Switzerland: WHO.

Zaki, L. F., Gross, M., & Pachankis, J. E. (2017). Help-seeking for nonsuicidal self-injury in sexual minority adolescent and young adult females. *Journal of Gay & Lesbian Mental Health, 21*, 171-187.

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2 The Non-Suicidal Self-Injury-Assessment Tool (NSSI-AT) can be obtained at http://www.selfinjury.bctr.cornell. edu/perch/resources/nssi-at-revised-final-3.pdf