Child, Adolescent and Young Adult Suicides: A Comparison Based on the Queensland Suicide Registry

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Abstract

Objective: The incidence of suicides increases rapidly up to the age of 20 years. Despite major developmental changes, only a limited number of studies has compared characteristics of child, adolescent and young adult suicides. The aim of the current study was to compare demographic, psychosocial and psychiatric characteristics of suicides in three youngest age groups - 10-14 years, 15-19 years and 20-24 years - in Queensland, Australia, between 2002 and 2011.

Methods: The Queensland Suicide Register (QSR) contains information from a variety of sources, including: police report of death to a Coroner, post-mortem autopsy report, toxicology report and Coroner's findings. Annual suicide rates were calculated by gender and age group. Odds Ratios (OR) with 95% confidence intervals (95% CI), Chi2 test are presented.

Results: Between 2002 and 2011, there were 850 youth suicides recorded in the QSR - 43 aged 10-14 years, 295 aged 15-19 years and 512 aged 20-24 years. The proportion of males increased with age (51.2%, 69.5% and 76.6%). However, the proportion of Indigenous people decreased significantly with age (45.2%, 18.1% and 14.5%). Hanging was the most frequent suicide method for all age groups and for both genders, decreasing significantly with age for both genders. Prevalence of a diagnosed psychiatric disorder, substance use and psychiatric treatment increased with age. Evidence of untreated mental health problems was reported without significant differences between age groups. Similarly, there were no significant differences in history of previous suicide attempts and communication of suicide intent. Suicide in social group and attention to suicide in media, family conflict, school/work-related problems and childhood trauma decreased significantly with age while relationship problems increased.

Conclusion: Suicides in early adolescence were characterised by higher prevalence of family conflicts, school-related problems and suicides in social groups. Suicides in young adults had significantly higher prevalence of psychiatric disorders and were much more impacted by relationship problems. The characteristics of suicides in late adolescents fell in between the other age groups.

Introduction

The incidence of suicide increases rapidly throughout teenage years. While globally suicide rates are approximately 1 per 100,000 in the age group 10-14 years, they rise almost 10-fold in age group 15-19 years [1,2]. This phenomenon is not unexpected, as it coincides with major developmental changes of a maturing young person. Suicide rates stabilize in early adulthood [3].

Suicides in adolescents are impacted by a variety of factors including: psychological, psychiatric, genetic, social and cultural factors [4]. Although there are several studies focusing on adolescent suicide and suicidal behaviours, only a limited number compare characteristics of child and adolescent suicides, or adolescent and young adult suicides [5]. Considering major developmental differences between these groups, the aim of the current analysis was to examine demographic, psychosocial and psychiatric differences in suicides in three youngest age groups – children/early adolescents (10-14 years), late adolescents (15-19 years) and young adults (20-24 years) - in Queensland, Australia, between 2002 and 2011.

Methods

The Queensland suicide register (QSR)

The QSR is a comprehensive suicide database maintained by the Australian Institute for Suicide Research and Prevention (AISRAP). The QSR holds the records for all suicides in Queensland since 1990 and is currently the only research database of suicides in Australia. The information comes from a variety of sources, such as police report of death to a Coroner (Form 1), post-mortem autopsy report, toxicology report and Coroner's findings, including narrative of circumstances of death (who the deceased person was, and how, when and where the person died).

Documents are crosschecked with records from the National Coronial Information System (NCIS). Following the Suicide Classification Flow Chart, (developed by AISRAP), all suicide cases in the QSR are classified into one of three categories: Beyond Reasonable Doubt, Probable, or Possible [6]. For the present analyses only those cases falling into the categories of either Beyond Reasonable Doubt or Probable are included.

Statistical analysis

Annual suicide rates were calculated by gender and age group. Poisson regression was used to analyse In order to compare three age groups Chi-square test was used.

In order to compare two age groups, Odds Ratios (OR) with 95% confidence intervals (95% CI) were calculated. Age group 15-19 years was used as reference group when calculating OR. With small numbers (less than 5), Fisher's exact test was used. SPSS 22.0 was employed for all data analyses.

Results

Between 2002 and 2011, 850 youth suicides were recorded in the QSR: 43 children/early adolescents aged 10-14 years, 295 late adolescents aged 15-19 years, and 512 young adults aged 20-24 years. Figure 1 shows that suicide numbers grow rapidly with age until the age of 20 years and stabilize in early 20s.

The proportion of males increased with age: 51.2%, 69.5% and 76.6% respectively (Chi^2=15.47, df=2, p<0.001). However, the proportion of Aboriginal and Torres Strait Islander peoples decreased significantly with age (Chi^2=25.86, df=2, p<0.001), being the highest in the age group 10-14 years (45.2%), followed similarly by age groups 15-19 years (18.1%) and 20-24 years (14.5%).
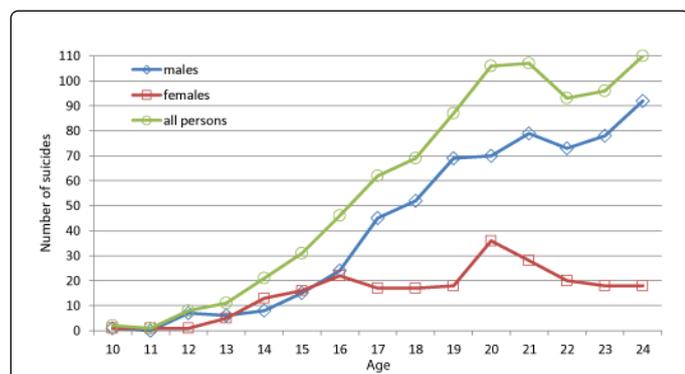

Figure 1: Suicide counts by age in Queensland, Australia (2002-2011).

Figure 2 presents suicide rates by age group and gender. Average suicide rates were similar between genders for age group 10-14 years (1.51 per 100,000 for males and 1.54 for females); gender differences and suicide rates rose with age, followed by age group 15-19 years (14.27 for males and 6.51 for females) and age group 20-24 (27.03 for males and 8.29 for females). Between 2002 and 2011, annual suicide rates showed a significant increase for females aged 20-24 years (IRR=1.07 95% CI 1.00-1.14) and a significant decrease for males in the same age group (IRR=0.94 95% CI 0.91-0.98); other age groups did not show significant trends.
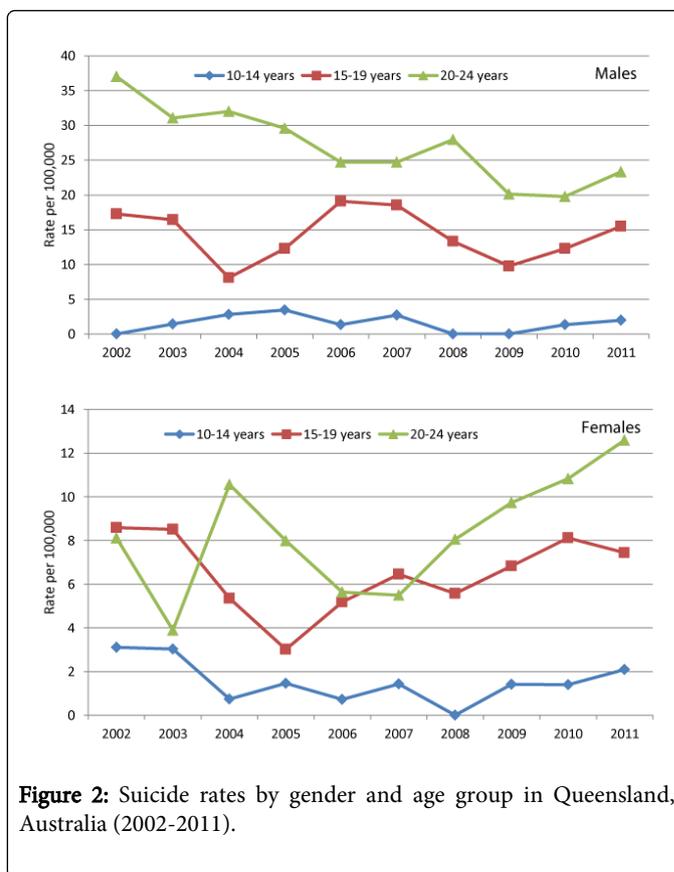

Figure 2: Suicide rates by gender and age group in Queensland, Australia (2002-2011).

Hanging was the most frequent suicide method for all three age groups and for both genders (Figure 3). This method was decreasing significantly with age: from 90.9% to 69.8% and 65.3% for males (Chi^2=6.84, df=2, p=0.033) and from 95.2% to 76.7% and 65.8% for females (Chi^2=8.95, df=2, p=0.011). Although hanging was higher in young females, gender differences were not significant. Other suicide methods did not differ significantly between age groups.
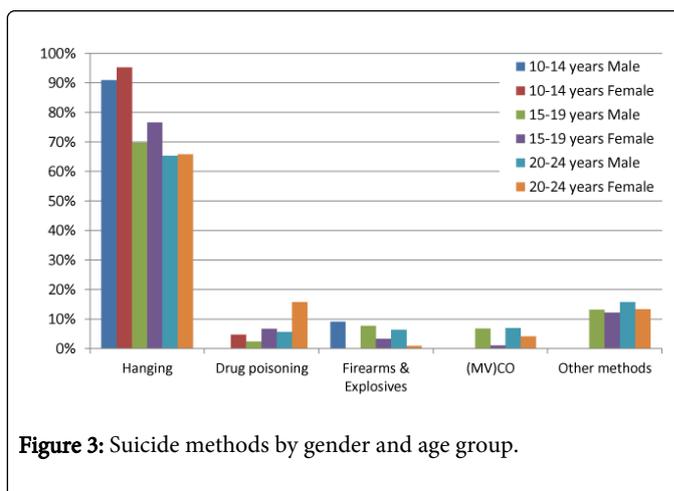

Figure 3: Suicide methods by gender and age group.

Prevalence of a diagnosed psychiatric disorder (Chi2=20.11, df=2, p<0.001), psychiatric treatment (Chi^2=24.67, df=2, p<0.001), consultation with a mental health professional in last three months (Chi^2=18.56, df=2, p<0.001), illicit drug use (Chi^2=21.37, df=2, p<0.001) and problematic alcohol use (Chi^2=5.82, df=2, p=0.055), all

increased with age (Table 1). Comparison between age groups 20-24 years and 15-19 years showed a significantly higher prevalence of a diagnosed psychiatric disorder, psychiatric treatment, consultation with a mental health professional in the last three months prior to death and illicit drug use in age group 20-24 years. Comparison between the two younger age groups showed that the prevalence of consultation with a mental health professional in the last three months was significantly lower in children aged 10-14 years who died by suicide (Table 1). Figure 4 presents the 6 most frequent psychiatric disorders. Unipolar depression was the most frequent in age groups 15-19 years and 20-24 years, and developmental disorder in the youngest age group. Indication of an untreated mental health problem was reported without significant differences between age groups, respectively 25.6%, 27.9% and 32% (growing with age).

	10-14 years (a)		15-19 years (b)		20-24 years(c)		Comparison of a and b*	Comparison of c and b*
	N	%	N	%	N	%	OR (95% CI)**	OR (95% CI)
A diagnosed psychiatric disorder	9	20.9	84	28.6	217	42.4	0.66 (0.30-1.44)	1.84 (1.35-2.50)
Any type of psychiatric treatment	9	20.9	82	27.9	223	43.6	0.68 (0.31-1.49)	2.00 (1.47-2.72)
Consultation with a mental health professional in last three months	0	0	49	16.7	125	24.4	p=0.001	1.62 (1.12-2.33)
An untreated mental health problems	11	25.6	80	27.2	164	32.0	0.92 (0.44-1.91)	1.26 (0.92-1.73)
Problematic alcohol use	3	7.0	41	13.9	95	18.6	p=0.330	1.41 (0.94-2.09)
Illicit drug use (current and past)	10	23.3	111	37.8	260	50.8	0.50 (0.24-1.05)	1.70 (1.27-2.28)
A physical condition	4	9.3	51	17.3	82	16.0	p=0.268	0.91 (0.62-1.33)
Life events								
Family conflict	18	41.9	56	19.0	54	10.5	3.06 (1.56-5.99)	0.50 (0.33-0.75)
Interpersonal conflict	5	11.6	23	7.8	42	8.2	1.55 (0.56-4.32)	1.05 (0.62-1.79)
Relationship problems	7	16.3	118	40.1	218	42.6	0.29 (0.13-0.67)	1.11 (0.83-1.48)
Bereavement	6	14.0	28	9.5	60	11.7	1.54 (0.60-3.97)	1.26 (0.79-2.03)
Recent or pending unemployment	0	0	20	6.8	34	6.6	p=0.089	0.97 (0.55-1.73)
Financial problems	0	0	17	5.8	40	7.8	p=0.144	1.38 (0.77-2.48)
Work/school problems	10	23.3	33	11.2	28	5.5	2.40 (1.08-5.31)	0.46 (0.27-0.77)
Pending legal matters	2	4.7	21	7.1	53	10.4	p=0.751	1.50 (0.89-2.54)
Childhood trauma	5	11.6	24	8.2	22	4.3	1.48 (0.53-4.11)	0.51 (0.28-0.92)
Sexual abuse	1	2.3	14	4.8	13	2.5	p=0.703	0.51 (0.24-1.12)
Suicide in social group	13	30.2	33	11.2	42	8.2	3.43 (1.63-7.22)	0.71 (0.44-1.14)
Previous suicide attempt								
Lifetime	12	27.9	83	28.2	165	32.3	0.98 (0.48-2.01)	1.21 (0.71-1.26)
Last 12 months	9	20.9	68	23.1	99	19.3	0.88 (0.40-1.93)	0.80 (0.56-1.13)
Communication of suicide intent								
Lifetime	18	41.9	135	45.9	228	44.5	0.85 (0.44-1.62)	0.95 (0.71-1.26)
Last 12 months	15	34.9	120	40.8	195	38.1	0.77 (0.40-1.52)	0.89 (0.67-1.20)
Attention to suicide in media	5	11.6	10	3.4	7	1.4	3.74 (1.21-11.52)	0.39 (0.15-1.05)

*age group 15-19 years (b) has been used as a reference group

**p-values of the Fisher's exact test are presented when a group had less than 5 cases

Table 1: Prevalence of different characteristics among young people who died by suicide.
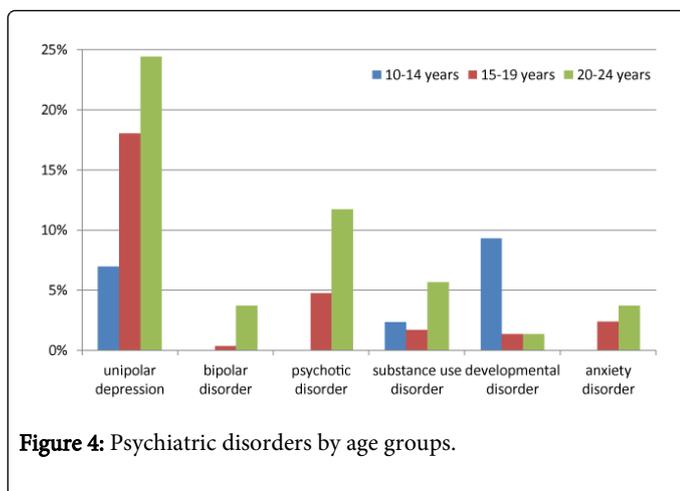
Figure 4: Psychiatric disorders by age groups.

Approximately every five young person who died by suicide one made a previous suicide attempt, and more than a third communicated their suicide intent in the previous 12 months, with no significant differences between the three age groups (Table 1). Suicide in social group and attention to suicide in media were both highest in the youngest age group and decreased with age (Table 1).

The prevalence of family conflict (Chi^2=35.92 df=2 p<0.001), school/work related problems (Chi^2=21.18, df=2, p<0.001) and childhood trauma (Chi^2=7.48, df=2, p=0.024) decreased significantly with age (Table 1). The prevalence of relationship problems increased significantly with age (Chi^2=11.41 df=2 p=0.003). Family conflict was the most frequent event in age group 10-14 years and relationship problems in age groups 15-19 and 20-24 years.

Discussion

Suicide numbers and rates increased rapidly with age, especially for males, contributing to the growing gender cap. Similarly rapid growth for males, until age 20 years, was presented in a recent analysis of UK and Ireland [3]. The aim of the current study was to analyse differences in the characteristics of suicide by young people below the age of 25 years by comparing three age groups: 10-14 years (children/early adolescents), 15-19 years (late adolescents) and 20-24 years (young adults). Our cut-off points might not be ideal, considering major developmental, emotional and cognitive changes occurring between the age of 10 and 24 years. However, the end of childhood, beginning of adolescence and end of adolescence and beginning of adulthood are not clear-cut periods. Nevertheless, this approximate categorisation has been endorsed by the American Academy of Child and Adolescent Psychiatry [7].

Earlier research has indicated that suicide risk is particularly high in young Aboriginal and Torres Strait Islander people [8]. Potential explanations have included loss of cultural identity, intergenerational trauma caused by colonization and social exclusion. However, understanding of mental health problems in Aboriginal and Torres Strait Islander people remains unclear [9]. Differences in suicide rates compared with other Australians are particularly deep for early adolescents aged 10-14 years, with Indigenous Australians having over 12-times higher suicide rates [10]. Comparison of Indigenous and other Australian characteristics of suicide in age group 10-14 years did not provide clear answers for those differences [10]. Similarly to older groups, Aboriginal and Torres Strait Islander early adolescents had

significantly lower prevalence of mental health problems compared to other Australians [10,11]. In line with earlier observations, the current study showed that close to half of suicides in the youngest age group were by Aboriginal and Torres Strait Islander people, which declined to 18% in age group 15-19 years and 15% in age group 20-24 years.

Restricting access to means has proven to be the most effective activity to reduce suicide numbers [12]. Our analysis showed very high prevalence of hanging with over 90% of early adults using this method of suicide. Although hanging significantly declined in with age, it remained over 60% for both genders in age group 20-24 years. It is important to note that hanging seems to be further decreasing with age in Queensland; in age group 35-54 years hanging accounted for 44% of suicides in 2008-2010 [6]. There is a possibility that high prevalence of hanging in younger age groups might indicate to a possible underreporting of suicides using other methods (e.g. running into traffic, jumping from height), especially in children, a fact that has been indicated in research [13]. Considering that the QSR classification of suicides is based on research classification and does not depend on coronial inquests, there is lower probability of missing suicide cases.

Family and school are the most important social institutions in child and adolescents' life. Adverse events and changes in social environment can have an important impact. Similarly to some earlier studies, children who died by suicide had significantly higher prevalence of family conflicts [14,15] and school/work-related problems [5] compared to suicides in adolescents. Prevalence of both types of life events decreased with age, while prevalence of relationship problems (including conflicts and separation) increased with age [5,14]. Already in age group 15-19 years, relationship problems played an important role, being present in 40% of cases.

Prevalence of diagnosed psychiatric disorders also increased with age, and this might be related to the onset of major psychiatric disorders during adolescence [16]. A few studies have presented lower prevalence of psychiatric problems in children/early adolescents aged below 15 years compared to older adolescents [14,17] and to older adults [5]. Our analysis showed that a diagnosed psychiatric disorder was present in 21% cases of suicides in early adolescence, 29% in late adolescence and 42% in early adulthood. In addition, it is important to note that over one-fourth in all age groups had indication of an untreated mental health condition. However, it is rather concerning that nobody in the youngest age group had contact with mental health professionals in relation to their condition in last three months before suicide.

Despite remarkable differences in the prevalence of psychiatric disorders, there were no significant differences in the prevalence of a previous suicide attempt and communication of suicide intent in the previous 12 months and during lifetime, which contrasts with some previous studies [18]. Suicide in social group and attention to suicide in media seem to particularly affect early adolescents, being significantly more frequent in the age group 10-14 years and decreasing with age.

The QSR is a comprehensive suicide mortality database; however, several limitations may hinder the accuracy of results. Considering that data are reliant on external sources such as police or coronial information along with the conjecture of next of kin, accuracy of information depends on the quality of investigating possible suicide cases. Some information that might be relevant for a better understanding of that person's death can go unrecorded if the

investigating officer does not systematically enquire about it. In addition, accuracy of data may also be hindered by the informant's lack of knowledge of a particular aspect of the deceased's life (e.g., presence of medical or psychiatric diagnosis, precipitating life events).

Acknowledgement

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