

Youth Suicide and Parasuicide in Singapore

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Abstract

Introduction: Suicide and parasuicide rates are important markers of the health of a nation. Suicide is a common cause of mortality in youth and parasuicide has its peak prevalence in adolescence and early adulthood. Both pose a tremendous burden to individuals, families and society. Historical and current studies on suicide and parasuicide in Singapore are reviewed and discussed in the light of available worldwide research. **Methods:** Studies on suicide and parasuicide in Singapore were identified through a MEDLINE search (from 1979). Information from these studies were supplemented with relevant local monographs on suicide and parasuicide. **Results:** Suicide is extremely rare in children under 10 years of age. Rates rise in the 10 to 14 years age group and increase markedly in the 15 to 19 years age group. The male to female ratio is about 2:1 for youths 10 to 14 years old and 1:1 for the 15 to 19 years age group. The historical preponderance of female suicide is much less clearly seen in recent years. Jumping from a height is the commonest method used, and mental illness and recent life stress are common causative factors. A peak in suicides in the young was found for June and October, and a trough for November and December. Parasuicide is extremely rare in children under 10 years of age. There was a peak in the months of October and November in the student population, corresponding to the examination months. Youths of Indian ethnicity were over-represented. **Conclusions:** Preventing suicide and parasuicide is of paramount importance, given the severe burden of such acts on individuals, families and society. Current studies on youth suicide in Singapore and a national study on parasuicide are urgently needed to increase our understanding of these phenomena.

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Introduction

The World Health Organization defines suicide as an act with a fatal outcome that is deliberately initiated and performed by the person himself or herself in the knowledge, or expectation, of its fatal outcome.¹ Parasuicide or attempted suicide is distinguished from suicide by the non-fatal outcome. There is a close relationship between suicide and parasuicide, with the risk of suicide rising up to a hundredfold in those who attempt suicide.² Notwithstanding the close relationship and features in common, Van Egmond and Diekstra,³ in their review of 81 published studies, concluded that there were sufficient differences to warrant a distinction. Those who commit suicide tend to be older, male, plan their suicide and choose more lethal methods, whereas those who attempt suicide (parasuicide) tend to be younger, female, impulsive and use less dangerous methods. The term “deliberate self-harm” is sometimes used to define a group who self-harm without the intention of dying. For the purposes of this review, both terms will be used synonymously.

Experts have long debated the accuracy of suicide statistics, in view of the under-reporting secondary to the

social stigma that suicide and parasuicide carry. Current statistics are likely to be an underestimate of the true rate. Premature death from suicide is estimated to be the tenth leading cause of death worldwide,⁴ accounting for an estimated 1% to 2% of deaths in developed countries.⁵ Suicide is all the more tragic when it occurs in the young, stripping both the family and society of a person who has yet to see the prime of his or her life. There has been growing concern about the rise of suicide in young people in several Western countries.⁶ Cross-national data from nine countries found lifetime rates of parasuicide to range from 0.72 to 5.93 per 100 persons. Approximately 10% to 18% of the population across these nine countries reported suicidal ideation, and 3% to 5% have made a suicide attempt at some time in their life.⁷ Of the two Asian countries in this study, Taiwan⁸ had a low lifetime parasuicide rate of 0.75 per 100 individuals and Korea⁹ a higher figure of 3.2 per 100 individuals. No national figure is available for Singapore for any age group.

Methods

Studies on suicide and parasuicide in Singapore were

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identified through a MEDLINE search (from 1979) using the key words “suicide”, “parasuicide”, “deliberate self-harm” and “Singapore”. This was complemented with local monographs on suicide and parasuicide known to the author. Data relating to risk factors, epidemiology, temporal variations and methods of suicide and parasuicide are presented and compared with other Asian or international data where relevant.

Results

Singapore Studies on Youth Suicide

Suicide is exceedingly rare in children under the age of 10. Only two cases were recorded in 1981 and there have been no cases since. Chia,¹⁰ in the earliest study on youth suicide in Singapore, reported 137 suicides by young people under the age of 20 from 1969 to 1976, with only one case of suicide under 10 years of age. The prevalence begins to increase for youths aged 10 to 14 years, and in the 15 to 19 years age group, there is a dramatic increase in absolute numbers. Singapore's suicide rate for females aged 15 to 24 years is ranked 11th out of 13 member nations of the World Health Organization outside Europe who reported for 1991.¹¹ For males of the same age group, Singapore is ranked 7th.

Data from 1980 to 1988 showed a preponderance of female suicides in the 15- to 19-year-old cohort (Fig. 1). Since then, the suicide rates for young females have been little changed or slightly increased, but the rates for young males have shown a more consistent increase. Over the last two years for which data is available, more girls than boys committed suicide in the 15 to 19 years age group and it would be interesting to see if this pattern persists in subsequent years. The male to female ratio of suicides in Singapore is less marked than that reported for Western countries.⁶

In his early study in youth suicide, Chia found interpersonal conflicts to be the predominant causative factor in suicide in young females, and mental illness for young males. Fear of school examinations or problems in school were dominant causative factors of suicide only for young females.¹⁵ A high rate of adjustment disorders are seen, with a low rate of mental disorders. More recent Western studies using psychological autopsy are shown in Table I. Unlike Western studies, substance abuse appears to be an uncommon causative factor for local youth suicides.

In Chia's study, jumping from a height and self-poisoning were the commonest modes of suicide in the young.¹⁵ Jumping from a height is consistently the commonest method chosen for suicide locally, regardless of the age group studied (Table II). The type of drug chosen for

overdose has shown temporal changes, with pesticides giving way to salicylates as the leading poison consumed in overdosage.¹⁸ It is likely that in more recent years, paracetamol will overtake salicylates as the leading medication consumed for suicide. Chia has since written a useful resource about youth suicide in Singapore, commenting on the data obtained through his six-year study of coroner's case files and family interviews on 54 youth suicides. Over the years, another 25 suicides among 1275 of his young patients (aged 10 to 24 years) have been added.¹⁹ Of his 1275 patients, 15 of the 417 patients with a diagnosis of schizophrenia committed suicide (risk ratio of 28 patients to 1 suicide), 1 of 44 with paranoid disorder (risk ratio of 44 to 1), 7 of 362 with affective disorder (risk ratio of 52 to 1) and 2 out of 260 with neurosis (risk ratio of 130 to 1). He found that 23% of young suicides had left suicide notes and gave poignant examples of suicide letters in his book.¹⁹

Kok and Tsoi²⁰ studied the impact of season and climate on suicide rates for the period 1980 to 1989 and found seasonal and meteorological factors to be most prominent in the young (aged below 20 years). Adolescents tended to be affected by dry, hot, humid and windless conditions more than all other age groups. Multiple regression analysis showed high temperature to account for 58% of the variance in suicides in the young. Hours of sunlight were negatively correlated with total suicides and there was no correlation with maximum temperature and suicide. A peak in suicide rates was found in June and October, and a trough in December and January.

Singapore Studies on Attempted Suicide

Like suicide, attempted suicide is rare in children below 10 years of age. In children under 15 years of age, attempted suicide is four to five times more common in girls. Nevertheless, from 1950 to the early 1980s, increasing rates of attempted suicide in young males have been noted.²¹ There are no local nation-wide prevalence figures

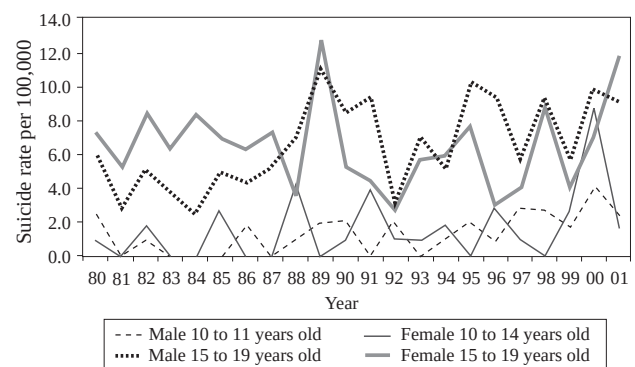


Fig. 1. Rates of suicide per 100,000 from 1980 to 2001. (Data from report of Registry of Births and Deaths, National Registration Department, 1980 to 2001)

TABLE I: MENTAL ILLNESS AND SUICIDE—A COMPARISON OF THREE STUDIES

Disorder	Singapore ¹² (%) (7–19 years old; n = 137)	USA ¹³ (%) (<20 years old; n = 147)	Finland ¹⁴ (%) (13–19 years old; n = 53)
Mood disorders	–	61	51
Disruptive disorders	–	50	12
Anxiety disorders	–	27	–
Adjustment disorders	71	6	21
Substance abuse	1	35	26
Eating disorders	–	4	–
Schizophrenia	18	3	6
Personality disorders	3	–	32

TABLE II: METHODS USED IN SUICIDE—A COMPARISON OF THREE SINGAPORE STUDIES

Method	Chia ¹⁵ (%) (7–19 years old; n = 137)	Kok & Aw ¹⁶ (%) (all age groups; n = 342)	Kok & Tsoi ¹⁷ (%) (all age groups)
Jumping from a height	54.0*	62*	67*
Self-poisoning	29.2*	6	22*
Hanging	8.0	30*	7
Drowning	3.6	1	1
Firearm	3.0	0	–

* Top two modes of suicide.

TABLE III: METHODS USED IN PARASUICIDE—A COMPARISON OF THREE SINGAPORE STUDIES

Method	General hospital admissions >21 years old ²¹ (n = 214) (%)	National Servicemen ²⁴ (n = 10) (%)	National Servicemen ²⁵ (n = 156) (%)
Overdosage with medications	76	50	73.1*
Self poisoning with insecticide or detergent	14	10	–
Self-injury	5.5	20	10.3
Jumping from a height	–	20	10.9
Others	–	–	3.8

* Includes self-poisoning.

of attempted suicide. A local study looking at patients under 21 years of age, who had received treatment for attempted suicide in a general hospital setting, found a six-fold increase from 1991 to 1995.²² This increase was more prominent in females. Females outnumbered males by about four to one for the last two years of the study, 1994 and 1995. An over-representation of young adults of Indian origin was seen. Of the 214 suicide attempters studied, the youngest was 13 years old. Adjustment disorder was diagnosed in 53.5%, major depression in 24.3%, schizophrenia in 1.9% and substance abuse in 0.5%.

Common precipitants to self-harm in the young include conflicts/arguments with parents or family members (24.5%), interpersonal difficulties with friends and boy-girl relationship problems (23.6%) and school problems (11%). About 10% of the males cited the prospect of serving national service as the precipitant for their suicide attempt. In up to a third, there is no such precipitant,

suggesting that in these cases underlying psychiatric disorders may be at play.²³ Females tend to take overdoses whereas self-injury tends to be commoner in males than females (Table III). Analgesics were used in 65.6% of overdoses and benzodiazepines in 16%. Paracetamol was the commonest drug used (in 55% of overdoses). An extension of this study to all age groups found that the female to male ratio fell from 1:4.5 in the under-20 age group to 1:1.26 in the above-60 age group, confirming the preponderance of female suicide attempters in young people.²⁶

A study on the temporal variation in parasuicide among Singaporean Chinese from the sample above found a peak in parasuicide among the student population for the months of October and November.²⁷ A student was defined as anyone engaged in full-time education and the mean age was 17.5 years. This contrasts with a peak in the months of June, August and September found for parasuicide

at all ages. Although the variation did not achieve statistical significance, there is a suggestion that different mechanisms may be at work in the student population compared to older adults.

Every Singaporean male citizen or permanent resident aged 18 years or older, who is medically fit, is required to serve compulsory national service for two to two-and-a-half years. With the possibility of increased stress comes the increased risk of attempted suicide. A local study looked at 246 male servicemen who presented to the Psychological Medicine Branch within six months of enlistment.²⁴ Ten cases of parasuicide were recorded. Methods included drug overdose ($n = 5$), wrist slashing ($n = 2$), jumping from a height ($n = 2$) and ingestion of toxic substances ($n = 1$). Six cited adjusting to military life as their major stressor. Five of the 10 were diagnosed as suffering from a mental disorder (schizophrenia, $n = 1$; major depression, $n = 1$, sexual disorder not otherwise specified, $n = 1$; and adjustment disorder, $n = 2$). A previous study, examining 156 parasuicides over a five-year period from 1983 to 1987, found a parasuicide rate of 12.5 per 100,000 soldiers at risk,²⁵ lower than the 1986 national average of 60 per 100,000 for the 10 to 19 years age group.²⁸

Discussion

The rarity of suicide in children under the age of 10 in Singapore, and its gradual increase in those aged 10 to 14 years, and the steep increase in those aged 15 to 19 years is a typical pattern seen in the industrialised world. Because of the small numbers of suicides in young people locally, it is difficult to generate conclusive findings. In Singapore, any unnatural death, such as suicide, automatically becomes a coroner's case and a police officer is assigned to perform an investigation and submit a report to the coroner. Although these reports yield valuable information, they cannot take the place of stringent and structured psychological autopsies that are performed routinely in many Scandinavian countries. Chia and an assistant visited the homes of all the suicide cases for 1974 to perform a structured psychological post-mortem that yielded much valuable information.¹⁵ No such study has been conducted in recent years in order to minimise causing distress to bereaved relatives of suicide victims.

The strongest risk factor for suicide is mental illness. In their meta-analysis, Harris and Barraclough²⁹ conclude that virtually all mental disorders carry increased risk of suicide, with the risk being highest for functional and lowest for organic disorders. Psychological autopsy studies show that the majority (about 90%) of adolescents who commit suicide have a pre-existing psychiatric illness.^{30,31} Psychiatric disorders with the highest risk include mood disorders (accounting for 59% to 87% of suicides in all age

groups), anxiety/adjustment disorders, disruptive disorders (especially for males), substance abuse and eating disorders (especially for females). A Danish case control study, seeking to estimate the risk of suicide in young people related to family, psychiatric and socio-economic risk factors, found the strongest risk factor to be mental illness in the young individual.³² Individual admission to a psychiatric facility for mental illness had a 15% attributable risk, compared to 1.4% for a history of suicide for mother and 1.1% for a history of suicide for father. The sharp increase of suicide in adolescence mirrors the increase in mental disorders such as substance misuse, depression, anxiety, eating disorders and schizophrenia.

Chia's study¹⁵ of youth suicides from 1969 to 1976 probably underestimated the prevalence of mental illness due to (1) under-reporting of mental illness secondary to the stigma of mental illness in the community; (2) lack of awareness of mental illness amongst the relatives surveyed; (3) non-usage of a structured interview instruments to detect psychiatric disorder; and (4) lack of common usage of an international psychiatric classification schedule then. In many cases of youth suicide, the presence of a mental disorder may be missed, especially in young persons who appear to be "well" and "have so much going for them". Often, a perturbation or stressor is the final straw in these young people with an existing, but undetected, mental disorder. This leads to an over-diagnosis of adjustment disorders and an under-diagnosis of specific syndromes, such as depressive and anxiety disorders.

Only more recently have protective factors buffering the risk of suicide been explored. Good family support, pregnancy, the post-partum period, having a great number of children and holding strong religious beliefs seem to afford some protection.³³

The previously reported unusual finding of a preponderance of female suicides in young people is no longer seen in the 1990s. Notwithstanding yearly fluctuations, the sex ratio appears to be moving towards parity. Apart from Japan, Singapore was the only other country in the world in which the relative mortality by suicide was higher for females than for males among 15- to 24-year-olds when Diekstra reviewed the data in 1989.³⁴ A recent local review showed that the previous male preponderance had again become distinct.³⁵ The authors speculated that the change could perhaps be explained by improvements in the socio-economic status of women and educational opportunities. The more modest differences between males and females are also seen in China,³⁶ where suicide in young females (it is the leading cause of death for females aged 15 to 34 years) outnumber suicides in young males (the second leading cause of death for males aged 15 to 34 years).³⁷

Such is the rarity of suicide in the pre-adolescent that any such event often leads to prominent reporting in the mass media. There is concern that media reporting and the sensationalisation of such acts lead to “copy cat” suicides in vulnerable young people. Suicide contagion or the “Werther effect” has repeatedly been shown by studies looking at the relationship between non-fictional suicide reporting in the media and suicide rate. The extent of the increase in suicide rate is proportional to the amount, duration and prominence of media coverage.³⁸ Although the majority of these studies have focused on Western populations, at least two studies have looked at a Japanese population.^{39,40} Both supported the notion of imitative suicides. Guidelines for reporting now exist in many countries. Following the implementation of media guidelines by the Austrian Association for Suicide Prevention in 1987, a significant decline (7%) in suicide rate occurred within the first year, with the rate decreasing nearly 20% over a four-year period.⁴¹ Such guidelines would probably have the greatest impact in young suicides, given the influence the media holds over this age group.

The peaks of suicide found in June and October in Kok and Tsoi’s study²⁰ may correspond to mid-year and end-year examinations (although the authors suggested other possibilities). This would be consistent with the results found for youth parasuicide.²² The troughs can be explained by the relief of completing a year’s study, the end of examinations and the long holiday period. Kok and Tsoi postulated that the suicidal young might be particularly vulnerable to unpleasant weather conditions and have a particularly low threshold for distress under such conditions. The examination period may constitute a high-risk period and particular vigilance in these months may help identify some of those at risk of suicide.

Prevention of youth suicide has been attempted through (1) crisis hotlines; (2) control of lethal methods of suicide; (3) training and educating youths and those working with youths to identify warning signs of suicide; (4) questionnaire or interview screening for high-risk individuals; (5) media counselling and control; and (6) training health professionals to better identify and treat mood disorders in youth.

The most familiar youth crisis hotlines in Singapore are the Samaritans of Singapore (SOS) and the School Counselling Service (SCS). The sparse research available, however, fails to show that hotlines impact on suicide rates. Method restriction is difficult in Singapore where the majority of people live in high-rise dwellings. The commonest means of suicide locally, in both young and old, is jumping from a height. Psycho-education to students to increase help-seeking behaviour has failed to show benefit,⁴² and there is evidence that vulnerable students may be more disturbed than helped by it.⁴³ Screening for

and evaluating “high-risk” individuals in a school setting appears to be the most beneficial and cost-effective method to date.⁴⁴ Screening should enquire about parasuicide (previous suicide attempts), recent serious thoughts about committing suicide, family history of suicide or significant psychiatric disorders and about depressive symptoms. Unlike the West, local studies of parasuicide do not suggest that substance abuse is a common accompaniment or causative factor for parasuicide. Educational strategies to improve the detection of depression amongst primary healthcare physicians in the island of Gotland in Sweden resulted in a reduction of female suicides and parasuicides after the two-day training course.⁴⁵ Such training would be beneficial for primary care physicians more accustomed to screen and treat adult depression.

Parasuicide is commoner in adolescence and young adulthood than at any other age. It is difficult to ascertain the reasons for the six-fold rise in parasuicide over the five-year period in the only local study on youth parasuicide. The authors were of the opinion that this rise reflected greater public awareness and greater likelihood for general practitioners to refer such cases for treatment. As in the case with suicide, only recently have protective factors been studied. Parent-family connectedness, school connectedness (sense of “fitting in”, good grades) and emotional well-being have been found to be protective factors against parasuicide.⁴⁶

The peak of parasuicides in young people occurring in October and November coincides with the examination period and may be linked to the stress of having to perform well at examinations and the fear of failure. The authors speculated that the peak in older adults in August and September might be related to the Chinese festival of “Hungry Ghosts” which occurs in either of these months in the lunar calendar. During this period, the tendency to attribute negative experiences to evil spirits and bad omens may exacerbate personal experiences of distress. This would be consistent with the notion that younger people are less likely to accept these traditional Taoist beliefs and, consequently, not be unduly affected during this period.

The finding of an over-representation of parasuicides amongst young Indians mirrors that of a Malaysian study, which found suicide attempters of Indian ethnicity to be over-represented.⁴⁷ One possible factor may be the clash between the more liberal Indian youths, who have been exposed to better education and Western ideas, and their more conservative and traditional parents and elders. Ho and Kua²⁴ also speculated on the role of Indian media portrayals of suicide and parasuicide, and the traditionally tolerant Hindu attitude towards suicide. Until the middle of the last century, the “suttee”, in which it was considered dutiful for a grieving widow to throw herself on the funeral

pyre of her deceased husband, was still practised.

About 10% of young males who attempted suicide cite national service as a precipitant.²⁶ The parasuicide rate of 12.5 per 100,000 soldiers at risk is likely to be an underestimate. Deliberate self-harm is an offence in national service, and many instances may not have reached the attention of a clinician. Furthermore, it would be more accurate to use recent recruits as a denominator rather than all soldiers at risk. At the assessment phase, many of those with a psychiatric history would have been detected, leading to ongoing monitoring and care of their psychological state.

Prevention of youth parasuicide mirrors methods in suicide prevention, namely through (1) crisis hotlines and counselling; (2) control of methods of parasuicide; (3) training and educating youths, and those working with them to identify warning signs of distress and to cope appropriately; (4) questionnaire or interview screening for high-risk individuals; (5) media counselling and control; and (6) training health professionals to better identify and treat adjustment and mood disorders in youths.

Crisis hotlines and counselling centres may have a more important role in preventing parasuicide than suicide, given the impulsive nature of many parasuicides and the link with a life stressor. Paracetamol is the single commonest drug used in youth overdoses. An example of method control was undertaken in the United Kingdom when, in 1998, paracetamol became available only in blister packs of 16 500-mg tablets. Packs of 32 tablets are available only in pharmacies. Although there is a suggestion of reduced paracetamol poisoning and unaltered rates of benzodiazepine poisoning,⁴⁸ there was no change in the numbers referred to a tertiary unit for treatment of liver damage.⁴⁹ There is generally poor knowledge of its side effects and a tendency to underestimate its lethality.⁵⁰ The peak in October suggested that this is a high-risk time when professionals and teachers need to be especially vigilant.

Like suicide, media depictions have also been implicated as a contributory factor for parasuicide. A British study reported that 20% of those who presented to an emergency room for deliberate self-poisoning, after a television broadcast of deliberate self-poisoning with paracetamol, said they had been influenced by the broadcast, and 17% said it had influenced their choice of drug.⁵¹

Clinical Implications

A number of clinical implications arise from the accumulated local studies of suicide. Firstly, there is an urgent need for a current study on youth suicide in Singapore. The last study was conducted about a quarter of a century ago. In that time, we have understood much more about suicide from the collective research reported worldwide.

Secondly, there is an urgent need for a suicide registry and for psychological autopsies to be conducted as a routine for each suicide. The current practice of a (police) investigating officer conducting the investigation could be improved by having a police psychologist, or at least a group of police officers trained in psychological autopsy techniques conducting the investigation, and extending it to a psychological autopsy. This is unlikely to cause any more distress to bereaved families than the current procedure. Thirdly, there is sufficient evidence to recommend that media guidelines should be introduced for the reporting of all suicide, and especially youth suicide. Lastly, current evidence points to early detection and adequate treatment of mental disorders as the most effective and cost-efficient means of preventing suicide, especially for mood disorders. Training for primary care physicians and those at the front-line of work with youths (teachers and counsellors) is warranted.

With respect to parasuicide, a rethink on the packaging of paracetamol may be worth considering, should further data from the United Kingdom show an effect on both suicide rate or rates of liver damage subsequent to such poisoning. In view of adolescence being the peak prevalence for parasuicide, screening of the at-risk school-going population is a worthwhile consideration. The overrepresentation of parasuicide in Indian youth may suggest that this group may be worth targeting in any screening programme. As with suicide, training for primary care physicians, teachers and youth counsellors to detect at-risk individuals and to recognise warning signs of potential mental disorder may help reduce parasuicide rates. Examinations continue to rank highly as a source of stress in many local school children. A paradigm shift to decatastrophise academic setbacks amongst educators, parents and school children may help reduce acts of suicide and parasuicide in response to poor grades.

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