

*Full Length Research Paper*

# Trends of risk factors of completed suicide by gender and age

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The objective of this study was to identify trends of completed suicide based on gender and age groups. Population data of complete suicide in Sri Lanka during 2005 to 2014 were collected from the Sri Lanka Police Statistics Department. One-way analysis of variance (ANOVA), chi-square test and descriptive statistics were used to analyze the data. Risk factors of completed suicide is significantly depending with age (Chi-square= 15581.28,  $\chi^2_{0.05,70}=90.5$ ) and gender (Chi-square= 2109.71,  $\chi^2_{0.05,27}=40.1$ ). Risk factors of completed suicide in Sri Lanka during the last decades have not been changed significantly.

**Key words:** Suicide, mental health, risk factors, public health.

## INTRODUCTION

Suicide is an important health problem, which receives an increasing attention worldwide. The total suicidal death in 2012 was 803900 which accounting 11.4 deaths per 100,000 out of total death in the world (WHO, 2014a). The suicide rate in Sri Lanka was 47.0 suicides per 100,000 population in 1995 and since then the overall rate has fallen by more than half in 2009 to 19.6 per 100,000 (Gunnell, 2007). Although the pattern of suicide rate has decreased in 2009, in 2012 the rate of suicide has significantly increased up to 28.8 per 100,000 populations in Sri Lanka (WHO, 2014b). When compared with the global situation, the trend of suicide in Sri Lanka still to be considerable. In the annual report of WHO (2014b), Sri Lanka had been ranked in the fourth position among 172 countries in terms of most suicide prone countries in the world.

Chemical and plant poisoning, taking pills, self-immolation, hanging, narcotics, chalks, self-harm,

drowning, jump from high places, fire arms, explosive, sharp weapons, firearms, etc., have been used as method of commit suicide globally (Meyer-Rochow et al., 2015). Considering high income country, 50% of the suicides are due to hanging and second most common method is firearms accounting for 18% of total suicide (WHO, 2014b). However, it was revealed base on world suicide data during 1990 to 2007 that most common method of suicide was pesticide self-poisoning globally (Gunnell et al., 2007). And also pesticide self-poisoning is most common method of suicide within the rural residents engaging in small scale agriculture in low and middle income country (Wu et al., 2012; Behere and Bhise, 2009).

Male suicide rate is higher than the rate of female suicide in many countries (Jayasinghe and Foster, 2011; Poorolajal et al., 2015; Purushothaman et al., 2015; WHO, 2014b). In Sri Lanka, the rate of male suicide is

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**Table 1.** Risk Factors and total suicidal deaths in Sri Lanka during 2005-2014 (Sri Lanka Police Statistics Department).

Factor	Total
Harassment by the husband/wife and family disputes	8194
Chronic diseases and physical disabilities	5423
Mental disorders	3530
Disappointment and frustration caused by love affairs	3383
Economic problems (poverty, indebtedness)	2695
Addiction to narcotic drugs	2575
Problems with elders in the family	1422
Aggrieved over the death of parents/relations	868
Employment problems	534
Ill-treatment by the children	305
Loss of property	116
Failure at the examination	67
Due to sexual harassment/Rape	58
Sexual incapacity	52

the highest as same in globally (Rajapakse et al., 2014). Further, it was revealed that, physical and psychological disorders and economic and social conditions have been recognized as main factors to prevalence suicide (Behere and Bhise, 2009; Poorolajal et al., 2015; Jayasinghe and Foster, 2011; Garand et al., 2006). The social adaptability, social relationships and childhood abuse and sexual assault have been categorized under the social factors. Under economic factors, unemployment, foreclosures and other economic losses have been identified which often result in feelings of shame, humiliation, and despair in individuals where isolation, a lack of sense of connectedness or belonging and hopelessness have been the outcomes. These are themselves significant risk factors for suicide, and they can in turn lead to more serious manifestations such as increased substance use, addiction or depression (Satya et al., 2009).

Considering the earlier mentioned factors, it is convenient to describe suicide as a complex human behavior that cannot easily be predicted. And trends of suicide incidents have been varying within deferent age categories and also gender. Therefore, the objective of this research is to identify the trend of risk factors of completed suicide (CS) and the relationship of risk factors in CS with gender and age group.

## METHODOLOGY

This study is based on population data on completed suicide during 2005 to 2014 in Sri Lanka. The data was quoted from the records of the Sri Lanka Police Statistics Department. Dependent variable is a risk factor of completed suicide and the two independent variables are gender, age and time. Time series analysis and one-way analysis of variance (ANOVA) were implemented to identify whether risk factors of completed suicide have changed during the last decade. Chi-square test was used to find out the dependency

between the age groups and gender with the risk factors of completed suicide. Age of suicides was categorized as children -8 to 16 years, Young -17 to 30 years, Middle age -31 to 45 years, Elder -46 to 55 years, Senior -56 and above.

## RESULTS AND DISCUSSION

### Risk factors of completed suicide and trends

Considering trends of CS by risk factors in the past ten years, the mean deference of CS due to each risk factors within time (years) is not statistically significant (ANOVA  $F=0.987$ ,  $p>0.05$ ), which concludes that risk factors of CS has been not significantly changed for last ten years. Specially, Harassment by the husband and family disputes, chronic diseases and physical disabilities and mental disorders have been top in considering time period. Some of the risk factors show simple fluctuations with some years, but cannot identify a clear fluctuation over the past decade (Table 1).

The results show that most motivational factor of last 10 years is "Harassment by the husband and family disputes" (28%). In society, the family has played a central role. However most significant shadow of collapsing the unity of the family is that the increasing trend of divorce rate in Sri Lanka (Department of Census and Statistics, 2006). Divorce, the formation of a new family with step-parents and step-siblings, or shift to a new community can be stressful and can build up self-doubts. In some cases, suicide appears to be a solution especially for children who face family issues. Psychologists say that parents who feel that their child is suicidal or troubled should ask him or her to talk about their feelings (Abeyasinghe and Gunnell, 2008; Rachel et al., 2012). The parent should reassure them that they are loved, and remind them that no matter how awful their

problems seem, they can be worked out. They must listen to their children patiently rather than just dismissing them. The important thing is to pay attention, encourage them to talk, be on their side and reassure them. According to Duthé et al. (2014), it is very important to talk to someone who might be contemplating suicide. Do not accuse people of being suicidal, listen and let them do most of the talking. The important thing to do is to continue to listen to the person who is suicidal; "Bringing up the question of suicide and discussing it without showing shock or disapproval is one of the most helpful things.

The second most common motivational factor of CS is chronic diseases and physical disorders (19%). WHO (2014a) reveal that chronic diseases accounted for 75% of total deaths. People can be disabled for various reasons. Some are born with mental and physical disabilities. Due to 30 years of armed conflict, not only armed forces personnel and combatants but also considerable number of children, youth, and adults, both male and female became disabled. This was adding more numbers apart from the people who met with regular accidents or born with disabilities or became disabled due to sickness or disease. The senior citizens were also proved to be restricted of movements due to dysfunction of the body as the results of aging. According to the world accidents statistics, in recent years the rate of road accidents has been increasing in Sri Lanka at an alarming rate. Sometimes victims are not fully recovered and became physically disabled permanently (Chen et al., 2015; Fernando, 2003; Pil et al., 2013; Sadanandan, 2014). The challenges faced by people who experience forms of disabilities are influenced more by negative social expectations and tacit ideas concerning disability than by any emotional, physical, or cognitive impairment a person may experience (Chapman et al., 2005). Research on disability and depression has consistently shown that when people with disabilities report dissatisfaction with their lives, they are not nearly as concerned with things such as reliance on machines or medications as they are with their relationships, financial security, or difficulties while at work (Jose and Duarte, 2006; Mohamed et al., 2011; Rajkumar et al., 2015; Robinson et al., 2015). Despite this, the social message repeatedly presented is that life with a form of disability is miserable and when the people around them believe that without questioning it, it may become very hard for people with disabilities to think anything different. Through this, people with disabilities come to internalize oppressive images and after that happens, it becomes very difficult for people with disabilities to hope for something better in their lives. At this point, suicide also becomes an issue. So many people need to stop tolerating the notion that people with disabilities have a reason to die and instead become active partners with the disability community to create a world that is both inclusive and accessible (Sadanandan, 2014). Raising

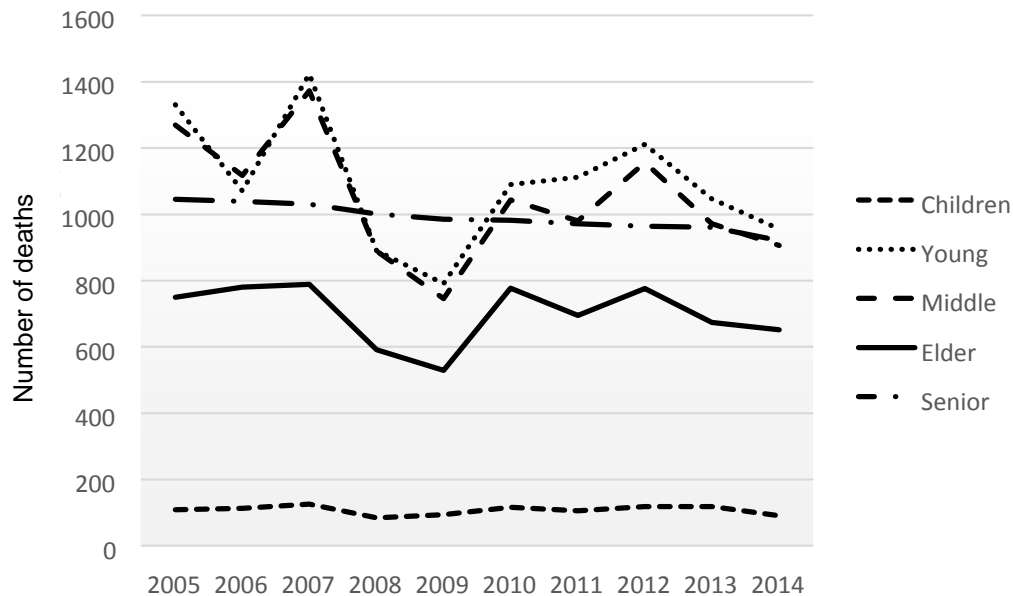
awareness about suicide will make the disability community visible while bringing people together so they can prevent unnecessary suffering and pain (Behere and Bhise, 2009).

The number of people suffering from mental illness in Sri Lanka is on the rise, and the third highest motivation risk factor for CS is "Mental disorders". Statistics reveals that prevalence of mental illness has been critical in Sri Lanka (Samarasekare et al., 2012; Weerasundera, 2012). Somasundaram and Rajadurai (1995), who have investigated psychological problems among people in the Northern Province, has said there is a need to re-establish mainline psychiatric services in the North. The minor mental health disorders due to war trauma and postwar factors are widely prevalent, and are not being addressed adequately, and according to Somasundaram and Rajadurai (1995), 13% suffer from Post Traumatic Disorder (PTSD), 49% from anxiety disorders and 42% from depression in Northern Province. These figures reveal that the island's protracted civil war combined with poor socio-economic conditions such as poverty, unemployment, poor nutrition and a lack of basic services significantly influenced to prevalence mental illness of the people in Sri Lanka. Nevertheless, Kathriarachchi and Perera (2011) claims that the tsunami disaster in 2004 has had a strong negative impact on mental health in Sri Lanka. Somasundaram and Rajadurai (1995) claimed that in Sri Lanka, 6.7% had PTSD, 15% had depressive disorder, and 9.5% had psychosis schizophrenia, while suffering from alcohol and substance abuse. Most mental ill patients are reluctant to get medication. One-to-one basis though the treatment is not very convenient in Sri Lanka at present (Kathriarachchi and Perera, 2011; Poorolajal et al., 2015).

### **Trend of completed suicide by age group**

Considering the last 10 years, CS rate of children indicates relatively low rate with regular trends (Figure 1). However, number of incidents of CS of children is still considerable. Compared with other age groups, children do not face huge problems and most of the children's suicides have occurred due to precipitant reasons which are emerged due to strong feelings of stress, confusion, self-doubt, pressure to succeed, financial uncertainty, and other fears while growing up (Jose and Duarte, 2006). For some teenagers, divorce of parents, the formation of a new family with step-parents and step-siblings, or moving to a new community can be very unsettling and can intensify self-doubts and shock and revenge (Kaushal, 2015; Kinder and Cooper, 2009; Bagalkot et al., 2014).

CS trend of young and middle age group have relatively similar distribution (Figure 1). Though, from 2005 to 2008, CS rate of the young has decreased, during 2008 to 2010 it has increased slightly whereas



**Figure 1.** Completed suicide incidents by age groups over the 10 years 2005-2014 (Sri Lanka Police Statistics Department).

from 2010 to 2014, the CS rate has decreased significantly. The middle age has the second highest CS rate till 2008. It shows a huge downward slope but afterward the CS rate has decreased in a decreasing rate. Increased alcohol and substance use, the increased availability of firearms, and the fact that many mental disorders (such as depression and schizophrenia) accounted for CS in young and middle age groups (Bagalkot et al., 2014). When elders (46 to 55 years old) and seniors (56 years old and above) are concerned, CS rate of seniors is high considerably than elders (Figure 1).

The highest incidents of CS in children and young age groups are reported due to disappointment and frustration which is respectively 35 and 30% (Table 2). However, majority of the middle aged and elders have committed suicide due to harassment by the husband and family disputes accounting 41 and 31%, respectively (Table 2). And the highest CS incidents among seniors were reported due to mental disorders which is 17% out of total CS in this category. The aforementioned result concludes that risk factors of CS depend on age groups. Moreover, this association is also statistically significant (Chi-square=15581.28,  $\chi^2_{0.05,70}=90.5$ ).

### Trend of completed suicide by gender

According to the population data presented in Table 3, during the last ten years the completed suicide number is 39368. This includes 8703 (23%) females and 30665 (77%) males. Compared to the year 2005, the number of CS has decreased by 33% although the CS is relevantly

high. The total number of male CS over total male deaths in the past decade is 5.92% while the total number of CS over total female deaths over the past decade is 2.20%.

As shown in Table 3, in 2014, though the rate of male completed suicide has indicatively decreased by 33%, while female completed suicide decreased by 36%, amount CS of both male and female is still in critical level (Table 3). In addition to the fact that the male completed suicide is three times higher than the female completed suicide. Women who attempt suicide tend to use nonviolent means, such as overdosing (Freeman and Freeman, 2015). Men often use firearms or hanging, which are more likely to result in death (Russell and Joyner, 2001). Once men are affected by financial, professional, or personal problems, they get easily depressed and end in suicide more frequently than women do (Russell and Joyner, 2001).

According to the figure in Table 4, the highest rate of total CS incidents in both male and female is harassment by the husband or family disputes which reported as 24 and 33%, respectively. The second highest CS risk factor of male is chronic diseases and physical disabilities accounting for 31%. Followed by mental disorders (13%), economic problems (poverty, indebtedness) (11%), addiction to narcotic drugs (11%) and disappointment frustration caused through love affairs (9%) (Table 4). Considering CS of female, 18% of suicide deaths was reported due to mental disorders whereas disappointment and frustration caused through love affairs accounted for 16%, chronic diseases and physical disabilities (14%) and problems with elders in the family (8%) (Table 4). This reveals that risk factors of CS

**Table 2.** Trend of completed suicide by age (Sri Lanka Police Statistics Department).

Age group (years)	Economic problems (Poverty, indebtedness, %)	Employment problems (%)	Problems caused with the elders (%)	Harassment by the husband & family disputes (%)	Using disappointment frustration caused through love affairs (%)	Addiction to narcotic drugs (%)	Aggrieved over the death parents/relations (%)	Mental disorders (%)	Chronic diseases & physical disabilities (%)	Other (%)	Total
08 - 16 (children)	1	2	34	4	35	-	6	11	4	3	100
17 - 30 (Young)	5	3	9	29	30	4	3	12	4	1	100
31 - 45 (Middle ages)	12	2	3	41	3	12	3	15	9	-	100
46 - 55 (Elders)	13	2	1	31	-	14	3	15	20	1	100
56 & above (Seniors)	8	1	-	8	-	8	3	17	50	5	100

**Table 3.** Population and the suicide death and total death by gender in Sri Lanka.

Year	Population (million)	Completed suicide		Total number of deaths	
		M	F	M	F
2005	19.7	3708	1034	75,663	56,434
2006	19.9	3558	946	69,895	47,572
2007	20	3281	944	71,207	47,791
2008	20.2	3260	860	73,690	50,124
2009	20.45	3097	921	76,094	51,682
2010	20.65	2914	950	74,170	54,433
2011	20.87	2939	831	20,300	35,566
2012	20.32	2721	805	18,400	16,700
2013	20.483	2703	752	18,800	17,000
2014	20.675	2484	660	19,200	17,500
Total		30665	8703	517,419	394,802

Source: Central bank of Sri Lanka (2014), Department of Census and Statistics, Sri Lanka (2015), Sri Lanka Police Statistics Department.

**Table 4.** Trend of Completed suicide by gender (Sri Lanka Police Statistics Department).

Factor	Male (%)	Female (%)
Harassment by the husband/wife and family disputes	24	33
Chronic diseases and physical disabilities	21	14
Mental disorders	13	18
Economic problems (Poverty, indebtedness)	11	5
Addiction to narcotic drugs	11	-
Using disappointment frustration caused through love affairs	9	16
Problems caused with the elders	4	8
Aggrieved over the death parents/relations	3	3
Employment problems	2	1
Other	2	2
Total	100	100

depend on gender. Further, chi-square statistics (chi-square= 2109.71,  $\chi^2_{0.05, 27} = 40.1$ ) proved that this association is statistically significant.

## Conclusion

Risk factors of completed suicide in Sri Lanka during the last decades have not been changing significantly. During the past decade in every year the most motivational risk factor for CS is “harassment by the husband/wife and family disputes” while second and third motivational risk factors for CS are chronic diseases and physical disabilities and mental disorders in both sex. Risk factors of CS are different in each age group and as well as gender.

## Conflict of Interests

The authors have not declared any conflict of interests.

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## REFERENCES

- Abeyasinghe R, Gunnell D (2008). Psychological autopsy study of suicide in three rural and semi-rural districts of Sri Lanka. *Gunnell, R. A. Æ. D. (2008). Psychological Autopsy Study of Suicide in Three Rural and Semi-Rural Districts of Sri Lanka.* <http://doi.org/10.1007/s00127-008-0307-3>, 43, 280–285. <http://doi.org/10.1007/s00127-008-0307-3>
- Behere P, Bhise MC (2009). Farmers’ suicide: Across culture. *Indian J. Psychiatry* 51(4):242.
- Department of Census and Statistics (2006). Sri Lanka Demographic and Health Survey 2006-07, 201.
- Freeman D, Freeman J (2015). Why are men more likely than women to take their own lives? | Science | The Guardian.
- Garand L., Mitchell, A. M., Dietrick, A., Hijawi, S. P., & Pan, D. (2006). Suicide in Older Adults: Nursing Assessment of Suicide Risk. *Issues in Mental Health Nursing* 27(4):355-370.
- Gunnell D, Fernando R, Hewagama M, Priyangika WD, Konradsen F, Eddleston M (2007). The impact of pesticide regulations on suicide in Sri Lanka. *Int. J. Epidemiol.* 36(6):1235-1242.
- Jayasinghe NRM, Foster JH (2011). Deliberate Self-Harm/Poisoning, Suicide Trends. The Link to Increased Alcohol Consumption in Sri Lanka. *Arch. Suicide Res.* 15(3):223-237.
- Jose-Alberto M, Duarte R (2006). Risk Determinants of Suicide Attempts among Adolescents Risk Determinants of Suicide Attempts Among Adolescents Asked me for a kiss. Source: *Am. J. Econ. Sociol. Inc.* 65(2):407-434.
- Meyer-Rochow VB, Hakko H, Ojamo M, Uusitalo H, Timonen M (2015). Suicides in Visually Impaired Persons: A Nation-Wide Register-Linked Study from Finland Based on Thirty Years of Data. *PLoS ONE* 10(10):e0141583.
- Poorolajal J, Mahjub H, Esmailnasab N (2015). Completed Suicide and Associated Risk Factors: A Six-Year Population Based Survey. *Arch. Iranian Med.* P 18.
- Purushothaman P, Premarajan K, Sahu S, Kattimani S (2015). Risk factors and reporting status for attempted Suicide: A hospital-based study. *Int. J. Med. Public Health* 5(1):45.
- Rachel Jenkins Mendis J, Cooray S, Cooray M (2012). Integration of mental health into primary care in Sri Lanka. *Mental Health in Family Medicine.*
- Rajapakse T, Griffiths KM, Christensen H, Cotton S (2014). A comparison of non-fatal self-poisoning among males and females, in Sri Lanka. *BMC Psychiatry* 14(1):221.
- Russell ST, Joyner K (2001). Adolescent sexual orientation and suicide risk: evidence from a national study. *Am. J. Public Health* 91(8):1276-1281.
- Sadanandan A (2014). The Journal of Developing Areas Political Economy of Suicide: Financial Reforms, Credit Crunches and Farmer Suicides in India. *J. Developing Areas* 48(4):287-307.
- Samarasekare N, Lloyd M, Davies M, Siribaddana S (2012). The Stigma of Mental Illness in Sri Lanka: The Perspectives of Community Mental Health Workers, 2(2):93-99.
- Satya P, Rao Taani M, Lozano V, Kennedy EE (2009). Educating Students about suicide: A framework for the use of fotonovelas on college campuses. *College Student J.*49(2):217-224.
- Weerasundera R (2012). Mental health and criminality: A Sri Lankan perspective. *Sri Lanka J. Psychiatry* 3(2r):1-2.
- World Health Organization (WHO). (2014a). Non communicable Diseases Country Profiles. *Genève*: WHO Press, 2014. Retrieved from [http://www.who.int/nmh/countries/ben\\_en.pdf?ua=1](http://www.who.int/nmh/countries/ben_en.pdf?ua=1)
- World Health Organization (WHO) (2014b). Preventing suicide: A global Imperative.