

ORIGINAL ARTICLE

A 10-year sociodemographic study of suicide cases

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Abstract

Introduction: The prevalence of suicide presents a significant public health challenge globally, affecting diverse populations around the world. This study is motivated by the urgency to tackle suicide as a crucial public health issue on a global level, according to the United Nations Sustainable Development Goals and the General Programme of Work and Mental Health Action by the World Health Organization. **Materials and Methods:** The research was performed at the Forensic Unit of Hospital Canselor Tuanku Muhriz, spanning a retrospective analysis covering 2012 to 2021. A descriptive analysis was conducted to analyse the patterns of suicide and the sociodemographic characteristics of the cases. **Results:** The findings show monthly variations and a recent increase in suicide rates, especially during the pandemic of COVID-19. Analysis of suicide methods indicates that hanging is the most common suicide method, which accounts for almost half of the sample population, followed by jumping from a height and burning charcoal. Adult males are primarily implicated in suicidal acts, and the study reveals unique trends among different age groups, genders and employment statuses. **Conclusion:** This study aims to offer thorough insights and comprehension into suicide within the Malaysian sociodemographic framework. Consequently, it could furnish valuable insights for public health authorities and governmental bodies.

Keywords: Suicide, retrospective, public health, demography, forensic.

INTRODUCTION

Suicide is an intentional and self-harm act leading to death.¹ The World Health Organisation (WHO) reports roughly 703,000 suicides yearly globally, making it a critical global priority and a serious public health issue.² The suicide rate indicator is included in both the United Nations Sustainable Development Goals target indicator 3.4.2 and WHO Mental Health Action. Countries categorised as low and middle-income have a higher suicide rate, accounting for up to 77% of suicide cases.^{2,3}

The escalating suicide rates in Malaysia have raised concerns, prompting the necessity for targeted investigations that incorporate forensic methodologies.^{4,5} Various age and ethnic groups demonstrate unique patterns in suicide methods, including jumping from heights, hanging, poisoning, immolation, and drowning.^{6,7}

Contributing factors encompass economic crises, unemployment, substance abuse, and mental health issues.^{8,9}

In the Malaysian context, grasping the forensic aspects of suicide is essential for devising efficient strategies and interventions. Despite valuable global research on suicide, adapting this knowledge to Malaysia's unique sociodemographic landscape is crucial. Malaysia's population, totalling 33.4 million people, comprises major ethnic groups. The Bumiputera category, including Malays, Bumiputera Sarawak, and Sabah, constitutes approximately 62.87% of the population (21 million). The Chinese population is around 20.36% (6.8 million), while the Indian population comprises about 5.99% (2 million). Minority groups represent approximately 0.68% of the population (226 thousand), and non-Malaysian

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citizens account for around 8.68% (2.9 million).¹⁰ Understanding the distribution of suicide rates across these diverse ethnic groups is crucial for tailoring prevention strategies effectively. In a recent study, the rate of suicide cases in Malaysia was compared with the global rate, which showed that the suicide rate among Malaysians was lower compared to the global rate, which was 5.8 per 100,000 population versus 9 per 100,000 population, respectively.¹¹

However, there is a noticeable gap in research concerning suicide trends within the Kuala Lumpur region. The sociodemographic study conducted in this area aims to uncover patterns associated with suicide occurrences, offering valuable insights into the diverse methods of suicide. This study seeks to investigate the sociodemographic factors influencing suicide patterns among cases reported to the Forensic Unit, Hospital Canselor Tuanku Muhriz (HCTM) from 2012 to 2021. These findings will be beneficial for forensic professionals and law enforcement personnel involved in managing suicide incidents. Additionally, the project will establish a foundational dataset as a starting point for testing and evaluating various intervention strategies.

MATERIALS AND METHODS

This research employs a retrospective cross-sectional study design, covering suicidal cases documented at the Forensic Unit, HCTM, for ten years from January 2012 to December 2021 at the Forensic Unit, HCTM, Kuala Lumpur. The minimum sample size needed was 184 cases.

The postmortem data were retrieved for suicide cases occurring during the time frame. Cases with unknown identification were excluded from the study. Only suicide cases that were classified as suicide by police were included in the search criteria, and each case underwent a complete postmortem examination. Sociodemographic data, along with any additional history and risk factors, were retrieved to study their association with suicidal methods. Ethics approval was approved by Universiti Kebangsaan Malaysia Research Ethics Committee (approval code: UKMPPI/111/8/JEP-2022-461).

A descriptive analysis was conducted using SPSS software version 25.0 to study the prevalence and sociodemographic characteristics of suicidal cases, as well as suicidal patterns.

RESULTS

4264 cases underwent complete medicolegal autopsies at the Forensic Unit, HCTM. Among these cases, 534 were identified as suicides according to the specified inclusion and exclusion criteria. The prevalence of suicide within the total medicolegal autopsies conducted over the ten years was 12.52%. Throughout the decade, the annual prevalence of suicide in the total medicolegal autopsies ranged from 9.95% to 16.82%, as shown in Table 1. Over the last three years, there has been a decline in the prevalence of suicide.

The trends in suicide cases exhibit significant variations across the years from 2012 to 2021. Monthly fluctuations are evident, with no specific peaks observed in particular months. However,

Table 1: The prevalence of suicide cases over a 10 years period

Year	Suicide cases	Autopsy cases	Prevalance over autopsy cases
2012	44	331	13.29
2013	56	333	16.82
2014	49	370	13.24
2015	39	392	9.95
2016	38	360	10.56
2017	58	412	14.08
2018	48	446	10.76
2019	70	496	14.11
2020	61	483	12.63
2021	71	641	11.08
Total	534	4264	12.52

despite the apparent increase in the raw number of suicide cases, a contrasting pattern emerges when considering prevalence, as previously mentioned.

Demographically, the median age in the study was 38 years old, ranging from 9 to 86 years old. Adults represented the most prominent segment when categorised by age group, totalling 258 cases (48.3%). Middle-aged adults closely followed, accounting for one-third of the cases (31.3%). Meanwhile, the male gender exhibited a higher prevalence compared to females, representing almost three-quarters of the total cases (73.8%) (Table 2).

The majority of cases involve Malaysian citizens, comprising 80.1% of the total suicide cases (Table 2). Chinese ethnicity was predominant in our study, representing more than half (57.5%, n=307) of Malaysians involved in suicide (Table 3). The second-largest ethnic group was Indian, accounting for 80 cases (15%), followed by Malay at 34% (n=6.4). Other ethnicities, including Punjabi, Bidayuh, Serani, and Orang Asli, collectively accounted for less than 1.5% of the cases.

The analysis of suicide methods reveals that hanging is the predominant method, comprising 247 cases (46.3%). Following hanging, jumping from a height is the predominant method for suicide in this study, accounting for 206 cases

(38.6%). The third most common method is using burnt charcoal, which was identified in 39 cases (7.3%) (Table 4). Other suicide methods include poisoning, inhaling fumes, wrist cutting or cutthroat, drowning, railway suicide, plastic bag suffocation, gunshot, stab wounds, and ligature strangulation. However, these methods are reported to be less frequently observed in the studied cases.

The suicide methods were further classified into three main groups: jumping from a height, hanging, and others, to facilitate practical and interpretable analysis (Table 5). Examination of suicide methods by gender revealed hanging and jumping from a height as the most preferred methods in our study population. Proportionally, males predominated in all types of suicidal methods, suggesting a gender-specific pattern where males more commonly employed various suicide methods compared to females. A significant association between gender and the suicidal method were observed, indicating a substantial association between individuals' gender and the specific method chosen for suicide.

When evaluating the methods of suicide based on age groups, the findings show significant results and indicate that the adult group predominantly engages in jumping from a height, hanging, and other methods. These distinctions

Table 2: The demographic background of suicide cases

Variables	Frequency (%)	Median (IQR)
Age (years)		38 (24)*
Age group (years)		
Child (5-12)	1(0.2)	
Youth (13-19)	23 (4.3)	
Adult (20-39)	258 (48.3)	
Middle age adult (40-59)	167 (31.3)	
Elderly (>59)	85 (15.9)	
Gender		
Male	394 (73.8)	
Female	140 (26.2)	
Nationality		
Malaysia	428 (80.1)	
Bangladesh	18 (3.4)	
Myanmar	17 (3.2)	
India	14 (2.6)	
Nepal	12 (2.2)	
Indonesia	11 (2.1)	
Others	34 (6.4)	

*Skewed to the right

Table 3: The distribution of suicide cases in ethnicity

Ethnicity	Number of cases (%)
Malay	34 (6.4)
Chinese	307 (57.5)
Indian	80 (15.0)
Punjabi	4 (0.7)
Bidayuh	1 (0.2)
Orang asli	1 (0.2)
Serani	1 (0.2)

highlight age-specific patterns in the choice of suicide methods.

Among Malaysian ethnic groups, distinct preferences were observed. Among the Chinese, jumping from a height is the preferred method with 145 cases, followed by hanging with 95 cases. Conversely, among the Indian ethnic group, hanging is favoured, with 58 cases, compared to 17 cases of jumping from a height. Despite the dominance of the Chinese across various methods, the Chi-square analysis showed no statistically significant association in the choice of suicide methods among ethnic groups.

Examining suicide methods based on marital status reveals statistically significant patterns. Single individuals are noted to be predominant in suicide methods such as jumping and hanging, with a preference for jumping from height (n=102) compared to hanging (n=97). Married couples lead in other methods of suicide (n=33) compared to other marital status groups.

According to our study findings, government servants exhibited the lowest number of suicides compared to the unemployed, self-employed, or non-government servants. In our study, the unemployed favoured jumping from a height (n=114), followed by hanging (n=95). Conversely, the non-government servant group preferred hanging (n=113), followed by jumping from a height (n=65). The choice of suicide methods was associated with the employment status of individuals.

The analysis between the method of suicide and toxicology study indicates a significant association outcome. The common toxicology found were ethyl alcohol, carbon monoxide, and recreational drugs. Notably, distinct patterns emerge for jumping from a height and hanging. Jumping from a height predominantly aligns with positive toxicology studies, comprising 109 cases, while hanging is associated with negative toxicology studies, totalling 129 cases.

The identified risk factors associated with an increased likelihood of suicide encompass previous suicidal attempts, positive toxicology, underlying psychiatric illness, underlying chronic medical illness such as malignancy or chronic pain, relationship problems, and financial problems. The prevalence of any of these risk factors was particularly prominent across various suicide methods, notably jumping from a height, hanging, and other methods. The crosstabulation analysis showed a significant association between the method of suicide and the presence of identified risk factors.

Table 4: The methods used in the cases of suicide

Method of suicide	Frequency (%)
Jumping from height	206 (38.6)
Hanging	247 (46.3)
Burnt charcoal	39 (7.3)
Poisoning	10 (1.9)
Inhaling exhaust fumes	10 (1.9)
Incised wound to the neck and wrists	9 (1.7)
Drownig	3 (0.6)
Railway suicide	3 (0.6)
Plastic bag suffocation	2 (0.4)
Gunshot	2 (0.4)
Stab wound to chest	2 (0.4)
Ligature strangulation	1 (0.2)

Table 5: The association between the methods of suicide and other variables

Variables	Method of suicide, <i>n</i> (%)			χ^2	<i>p</i> value
	Jumping from a height	Hanging	Others		
Gender	Male	132 (64.1)	192 (77.7)	18.71	<0.01
	Female	74 (35.9)	55 (22.3)		
Age group	Child	6 (2.9)	12 (4.9)	15.62	<0.01
	Adult	155 (75.2)	201 (81.4)		
	Elderly	45 (21.8)	34 (13.8)		
Ethnicity	Chinese	145 (81.0)	95 (54.6)	51.37	<0.01 ^a
	Malay	15 (8.4)	16 (9.2)		
	Indian	17 (9.5)	58 (33.3)		
	Others	2 (1.1)	5 (6.7)		
			0 (0)		
Marital status	Single	102 (52.6)	97 (44.5)	16.83	<0.05
	Married	58 (29.9)	86 (39.4)		
	Divorced	12 (6.2)	25 (11.5)		
	Widowed	22 (11.3)	10 (4.6)		
Employment status	Self employed	8 (4.2)	13 (5.9)	40.62	<0.01
	Government servant	3 (1.6)	1 (0.5)		
	Non-government servant	65 (34.2)	113 (50.9)		
	Unemployed	114 (60)	95 (42.8)		
Positive toxicology status	Positive	121 (58.7)	118 (47.8)	15.36	<0.01
	Negative	85 (41.3)	129 (52.2)		
Present of any known of suicidal risk factor	Present	193 (93.7)	212 (85.4)	8.67	<0.05
	Absent	13 (6.3)	36 (14.6)		

DISCUSSION

The in-depth examination of suicide prevalence over ten years provides insights into the evolving nature of this public health issue. Among the total 4264 medicolegal autopsies conducted at the Forensic Unit, HCTM, during this period, 534 cases were identified as suicides. External factors, such as the global COVID-19 pandemic, influence the apparent decrease in suicide prevalence observed in the last three years. It is essential to acknowledge that the calculation of suicide prevalence is based on the total number of medicolegal autopsies conducted, serving as the denominator. The perceived decline in prevalence could be partly attributed to a significant rise in brought-in dead cases associated with COVID-19 nationally and globally.¹² The increment in brought-in dead cases likely contributes to a larger overall denominator, thereby affecting the calculated prevalence. As the denominator expands, the proportion of suicide cases to the total autopsies may diminish, potentially explaining the observed decline in prevalence. Therefore, while the prevalence seems to decrease, it is essential to interpret this trend within the broader context of external factors, such as the ongoing pandemic and its impacts on mortality patterns.

However, from the other perspective, the upsurge in global suicide incidents during the pandemic aligns with the documented notable increase in the absolute number of suicide cases in our analysis. The broader context of the global pandemic crisis undeniably contributes to mounting pressures, mental health challenges, and societal disruptions, potentially influencing the frequency of suicidal behaviours. The concurrent increase in suicides underscores the urgent need to address mental health issues and develop targeted interventions to mitigate the adverse impacts of external pressures on individuals' overall well-being. Understanding these trends in the context of the pandemic is crucial for tailoring effective public health interventions and bolstering mental health support systems.¹³

As per the WHO, suicide stands as the top five most common cause of death worldwide especially between the age of 15 to 29 years. Our categorisation aligns with their data, indicating that adults constitute the primary demographic involved in suicide.² These findings are consistent with our research, where the adult age group emerges as the predominant category, closely followed by middle-aged adults. This study

highlights a notable male predominance in the prevalence of suicide cases, with a ratio of 2.8 males to every female. This trend, although slightly elevated, is consistent with global norms, where the suicide rate among males is 2.3 times higher compare to females.²

These results are consistent with numerous local studies showing that Chinese individuals have the highest incidence of suicide among other ethnic groups, followed by Indians. Intriguingly, despite being the largest population group in Malaysia, Malays appear to have the lowest involvement in suicide, as evidenced in both our study and other research.¹⁴⁻¹⁶

The examination of suicide methods unveils distinct patterns, with hanging emerging as the predominant method, comprising nearly half of the cases, followed by jumping from a height, which constitutes over one-third of the cases. These results are consistent with our literature review, which noted hanging as the most common method in Asia. Furthermore, in areas with a substantial presence of high-rise buildings, jumping from a height emerges as the primary method, facilitated by the prevalence of high-rise living conditions.¹⁷

The presence of any risk factors, such as previous suicidal attempts, positive toxicology, psychiatric illness, medical conditions, relationship issues, and financial struggles, had significant association elements influencing the choice of suicide method. Their prevalence across different methods highlights the interconnectedness of these factors.

CONCLUSION

This sociodemographic analysis of suicide cases provides insights into the complex patterns and factors surrounding suicide. External factors like the global COVID-19 pandemic influence the increase in suicide cases. The study highlights the significant involvement of adults and middle-aged adults in suicide, echoing global trends. Factors such as gender, employment status, marital status, toxicology positivity and presence of any known suicide risk factors emphasise the multifaceted nature of suicide. These insights offer valuable guidance for health officials and policymakers to tailor interventions and prevention strategies addressing the intricate interplay between sociodemographic factors and suicidal behaviours.

Acknowledgement: None.

Author contributions: MIJ, WMH, and RSS contributed to the concept and design of the study. MIJ performed the literature review, data collection, analysis, and manuscript writing. The manuscript was reviewed and revised critically for the intellectual content by MSS and FMN. All authors read and approved the final version of the manuscript.

Conflict of interest: All authors have no conflicts of interest to declare.

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