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ORIGINAL ARTICLE

Risk factors of suicide mortality among multiple attempters: A national registry study in Taiwan



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Received 1 December 2014; received in revised form 4 July 2015; accepted 6 July 2015

KEYWORDS

case registry;
multiple attempters;
population-based
study;
risk factor;
suicide method

Background/Purpose: Little is known about the risk factors of suicide mortality among multiple attempters. This study aims to investigate the predictors of suicidal mortality in a prospective cohort of attempters in Taiwan, focusing on the time interval and suicide method change between the last two nonfatal attempts.

Methods: The representative data retrieved from the National Suicide Surveillance System (NSSS) was linked with National Mortality Database to identify the causes of death in multiple attempters during 2006–2008. Cox-proportional hazard models were applied to calculate the hazard ratios for the predictors of suicide.

Results: Among the 55,560 attempters, 6485 (11.7%) had survived attempts ranging from one to 11 times; 861 (1.5%) eventually died by suicide. Multiple attempters were characterized by female (OR = 1.56, $p < 0.0001$), nonrecipient of national aftercare service (OR = 1.62, $p < 0.0001$), and current contact with mental health services (OR = 3.17, $p < 0.0001$). Most multiple attempters who survived from hanging (68.1%) and gas poisoning (61.9%) chose the same method in the following fatal episode. Predictors of suicidal death were identified as male, older age (≥ 45 years), shorter interval and not maintaining methods of low lethality

Conflicts of interest: The authors have no conflicts of interest relevant to this article.

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<http://dx.doi.org/10.1016/j.jfma.2015.07.009>

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in the last two nonfatal attempts. Receipt of nationwide aftercare was associated with lower risk of suicide but the effect was insignificant.

Conclusion: The time interval of the last two nonfatal attempts and alteration in the lethality of suicide method were significant factors for completed suicide. Risk assessment involving these two factors may be necessary for multiple attempters in different clinical settings. Effective strategies for suicide prevention emphasizing this high risk population should be developed in the future.

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Introduction

Suicide attempt is a major public health threat that may lead to fatal consequences. Researchers had elucidated a repetitive and self-propagating nature of suicidal behaviors.^{1,2} Multiple attempters, defined as people with two or more survived suicide attempts, were found to have more severe psychopathology, stronger suicidal ideation, more perceived problem solving difficulties, and higher risk of further attempts compared with single attempters.^{3–5} However, current evidence for the risk factors of mortality in this high-risk group for suicide is scarce; findings derived from large cohort studies were also limited.

Recent studies have identified some important predictors of repetition of self-harm acts, including female gender, the young or middle-aged, self-cutting or drug-poisoning, and psychiatric service recipients.^{6–9} Poverty and chronic illness additionally increased the risk of hospitalization due to repeated suicide attempts.⁷ Yet these investigations mostly contribute to our knowledge about the risk factors of repetition of self-harm rather than on suicidal mortality, and researchers gathered regional data or suicidal inpatients while some suicidal attempts did not lead to subsequent admissions.^{6–9} Nationwide research on the characteristics and suicidal mortality of multiple attempters are still lacking.

Moreover, nonfatal attempts of high lethality was an important predictor of later suicide,^{10,11} and multiple self-harm acts alone increased subsequent suicide risks.¹¹ Although lower lethality of methods was found to associate with more repeated suicidal behaviors, this association requires further investigation.^{8,11} The impact of frequency of attempts and level of lethality on suicide mortality has never been concurrently examined and remains unclear. As a correlation between suicide method and mortality, the continuity of methods of different lethality and its consequence of death should be considered as well. So far only one study indicated their nonsignificant association with limited representativeness due to its sampling from three centers, the authors suggested that the timing of repetition and its duration might determine the correlation between suicide method and mortality.¹² Besides, recent psychiatric care and aftercare service were reported to be associated with suicide mortality.^{13–15}

Therefore, the aim of this study is to elucidate factors of suicide mortality among multiple attempters from a national prospective sample: (1) we hypothesized that

distinct demographic characteristics, contacts of mental health services, and utilization of aftercare service exist between multiple and single attempters in the National Suicide Surveillance System (NSSS) registry; (2) we hypothesized that the time interval and suicide method alteration between the last two nonfatal attempts were associated with suicide mortality among multiple attempters in a large cohort of hospital registers after adjusting for demographics and service utilization.

Methods

National Suicide Surveillance System (NSSS)

The NSSS was launched in 2006 with the aim of delivering aftercare for suicide attempters upon hospital reports of people with suicide attempts in Taiwan. All emergency departments were mandated to report inflictors of suicidal behavior to the national suicide prevention center via web-based system or by facsimile. Initial assessment and online registration should be done within 24 hours of any people presenting to the hospitals with self-harm or suicidal attempts. Meanwhile the local government provides aftercare services within 72 hours after receiving the case reports according to standardized procedures regulated by the National Suicide Prevention Center. The aftercare services included mental health screening by the five-item Brief Symptom Rating Scale and at least one visit by telephone or via face-to-face interview upon consent by trained personnel of social work, volunteer work, or nursing backgrounds.¹⁶ Information regarding attempters that were gathered by first-line health care providers included gender, age, current utilization of mental health services (positive, negative, or uninformative upon query), date of attempt, adopted methods, and receipt of aftercare services.

Study design and individuals

We collected 55,560 suicide attempters who registered in the NSSS between January 1, 2006 to December 31, 2008. There were 6485 multiple attempters who had two or more nonfatal records of attempts and 45,274 single attempters each with a nonfatal attempt during the study period. We adopted the principle in our previous study to deal with delayed deaths arising from the index attempt.¹⁵ As deaths

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