

MENTAL HEALTH

The influence of media reporting of the suicide of a celebrity on suicide rates: a population-based study

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Background The impact of media reporting of suicides of entertainment celebrities may affect suicide rates due to an imitation effect. We investigated the impact on suicides of the media reporting of the suicide of a male television celebrity.

Methods All suicides during 2003–2005 in Taiwan ($n = 10\,945$) were included in this study. A Poisson time series autoregression analysis was conducted to examine whether there was an increase in suicides during the 4-week period after extensive media reporting of the celebrity suicide.

Results After controlling for seasonal variation, calendar year, temperature, humidity and unemployment rate, there was a marked increase in the number of suicides during the 4-week period after media reporting (relative risk = 1.17, 95% CI 1.04–1.31). The increase was in men (relative risk = 1.30, 95% CI 1.14–1.50) and for the individuals using the same highly lethal method (hanging) as the TV actor did (relative risk = 1.51, 95% CI 1.25–1.83). However, the age groups in which the increase occurred were younger than the age of the celebrity.

Conclusions The extensive media reporting of the celebrity suicide was followed by an increase in suicides with a strong implication of a modelling effect. The results provide further support for the need for more restrained reporting of suicides as part of suicide prevention strategies to decrease the imitation effect.

Keywords Media report, celebrity suicide, completed suicide

Introduction

The deaths of celebrities, especially by suicide, can be followed by an increase in population suicide rates.^{1–4} The impact of media reporting of suicides of entertainment celebrities may affect suicide rates due to an imitation effect.¹ This ‘copycat’ effect appears to be more prominent when there is extensive media coverage of the suicide, with the method of suicide explicitly detailed and reports glamorized and sensationalized.^{2,4,5–9} A meta-analysis of 419 findings from 55 studies of media effects on suicide showed that studies

based on celebrity suicides were 5.27 times more likely to report a copycat effect than studies based on non-celebrity suicides.¹⁰

Ascertaining the reasons for a suicide after an event is often difficult or impossible and investigators have therefore looked for clustering of suicides as indirect evidence of imitation.¹¹ Time clustering following the media coverage of a suicide has been put forward as evidence for imitation.^{1,12}

In this paper we reported findings from a population-based study to investigate the clustering of suicides following the media reporting of the suicide of a celebrity. The celebrity was a famous male television actor in Taiwan, MJ Nee, who committed suicide by hanging from a tree in a countryside orchard at the age of 59 years, sometime in April 2005. Extensive media coverage of Nee’s suicide started from May 2, 2005, the day his body was found and lasted for about 17 days. Data for all suicides between 2003 and 2005 were used to assess whether there was an increase in suicides after the media reporting began and any potential high-risk groups for such an effect.

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Material and methods

The media report

Nee's suicide was reported by all the seven television news channels and all newspapers in Taiwan. The former reported it hourly every day, each report lasting between minutes and an entire hour as the headline news. News of Nee's death appeared in the four most popular national newspapers, with an average daily coverage of 1.2 (SD=0.7) to 2.2 (SD=0.9) pages during 17 days. All these media reports were characterized by sensational words and statements of sympathy for the victim and the method used for suicide was repeatedly described in detail, with pictures/photos featuring the tree where Nee hanged himself, the rope used and his body. Nearly all aspects of the guidelines published by the World Health Organization in 2000 for the media regarding how to report suicide by a celebrity were contravened (www.who.int/mental_health/media/en/59.pdf).¹³

Suicide data

The nationwide mortality database for suicides during 2003–2005 ($n=10\ 945$) was obtained from the Department of Health, Taiwan. This database contains socio-demographic information and dates and methods of suicide classified according to International Classification of Diseases (ICD) 9.¹⁴

Time series data

In order to adjust for the possible confounding effects of biological and social environmental factors on the risk of suicide immediately after the media reporting began, time series data on average temperature, average humidity and unemployment rate by week between 2003 and 2005 were obtained. Records of temperature and humidity were retrieved from 20 major observation stations of the Central Weather Bureau for the whole of Taiwan. Unemployment rates came from the monthly manpower survey report in Taiwan.¹⁵ In our analysis, the weekly unemployment rate (%) was represented by the rate for the month.

Statistical analysis

A Poisson time series autoregression model was used to examine whether there was an increase in suicides during the 4-week period after the initiation of media reporting of Nee's suicide.¹⁶ Instead of assessing time trend and cycle of suicide as in a conventional time series model, our aim was to assess the specific potential impact due to media reporting. This model estimated the relative risk of suicides occurred in the 4-week after the media reporting began, compared with that in the remaining weeks of each year between 2003 and 2005. The weekly counts of suicides from 2003 to 2005 were treated as a Poisson distribution. Since frequency of suicides may be affected by seasonal variation, calendar year, temperature, humidity^{17,18} and unemployment rate,^{18–20} these variables were simultaneously controlled in the model. Both season and calendar year were treated as categorical variables and temperature, humidity and unemployment rate were treated as continuous variables. A consecutive series of autoregressive order from the last 1 (order 1) to the last 4 weeks (order 4)

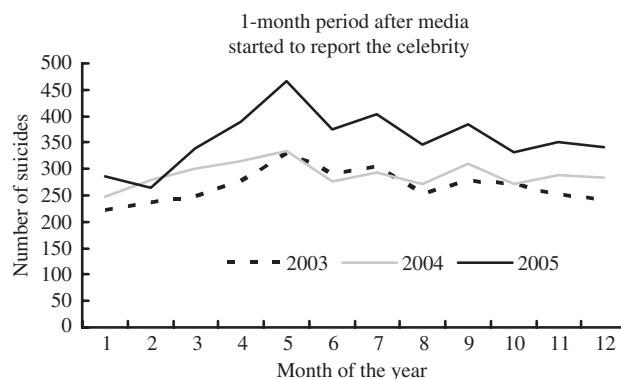


Figure 1 Monthly number of suicides in Taiwan, 2003–2005

were included in the model to examine the effect of past observations on current ones.

The model was tested first among the total group of suicides, then among subgroups according to age (<35, 35–49 and ≥ 50 years), gender and suicide methods (hanging and others). The SAS version 9.1 GENMOD was used to estimate Poisson time series autoregression models.

Results

The increase of suicides after media reporting

Figure 1 shows that there was a marked increase in the number of suicides in the 4-week period (May 2005) after the initiation of Nee's news, compared with the contemporaneous periods in the two preceding years, 2003 and 2004. The numbers of suicides during each of the 4 weeks of May 2005 were 118, 114, 104 and 104. The number of suicides clearly increased from 390 in April to 467 in May (a 19.7% increase with 95% CI as 15.9–24.0%), then decreased to 376 in June 2005. The corresponding increase from April to May was 19.6% (95% CI 15.1–24.7%) in 2003 and 6.0% (95% CI 3.7–9.3%) in 2004. The increase in the 4 weeks in May 2005 was mainly observed in males, with a change in the sex ratio (male/female) from 2.0 in April 2005 to 2.9 in May 2005 and 2.4 in June 2005 ($\chi^2=7.18$, $df=2$, $P<0.05$). The corresponding sex ratios were 1.9, 2.4, 2.2 in 2003 ($\chi^2=1.98$, $df=2$, $P=0.37$) and 2.4, 1.9, 2.0 in 2004 ($\chi^2=2.02$, $df=2$, $P=0.36$). It was also mainly found in the group using hanging, with the ratio of hanging/other methods increasing from 0.5 in April 2005 to 0.8 in May 2005 and decreasing to 0.5 in June 2005 ($\chi^2=15.06$, $df=2$, $P<0.001$). The corresponding figures were 0.6, 0.7, 0.5 in 2003 ($\chi^2=3.2$, $df=2$, $P=0.20$) and 0.6, 0.6, 0.6 in 2004 ($\chi^2=0.01$, $df=2$, $P=0.99$). Moreover, the increase in hanging in May was only observed in men in 2005 ($\chi^2=15.43$, $df=2$, $P<0.001$) and not in women in 2005 or in either sex in 2003 and 2004. There was no difference in the proportion of age groups (<35, 35–49, ≥ 50 years) among suicides across the 3 months ($\chi^2=2.78$, $df=2$, $P=0.60$).

Time series autoregression analyses

A Poisson autoregression analysis for the risk of suicide during the 4 weeks after media reporting of Nee's death began

Table 1 Adjusted relative risk for factors associated with the risk of suicide after media reporting of the suicide of a celebrity during May 2005 in Taiwan^a

Variable	Adjusted relative risk (95% CI)	P-value
Time period		
4-week after media reporting began ^b	1.17 (1.04–1.31)	0.008
Other period	1.00 ^c	
Season^d		
Summer (June–August)	0.88 (0.79–0.98)	0.021
Spring (March–May)	1.04 (0.97–1.12)	0.241
Fall (September–November)	0.93 (0.85–1.01)	0.080
Winter (December–February)	1.00 ^c	
Year^e		
2003	0.81 (0.71–0.93)	0.003
2004	0.84 (0.78–0.90)	<0.001
2005	1.00 ^c	
Temperature (°C)	1.03 (1.02–1.04)	<0.001
Humidity (%)	1.00 (1.00–1.01)	0.813
Unemployment rate (previous week)	0.90 (0.77–1.05)	0.171
Last week suicides	1.00 (1.00–1.00)	0.377

^aPoisson time series autoregression mode (CI, confidence interval).
^bAfter adjusting for the effects of season, year, temperature, humidity, unemployment rate and the number of suicides in the last week (first-order autoregression).
^cReference group.
^dLikelihood ratio test statistic=23.54, degree of freedom=3, $P < 0.001$ for the test of seasonal effect on weekly suicides.
^eLikelihood ratio test statistic=27.42, degree of freedom=2, $P < 0.001$ for the test of year effect on weekly suicides.

was then conducted, with adjustment for seasonal variation, calendar year, temperature, humidity, the unemployment rate in the previous month and autoregression orders. As there was no association between the risk for suicide and the autoregression orders from order 1 to order 4, only the first order was retained in the model. After controlling for these variables, the risk of suicides during the 4 weeks after media reporting began was considerably greater than during the rest of the study period [adjusted relative risk = 1.17 (95% CI 1.04–1.31)]. The excess number of suicides attributable to a media effect was $467 - (467/1.17) = 68$ (95% CI as 18–111) (where 467 was the number of suicides in the 4-week period after extensive media reporting of the celebrity suicide began). Calendar year, seasonal variation and temperature were associated with the risk of suicide. The number of suicides increased between 2004 and 2005 and was higher in periods of higher temperature (Table 1). However, the unemployment rate in the previous week did not make a contribution to the higher risk of suicide.

We then fitted the Poisson autoregression model with interaction terms between media reporting of the celebrity suicide and subgroup variables, including age (<35, 35–49, ≥50 years), gender (male, female) and methods of suicide (hanging, non-hanging). The results showed that there was an interaction between media reporting of the celebrity suicide and each of these three subgroup variables (Table 2).

The Poisson autoregression model was further tested for various subgroups of suicides. The risk of suicides during the

Table 2 Interaction between media reporting of the suicide of a celebrity and age group (<35, 35–49, ≥50 years), gender and methods of suicide (hanging, non-hanging)^a

Variables	Degree of freedom	Likelihood ratio test statistic	P-value
Media	1	1.20	0.274
Age	2	82.10	<0.001
Gender	1	296.51	<0.001
Method	1	94.53	<0.001
Media*Age	2	1.30	0.521
Media*Gender	1	12.11	0.001
Media*Method	1	2.77	0.096
Media*Age*Gender	4	13.16	0.011
Media*Age*Method	4	257.69	<0.001
Media*Gender*Method	2	55.63	<0.001
Season	3	22.14	<0.001
Year	2	26.06	<0.001
Temperature (°C)	1	30.77	<0.001
Humidity (%)	1	0.04	0.845
Unemployment rate	1	1.53	0.217
Last week suicides	1	0.40	0.528

^aPoisson time series autoregression model, adjusting for the effects of season, year, temperature, humidity, unemployment rate and the number of suicides in the last week (first-order autoregression).

4 week after media report began was found to have increased in men. It had also increased in the male group aged <35 years [adjusted relative risk = 1.40 (95% CI 1.08–1.80)], but not in the other age groups of both sexes. There was also an increase in hanging as the method of suicide, but not in the use of other methods. The increase in the risk of suicide by hanging was only observed in men [adjusted relative risk = 1.63 (95% CI 1.32–2.02)], but not in women; and was only observed in the age group 35–49 years [adjusted relative risk = 2.00 (95% CI 1.43–2.78)], but not in the other age groups (Table 3).

Discussion

The increase in suicides after media reporting

Previous studies investigating media influences on suicidal behaviour have largely used a ‘before-and-after’ comparative strategy, often controlling for seasonal and secular changes for identical periods in earlier years.^{4,21,22} Although there was a similar rate of increase in suicides from April to May in 2003 and 2005 in this study, an increase in male suicides using hanging was only observed in May 2005, suggesting a copycat effect. To further verify the effect of media reporting of Nee’s suicide on subsequent suicides, we employed the Poisson autoregression model controlling for temperature, humidity, calendar year, seasonal variation, unemployment rate and autoregressive order. Simultaneous controlling for major potential confounding variables considerably increases the credibility of our findings. Moreover, this study included a major socio-environmental factor, unemployment, in the analysis.

Table 3 Adjusted relative risk for factors associated with the risk of suicide after media reporting of the suicide of a celebrity during May in Taiwan, by subgroups of age, gender and methods of suicide^a

Subgroup	<i>n</i>	Adjusted relative risk (95% CI) ^b	<i>P</i> -value
Age			
< 35	2701	1.14 (0.91–1.42)	0.246
35–49	3538	1.22 (0.99–1.49)	0.057
≥ 50	4706	1.11 (0.93–1.32)	0.235
Gender			
Male	7486	1.30 (1.14–1.50)	<0.001
Female	3459	0.90 (0.73–1.12)	0.338
Methods of suicide			
Hanging	4052	1.51 (1.25–1.83)	<0.001
Others	6893	1.10 (0.87–1.16)	0.967
Age by gender			
Male			
< 35	1822	1.40 (1.08–1.80)	0.010
35–49	2468	1.25 (0.99–1.58)	0.064
≥ 50	3196	1.23 (1.00–1.51)	0.053
Female			
< 35	879	0.62 (0.39–1.00)	0.051
35–49	1070	1.14 (0.78–1.66)	0.497
≥ 50	1510	0.94 (0.69–1.30)	0.727
Age by Method			
Hanging			
< 35	743	1.28 (0.86–1.91)	0.223
35–49	1173	2.00 (1.43–2.78)	0.001
≥ 50	2136	1.28 (0.99–1.66)	0.059
Others			
< 35	1958	1.11 (0.85–1.44)	0.445
35–49	2365	0.91 (0.70–1.18)	0.459
≥ 50	2570	0.99 (0.78–1.26)	0.953
Gender by Method			
Male			
Hanging	2942	1.63 (1.32–2.02)	<0.001
Others	4544	1.09 (0.91–1.30)	0.350
Female			
Hanging	1110	1.04 (0.71–1.52)	0.834
Others	2349	0.85 (0.65–1.11)	0.226

^aPoisson time series autoregression model, adjusting for the effects of season, year, temperature, humidity, unemployment rate and the number of suicides in the last week (first-order autoregression); there were 23 runs of Poisson time series autoregression model.

CI, confidence interval.

^bFor 4-week period after media started to report the celebrity suicide, using remainder of 2003–2005 as reference.

The results from this model have clearly indicated an increase in suicides in the 4 weeks following the initiation of media reporting of Nee's suicide. Such an increase might be attributable to the lengthy and huge amount of the media reporting and its characteristics: sensational, repeatedly featuring details of the suicide method and glorifying the celebrity suicide as

a martyr, with adulation over his past career performance. These features have been shown to contribute to media influences on suicidal behaviour.^{2,4,5–9}

Of the variables which were controlled for in the model, temperature was the most salient factor because the period of the media reporting of Nee's news was very close to the transition from spring to summer, which is a time when rates of suicidal behaviour often increase in several countries, including Taiwan.^{18,23}

Groups at most risk of influence of media reporting

Media influences on suicidal behaviour are thought to be greater when there is close similarity between the media stimulus or model and the observer, in terms of age, gender, nationality and method of suicide.⁹ Findings in previous studies regarding age have been inconsistent: some have indicated a higher vulnerability to media influence among younger people,⁷ while others have not shown an age-specific effect in common with the age of the media model.⁹ Suicides of celebrities appear to have a particularly strong effect on suicide rates.¹ Then the impact may occur in a broader population, rather than being confined largely to those most similar to the model. In this study, we found a greater increase in suicides in people younger than the celebrity. Since Nee was a popular TV actor among adults of all ages in Taiwan, this finding may suggest that younger people are more vulnerable to such media influence. Our findings that the number of suicides was increased in men and in the group using the same highly lethal method (hanging) as the model did are, however, also very much in keeping with a modelling effect.

Limitations

A major limitation in this study and in other similar studies is that whether individuals who engaged in suicidal behaviour following the media event had actually been exposed to it has not usually been investigated,⁹ with rare exceptions.²⁴ However, in another study conducted by us with direct interviews with suicide attempters identified during May and June, 2005 (2 months after the initiation of media reporting on Nee's suicide), 89.2% of them reported an exposure to the media report. About a quarter of the exposed reported an influence of the news on their subsequent suicide attempts.²⁵ It is thus reasonable to speculate that a large proportion of the suicides in this study could have been exposed to media reporting of Nee's death and a substantial proportion among those under exposure may have been influenced.

Although major confounding ecological factors (season, calendar year, temperature and humidity) and unemployment rate were controlled in our Poisson autoregression analysis, the possible influence of other unknown factors on the increase in suicides after the onset of the media reporting cannot be ruled out. Account was not taken of other possible widely publicized suicides during the period of the study. If any occurred and also had an influence on suicide rates, then the apparent influence of Nee's suicide could have been even greater. Finally, misclassification and under-reporting of suicides in the registry system in Taiwan might have confounded the findings of this study.²⁶

Implications for suicide prevention

Better understanding of the nature of the association between media reporting of suicides and subsequent suicidal behaviour may provide evidence for developing effective strategies for suicide prevention. Recent initiatives in Austria and Switzerland indicate that suicide prevention organizations can successfully convince the media to change the frequency and content of their suicide coverage in an effort to reduce copycat effects.^{27,28}

Findings from this study provide more convincing evidence of a strong association between dramatic and extensive media reporting of a celebrity suicide and subsequent suicide.

They support the need for more restrained reporting of suicide. They also suggest that particular attention in terms of potentially adverse media influences should be paid by clinicians to people who have similar characteristic to the model, although the risk may also be increased in other groups.

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KEY MESSAGES

- The extensive media reporting of the suicide of a celebrity in Taiwan was followed by an increase in suicides with a strong implication of a modelling effect.
- There is a close similarity between the model and the observer, in terms of gender (male) and method of suicide (hanging).
- The results provide further support for the need for more restrained reporting of suicides as part of suicide prevention strategies to decrease the imitation effect.

References

¹ Stack S. Media coverage as a risk factor in suicide. *J Epidemiol Community Health* 2003;**57**:238–40.

² Tousignant M, Mishara BL, Caillaud A, Fortin V, St-Laurent D. The impact of media coverage of the suicide of a well-known Quebec reporter: the case of Gaetan Girouard. *Soc Sci Med* 2005;**60**:1919–26.

³ Pirkis JE, Burgess PM, Francis C, Blood RW, Jolley DJ. The relationship between media reporting of suicide and actual suicide in Australia. *Soc Sci Med* 2006;**62**:2874–86.

⁴ Yip PS, Fu KW, Yang KC, Ip BY, Chan CL, Chen EY *et al*. The effects of a celebrity suicide on suicide rates in Hong Kong. *J Affect Disord* 2006;**93**:245–52.

⁵ Schmidtke A, Häfner H. The Werther effect after television films: new evidence for an old hypothesis. *Psychol Med* 1988;**18**:665–76.

⁶ Gould MS. Teenage suicide clusters. *JAMA* 1990;**263**:2051–52.

⁷ Gould MS, Petrie K, Kleinman MH, Wallenstein S. Clustering of attempted suicide: New Zealand national data. *Int J Epidemiol* 1994;**23**:1185–89.

⁸ Alao AO, Yolles JC, Armenta W. Cybersuicide: The internet and suicide. *Am J Psychiatry* 1999;**156**:1836–37.

⁹ Hawton K, Williams K. Media influences on suicidal behaviour: evidence and prevention. In: Kawton K (ed.). *Prevention and Treatment of Suicidal Behaviour: From Science to Practice*. Oxford: Oxford University Press; 2005; pp. 293–306.

¹⁰ Stack S. Suicide in the media: a quantitative review of studies based on nonfictional stories. *Suicide Life Threat Behav* 2005;**35**:121–33.

¹¹ McKenzie N, Landau S, Kapur N *et al*. Clustering of suicides among people with mental illness. *Br J Psychiatry* 2005;**187**:476–80.

¹² Gould MS. Suicide and the media. *Ann N Y Acad Sci* 2001;**932**:200–21; Discussion 221–204.

¹³ World Health Organization. *Preventing Suicide: A Resource for Media Professionals*. Geneva: WHO, 2000.

¹⁴ World Health Organization. *The Ninth Revision of the International Classification of Diseases and Related Health Problems (ICD-9)*. Geneva: WHO, 1975.

¹⁵ Directorate-general of Budget Accounting and Statistics, Executive Yuan, Taiwan. Yearbook of Manpower Survey Statistics, 2003–2005 (Bilingual).

¹⁶ Fahrmeir L, Tutz G. *Multivariate Statistical Modeling Based on Generalized Linear Models*. New York: Springer-Verlag, 1994; pp. 187–218.

¹⁷ Deisenhammer EA. Weather and suicide: the present state of knowledge on the association of meteorological factors with suicidal behaviour. *Acta Psychiatr Scand* 2003;**108**:402–9.

¹⁸ Lee HC, Lin HC, Tsai SY, Li CY, Chen CC, Huang CC. Suicide rates and the association with climate: a population-based study. *J Affect Disord* 2006;**92**:221–26.

¹⁹ Otsu A, Chinami M, Morgenthale S, Kaneko Y, Fujita D, Shirakawa T. Correlations for number of sunspots, unemployment rate, and suicide mortality in Japan. *Percept Mot Skills* 2006;**102**:603–8.

²⁰ Stack S. The media and suicide: a nonadditive model, 1968–1980. *Suicide Life Threat Behav* 1993;**23**:63–66.

²¹ Etzersdorfer E, Voracek M, Sonneck G. A dose-response relationship between imitational suicides and newspaper distribution. *Arch Suicide Res* 2004;**8**:137–45.

²² Shoval G, Zalsman G, Polakevitch J *et al*. Effect of the broadcast of a television documentary about a teenager’s suicide in Israel on suicidal behavior and methods. *Crisis* 2005;**26**:20–24.

²³ Barker A, Hawton K, Fagg J, Jennison C. Seasonal and weather factors in parasuicide. *Br J Psychiatry* 1994;**165**:375–80.

²⁴ Hawton K, Simkin S, Deeks JJ *et al*. Effects of a drug overdose in a television drama on presentations to hospital for self-poisoning: Time series and questionnaire study. *BMJ* 1999;**318**:972–77.

- ²⁵ Cheng ATA, Hawton K, Chen THH *et al.* The influence of media coverage of a celebrity suicide on subsequent suicide attempts. *J Clin Psychiatry* 2007;**68**:862–66.
- ²⁶ Cheng ATA. Mental illness and suicide: a case-control study in East Taiwan. *Arch Gen Psychiatry* 1995;**52**:594–603.
- ²⁷ Michel K, Frey C, Wyss K, Valach L. An exercise in improving suicide reporting in the print media. *Crisis* 2000;**21**:71–79.
- ²⁸ Etzersdorfer E, Sonneck G. Preventing suicide by influencing the mass media reporting, the Viennese experience, 1980–1996. *Arch Suicide Res* 1998;**4**:67–74.