Gender differences in healthcare service utilisation 1 year before suicide: national record linkage study

Chia-Ming Chang, Shih-Cheng Liao, Hung-Chi Chiang, Ying-Yeh Chen, Kwan-Cho Tseng, Yeuk-Lun Chau, Hsiu-Ju Chang and Ming-Been Lee

Summary
All suicides (n=12,497) in Taiwan in 2001–2004 were identified from mortality records retrieved from the National Health Insurance Database. Altogether, 95.1% of females and 84.9% of males had been in contact with healthcare services in the year before their death. Females received significantly more diagnoses of psychiatric disorders (48.0% v. 30.2%) and major depression (17.8% v. 7.4%) than males. Such differences were consistent across different medical settings where contact with hospital-based non-psychiatric physicians was as common as with general practitioners (GPs). However, diagnoses of psychiatric disorders were underdiagnosed in both genders.

Declaration of interest
None.

Previous studies1–4 have shown that most people who die by suicide have contact with healthcare services and have suffered mental disorders (particularly major depression) prior to the event.3–5 A few studies4–6 have demonstrated that females are more likely than males to contact healthcare services before taking their own lives. However, the diagnoses they receive and the association of these diagnoses with medical settings are unknown.

These issues are important for suicide prevention. With the recent increase of suicide in Taiwan, the expertise of physicians and their diagnoses may have implications for the management of suicide prevention in different medical settings. We investigated the gender differences in healthcare service utilisation and diagnoses received by patients 1 year prior to suicide.

Method
Deaths were identified as suicides between 1 January 2001 and 31 December 2004 using the ICD–9 codes E950–E959. To determine healthcare service utilisation in the year preceding death, the record of each suicide case was retrieved from the National Health Insurance Database. Altogether, 95.1% of females and 84.9% of males had been in contact with healthcare services in the year before their death. The study was approved by the ethics committee of the National Taiwan University Hospital (NTUH-REC no. 200711030R).

Descriptive analyses were carried out using SAS version 9.1 for Windows. Chi-squared tests were used to compare the proportion of males and females who used healthcare services in the year prior to suicide. A probability level of <0.05 was considered significant.

Results
A total of 12,497 patients died by suicide (8523 males, 3974 females; male-to-female ratio 2.1:1; mean age 49.2 years (s.d.=18.0)) in the 4-year period. Overall, 88.2% had had at least one contact with healthcare services, but only 24.9% had had contact with psychiatrists in the year before their death. The most common non-psychiatric contacts were with hospital-based non-psychiatric physicians (79.5%) and GPs (72.1%). Only 35.9% of all patients who died by suicide received a diagnosis of psychiatric disorder in the 12 months prior to their death, and only 10.7% received a diagnosis of major depression (Table 1).

A higher proportion of females than males had contacted healthcare service providers, psychiatrists, hospital-based non-psychiatric physicians, and GPs. Psychiatric disorders were diagnosed in 48% of females and 30.2% of males, but major depression was diagnosed in only 17.8% of females and 7.4% of males. Psychiatric disorders and major depression were diagnosed in significantly more female than male patients regardless of the medical setting. The P-values for all of the above were <0.0001.

Discussion
This study found that significantly more females than males had contacted healthcare services prior to suicide. These results are consistent with other findings.5,6 We also found that major depression was diagnosed in only 17.8% of females and 7.4% of males before their death. In addition, 15.1% of males and 4.9% of females had had no contact with services in the year prior to suicide. Our results show that mental disorders and major depression are largely underdiagnosed, especially in males. Possibly, underdiagnosis of mental disorders and major depression in suicide cases reflects a cultural bias against confronting emotional/psychological problems.

Healthcare systems and help-seeking behaviours are different between Taiwan and Western societies.7 A national study in the UK focused on suicides within 12 months of contact with mental health services. Our study demonstrated the utilisation of non-mental health services and found that contact with hospital-based non-psychiatric physicians was as frequent as with GPs. Hospital-based non-psychiatric physicians seemed more likely than GPs to make a diagnosis of psychiatric disorder and major depression (the between-group differences were not analysed since these two groups were not mutually exclusive).

This study has some limitations. First, possible information biases in the NHID and mortality database may have affected
In summary, our study found a female predominance in health service utilisation and in receiving a diagnosis of a mental disorder and major depression prior to suicide, although disorders were underdiagnosed in both genders. We suggest that hospital-based non-psychiatric physicians and GPs should be better trained to identify suicide risk and treat depression to reduce the suicide rate in Taiwan.

### Table 1: Healthcare utilisation by males and females within 12 months prior to suicide

<table>
<thead>
<tr>
<th>Healthcare contacts</th>
<th>Males (n=8523) n (%)</th>
<th>Females (n=3974) n (%)</th>
<th>Total (n=12497) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any</td>
<td>7239 (84.9)</td>
<td>3778 (95.1)</td>
<td>11017 (88.2)</td>
</tr>
<tr>
<td>Psychiatrists</td>
<td>1721 (20.2)</td>
<td>1383 (34.8)</td>
<td>3104 (24.9)</td>
</tr>
<tr>
<td>Hospital-based non-psychiatric physicians</td>
<td>6400 (75.1)</td>
<td>3536 (90.0)</td>
<td>9936 (79.5)</td>
</tr>
<tr>
<td>General practitioners</td>
<td>5652 (66.3)</td>
<td>3359 (84.5)</td>
<td>9011 (72.1)</td>
</tr>
<tr>
<td>No contacts</td>
<td>1284 (15.1)</td>
<td>196 (4.9)</td>
<td>1480 (11.8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Psychiatric disorders diagnoses</th>
<th>Males (n=8523) n (%)</th>
<th>Females (n=3974) n (%)</th>
<th>Total (n=12497) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any</td>
<td>2575 (30.2)</td>
<td>1907 (48.0)</td>
<td>4482 (35.9)</td>
</tr>
<tr>
<td>Psychiatrists</td>
<td>1686 (19.8)</td>
<td>1362 (34.3)</td>
<td>3048 (24.4)</td>
</tr>
<tr>
<td>Hospital-based non-psychiatric physicians</td>
<td>1326 (15.6)</td>
<td>972 (24.5)</td>
<td>2298 (18.4)</td>
</tr>
<tr>
<td>General practitioners</td>
<td>596 (7.0)</td>
<td>547 (13.8)</td>
<td>1143 (9.2)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Major depression diagnoses</th>
<th>Males (n=8523) n (%)</th>
<th>Females (n=3974) n (%)</th>
<th>Total (n=12497) n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any</td>
<td>633 (7.4)</td>
<td>706 (17.8)</td>
<td>1339 (10.7)</td>
</tr>
<tr>
<td>Psychiatrists</td>
<td>490 (5.8)</td>
<td>574 (14.4)</td>
<td>1064 (8.5)</td>
</tr>
<tr>
<td>Hospital-based non-psychiatric physicians</td>
<td>184 (2.2)</td>
<td>213 (5.4)</td>
<td>397 (3.2)</td>
</tr>
<tr>
<td>General practitioners</td>
<td>85 (1.0)</td>
<td>94 (2.4)</td>
<td>179 (1.4)</td>
</tr>
</tbody>
</table>

a. All comparisons were statistically significant.

### Funding

This study was supported by a grant from the Department of Health, Executive Yuan, Taiwan, R.O.C. to the National Suicide Prevention Center (94-2358), and by a grant from the Department of Health, Executive Yuan, Taiwan, R.O.C. $DOH93-TD-M-113-007$ and National Science Council (NSC 93-2314-B-040-027) to C.-M.C..

### References

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Access the most recent version at DOI: 10.1192/bjp.bp.108.053728

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