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Suicides in general hospitals in Hong Kong: retrospective study

有關香港醫院裏病人自殺的回顧研究

Objective. To describe the characteristics of suicidal patients and their suicidal acts occurring in general wards.
Design. Retrospective study.
Setting. All general public hospitals in Hong Kong.
Patients. Survey data based on hospital records of patients who died of suicide or who attempted suicide in general wards between 2000 and 2002 were studied.
Main outcome measures. Demographic information, medical history, and circumstances of the suicidal acts.
Results. Twenty-six hospitals reported a total of 166 suicidal acts, which included 34 completed suicides, corresponding to 9.46 attempted suicides and 1.93 completed suicides per 100 000 admissions. Most suicidal acts occurred in medical wards. Patients were, on average, in their mid-50s, predominantly male, and had been admitted because of physical problems. Fewer than 20% were admitted because of attempted suicide. A significant proportion of suicide attempters used potentially lethal suicide methods in the wards. Wide ranges of objects were used in the suicidal acts. Completed suicides tended to occur after midnight and in the ward toilet. Patients who went missing and then committed suicide acts did so in the first few hours of leaving the hospital. The timing of suicidal acts varied greatly with the reasons of admission.
Conclusion. Prevention efforts in general wards are unlikely to be effective if they simply focus on patients admitted for attempted suicide, or on the restriction of suicide means. For patients admitted to general wards because of attempted suicide, the risk is highest just after admission; hence, these patients have to be monitored closely. A high degree of alertness to the possibility of depression and suicidal risk among general ward patients is required.

目的：描述普通科病房內有自殺傾向的病人和其自殺行為的特點。
設計：回顧研究。
安排：香港所有公立綜合醫院。
患者：調查數據取自2000至2002年間，在普通科病房裏自殺身亡和企圖自殺個案的醫院紀錄。
主要結果測量：與人口特徵有關的資料、病史，以及發生自殺事件的環境情況。
結果：26所醫院合共呈報166宗自殺個案，其中34宗為自殺致死。按比例計算，即相等於每100 000名入院病人，便有9.46位企圖自殺、1.93位自殺致死。大部分自殺事件都在病房裏發生。自殺的病人平均50多歲，大多為男性，因為身體問題而入院，企圖自殺而入院的個案則低於兩成。在病房內用可致命方法自殺的病人佔大多數，而用作自殺的物件，種類很多。自殺致死的個案，大多在午夜後於病房洗手間裏發生。失蹤後自殺的病人，通常在離開醫院後數小時內有所行動。自殺時間的選擇因應入院原因而大有不同。
結論：只著眼於因企圖自殺而入院的病人，或者限制擁有可用來自殺的工具，並不能有效防止病人在普通科病房內作自殺行為。因企圖自殺而入住普通科病房的病人，在剛入院後再次自殺的危險性最高。因此，嚴密看管這類病人是必要的。此外，醫護人員亦應對普通科病房的病人有否出現情緒低落和自殺傾向提高警覺。

Key words:
Hospitals, general;
Inpatients/statistics & numerical data;
Suicide

關鍵詞：
醫院，綜合；
住院病人／統計和數據；
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Introduction

Suicide rarely occurs in hospital settings. The phenomenon is not well studied, often causes staff distress, and has potential medico-legal consequences. In this article, 'completed suicide' refers to suicide resulting in death, 'attempted

Table 1. Summary of studies on suicidal acts in general hospitals

Study	Setting	Study period	No. of suicides (completed/ attempted)	Rate of completed suicide/100 000 admissions	Remarks
Pollack,[4] 1957	1 VA* hospital, US	1948-1953	11/0	-	Male patients only
Brown and Pisetsky,[5] 1960	1 VA hospital, New York, US	1947-1958	23/0	20.9	<3% admissions female
Farberow et al,[2] 1971	42 VA hospitals, US	1959-1966	281/0	6	98% admissions male
Reich and Kelly,[6] 1976	1 hospital, Boston, US	1967-1973	0/17	-	-
Glickman,[7] 1980	1 hospital, New York, US	1963-1978	22/0	3.3	-
Shapiro and Waltzer,[8] 1980	1 hospital, New York, US	1965-1979	16/21	9.8	Included 5 psychiatric cases
Kellner et al,[9] 1985	2 hospitals, South Carolina, US	Not specified	0/7	-	-
White et al,[10] 1995	1 hospital, Sydney, Australia	1980-1992	8/12	1.7	Jump from heights only
Hung et al,[11] 2000	1 hospital, Taiwan	1988-1997	15/75	1.8	-
Suominen et al,[12] 2002	Finland population	1987-1988	26/0	-	-

* VA veteran administration

Table 2. Rates of suicidal behaviour in general wards in Hong Kong, 2000-2002

Specialty	No. of admissions (x 1000)	No. of suicidal acts	Rate of suicidal acts/100 000 admissions	No. of completed suicides	Rate of completed suicide/100 000 admissions
Medicine	740.9	80	10.80	22	2.97
Surgery	658.0	20	3.04	6	0.91
Orthopaedic surgery	155.7	12	7.70	2	1.28
Oncology	32.4	6	18.50	0	0
Obstetrics and gynaecology	79.3	5	6.29	1	1.26
Others	88.2	43	48.70	3	3.40
Total	1754.5	166	9.46	34	1.93

suicide' refers to a non-fatal attempt with or without alleged suicidal intent, and 'suicidal acts' refer to both completed and attempted suicide. 'General wards' refer to non-psychiatric wards in acute, chronic, rehabilitation, or hospice hospitals.

Studies have reported consistently that suicides in psychiatric wards differ from those in general wards in age, marital status, employment status, diagnoses, reasons for admission, suicide methods, and circumstances leading to suicide.[1,2] In view of the these differences, studies that describe the two groups as if they were the same will not be reviewed here.[3]

The body of literature on suicide in general hospitals consists entirely of descriptive studies based on retrospective case series (Table 1).[2,4-12] With the exceptions of Farberow et al,[2] Kellner et al,[9] and Suominen et al,[12] studies were each based on a small number of cases occurring in one hospital during 7 to 15 years,[4-8,10-12] thereby raising problems of limited generalisability and confounding by period effects. One study focused only on suicides involving jumping from heights.[10] Three studies were based on veteran administration (VA) hospitals in the United States, and more than 97% of the patients involved in the suicides were male.[2,4,5] Five papers were predominantly case studies.[4-6,8,10] The largest study collected 281 cases of suicide in medical and surgical wards of 42 VA general hospitals between 1959 and 1966.[2] Of these cases, 109 occurred in an out-of-hospital settings, corresponding to a suicide rate of more than 200 times the rate in in-patient settings. In-patient status was not clearly defined, however, and many in-patient suicides probably did not occur inside the hospitals. As acknowledged in a recent review on suicide in general hospitals,[13] it is difficult to draw a clear consensus from these findings. Furthermore, no similar studies have been performed in Hong Kong. This retrospective descriptive study aimed at examining suicide cases occurring in general hospitals in Hong Kong during a 2-year period.

Methods

All public general hospitals in Hong Kong participated in this study. The survey period was from 1 April 2000 to 31 March 2002. There has been a long-held practice that all types of suicidal acts occurring in hospital wards are recorded by nurses and reported to hospital management. Using these records, each hospital completed a standardised, anonymous survey. The survey asked for patients' demographic information and medical history, as well as circumstances of the suicidal acts.

Results

During the survey period, 26 hospitals reported a total of 277 suicidal acts. Ten hospitals reported no suicidal acts. The suicidal acts reported by two mental hospitals (n=79) and psychiatric wards of general hospitals (n=32) were excluded from further analysis. Of the 166 suicidal acts

Table 3. Characteristics of patients and suicidal acts

	Attempted suicide, n=132 No. (%)	Completed suicide, n=34 No. (%)	Statistics
Mean (SD) age (years)	53.5 (21.7)	57.9 (19.3)	t=0.28, NS*
Male	65 (49)	28 (82)	χ^2=12.0, P<0.01
Reasons for admission			
Physical reasons	58 (45)	20 (59)	χ^2=2.93, NS
Pain	14 (11)	2 (6)	
Respiratory problems	13 (10)	4 (12)	
Abnormal mental state	12 (9)	2 (6)	
Suicide attempts	24 (19)	4 (12)	
Clinical transfer	8 (6)	2 (6)	
Physical diagnoses			-
Neoplasm	35 (27)	9 (26)	
Cardiovascular diseases	30 (23)	8 (24)	
Respiratory diseases	17 (13)	7 (21)	
Past psychiatric service	24 (18)	7 (21)	χ^2=0.10, NS
Past suicide record	25 (20)	5 (15)	χ^2=0.46, NS

* NS not significant

occurring in general wards (including missing data of two cases), 124 (75%) occurred in acute wards, 29 (17%) in chronic or rehabilitation wards, and 11 (7%) in hospice settings. Thirty-four of these 166 acts were fatal and were thus classified as completed suicides.

On the basis of the number of admissions during the same period, we estimated the rate of suicidal acts and completed suicides at each specialty ward (Table 2). Nearly half of suicidal acts and two thirds of completed suicides occurred in medical wards. The highest rates, however, were found in the category of 'other' specialties, which referred to unspecified or mixed specialty ward settings. The overall rates of suicidal acts and completed suicides were 9.46 and 1.94 per 100 000 admissions, respectively.

Patient characteristics

Although patients who attempted or completed suicides had a similar age, males were more common among those who completed suicide than among those who attempted suicide (Table 3). As expected, admission to the general ward was most common because of physical problems, and pain and respiratory problems were often specifically reported. Fewer than 20% of patients who attempted suicide, and 12% of those who completed suicide were admitted because of suicidal attempts.

Neoplastic, cardiovascular, and respiratory diseases were the most common physical diagnoses reported among the patients. Among the cases of neoplasm, there were 12 cases of carcinoma of the lung, four of the breast, three each of the liver and oesophagus, and three cases of leukaemia. Among patients with cardiovascular disease, eight had ischaemic heart disease, seven had hypertension, and four had heart failure. Eighteen of the 25 cases of respiratory diseases were cases of chronic obstructive airway disease. Other common diseases included connective tissue diseases (n=11), endocrine diseases (n=8), neurological diseases (n=6), gastrointestinal diseases (n=5), infectious diseases (n=4), dermatological diseases (n=2), and pregnancy-related diseases (n=2).

A total of 31 (19%) patients had previously received psychiatric care. Diagnoses included depression (n=13), schizophrenia (n=11), substance abuse disorders (n=9), and personality disorder (n=2). Fewer than 20% of these patients had records of previous suicidal behaviour.

Overall, attempted and completed suicide groups did not differ in age, reasons for admission, past psychiatric service, or history of suicidal acts.

Timing of suicidal acts

There were no particular peak hours for attempted suicides in general wards (20% occurred between midnight and 6:00 AM, 26% between 6:00 AM and noon, 29% between noon and 6:00 PM, and 25% between 6:00 PM and midnight). On the contrary, completed suicides most often occurred after midnight (41% between midnight and 6:00 AM, 22% between 6:00 AM and noon, 9% between noon and 6:00 PM, and 28% between 6:00 PM and midnight). There were no clear differences in monthly distribution of attempted and completed suicides. The small number of cases in each month also did not allow further examination of seasonal effects.

Completed suicides in general wards occurred at a mean of 8 days after admission, and attempted suicide took place after 17 days (mean for all suicidal acts, 15.5 days). Among patients who were admitted because of pain and breathing difficulties, suicidal acts occurred at a mean of 12.9 (standard deviation, 24.4) days after admission. Among those admitted because of other physical reasons, the mean interval to the suicidal act was 21.4 (73.4) days; among those with an abnormal mental state, it was 8.1 (24.0) days; among those admitted because of suicidal attempts, it was 1.2 (1.7) days; and among those who had been transferred to the general ward, it was 31.1 (47.4) days. The subgroup

Table 4. Methods and places of suicidal acts

	Attempted suicide, n=132 No. (%)	Completed suicide, n=34 No. (%)	Statistics
Suicide methods*			
Hanging and strangulation (X70)	35 (27)	16 (47)	χ^2=39.0, P<0.001
Jump from heights (X80)	18 (14)	17 (50)	
Poisoning (X60-69)	18 (14)	1 (3)	
Self-harm by objects (X78-79)	58 (44)	0	
Others	3 (2)	0	
Place of suicide†			
Ward toilet	6 (5)	6 (18)	χ^2=36.0, P<0.001
Bed	55 (42)	4 (12)	
Ward	38 (29)	7 (21)	
Inside hospital	28 (21)	7 (21)	
Outside hospital	4 (3)	10 (29)	

* International Classification of Diseases (10th revision) code is shown in parentheses
† Totals do not add up exactly because of missing data

differences, however, were not statistically different (F=1.00, degrees of freedom=4, P>0.05).

Methods used in suicidal acts

Virtually all cases of completed suicide were by jumping from heights (International Classification of Diseases, 10th revision, code X80) or hanging and strangulation (X70) [Table 4]. In nearly half of the attempted suicides, patients tried to harm themselves by using objects (X78-79). Two fifths of suicide attempters used similar lethal methods to those used by suicide completers (ie jumping from heights, or hanging and strangulation).

Objects used in hanging and strangulation included bell cord (n=6); bandage (n=6); ties or belts (n=6); oxygen tubing (n=5); towel (n=4); bed sheet (n=4); rope, window curtain, and safety belt (n=3 each); and a plastic bag and electric cord (n=2 each). Substances taken in cases of self-harm by poisoning (X60-69) included shampoo (n=2), hypnotic (n=2), and deodorant, calamine lotion, digoxin, dologesic, aspirin, and transamin (n=1 each). Objects used in self-harm (X78-79) included knife or scissors (n=16); cutter (n=8); shaving blade (n=6); broken or window glass (n=5); broken cup (n=3); pull ring of aluminium can or paper clip (n=2 each); and broken toothpaste tube, toothbrush, foot stool, remote control, hair pin, or syringe (n=1 each).

Location of suicidal acts

Table 4 lists the places where the suicidal acts occurred. Whereas the majority of attempted suicides occurred in in-patient's beds or inside the ward, a sizeable minority occurred elsewhere in the hospital, including hospital garden (n=3), out-patient department (n=1), lift lobby (n=1), rear exit of ward (n=3), and roof of hospital building (n=5).

Compared with the attempted suicides, far more completed suicide cases took place at the ward toilet and outside the hospital (including three cases in which the patients who left the ward on their own and committed suicide at home). Among patients whose suicidal acts occurred outside hospitals, and the time patients were found missing and the time the suicidal act were known, four cases occurred within first hour found missing, three cases occurred within second to fourth hours found missing.

Among patients who attempted suicide, 104 (81%) required no treatment or were treated in the same ward, 27 (16%) required transfer to another ward or hospital for treatment, and five (4%) required resuscitation and transfer to an intensive care unit.

Discussion

Strengths and limitations

This is a retrospective study that provides descriptive data on the rates and characteristics of suicidal acts occurring in general public hospitals in Hong Kong. It has the strength of accumulating a reasonable sample size in 2 years' time. The participation of all public hospitals eliminated bias due to clinical practice specific to a few hospitals. The study, however, omits suicidal acts that occurred in private hospitals. A retrospective study of this design had problems of variable data quality, non-standardised recording procedures, and the possibility of underestimating the true frequency of suicidal acts (especially minor suicidal acts). These limitations have to be balanced with the fact that the reported findings were factual data. A case series does not allow us to estimate how many non-suicidal patients bear similar characteristics.

Rates of completed suicides in general wards

The rate of completed suicide was 1.93 per 100 000 admissions. This rate should not be interpreted as one lower than that of completed suicides among the general population (14.2 per 100 000).[14] The rate reported in this study included only those fatal suicides occurring during patients' stay in general hospitals (mean, 6.6 days).[15] In contrast, the rate among the general population is for the whole year, regardless of location. A more accurate estimation of the rate should take into account the number of person-years of hospitalisation.

The rate of completed suicide in general wards in Hong Kong is among the lowest so far reported in the literature (Table 1). In agreement with the report by Hung et al,[11] we found that the bulk of completed suicide cases occurred in medical wards; our rates were also comparable (2.9 per 100 000 in this study versus 4.4). It seems that medical ward patients are one of the obvious targets for programmes aimed at preventing suicide in hospital.

Characteristics of suicidal patients in general wards

A mean age in the 50s in this study agreed well with that in the literature.[10-12] It was noteworthy that studies based on VA hospitals or studies including psychiatric patients usually reported a younger mean age, in the 40s.[2,5,8]

The male-to-female ratio for completed suicides in general wards was about 4:1. The sex ratio for completed suicides in the general population is 1.6:1.[14] A World Health Organization multicentre study on parasuicide[16] reported a male-to-female ratio for attempted suicides in the general population of 1:1.4. The sex ratio of suicide attempters in our study was nearly 1:1. This male predominance in completed (67%-81% male) and attempted (58%-68%) suicides occurring in general wards, relative to that occurring in general population, was also consistently reported in the literature.[6-8,10-12]

According to the literature, up to 30% (median, 21%) of suicidal patients in general wards had neoplastic diseases,[2,4,5,7,8,10-12] indicating that our finding of 26% is on the high side. Population-based studies of cancer registries have suggested that cancer patients have higher suicide rates than the general population, and that the risk is the highest in the first 5 years and is associated with the use of chemotherapy.[17] Thus suicidal risk of cancer patients is not confined to those at the terminal stage of their illness. Apart from neoplasms, respiratory diseases are rather common (12%-27%) among suicidal patients in general wards.[4,8,12] The relationship between physical illnesses and suicide is complex. The specific physical diagnoses associated with suicide may not be more important than the chronicity and severity of the diseases, suffering experienced by patients, personality, and co-morbid psychiatric disturbances.

Given that all previous studies are retrospective series of patients admitted to general wards, the assessment of psychiatric disturbances are often unsystematic and unstandardised.[6,8] Suominen et al[12] provided the most comprehensive assessment ever reported. The authors performed psychological autopsy on all suicides occurring in Finland and found 26 cases of completed suicides during patients' stays in general hospitals. The most common psychiatric diagnoses were major depression (n=16; 62%), anxiety disorder (n=5; 19%), and alcohol dependence (n=3; 12%). The results suggested that most people who completed suicide during general hospital treatment had concurrent mental disorders, especially major depression. The overall rate of previous psychiatric service in our sample was low. If the findings of Suominen et al[12] were extrapolated to the local setting, one would have to be more vigilant to the possibility of depression in these patients.

In line with previous findings (10%-22%; median, 15%),[7,10-12] less than 12% of our sample completed suicide following admissions for suicidal attempts. Prevention efforts just focused on patients admitted because of suicidal attempts are likely to miss the bulk of suicidal cases occurring in general wards.

Circumstances of suicide

Previous studies reported considerable variation in the suicide methods in general wards (eg 20%-94% patients jumped from heights and 0%-53% used hanging).[8,11,12] The ranges probably reflect the availability of suicide means. In this study, an extremely wide range of objects was used in the suicidal acts. They included daily objects, clothing, medical instruments, and prescribed medications. It seems that a restriction of means as a prevention strategy would be impossible to achieve.

It is disturbing to find that nearly half of attempters tried to kill themselves with methods similar to those used by completers, and that a sizeable minority of attempted suicides resulted in serious and life-endangering complications. One may argue that our sample of attempters was biased towards serious attempters. Even if just a fraction of these serious attempters had succeeded to kill themselves with these lethal means, the rate of complete suicide would have increased considerably.

More often than not, completed suicide occurred at time (after midnight) and place (toilet) where staff supervision was likely to be the weakest. This finding does not necessarily mean putting more staff at that time or place could prevent suicide, because it seems to also occur, albeit less frequently, at other times and places at which manpower is relatively more adequate. Furthermore, in our study, patients who left the ward and attempted suicide did so soon after leaving. These patients were probably in a suicidal state of mind when they left the ward. Close ward observation and prompt search for missing patients are thus warranted.

Previous studies reported great variations in mean length of stay in patients who committed suicide in general wards. White et al[10] reported a median of 3 days. Hung et al[11] reported that one third occurred within the first week of admission. Proulx et al[1] reported a mean of 156 days with 40% occurring within the first week. Our study found a wide distribution of days on which suicides happened. Among patients who were admitted because of attempted suicide, some carried out suicidal acts in the general wards on the day after admission and some did so on the day of admission. Because such patients are probably still acutely suicidal, intensive observation should be

tailored towards meeting their needs within this acute period. Prevention of this quick succession of suicidal acts requires a very responsive and timely suicidal assessment service. It is questionable whether consultation liaison psychiatric service could provide such a timely service on a regular basis. This would be even more unattainable for hospitals without on-site psychiatrists.

The bulk of patients who tried to kill themselves in general wards and who were admitted because of physical illness attempted suicide on an average of 2 to 3 weeks after admission. There is no clear-cut high-risk period for these patients. Even though these patients have been staying in wards for such a long period, their mental process of becoming suicidal and thus the escalating suicidal risk have not be detected. A local study[18] found that 24% of general ward patients had psychiatric disorders and general medical staff may not be able to pick up these psychiatric morbidities. The practice of referring the obviously disturbed patients for psychiatric assessment could have missed some cases. A better awareness and a heightened sensitivity to the suicidal risk among withdrawn or quiet patients who may suffer from depression in silence are thus needed.

References

1. Proulx F, Lesage AD, Grunberg F. One hundred in-patient suicides. Br J Psychiatry 1997;171:247-50.
2. Farberow N, Ganzler S, Cutter F, Reynolds D. An eight-year survey of hospital suicides. Suicide Life Threat Behav 1971;1:184-202.
3. Blain PA, Donaldson LJ. The reporting of in-patient suicides: identifying the problem. Pub Health 1995;109:293-301.
4. Pollack S. Suicide in a general hospital. In: Shneidman E, Farberow NL, editors. Clues to suicide. New York: McGraw-Hill; 1957:152-63.
5. Brown W, Pisetsky JE. Suicidal behavior in a general hospital. Am J Med 1960;19:307-15.
6. Reich P, Kelly MJ. Suicide attempts by hospitalized medical and surgical patients. N Engl J Med 1976;294:298-301.
7. Glickman LS. Psychiatric consultation in the general hospital. New York: Marcel Dekker; 1980.
8. Shapiro S, Waltzer H. Successful suicides and serious attempts in a general hospital over a 15-year period. Gen Hosp Psychiatry 1980;2:118-26.
9. Kellner CH, Best CL, Roberts JM, Bjorkstein O. Self-destructive behavior in hospitalized medical and surgical patients. Psychiatr Clin North Am 1985;8:279-89.
10. White RT, Gribble RJ, Corr MJ, Marge MM. Jumping from a general hospital. Gen Hosp Psychiatry 1995;17:208-15.
11. Hung CI, Liu CY, Liao MN, Chang YH, Yang YY, Yeh EK. Self-destructive acts occurring during medical general hospitalization. Gen Hosp Psychiatry 2000;22:115-21.
12. Suominen K, Isometsa E, Heila H, Lonnqvist J, Henriksson M. General hospital suicides-a psychological autopsy study in Finland. Gen Hosp Psychiatry 2002;24:412-6.
13. Berger D. Suicide risk in the general hospital. Psychiatry Clin Neurosci 1995;49(Suppl 1):85S-89S.
14. Coroner's Court annual report. Hong Kong: Hong Kong SAR Government; 2000 & 2001.
15. Hospital Authority annual report. Hong Kong: Hospital Authority; 2001.
16. Kerkhof JF. Attempted suicide: patterns and trends. In: Hawton K, Heeringen K, editors. The international handbook of suicide and attempted suicide. Chichester: Wiley; 2000:49-64.
17. MacKenzie TB, Popkin MK. Suicide in the medical patient. Int J Psych Med 1987;17:3-22.
18. Leung CM, Chan KK, Cheng KK. Psychiatric morbidity in a general medical ward. Hong Kong's experience. Gen Hosp Psychiatry 1992;14:196-200.