

ORIGINAL ARTICLE

Factors associated with quality of life after attempted suicide: a cross-sectional study

Shu-May Wang, Yu-Ching Chou, Mei-Yu Yeh, Chih-Hao Chen and Wen-Chii Tzeng

Aims and objectives. To describe factors associated with the subjective quality of life of individuals who had attempted suicide.

Background. Although quality of life has been a focus of concern in mental health care, data are lacking on what life is like and what factors are related to an individual's quality of life after a suicide attempt.

Design. A cross-sectional, descriptive design was used.

Methods. Participants comprised a convenience sample of 103 individuals who had attempted suicide within the previous three months and received follow-up care from one suicide-prevention centre in northern Taiwan. Participants were assessed for depression and quality of life using the Beck Depression Inventory, Taiwan version and the World Health Organisation Quality of Life Instrument-BREF, Taiwan version, respectively.

Results. Almost half the participants ($n = 49$) had severe depression and one-third of them ($n = 30$) reattempted suicide while receiving follow-up care. Depression and quality-of-life scores were statistically significantly inversely correlated. Participants' quality-of-life scores were most associated with their depressive level, reattempting suicide during suicidal follow-up care, high educational level and older age.

Conclusions. The present study indicates that factors associated with quality of life decreased more in individuals with moderate/severe depression than in those with mild depression. In addition, individuals who reattempted suicide during follow-up care were more likely to suffer from poor life quality.

Relevance to clinical practice. Mental health professionals should include frequent evaluation of depressive status and quality of life in follow-up care for patients who have recently attempted suicide. Particularly, mental health professionals must treat suicidal individuals with a high tendency to reattempt suicide by establishing trust with them and allowing them to narrate their painful experiences during follow-up care.

Key words: attempted suicide, community care, depression, quality of life, Taiwan

Accepted for publication: 24 October 2012

Introduction

Suicide is a worldwide mental health problem. In Taiwan, suicide accounted for 16.8 deaths per 100,000 population in 2010 (Department of Health R.O.C. 2011), more than

the global average of approximately 16 deaths per 100,000 population (World Health Organisation 2012). Suicidal individuals in Taiwan have a high risk of repeated suicide attempt, especially within the first year of self-harm (Chen *et al.* 2010a). Moreover, suicide sometimes results from

Authors: *Shu-May Wang*, RN, MS, Head Nurse, Department of Health, Taoyuan Mental Hospital, Taoyuan; *Yu-Ching Chou*, PhD, Assistant Professor, School of Public Health, National Defense Medical Center, Taipei; *Mei-Yu Yeh*, RN, PhD, Professor, Department of Nursing, Chang Gong University of Science and Technology, Taoyuan; *Chih-Hao Chen*, MS, Health Inspector, Department of Health, Taipei City Government, Taipei; *Wen-Chii Tzeng*, RN, PhD,

Director, Department of Nursing, Tri-Service General Hospital, Taipei and Associate Professor, School of Nursing, National Defense Medical Center, Taipei, Taiwan, ROC

Correspondence: Wen-Chii Tzeng, Director, No. 325 Section2 Cheng-gong Road, Neihu 114, Taipei, Taiwan, ROC. Telephone: +886 2 8792 7250.

E-mail: wctzeng@mail.ndmctsg.edu.tw

decreased life satisfaction associated with depression (Fuji-no *et al.* 2005, Bray & Gunnell 2006). Suicide-related studies have focused on suicide rates (Mok *et al.* 2012), assessment and diagnosis (Edelstein *et al.* 2009), suicidal behaviours and methods (Lin *et al.* 2010) and risk factors for suicidal behaviours (Chen *et al.* 2010a), but few studies have explored quality of life (QOL) to help mental health professionals understand how individuals adapt following a suicide attempt. The purpose of this study therefore was to examine factors associated with QOL in individuals who attempted suicide within the previous three months.

Background

In Taiwan, the male/female suicide death ratio is 2.1:1 (Department of Health R.O.C. 2011). Suicide death rates increase with increasing age. One-third of deaths by suicide occur among those 25–44 years old (Department of Health R.O.C. 2011). The most common methods of suicide in Taiwan are hanging, charcoal-burning and pesticide poisoning (Lin *et al.* 2010). Risk factors for suicide include unemployment (Chen *et al.* 2010b), being unmarried, history of psychiatric illness (Cheng 1995, Hung *et al.* 2010), physical illness (Hung *et al.* 2000), first-degree family history of suicide and history of repeated suicide attempts (Tsai *et al.* 2002). Furthermore, death by suicide increased significantly following media reports of a celebrity suicide (Chen *et al.* 2012).

Those who attempt suicide tended to reattempt suicide within the first year (Berlim *et al.* 2006, Chen *et al.* 2010a, Simon 2011) and even sooner after a psychiatric hospitalisation (Meehan *et al.* 2006), especially if they were females, living with family members, had a history of psychiatric treatments (Beghi & Rosenbaum 2010, Oh *et al.* 2011) and suffered from depression and substance abuse (da Silva Cais *et al.* 2009). Significant risk factors for immediate postdischarge suicide among psychiatric patients in Hong Kong were being out of contact after discharge and living alone (Kan *et al.* 2007). Unfortunately, many people who attempt suicide do not receive follow-up mental health care (Olfson *et al.* 2012).

In Taiwan, only 13% of individuals sought mental health services during the month before their death by suicide (Lee *et al.* 2008). One reason for not seeking help might be the cultural stigma associated with suicide (Tzeng & Lipson 2004). Thus, Taiwan established the National Suicide and High Risk Group Notification System, which lists individuals who have attempted suicide (with their permission) and are provided three months of follow-up

care by a case manager from the National Suicide-Prevention Centre. After this policy was implemented, deaths by suicide decreased from 21.4–17.8 per 100,000 in Kaohsiung City, Taiwan (Ho *et al.* 2011), but little is known about how individuals in the community adapt after attempting suicide.

To understand how a disease or event such as a suicide attempt influences one's physical, mental and social well-being, QOL must be assessed [World Health Organisation (WHO) Group 1997]. A brief version of the WHO Quality of Life Instrument (WHOQOL-BREF) was developed for use when time is restricted and respondent burden should be minimised. Measuring QOL to assess likelihood of suicide attempts is supported by previous research.

For example, poor QOL was associated with suicidal ideation and suggested as a marker for poor adaptation and inadequate social support in individuals with HIV-AIDS (Kalichman *et al.* 2000). Similarly, suicidal patients diagnosed with bipolar disorder had significantly lower scores in all four WHOQOL-BREF domains than their non-suicidal counterparts (de Abreu *et al.* 2012). Likewise, suicidal patients diagnosed with schizophrenia in Taiwan had significantly lower QOL scores in the social domain, after adjusting for depressive symptoms, than their non-suicidal counterparts (Kao *et al.* 2012). Furthermore, suicidal patients in Sweden had significantly lower health-related QOL scores in all domains than the general population (Borg *et al.* 2010). An outcome similar to QOL, life satisfaction, was found to be an important indicator for suicide risk in a nationwide sample of Finnish adults (Koivumaa-Honkanen *et al.* 2001).

Another variable correlated with QOL in both physical and psychiatric patients is depression. Indeed, QOL was even lower in depressed patients than in patients with chronic illnesses, for example hypertension, end-stage renal disease, chronic lumbar pain and cancer (Demyttenaere *et al.* 2002, Berlin *et al.* 2006). Furthermore, depression has been considered a risk factor for reattempting suicide (Nrugham *et al.* 2012). These results indicate that monitoring depressive symptoms and understanding patients' QOL after suicide attempts are critical in caring for suicidal patients. However, data are lacking on what life is like and what factors are related to an individual's QOL after attempting suicide in Taiwan.

Aim

The aim of this study was to describe the factors associated with subjective QOL of Taiwanese individuals after a suicide attempt within the previous three months.

Methods

Study design and participants

A cross-sectional research design was used in this study. Individuals were recruited by convenience from one mental hospital in a rural area of northern Taiwan. Individuals were recruited from the hospital's suicide-prevention centre if they met the following inclusion criteria: (1) >20 years old, (2) attempted suicide within the previous three months, (3) included in the national suicide and high-risk group notification list, (4) could read and write, and (5) received follow-up care by case managers from the hospital's suicide-prevention centre. Among 172 individuals referred to the suicide-prevention centre, 158 met the inclusion criteria. Of these 158 individuals, 112 agreed to participate, but nine dropped out during data collection, leaving a final sample of 103 (response rate = 65%).

Instruments

Data were collected on participants' demographic and clinical characteristics, depressive level and QOL using a three-part questionnaire: (1) a demographic and clinical data form, (2) the Beck Depression Inventory (BDI), Taiwan version (Beck *et al.* 1996, Chen 2000), and (3) the WHOQOL-BREF, Taiwan version (WHO Group 1997, Yao 2002).

Demographic data included participants' gender, age, marital status, education level, employment status, monthly family income and religious status. Clinical data included history of depression, history of suicide attempts and history of suicide attempts while receiving follow-up care.

The 21-item BDI is a self-report questionnaire examining depressive level by focusing on depressive symptoms, cognition and physical symptoms during the previous two weeks (Beck *et al.* 1996). Item scores (range = 0–3) are summed for a global score ranging from 0–63. Higher scores signify more severe depression. BDI scores are categorised as follows: 0–13 indicates minimal depression, 14–19 mild depression, 20–28 moderate depression and 29–63 severe depression. The Chinese version BDI has well-established internal consistency and construct validity (Chen 2000). In this study, Cronbach's alpha for the Chinese version BDI was 0.93.

The 24-item WHOQOL-BREF includes four domains: physical health, psychological health, social relationships and environment (World Health Organisation Group 1997). The scale also has two overall items measuring general QOL. The WHOQOL-BREF, Taiwan version includes not only the original 26 items, but also two

culture-specific questions reflecting the Taiwanese cultural values of being respected/accepted by others (social relationships domain) and eating food that one loves (environmental domain) (Yao 2002). Item scores range from 1–5. Mean scores are calculated for all items of each domain, with higher scores indicating better QOL. In this study, Cronbach's alpha for the overall scale was 0.94 and Cronbach's alphas for individual domains ranged from 0.72–0.86.

Data collection

Data were collected between April 2008–March 2009. The first author explained the purpose of the study to potential participants, who received an information sheet outlining the study aims and protection of confidentiality. After obtaining written informed consent, the first author gave participants anonymous, self-administered questionnaires (as described above) and a return envelope. All questionnaires were returned directly to the first author.

Ethical considerations

Permission for the study was obtained from the institutional review boards of the study hospital and the principal investigator's university.

Data analysis

SPSS for Windows version 17.0 (Data Statistical Analysis Corporation, Taipei, Taiwan, ROC) was used for statistical processing with significance set at 0.05. Demographic characteristics, BDI scores and mean scores for the four WHOQOL-BREF domains were described by means, standard deviations and percentages. Group differences in the four WHOQOL-BREF domains were determined by independent *t*-tests and one-way ANOVA. Associations among different continuous variables were identified by Pearson's correlations. The generalised linear model was used to identify significant explanatory variables associated with the four WHOQOL-BREF domains. This approach provides flexible statistical modelling and enables non-normal distributions of dependent variables (Wang *et al.* 2010).

Results

Participant demographics

Among the 103 participants in the final sample, 15% were 20–24 years old, 62% were 25–44 years old, and 23%

were ≥ 45 years old. Their average age was 36.7 years ($SD = 10.35$, range: 20–65). The majority (60%) were females and without a partner (73%) (Table 1). The majority (73%) had completed senior high school or above, were unemployed (73%) and had a low monthly income (58%). Their mean BDI score was 28.22 ± 15.27 (range = 0–60), with 49 (47.6%) having a BDI score ≥ 29 , indicating severe depression. Surprisingly, 30 (29%) participants admitted reattempting suicide while receiving three-month suicidal follow-up care.

Relationship of participants' characteristics with QOL

Participants' mean WHOQOL-BREF scores for physical health, psychological health, social relationships and environmental domains were 11.23 ($SD = 3.18$), 9.24

($SD = 3.26$), 10.40 ($SD = 3.07$), and 11.17 ($SD = 3.02$), respectively. Participants' mean score for overall QOL was 2.67 ($SD = 0.98$) and for global health status was 2.50 ($SD = 1.03$).

In Table 2, participants whose monthly household income was <50,000NT\$ reported poorer psychological health ($p = 0.027$) than participants whose monthly household income was >50,000NT\$. Participants with a history of depression reported poorer psychological health ($p = 0.030$) than participants with no history of depression. Participants with a history of repeated suicide attempts also reported poorer psychological health ($p = 0.006$) and social relationships ($p = 0.027$) than those without such a history. Moreover, participants who reattempted suicide while receiving suicidal follow-up care reported poorer physical health ($p = 0.004$), psychological health ($p < 0.001$) and social relationships ($p = 0.033$) than those who did not reattempt suicide.

Table 1 Participants' demographic and clinical characteristics as well as depressive level and quality-of-life scores ($n = 103$)

Variable	<i>n</i>	%	Mean	SD
Age (years)			36.69	10.35
Gender				
Male	41	40		
Female	62	60		
Marital status				
With partner	28	27		
Without partner	75	73		
Level of education (years)				
<12	28	27		
≥ 12	75	73		
Current employment				
Yes	28	27		
No	75	73		
Family income per month (New Taiwan \$)				
<50,000	60	58		
$\geq 50,000$	43	42		
Religion				
Yes	82	80		
No	21	20		
History of depression				
Yes	63	39		
No	40	61		
History of suicide				
First time	21	20		
Repeated suicide	82	80		
Attempted suicide while receiving care				
Yes	30	29		
No	73	71		
Beck Depression Inventory score			28.22	15.27
WHOQOL domains				
Physical health			11.24	3.17
Psychological health			9.24	3.26
Social relationships			10.57	3.16
Environment			11.19	3.00

Correlations between BDI scores and WHOQOL domains

Beck Depression Inventory scores were negatively correlated with physical health ($r = -0.67$, $p < 0.001$), psychological health ($r = -0.74$, $p < 0.001$), social relationships ($r = -0.54$, $p < 0.001$) and environment ($r = -0.60$, $p < 0.001$) (Fig. 1). Depressive level differed significantly by physical health ($F = 17.42$, $p < 0.001$), psychological health ($F = 39.17$, $p < 0.001$), social relationships ($F = 10.54$, $p < 0.001$) and environment ($F = 13.79$, $p < 0.001$). These results indicate that the greater the depressive level, the poorer the QOL among suicidal participants.

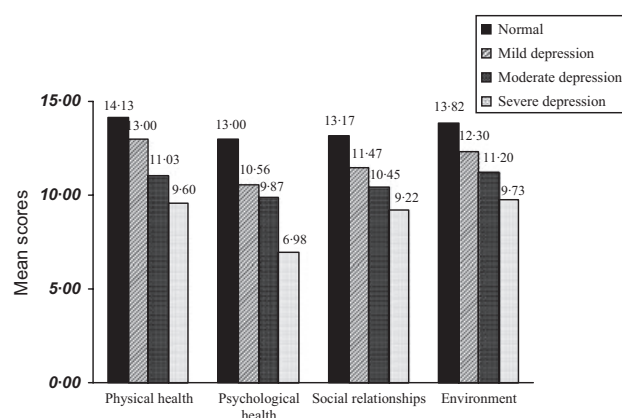
Regression model of four WHOQOL domains

The results of generalised linear modelling (Table 3) indicate that participants' age, reattempting suicide during follow-up and depressive level were significantly associated with the physical health domain and accounted for 42% of the variance. Participants' education level, reattempting suicide during follow-up and depressive level were significantly associated with the psychological health domain, accounting for 61% of the variance. Education level and depressive level were significantly associated with social relationships, accounting for 32.8% of the variance. Age, education level and depressive level were significantly associated with the environmental domain, accounting for 42.3% of the variance.

Across all domains, depression was a significant factor. Participants with more severe depression (higher BDI

Table 2 Comparison of scores for four WHOQOL-BREF domains by participants' characteristics ($n = 103$)

Variable	<i>n</i>	Physical health		Psychological health		Social relationships		Environment	
		Mean (SD)	<i>p</i>	Mean (SD)	<i>p</i>	Mean (SD)	<i>p</i>	Mean (SD)	<i>p</i>
Gender									
Male	41	11.46 (3.38)	0.568	9.71 (3.57)	0.242	10.43 (3.40)	0.726	11.20 (3.46)	0.977
Female	62	11.10 (3.04)		8.94 (3.04)		10.66 (3.02)		11.18 (2.69)	
Level of education (years)									
<12	28	11.43 (3.60)	0.718	9.36 (3.66)	0.829	10.98 (3.67)	0.424	11.92 (3.19)	0.132
≥ 12	75	11.17 (3.01)		9.20 (3.13)		10.41 (2.97)		10.91 (2.91)	
Marital status									
With partner	28	10.80 (3.56)	0.384	8.83 (3.41)	0.440	10.60 (3.21)	0.955	11.34 (3.28)	0.749
Without partner	75	11.41 (3.01)		9.40 (3.22)		10.56 (3.17)		11.13 (2.91)	
Current employment									
Yes	28	11.96 (3.20)	0.161	9.81 (3.73)	0.284	11.30 (3.38)	0.153	11.86 (3.11)	0.168
No	75	10.98 (3.13)		9.03 (3.08)		10.29 (3.06)		10.94 (2.95)	
Family income per month (NT\$)									
<50,000	60	11.02 (3.13)	0.410	8.64 (3.17)	0.027	10.08 (2.76)	0.067	10.82 (2.97)	0.145
≥ 50,000	43	11.55 (3.23)		10.08 (3.24)		11.24 (3.58)		11.70 (3.02)	
History of depression									
Yes	63	10.89 (2.91)	0.161	8.69 (3.04)	0.030	10.52 (2.96)	0.848	10.80 (2.84)	0.100
No	40	11.79 (3.54)		10.12 (3.46)		10.64 (3.49)		11.80 (3.18)	
History of repeated suicide									
Yes	82	11.03 (3.04)	0.175	8.80 (3.16)	0.006	10.22 (3.14)		10.97 (2.91)	0.155
No	21	12.08 (3.55)		10.98 (3.14)		11.92 (2.96)	0.027	12.02 (3.27)	
Reattempted suicide									
Yes	30	9.87 (2.56)	0.004	7.18 (2.64)	<0.001	9.53 (3.08)	0.033	10.43 (2.85)	0.101
No	73	11.81 (3.23)		10.09 (3.13)		10.99 (3.12)		11.50 (3.03)	

**Figure 1** Mean scores on the four domains of the WHO Quality of Life Instrument (WHOQOL-BREF) for participants whose BDI scores classified them as normal ($n = 22$), mildly depressed ($n = 12$), moderately depressed ($n = 20$) and severely depressed ($n = 49$).

scores) showed more significant decreases in physical health, psychological health, social relationships and environment than individuals with mild or moderate depression. Individuals who reattempted suicide while receiving follow-up care had significantly poorer physical

and psychological health than those who did not reattempt suicide.

Education was another significant negative factor in the four WHOQOL domains. Individuals with >12 years of education were more likely to have poorer physical health, psychological health, social relationships and environment than those with <12 years of education. Age also had a small effect on both physical health and environment; a 1-year increase in age was significantly associated with a 0.05-point decrease in physical health and a 0.08-point decrease in environment domain scores.

In summary, QOL of participants who had recently attempted suicide was most associated with four variables: depressive level, education level, reattempting suicide during follow-up care and age. These variables explained a large proportion of variability in psychological health, but less variability in social relationships.

Discussion

Nearly half of suicidal participants ($n = 49$) in this study reported severe depression (BDI score ≥ 29). Those with severe depression also reported lower mean scores on all four WHOQOL-BREF domains (physical health,

Table 3 Regression of each WHOQOL-BREF domain with related variables ($n = 103$)

Variables	Physical health			Psychological health			Social relationships			Environment		
	B	SE	p	B	SE	p	B	SE	p	B	SE	p
Age	-0.051	0.026	0.047	-0.020	0.022	0.368	-0.045	0.028	0.101	-0.082	0.024	0.001
Gender: male/female	0.345	0.520	0.508	0.112	0.440	0.798	0.852	0.559	0.127	0.553	0.494	0.263
Education level: <12/≥12 years	-1.079	0.551	0.050	-1.002	0.467	0.032	-1.227	0.592	0.038	-1.677	0.524	0.001
Marital status: with/without a partner	0.315	0.600	0.600	0.520	0.508	0.306	-0.024	0.645	0.971	-0.894	0.570	0.117
Current employment: no/yes	0.892	0.600	0.137	0.360	0.508	0.479	0.493	0.645	0.444	0.664	0.570	0.244
Monthly family income: ≤50,000/>50,000 NT\$	-0.243	0.521	0.641	0.510	0.441	0.248	0.455	0.560	0.417	0.118	0.495	0.812
History of major depression: no/yes	0.121	0.523	0.817	-0.292	0.443	0.510	0.596	0.563	0.290	-0.413	0.497	0.406
History of repeated suicide: no/yes	0.466	0.669	0.486	-0.166	0.566	0.769	-0.454	0.719	0.527	0.145	0.635	0.820
Reattempted suicide: no/yes	-1.265	0.607	0.037	-1.570	0.514	0.002	-0.727	0.652	0.265	-0.390	0.576	0.499
Depressive level												
Severe	-4.691	0.712	<0.001	-5.418	0.603	<0.001	-4.097	0.765	<0.001	-4.534	0.676	<0.001
Moderate	-3.538	0.803	<0.001	-3.073	0.680	<0.001	-3.202	0.864	<0.001	-2.985	0.763	<0.001
Mild	-1.358	0.890	0.131	-2.363	0.762	0.002	-1.592	0.967	0.100	-1.682	0.854	0.049
Adjusted R ²	0.420		<0.001	0.610		<0.001	0.328		<0.001	0.423		<0.001

psychological health, social relationships and environment) than participants with mild or moderate depression. In addition, our participants reported greater depression and poorer QOL than 181 depressed outpatients in Taiwan (Sung & Yeh 2007). This difference is likely due to Sung and Yeh's sample including depressive outpatients without suicidal ideation. On the other hand, our results are consistent with the findings for 808 depressed patients in Korea (Jung *et al.* 2012) and with depressive levels of 70 Brazilian outpatients with and without suicidal ideation, although they had poorer QOL than our participants (Berlim *et al.* 2003). Thus, different depressive levels differently impact suicidal individuals' QOL.

Over two-thirds of our participants had a history of repeated suicide attempts. Because patients with such a history eventually end their lives by suicide (Hawton *et al.* 2003), these participants needed intensive suicidal care. Almost one-third of participants reported that they reattempted suicide while receiving suicidal follow-up care. Indeed, these participants were more likely to experience poorer psychological health and social relationships than those who did not repeatedly attempt suicide during the previous three months of follow-up care. Our results on reattempting suicide and poor QOL echo report that patients with schizophrenia (Xiang *et al.* 2008, Kao *et al.* 2012) or bipolar disorder (de Abreu *et al.* 2012) and who previously attempted suicide had significantly lower scores in the four WHOQOL-BREF domains than their non-suicidal

counterparts. Taken together, these findings suggest that individuals who reattempt suicide and have greater depression are more likely to have poorer QOL.

Our participants had a mean score for perceived general QOL of 2.67, similar to the results from Australia (Goldney *et al.* 2001) and Finland (Koivumaa-Honkanen *et al.* 2001). Furthermore, our participants had notably lower mean QOL scores than the general population in Taiwan (The WHOQOL-Taiwan Group 2000) across all four WHOQOL-BREF domains, particularly in four components of psychological health (enjoying life, item 5; meaningful life, item 6; satisfied with self, item 19; and negative feelings, item 26) and one component of the environmental domain (enough money). Our suicidal participants also reported even worse QOL across all domains than patients with major depression in Taiwan (Chung *et al.* 2009), suggesting that a decline in QOL is related to further suicide attempts.

Regarding the relationship between QOL and demographic characteristics, participants with >12 years of education were more likely to have poorer QOL across all four domains than those with <12 years of education. Our results differ from previous reports that education level contributed to higher QOL scores (Lin *et al.* 2008, Jung *et al.* 2012). This difference may be due to the cultural phenomenon of highly educated suicidal individuals in Chinese societies being more likely to attempt suicide or accept suicide than poorly educated ones (Wang *et al.* 1998, Li & Phillips 2010). Another factor that may explain our results

is that poor QOL is associated with a sense of stigmatisation (Chung *et al.* 2009, Yen *et al.* 2009), and highly educated Taiwanese individuals who have attempted suicide are vulnerable to a greater sense of stigma from suicide (Tzeng & Lipson 2005). Therefore, these results suggest that mental health professionals should treat highly educated individuals who have attempted suicide by establishing trust with them and allowing them to narrate their painful stigmatisation during follow-up.

We also found that older participants had poorer QOL in the physical health and environment domains than younger people. This result might have been due to older individuals having comorbid medical conditions and less social support in Chinese societies, as reported (Lin *et al.* 2008, Chan *et al.* 2009). Economic issues may have been a critical factor for our participants, but became non-significant in the generalised regression analyses. In a related study, low household income contributed to suicide attempts (Sareen *et al.* 2011). We found that participants, especially those who were highly educated or older, suffered when they had to depend on their even older parents because they were not fulfilling their filial obligation to support them (Ho 1996). Therefore, during follow-up care with suicidal Chinese individuals, mental health professionals should acknowledge their cultural dilemma with filial piety, frequently reflect with them how one's Chinese background shapes one's values and communication style, and help them understand such suffering can be meaningful for their later lives. Health professionals must also educate family members to appropriately care for such a high-risk population.

Limitations

Interpretation of the study results is limited by several factors. First, the study used a cross-sectional design so causal relationships cannot be determined between QOL and demographic factors. Longitudinal studies are recommended to clarify these causal relationships. Second, the study instruments were all self-administered. Future studies could confirm self-reported results with more objective measures. Third, study participants were selected by convenience sampling from a northern rural county. In addition, we could not access information on non-responders' demographic and clinical characteristics due to the study hospital's regulations on protecting patients' privacy. Thus, selection of the study sample might have been biased, preventing the results from being generalisable to all suicidal individuals in Taiwan. Finally, we knew little about participants' family relationships and function as a possible factor influencing participants' social relationships and environment. To minimise this factor, future studies should collect data on family relationships.

Conclusion

This paper is the first to identify factors associated with the subjective QOL of Taiwanese individuals who attempted suicide within the previous three months. The study findings indicate that such individuals had poor QOL in all domains of the WHOQOL-BREF. In addition, QOL was negatively associated with several factors, that is, older age, higher education, reattempting suicide during follow-up and severe depression. Knowledge gained from this study is important for mental health professionals to incorporate suicidal patients' psychological state and life satisfaction during follow-up care.

Relevance to clinical practice

The findings from this study suggest that individuals who have attempted suicide and have both severe depression and poor QOL are more likely to make further attempts. Clearly, such knowledge will enable mental health professionals to understand depression as a critical factor associated with QOL in suicidal patients. Thus, mental health professionals should include frequent evaluation of depressive levels and QOL in follow-up care of suicidal patients. In addition, case managers need to attend ongoing education programmes on culturally appropriate care to frequently reflect how their own Chinese background shapes their values and communication styles and to understand how suicidal patients bear such suffering after attempting suicide. Therefore, case managers have to establish rapport with suicidal patients and allow patients to articulate their painful experiences during follow-up care. We also suggest that future research includes psychometric measures to explore possible relationships between suicidal patients' QOL and family function.

Acknowledgement

The authors thank the National Science Council, Taiwan, R. O.C. (NSC98-2314-B-016-032-MY3) for financial support and Professor Yue-Cune Chang for his help during data analysis.

Contributions

Study design: SW, MY, WT; data collection and analysis: SW, YC, CC, WT and manuscript preparation: SW, YC, MY, CC, WT.

Conflict of interest

The authors declare that they have no conflict of interests.

References

- de Abreu LN, Nery FG, Harkavy-Friedman JM, de Almeida KM, Gomes BC, Oquendo MA & Lafer B (2012) Suicide attempts are associated with worse quality of life in patients with bipolar disorder type I. *Comprehensive Psychiatry* 53, 125–129.
- Beck AT, Steer RA & Brown GK (1996) *Manual for the Beck Depression Inventory*, 2nd edn. Psychological Corporation, San Antonio, TX.
- Beghi M & Rosenbaum JF (2010) Risk factors for fatal and nonfatal repetition of suicide attempt: a critical appraisal. *Current Opinion in Psychiatry* 23, 349–355.
- Berlim MT, Mattevi BS, Pavanello DP, Caldieraro MA & Fleck MP (2003) Suicidal ideation and quality of life among adult Brazilian outpatients with depressive disorders. *Journal of Nervous and Mental Disease* 191, 193–197.
- Berlim MT, Mattevi BS, Duarte AP, Thomé FS, Barros EJ & Fleck MP (2006) Quality of life and depressive symptoms in patients with major depression and end-stage renal disease: a matched-pair study. *Journal of Psychosomatic Research* 61, 731–734.
- Borg T, Holstad M & Larsson S (2010) Quality of life in patients operated for pelvic fractures caused by suicide attempt by jumping. *Scandinavian Journal of Surgery* 99, 180–186.
- Bray I & Gunnell D (2006) Suicide rates, life satisfaction and happiness as markers for population mental health. *Social Psychiatry and Psychiatric Epidemiology* 41, 333–337.
- Chan S, Jia S, Chiu H, Chien WT, Chien WT, Thompson DR, Hu Y & Lam L (2009) Subjective health-related quality of life of Chinese older persons with depression in Shanghai and Hong Kong: relationship to clinical factors, level of functioning and social support. *International Journal of Geriatric Psychiatry* 24, 355–362.
- Chen H (2000) *Manual for the Beck Depression Inventory-Chinese Version*, 2nd edn. Chinese Behavioral Science Corporation, Taipei.
- Chen VC, Tan HK, Cheng AT, Chen CY, Liao LR, Stewart R, Dewey M & Prince M (2010a) Non-fatal repetition of self-harm: population-based prospective cohort study in Taiwan. *British Journal of Psychiatry* 196, 31–35.
- Chen YY, Yip PS, Lee C, Fan HF & Fu KW (2010b) Economic fluctuations and suicide: a comparison of Taiwan and Hong Kong. *Social Science and Medicine* 71, 2083–2090.
- Chen YY, Liao SF, Teng PR, Tsai CW, Fan HF, Lee WC & Cheng AT (2012) The impact of media reporting of the suicide of a singer on suicide rates in Taiwan. *Social Psychiatry and Psychiatric Epidemiology* 47, 215–221.
- Cheng AT (1995) Mental illness and suicide. A case-control study in east Taiwan. *Archives of General Psychiatry* 52, 594–603.
- Chung L, Pan AW & Hsiung PC (2009) Quality of life for patients with major depression in Taiwan: a model-based study of predictive factors. *Psychiatry Research* 168, 153–162.
- Demyttenaere K, Fruyt JD & Huygens R (2002) Measuring quality of life in depression. *Current Opinion in Psychiatry* 15, 89–92.
- Department of Health R.O.C. (2011) *Health Statistics in 2010*. Available at: <http://www.doh.gov.tw/> (accessed 10 October 2010).
- Edelstein BA, Heisel MJ, McKee DR, Martin RR, Koven LP, Duberstein PR & Britton PC (2009) Development and psychometric evaluation of the reasons for living-older adults scale: a suicide risk assessment inventory. *Gerontologist* 49, 736–745.
- Fujino Y, Mizoue T, Tokui N & Yoshimura T (2005) Prospective cohort study of stress, life satisfaction, self-rated health, insomnia, and suicide death in Japan. *Suicide and Life-Threatening Behavior* 35, 227–237.
- Goldney RD, Fisher LJ, Wilson DH & Cheok F (2001) Suicidal ideation and health-related quality of life in the community. *Medical Journal of Australia* 175, 546–549.
- Hawton K, Zahl D & Weatherall R (2003) Suicide following deliberate self-harm: long-term follow-up of patients who presented to a general hospital. *British Journal of Psychiatry* 182, 537–542.
- Ho DYF (1996). Filial piety and its psychological consequences. In *The Handbook of Chinese Psychology* (Bond MH ed.). Oxford University Press, New York, NY, pp. 155–165.
- Ho WW, Chen WJ, Ho CK, Lee MB, Chen CC & Chou FH (2011) Evaluation of the Suicide Prevention Program in Kaohsiung City, Taiwan, using the CIPP Evaluation Model. *Community Mental Health Journal* 47, 542–550.
- Hung CI, Liu CY, Liao MN, Chang YH, Yang YY & Yeh EK (2000) Self-destructive acts occurring during medical general hospitalization. *General Hospital Psychiatry* 22, 115–121.
- Hung TC, Tang HS, Chiu CH, Chen YY, Chou KR, Chiou HC & Chang HJ (2010) Anxiety, depressive symptom and suicidal ideation of outpatients with obsessive compulsive disorders in Taiwan. *Journal of Clinical Nursing* 19, 3092–3101.
- Jung YE, Seo HJ, Song HR, Woo YS, Yim HW, Sung HM, Lee MS, Kim JM & Jun TY (2012) Factors associated with subjective quality of life in Korean patients with depressive disorders: the CRESCEND study. *Quality of Life Research* 21, 967–974.
- Kalichman SC, Heckman T, Kochman A, Sikkema K & Bergholte J (2000) Depression and thoughts of suicide among middle-aged and older persons living with HIV-AIDS. *Psychiatric Services* 51, 903–907.
- Kan CK, Ho TP, Dong JY & Dunn EL (2007) Risk factors for suicide in the immediate post-discharge period. *Social Psychiatry and Psychiatric Epidemiology* 42, 208–214.
- Kao YC, Liu YP, Cheng TH & Chou MK (2012) Subjective quality of life and suicidal behavior among Taiwanese schizophrenia patients. *Social Psychiatry and Psychiatric Epidemiology* 47, 523–532.
- Koivumaa-Honkanen H, Honkanen R, Viinamäki H, Heikkilä K, Kaprio J & Koskenvuo M (2001) Life satisfaction and suicide: a 20-year follow-up study. *American Journal of Psychiatry* 158, 433–439.
- Lee HC, Lin HC, Liu TC & Lin SY (2008) Contact of mental and nonmental health care providers prior to suicide in Taiwan: a population-based study. *Canadian Journal of Psychiatry* 53, 377–383.

- Li X & Phillips MR (2010) The acceptability of suicide among rural residents, urban residents, and college students from three locations in China: a cross-sectional survey. *Crisis* 31, 183–193.
- Lin PC, Yen M & Fetzer SJ (2008) Quality of life in elders living alone in Taiwan. *Journal of Clinical Nursing* 17, 1610–1617.
- Lin JJ, Chang SS & Lu TH (2010) The leading methods of suicide in Taiwan, 2002–2008. *BMC Public Health* 10, 480.
- Meehan J, Kapur N, Hunt IM, Turnbull P, Robinson J, Bickley H, Parsons R, Flynn S, Burns J, Amos T, Shaw J & Appleby L (2006) Suicide in mental health in-patients and within 3 months of discharge. National clinical survey. *British Journal of Psychiatry* 188, 129–134.
- Mok PL, Kapur N, Windfuhr K, Leyland AH, Appleby L, Platt S & Webb RT (2012) Trends in national suicide rates for Scotland and for England & Wales, 1960–2008. *British Journal of Psychiatry* 200, 245–251.
- Nrugham L, Holen A & Sund AM (2012) Suicide attempters and repeaters: depression and coping: a prospective study of early adolescents followed up as young adults. *Journal of Nervous and Mental Disease* 200, 197–203.
- Oh SH, Park KN, Jeong SH, Kim HJ & Lee CC (2011) Deliberate self-poisoning: factors associated with recurrent self-poisoning. *American Journal of Emergency Medicine* 29, 908–912.
- Olfson M, Marcus SC & Bridge JA (2012) Emergency treatment of deliberate self-harm. *Archives of General Psychiatry* 69, 80–88.
- Sareen J, Afifi TO, McMillan KA & Asmundson GJ (2011) Relationship between household income and mental disorders: findings from a population-based longitudinal study. *Archives of General Psychiatry* 68, 419–427.
- da Silva Cais CF, Stefanello S, Fabricio Mauro ML, Vaz Scavacini de Freitas G & Botega NJ (2009) Factors associated with repeated suicide attempts. Preliminary results of the WHO Multisite Intervention Study on Suicidal Behavior (SUPRE-MISS) from Campinas, Brazil. *Crisis* 30, 73–78.
- Simon RI (2011) Improving suicide risk assessment with evidence-based psychiatry. In *Evidence-based Practice in Suicidology: A Source Book* (Pompili M & Tatarelli R eds.), Hogrefe Publishing, Cambridge, MA, pp. 45–64.
- Sung SC & Yeh MY (2007) Factors related to quality of life in depressive outpatients in Taiwan. *Psychiatry and Clinical Neurosciences* 61, 610–615.
- The WHOQOL-Taiwan Group (2000) *User Manual of the WHOQOL-BREF Taiwan Version*. Institute of Occupational Medicine and Industrial Hygiene, Taipei.
- Tsai SY, Kuo CJ, Chen CC & Lee HC (2002) Risk factors for completed suicide in bipolar disorder. *Journal of Clinical Psychiatry* 63, 469–476.
- Tzeng WC & Lipson JG (2004) The cultural context of suicide stigma in Taiwan. *Qualitative Health Research* 14, 345–358.
- Tzeng WC & Lipson JG (2005) Health professionals' perspectives of suicide in Taiwan. *Issues in Mental Health Nursing* 26, 451–463.
- Wang XL, Sheng L & Fang YQ (1998) A survey on suicide in China during the past decade. *Hong Kong Journal of Psychiatry* 8, 9–12.
- Wang RH, Hsu HY, Lin SY, Cheng CP & Lee SL (2010) Risk behaviours among early adolescents: risk and protective factors. *Journal of Advanced Nursing* 66, 313–323.
- World Health Organisation (2012) *Suicide Prevention (SUPRE)*. Available at: http://www.who.int/mental_health/prevention/suicide/suicideprevent/en/index.html# (accessed 16 October 2012).
- World Health Organisation Group (1997) *WHOQOL Measuring Quality of Life*. World Health Organization, Geneva.
- Xiang YT, Weng YZ, Leung CM, Tang WK & Ungvari GS (2008) Sociodemographic and clinical correlates of lifetime suicide attempts and their impact on quality of life in Chinese schizophrenia patients. *Journal of Psychiatric Research* 42, 495–502.
- Yao KP (2002) Development and applications of the WHOQOL-Taiwan version. *Formosan Journal of Medicine* 6, 193–200.
- Yen CF, Chen CC, Lee Y, Tang TC, Ko CH & Yen JY (2009) Association between quality of life and self-stigma, insight, and adverse effects of medication in patients with depressive disorders. *Depression and Anxiety* 26, 1033–1039.

The Journal of Clinical Nursing (JCN) is an international, peer reviewed journal that aims to promote a high standard of clinically related scholarship which supports the practice and discipline of nursing.

For further information and full author guidelines, please visit JCN on the Wiley Online Library website: <http://wileyonlinelibrary.com/journal/jocn>

Reasons to submit your paper to JCN:

High-impact forum: one of the world's most cited nursing journals, with an impact factor of 1.118 – ranked 30/95 (Nursing (Social Science)) and 34/97 Nursing (Science) in the 2011 Journal Citation Reports® (Thomson Reuters, 2011).

One of the most read nursing journals in the world: over 1.9 million full text accesses in 2011 and accessible in over 8000 libraries worldwide (including over 3500 in developing countries with free or low cost access).

Early View: fully citable online publication ahead of inclusion in an issue.

Fast and easy online submission: online submission at <http://mc.manuscriptcentral.com/jcnur>.

Positive publishing experience: rapid double-blind peer review with constructive feedback.

Online Open: the option to make your article freely and openly accessible to non-subscribers upon publication in Wiley Online Library, as well as the option to deposit the article in your preferred archive.