

Determinants of suicidal ideation in gynecological cancer patients

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Abstract

Objective: Gynecological cancer survivors are at increased risk of psychological problems including suicide risk. Suicidal ideation, which was thought to be precursor to suicide attempts, has not been well studied. This study aimed to investigate the prevalence, and determinants of suicidal ideation for women with gynecological cancer, and then to assess the effect of coping style and social support on suicidal ideation.

Methods: Patients with cervical, ovarian and endometrial cancers seen at Hunan Provincial Tumor Hospital from September 2012 to June 2013 were consecutively recruited and were asked to complete the Zung Self-Rating Depression Scale, Suicidal Ideation of Self-rating Scale, Medical Coping Modes Questionnaire and Social Support Rating Scale. Path analysis was used to examine the relationship among coping style, social support, depression symptoms and suicidal ideation.

Results: A total of 579 (579/623, 93.0%) gynecological cancer patients were enrolled in this study and completed all investigations between September 2012 and June 2013. Among them, 105 (18.1%) patients reported suicidal ideation, with the highest rate in patients with ovarian cancer (30.16%). Suicidal ideation was associated with depression symptoms, care providers, chemotherapy history and acceptance-resignation. Path analysis showed that the acceptance-resignation affected suicidal ideation directly as well as mediated by social support and depression symptoms, while confrontation and avoidance affected suicidal ideation entirely through social support and depression symptoms.

Conclusions: Suicidal ideation is high among patients with gynecological cancer, especially among ovarian cancer patients. Coping strategies such as confrontation and avoidance, and social support may be helpful for preventing suicidal ideation among them.

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Background

Gynecological cancers account for 21% of all cancers among women worldwide and over 26% in China [1]. Diagnosis of cancer itself and its subsequent treatment can both involve psychological trauma [2,3], leading to increased risk of committing suicide [4–6]. Incidence of suicide among the gynecological cancer population was 8.3 per 100,000 person-years higher than women among the general population [7], and suicide risk among women with gynecological cancer was 1.3 times higher than women with non-gynecological cancer [8]. It is therefore important to identify the risk and protective factors among women with gynecological cancer.

Suicidal ideation, defined as a desire to die with or without a specific plan, is a vital step and warrants greater research attention because it is a well-established precursor to suicide attempts [9,10]. Identification of patients with suicidal ideation would be of tremendous clinical

significance. It has been reported that the prevalence of suicidal ideation ranged from 0.8% to 71.4% in patients with cancer [11]. The risk factors associated with suicidal ideation in cancer patients include socio-demographic characteristic (gender), mental health (depression and hopelessness), physical health (impaired physical functioning and pain) and illness factors (illness type, time since diagnosis and prognosis of cancers) [11–15]. Little research has examined the buffering role of coping strategies and social support on suicidal ideation.

Coping strategies, served as moderators of psychosocial stress, have been consistently reported to be associated with suicidal behaviors [16,17] and made coping skill training program hold promise as a potential intervention for suicide [18]. Studies on middle-aged workers and adolescents found that those who reported at high suicidal risk use more emotion-focused (aimed at altering experiencing of negative emotion that results from stressful sources) and avoidance (aimed at orienting away from stress

sources) type strategies [10,19]. However, there has been little evidence as to how coping strategies relate to suicidal ideation in cancer patients.

Social support, defined as the general availability of family members and friends that provide psychological and material resources, has shown beneficial effect in health maintenance [20]. Studies have indicated that lower social support was associated with risk of suicidal ideation and suicide in general populations [21,22]. Recent evidence also suggested that social support played a protective role in cancer patients [23,24].

According to Kraemer, buffering factors can also occur or, potentially, work together in an integrated model [25]. A study in college students suggested that positive coping strategy and higher social support had direct buffering effect on depression [26]. Other studies on youth and rural residents showed that the effect of coping strategies (emotional regulation and acceptance) and social support was mediated by reductions in depressive symptoms, leading to reduction in suicidal ideation [18,27]. It is unclear, however, how specific buffering factors work in conjunction with one another in cancer patients. A detailed understanding of the role of the multiple factors in suicidal ideation is needed for the development of effective interventions for suicide prevention. As far as to our acknowledgement, there is no study that has identified the effect of coping strategies and social support on suicidal ideation and focused specifically on women with gynecological cancer. This study aims to examine the prevalence, and social-demographic, and clinical characteristics of suicidal ideation as well as effects of coping strategies and social support on suicidal ideation in patients with gynecological cancer. We also examined the potential mechanisms of coping style and social support in suicidal ideation using path analysis.

Materials and methods

Study overview and participants

This was a prospective study to investigate the risk factors and protective factors of suicidal ideation in patients with gynecological cancer. Between September 2012 and June 2013, all patients with gynecological cancer from Hunan Provincial Tumor Hospital, an affiliated Tumor Hospital of Xiangya Medical School of Central South University, were approached for participation of the study. Inclusion criteria were (a) primary diagnosis of cervical cancer, ovarian cancer or endometrial cancer by histological examination; (b) age over 18 years and (c) capacity to understand the contents of the study. Patients who had the following comorbid conditions identified by interview or medical record review including psychosis, alcohol and substance dependence were excluded. This study was approved by the Central South University institutional

review board. All participants were provided with written informed consent.

Data collection

Demographic data including age, education level, employment status, marital status and care providers were collected by structured interview. Months since cancer diagnosis, cancer stage, chemotherapy history, radiotherapy history and surgery history were also recorded. Pain was measured using one item (questions 4) of the Chinese Version of the Functional Assessment of Cancer Therapy-General Version 4 (FACT-G) [28]. The response to the question ranges from 0 'not at all' to 4 'always'. Cancer staging was performed using International Federation of Gynecology and Obstetrics (FIGO) staging system [29].

Psychological characteristics including suicidal ideation, depression symptoms, coping strategies and social support were obtained by structured interview. The presence of suicide ideation was assessed by using Suicidal Ideation of Self-rating Scale (SIOSS) which was developed by Chinese scholars based on Suicidal Ideation Screen Questionnaires widely used worldwide [30]. This scale comprises 26 items and contains four domains, namely optimism, desperation, sleep and dissimulation. Each question scores 0 or 1, and the sum of three domain scores (optimism, desperation and sleep) reflects the intensity of suicidal ideation. Higher scores denote greater possibility of the presence of suicidal ideation, with scores ≥ 12 indicative of a positive screen for suicidal ideation. The dissimulation domain score reflects the dependability of the results, and a score ≥ 4 indicates an unreliable result. SIOSS is a widely used scale with good reliability and validity [31]. The internal consistency of Cronbach's α was 0.85. Depression was evaluated using Zung Self-Rating Depression Scale (ZSDS) which is the most frequently used self-administered scale [32]. The ZSDS is a 20-item quantitative measurement of symptoms of depression with well-established reliability and validity in a sample of cancer patients [33]. The patients rated each item regarding how they felt during the week preceding. Item responses are ranked from 1 'no times' to 4 'all the time'. The raw score ranged from 20 to 80 with a cutoff value greater than 40 indicating significant depressive symptoms. Patients' coping responses were evaluated by the Medical Coping Modes Questionnaire (MCMQ) which was specifically designed to assess three illness-related coping responses: acceptance-resignation, confrontation and avoidance. [34]. The Chinese version of MCMQ contains 19 items, and each question scores 1–4 in Likert style [35]. Use of acceptance-resignation as a coping strategy (who rated higher score on items like 'did you often feel that you are hopeless in recovery?', 'did you resign yourself to your fate about the disease?') suggests strong elements of helplessness, hopelessness and surrendering to disease.

While confrontation coping (who rated higher score on item like how often do you ask your doctor for advice about what to do concerning your illness?) was supposed to be linked with those who confront disease with an optimistic attitude and are likely to seek social support and information help from others. Avoidance is most prominent among those who tend to distract themselves from disease (who rated higher score on item like 'When thought of your disease, would you do something else to divert your attention from it?'). Study has shown that the coefficient of internal consistency for three types of coping responses was 0.60–0.76 and the test–retest and Cronbach's alpha coefficient was 0.64–0.85[35]. Social support was assessed by the Social Support Rating Scale (SSRS) [36].

Statistical analysis

Univariate analyses for suicidal ideation were conducted by chi-squared test or *t*-tests. To determine the factors independently associated with suicidal ideation, multiple logistic regression was conducted. Any factors significantly associated with suicidal ideation in univariate analyses ($p < 0.05$) were then entered into a stepwise forward model of logistic regression to assess independence. Path analysis is an extension of the regression model that aimed to fit of the correlation matrix against two or more causal models. The criteria for a good fit included a non-significant chi-square test statistic, RMSEA (Root Mean Square Error of Approximation) value less than 0.05 and values of comparative fit index (CFI) and Tucker–Lewis Index (TLI) greater than 0.90[18]. Data analyses were carried out using SPSS 13.0, and path analysis was conducted using AMOS 18.0 Structural equation modeling (SEM) software from SPSS. All statistical tests were bilateral probability; $p < 0.05$ for the difference was accepted as statistically significant.

Results

Patients' characteristics by suicidal ideation

A total of 579 (579/623, 93.0%) patients were included with age ranged from 18 to 78 years. Among these patients, the most frequent cancer site was cervical cancer (397, 68.6%), followed by ovarian cancer (126, 21.8%) and endometrial cancer (56, 9.7%). Suicidal ideation was present in 105 (18.1%) of the 579 participants. Patients with ovarian cancer were the most frequently to report suicidal ideation (30.16%), cervical and endometrial cancer shared similar prevalence in this sample, with 15.1% for cervix and 12.5% for endometrial.

In the univariate analyses, factors significantly associated with suicidal ideation in patients with gynecological cancer included care provider, length of cancer diagnoses, history of chemotherapy and surgery, cancer stage,

depression symptoms, social support and acceptance-resignation (Table 1).

Multiple logistic regression analysis showed that care providers, depression symptoms, chemotherapy history and acceptance-resignation were independently associated with suicidal ideation (Table 2).

Path analysis results

The hypothesized path model, built on a basis depending on research literature and the aim of our study presented in Figure 1, was tested. The model fit was good, $\chi^2(7) = 13.181$, $p = 0.068$; CFI = 0.992; RMSEA = 0.039. The significant paths along with the corresponding standardized coefficients were presented in Figure 2.

All coping strategies significantly predicted mental health outcomes including depression symptoms and suicidal ideation. The effects of confrontation and avoidance were entirely channeled through social support, with significant carry-over effects on reductions in depression symptoms as well as suicidal ideation. In comparison, acceptance-resignation predicted increase in suicidal ideation directly as well as indirectly, and its indirect effect was channeled through social support and depression symptoms. Among all of the factors, acceptance-resignation was tested to be the most important predictor for suicidal ideation with total effects reaching 0.604. Social support was related to change in mental health outcomes. It directly predicted reduction in depressive symptoms and had significant carry-over effects on suicidal ideation. In a word, the coping strategies can affect suicidal ideation directly as well as mediated by social support and depression symptoms.

Discussion

To the best of our knowledge, this is the first study to describe the prevalence of suicidal ideation in a sample of patients with gynecological cancer. The observed prevalence's of suicidal ideation in this prospective study was 18.1%, which was much higher than those in the general populations: 2.2% in a community-dwelling of the 1159 Chinese seniors [37]. Schneider and Shenassa found a comparable rate of suicidal ideation: 17.1% in a sample of population-based cancer patients [38]. On the other hand, in a semi-structured interview study conducted by Madeira, 34.6% of cancer patients referred for psychiatric consultation expressed death-related thoughts, much higher than our result [39]. In Madeira's study, nearly half of subjects were diagnosed with major depressive episodes, an important risk factor for suicide ideation, which may explain the higher rate of suicidal ideation. Compared to cervical and endometrial cancer, patients with ovarian cancer had the highest prevalence of suicidal ideation, which was consistent with a previous study reporting that

Table 1. Sociodemographic and clinical characteristics of gynecological cancer patients with and without SI

	Total N(%, N = 579)	Patients with SI N(%, N = 105)	Patients without SI N(%, N = 474)	χ^2/t -test	P
Age(year)				1.645	0.801
18–30(not included)	18(3.1)	3(2.9)	15(3.2)		
30–40	85(14.7)	13(12.4)	72(15.2)		
40–50	284(49.0)	56(53.3)	228(48.1)		
50–60	141(24.4)	26(24.8)	115(24.2)		
≥ 60	51(8.8)	7(6.6)	44(9.3)		
Education				3.943	0.139
Elementary school and below	153(26.4)	30(28.6)	123(25.9)		
High school	383(66.1)	72(68.6)	311(65.6)		
College and above	43(7.5)	3(2.8)	40(8.5)		
Marital status				3.579	0.058
Married	542(93.6)	94(89.5)	448(94.5)		
Non-married	37(6.4)	11(10.5)	26(5.5)		
Employment status				0.268	0.605
Employed	407(70.3)	76(72.4)	331(69.8)		
Unemployed	172(29.7)	29(27.6)	143(30.2)		
Primary care providers				4.505	0.034
Spouse or child	514(88.8)	87(82.9)	427(90.1)		
Others	65(11.2)	18(17.1)	47(9.9)		
Months since cancer diagnosis				15.905	0.003
≤ 1 (included)	285(49.2)	39(37.1)	246(51.9)		
1–3	148(25.6)	27(25.7)	121(25.5)		
3–6	79(13.6)	20(19.1)	59(12.5)		
6–12	13(2.3)	1(1.0)	12(2.5)		
> 12	54(9.3)	18(17.1)	36(7.6)		
Chemotherapy history	323(55.8)	73(69.5)	250(52.7)	9.814	0.002
Radiotherapy history	149(25.7)	29(27.6)	120(25.3)	0.238	0.625
Surgery history	266(45.9)	61(58.1)	205(43.3)	7.613	0.006
Cancer stage				11.335	0.010
I	248(42.8)	34(32.4)	214(45.2)		
II	179(30.9)	34(32.4)	145(30.6)		
III	130(22.5)	35(33.3)	95(20.0)		
IV	22(3.8)	2(1.9)	20(4.2)		
Suicidal ideation (score) ^a	7.23 \pm 4.59	14.62 \pm 2.09	5.59 \pm 3.15	–27.980	0.000
Depression symptoms	264(45.6)	84(80.0)	180(38.0)	61.200	0.000
Pain (score) ^a	1.6 \pm 0.9	1.7 \pm 1.0	1.6 \pm 0.9	–1.280	0.152
Social support (score) ^a	41.3 \pm 5.6	39.3 \pm 5.6	41.7 \pm 5.5	3.992	0.000
Confrontation (score) ^a	19.5 \pm 3.8	19.9 \pm 3.9	19.4 \pm 3.8	–1.209	0.227
Acceptance-resignation (score) ^a	8.6 \pm 2.8	11.1 \pm 2.7	8.0 \pm 2.5	–11.561	0.000
Avoidance (score) ^a	16.5 \pm 2.7	16.5 \pm 2.4	16.5 \pm 2.8	–0.106	0.915

SI, suicidal ideation;

^aMean \pm SD.**Table 2.** Adjusted odds ratios (95%CI) of factors independently associated with suicidal ideation in patients with gynecological cancer

	Odds ratio (95%CI)	P value
Cared by spouse or child	0.485(0.239, 0.984)	0.045
Chemotherapy history	1.764(1.052, 2.958)	0.031
Depression symptoms	4.251(2.446, 7.391)	0.000
Higher acceptance-resignation (one score increase)	1.470(1.329, 1.626)	0.000
–2 Log likelihood = 401.329, Nagelkerke R Square = 0.366		

The above three adjusted variables with p-value are 'cared by others', 'have no chemotherapy history' and 'have no depression symptoms' respectively.

suicide rate was highest in patients with ovarian cancer among a sample of gynecologic cancer in the United States [7].

Our study suggested that psychosocial factors such as depression symptoms, and acceptance-resignation coping strategy, rather than biomedical factors (such as cancer stage and time since diagnosis known to be associated with suicidal ideation in cancer population [12,15]), were independently associated with suicidal ideation. This may be explained, at least in part, by our study population. It has been reported that an advanced cancer stage was significantly associated with suicidal ideation in males, but not in females [40]. In a study examining the use of

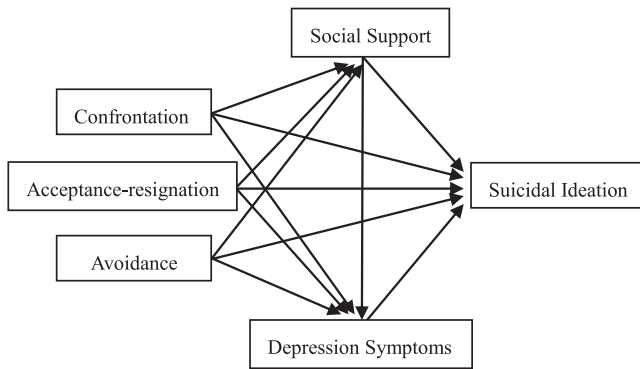


Figure 1. Hypothesized path model for coping strategies, social support, depression symptoms and suicidal ideation

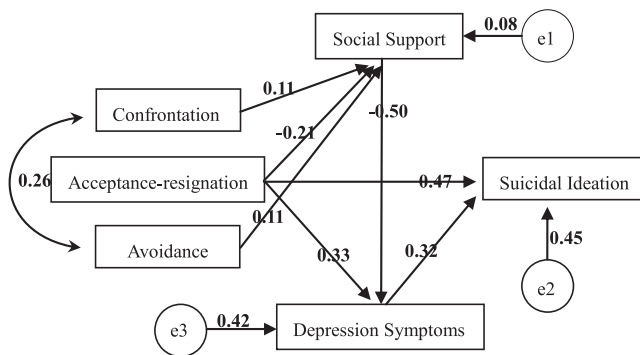


Figure 2. Tested path model for coping strategies, social support, depression symptoms and suicidal ideation. Note. Standardized coefficient values before the slash were given and all effects were significant. Model fit indices, $\chi^2(7) = 13.181$, $p = 0.068$; CFI = 0.992; RMSEA (90% CI) = 0.039. e1, e2 and e3 represented residual error for the social support, depression symptoms and suicidal ideation, respectively

suicide prevention centers among general population found that females were more likely to seek help and were benefited more from contact with these facilities [41].

In our study, almost half of patients had their cancer diagnosis within one month and more than one-fourth within one to three months. Newly diagnosed cancer and surgery may cause severe emotional distress [2]. Therefore, depression may prevail in other factors in the relationships with suicidal ideation at early stage which has been demonstrated in a previous study [12]. Effective coping strategies and social support have been perceived as important protective buffers for psychosocial distress, and their protective role in depression has also been demonstrated in various cancer samples [42–44]. In our study, the association between social support and suicidal ideation disappeared in the multiple logistic analysis; this may be caused by the fact that social support executes its effect on suicidal ideation through its impact on depression. Given that families, especially spouse and children

have been the most important source of social support [45], it is not surprising to see patients cared by their spouse or children exposed to lower risk of suicidal ideation.

Our study provides robust evidence of linkages between these psychosocial factors and changes in mental health outcomes, and helps to delineate the distinct pathways through which the coping strategies affect suicidal ideation, among female with gynecological cancer. More specifically, our findings indicate that the use of confrontation and avoidance predicted small but significant reduction in suicidal ideation, with the effect transmitted through social support. In contrast, the use of acceptance-resignation increased the risk of suicidal ideation by direct pathway as well as mediated. Confrontation is generally supposed to be a beneficial coping response [35]. Connor-Smith showed that distraction tended to confer mental health benefits when the stressors were relatively unalterable, but reliance on resignation coping was associated with poor adjustment and behavioral-emotional problems [46]. Patients who used confrontation and avoidance coping strategies may release themselves from suffering by sharing experience with companions, and distracting their attention to therapy or something they are interested in. As a result, they got more social support and better mental health. While those who use coping of acceptance-resignation usually felt hopeless, did nothing but bow to the inevitable, and were full of negative emotion. So it is not a surprise that acceptance-resignation increases suicidal ideation. Though the path analysis was often used to explore the causal models in two or more variables, it is should still be careful to interpret the causal relationship between coping strategies and suicidal ideation in a cross-sectional study. Despite all these limitations, our findings strengthen evidences to the coping-skill training programs and social support enhancing programs as promising supplements to current suicide prevention strategies, and thereby help to prevent the onset of suicidal behavior [16,21].

Our study has several limitations. Some important factors such as family history of suicide, religions and ethnic group, social media, personal disorders and socioeconomic status may also trigger suicidal ideation and attempt in human life, but they were not included in this study. Another important problem is the inability to assess the dynamic change of suicidal ideation as the assessment point was limited to one point. Although commonly used in observational research, this approach is unlikely fully to reflect complex syndrome trajectories, and further follow-up research would be required to ascertain the prevalence of suicidal ideation at different time points. In addition, the subjects were recruited from a tumor hospital, and all of them were inpatients. This tends to contain patients who want more intensive and professional treatment, suggesting that a sampling bias may exists and ignores the

outpatients considering that some cancer outpatients also have suicidality[47].

Conclusion

Suicidal ideation is common in patients with gynecological cancer, especially among ovarian cancer patients. Coping strategies, such as confrontation and avoidance, and social support may be helpful for preventing suicidal ideation in patients with gynecological cancer. While

acceptance-resignation coping and depression symptoms can increase the risk of suicidal ideation.

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Conflict of interest

No conflicts of interest declared.

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