

## Retrospective Study

## Investigation of the quality of life, mental status in patients with gynecological cancer and its influencing factors

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**Specialty type:** Psychiatry**Provenance and peer review:**

Unsolicited article; Externally peer reviewed.

**Peer-review model:** Single blind**Peer-review report's classification****Scientific Quality:** Grade B, Grade C**Novelty:** Grade C, Grade C**Creativity or Innovation:** Grade B, Grade C**Scientific Significance:** Grade B, Grade B**P-Reviewer:** Giannouli V; Young AH**Received:** May 7, 2024**Revised:** June 7, 2024**Accepted:** June 14, 2024**Published online:** July 19, 2024**Processing time:** 65 Days and 19.9 Hours**Hai-Xia Shang, Wen-Ting Ning, Jin-Fen Sun, Nan Guo, Xin Guo, Jan-Nan Zhang, Hong-Xin Yu, Su-Hui Wu**, Department of Gynaecology and Obstetrics, The Third Hospital of Shanxi Medical University, Shanxi Bethune Hospital, Shanxi Academy of Medical Sciences, Tongji Shanxi Hospital, Taiyuan 030032, Shanxi Province, China**Corresponding author:** Su-Hui Wu, PhD, Chief Physician, Professor, Department of Gynaecology and Obstetrics, The Third Hospital of Shanxi Medical University, Shanxi Bethune Hospital, Shanxi Academy of Medical Sciences, Tongji Shanxi Hospital, No. 99 Longcheng Street, Taiyuan 030032, Shanxi Province, China. [shx\\_mail2004@126.com](mailto:shx_mail2004@126.com)**Abstract****BACKGROUND**

Having a gynecological tumor or undergoing treatment can be a traumatic experience for women, as it affects their self-image and sexual relationships and can lead to psychological reactions. Psychological adjustment following cancer occurrence remains a key issue among the survivors.

**AIM**

To examine the current status of quality of life (QoL), anxiety, and depression in patients with gynecological cancer and to analyze the factors associated with it.

**METHODS**

Data for 160 patients with gynecological malignancies treated at Shanxi Bethune Hospital from June 2020 to June 2023 were collected and analyzed retrospectively. Patients' QoL was assessed using the European Organization for Research on Treatment of Cancer Quality of Life Questionnaire Core 30 and the Functional Assessment of Cancer Therapy-General Questionnaire. Their emotional status was evaluated using the Self-Rating Anxiety/Depression Scale. The associated factors of anxiety and depression were analyzed.

**RESULTS**

The overall QoL score of the patients 6 months after surgery was  $76.39 \pm 3.63$  points. This included low levels of social and emotional function and severe fatigue and pain. The scores for physiological, functional, emotional, social, and family well-being exhibited an upward trend following surgery compared with those before surgery. One month after surgery, some patients experienced anxiety and depression, with an incidence of 18.75% and 18.13%, respectively. Logistic analysis revealed that good sleep was a protective factor against anxiety and

depression in patients with gynecological tumors, whereas physical pain was a risk factor.

### CONCLUSION

Patients with gynecological malignancies often experience anxiety and depression. By analyzing the factors that affect patients' QoL, effective nursing measures can be administered.

**Key Words:** Gynecological; Tumors; Quality of life; Anxiety; Depression

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**Core Tip:** Patients diagnosed with cancer experience various emotions. Up to now, numerous papers exploring the association and risk factors between various types of cancer and depressive/anxiety episodes have been published. However, the results of these studies remain inconsistent. The aim of this study was to evaluate the relationship between depression and anxiety mood in gynecological cancer and its risk factors.

**Citation:** Shang HX, Ning WT, Sun JF, Guo N, Guo X, Zhang JN, Yu HX, Wu SH. Investigation of the quality of life, mental status in patients with gynecological cancer and its influencing factors. *World J Psychiatry* 2024; 14(7): 1053-1061

**URL:** <https://www.wjgnet.com/2220-3206/full/v14/i7/1053.htm>

**DOI:** <https://dx.doi.org/10.5498/wjp.v14.i7.1053>

## INTRODUCTION

Gynecological malignancies are crucial as they affect the lives and health of women, accounting for 14.4% of new cancer cases among women worldwide[1]. The common types are cervical, ovarian, endometrial, and vaginal cancers[2-5], each of which has a specific symptom burden on the survivor's quality of life (QoL). Over the past few decades, the average life expectancy of patients with gynecologic cancers has increased with the continued development and adoption of interdisciplinary and interprofessional care in clinical practice[6]. Because of the specific location of gynecologic malignancies, surgery usually involves pelvic organ dissection, which results in greater mental stress and psychological pain in these patients compared with patients with other cancer types. This is in addition to the harm and adverse effects caused by surgery and chemoradiotherapy common to all cancer patients[7,8]. Treatment also affects the self-efficacy, QoL, and physical function of cancer patients[9]. Even after treatment, cancer survivors face various difficulties and challenges that affect their QoL, a term that describes the alteration and enhancement of life attributes.

Symptoms such as anxiety, depression, and fatigue are common in all cancer patients[10]. In addition to physical symptoms, patients often struggle with psychological problems[11]. In addition, cancer patients often lack confidence or the ability to effectively manage life after receiving cancer treatment; thus, more information is needed. These cancer-related sequelae may significantly compromise mental health and QoL. Anxiety and depression are a direct threat to the physical and mental health of patients, are very common in clinical practice, and are a major cause of death[12]. Depression and anxiety are more common in patients with cancer than in people without chronic medical conditions; however, the prevalence varies widely[13]. Among patients with cancer, the estimated prevalence of depression is 11%-57%, whereas that of anxiety is 6.5%-23%[14]. Therefore, examining the anxiety and depression status of patients with gynecological cancer and analyzing the influencing factors will be useful for targeted intervention in patients who experience anxiety and depression in clinical practice, avoiding or reducing further physical and mental health damage caused by anxiety or depression, improving patients' QoL, and prolonging their lives.

## MATERIALS AND METHODS

### Study population

Patients with gynecological malignancies admitted to Shanxi Bethune Hospital between June 2020 and June 2023 were enrolled as the research subjects for this retrospective analysis. The inclusion criteria were as follows: (1) Definite diagnosis of a gynecological malignancy; (2) Age > 18 years; (3) Expected survival > 6 months; (4) Karnofsky Performance Status score  $\geq$  60; (5) Certain cognitive level with no language communication barriers; and (6) Complete clinical data. The exclusion criteria were as follows: (1) Cancer concomitant with other major diseases; (2) Recent major traumatic or life events; (3) Serious mental disorders; and (4) Incomplete clinical data. Of the 171 questionnaires distributed, 160 valid ones were recovered, with a questionnaire recovery rate of 93.6%.

### Data collection

The survey was conducted in the gynecology ward by uniformly trained investigators in the form of face-to-face interviews.

**General information questionnaire:** The questionnaire was designed by the researcher and patient clinical data were collected, including age, tumor type, ethnicity, education level, annual household income, marital status, number of children born, and working status.

**QoL:** This survey was conducted on week 1 as well as 1-, 3-, and 6-months after surgery. The European Organization for Research and Treatment on Cancer (EORTC) Quality of Life Questionnaire Core 30 (QLQ-C30) and the Functional Assessment of Cancer Therapy-General Questionnaire (FACT-G) were used to assess QoL. The QLQ-C30 consists of 30 items covering five functional dimensions (physical, role, emotional, cognitive, and social functioning), three symptom dimensions (fatigue, nausea and vomiting, and pain), one global health status, and six single-item measures (dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial problems). Except for global health status, which was measured on a 7-point Likert scale, the items were graded on a 4-point Likert scale. The final score was linearly transformed, with a total score of 0-100 for each category. The higher the score in the functional and global health status dimensions, the better the QoL. Scores for symptom dimensions and single-item measures are inversely associated with QoL. The FACT-G scale is usually used to measure the QoL of ordinary cancer patients, with a total of 27 items from the following four dimensions: Physical (7 items), social/family (7 items), emotional (6 items), and functional well-being (7 items). Each item is graded on a scale of 0-4, with 0 being not at all, 1 being a little bit, 2 being somewhat, 3 being quite a bit, and 4 being very much. Based on the scoring method of the scale, the four dimensions and the total score are calculated and the total score range is 0-108 points. A higher score suggests better QoL for the research subject.

**Depression and anxiety:** Depression and anxiety in the patients were assessed on week 1 and 6-months after surgery using the self-rating depression scale (SDS) and self-rating anxiety scale (SAS), respectively. Based on the results using Chinese norms, an SDS score of > 53 is considered depression and an SAS score > 50 indicates anxiety, with higher scores of both representing a higher level of anxiety or depression.

### Statistical analyses

SPSS 25.0 was used to analyze the data. Continuous variables (mean  $\pm$  SD) were comparatively analyzed between groups using a t-test and among groups using one-way analysis of variance. The counting data were expressed as percentages, and the  $\chi^2$  test was used. Based on univariate analysis, multivariate logistic regression was used to analyze the influencing factors of anxiety and depression. Tests were two-tailed with  $P < 0.05$  indicating statistical significance.

## RESULTS

### EORTC QLQ-C30 scores of gynecological tumor patients

Compared with the indicators before surgery, the scores of physical, role, emotional, cognitive, and social functioning of postsurgical patients with gynecological cancer exhibited an overall increasing trend (mean global health status:  $76.39 \pm 3.63$  points), of which the level of social and emotional functioning was low. For symptom dimensions, pain had the highest score ( $26.25 \pm 6.46$  points), followed by insomnia ( $21.83 \pm 4.95$  points) and fatigue ( $21.44 \pm 2.73$  points). Meanwhile, the score for financial problems was also high (Table 1).

### FACT-G scores of patients with gynecologic tumors

In the FACT-G scoring, the physical, functional, emotional, social, and family well-being scores all exhibited a significant upward trend in patients at 1 week, as well as 1-, 3-, and 6-month after surgery compared with before surgery ( $P < 0.05$ ; Table 2).

### SAS and SDS scores

The SDS score for gynecological cancer patients was  $41.31 \pm 9.88$  one week after surgery and  $42.28 \pm 11.53$  one month after surgery, with no statistical significance ( $P > 0.05$ ). In contrast, a significant difference was observed in SAS scores at 1 week ( $37.98 \pm 8.92$ ) and 1 month ( $43.07 \pm 8.58$ ) after surgery ( $P < 0.05$ ; Figure 1).

### Univariate analysis of the influencing factors of anxiety and depression

Among the 160 gynecological cancer patients, 30 (18.75%) had anxiety, 29 (18.13%) had depression, and 17 (10.63%) had both anxiety and depression. Univariate analysis of the influencing factors of anxiety and depression revealed that annual household income, working status, body pain, and sleep duration had a significant impact on anxiety (Table 3), whereas annual household income, body pain, and sleep duration significantly influenced depression (Table 4).

### Logistic regression analysis of influencing factors of anxiety and depression in patients with gynecological cancer

Multivariate regression analysis revealed that body pain was a risk factor for anxiety and depression, whereas sleep duration  $\geq 6$  h was a protective factor (Table 5).

## DISCUSSION

In general hospitals in China, physical illness often coexists with anxiety and depression[15]. Although anxiety and depression may be early symptoms of physical diseases, they are associated with physical diseases and have various effects on the diseases themselves. The incidence of anxiety was 32.0%-40.0% and that of depression was 25.8%-58.0% in

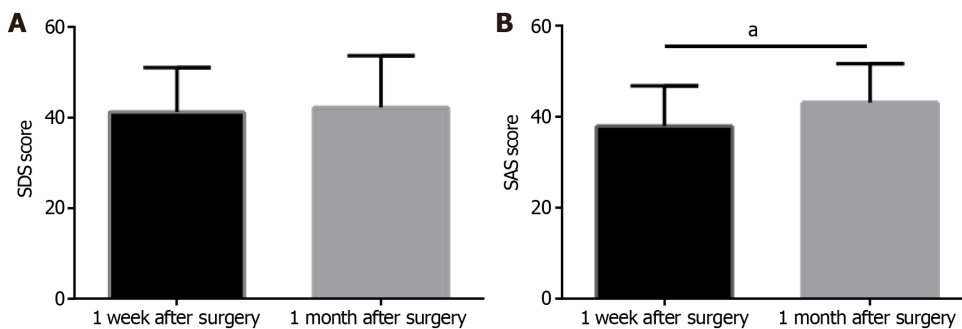
**Table 1 European Organization for Research and Treatment on Cancer Quality of Life Questionnaire Core 30 scores of patients**

<i>n</i> = 160	1 week after surgery	1 month after surgery	3 months after surgery	6 months after surgery	<i>F</i>	<i>P</i> value
Physical functioning	80.31 ± 4.28	84.14 ± 4.52	87.04 ± 4.05	89.96 ± 5.16	133.0	< 0.0001
Role functioning	81.77 ± 5.20	83.73 ± 4.61	86.72 ± 6.34	89.84 ± 4.50	73.25	< 0.0001
Emotional functioning	65.59 ± 4.01	68.17 ± 4.27	70.61 ± 7.34	73.99 ± 7.14	58.90	< 0.0001
Cognitive functioning	83.87 ± 6.09	86.53 ± 5.06	87.91 ± 4.68	88.74 ± 5.09	26.39	< 0.0001
Social functioning	64.09 ± 3.77	66.20 ± 5.74	69.39 ± 2.16	70.38 ± 3.60	82.90	< 0.0001
Global health status	65.49 ± 5.75	69.01 ± 4.70	72.33 ± 3.37	76.39 ± 3.63	174.0	< 0.0001
Fatigue	18.71 ± 1.17	19.58 ± 1.46	20.61 ± 2.33	21.44 ± 2.73	55.82	< 0.0001
Nausea and vomiting	10.17 ± 1.94	10.13 ± 1.83	8.94 ± 1.68	7.44 ± 1.27	91.87	< 0.0001
Pain	23.36 ± 3.55	24.38 ± 5.01	25.30 ± 3.05	26.25 ± 6.46	11.02	< 0.0001
Dyspnea	8.28 ± 1.03	7.97 ± 1.14	7.46 ± 0.93	6.82 ± 1.09	59.47	< 0.0001
Insomnia	19.89 ± 3.82	21.40 ± 4.43	21.81 ± 4.17	21.83 ± 4.95	7.033	0.0001
Appetite loss	6.33 ± 1.17	6.18 ± 1.12	5.44 ± 0.81	5.64 ± 1.04	26.43	< 0.0001
Constipation	4.50 ± 0.56	4.78 ± 0.47	4.25 ± 0.58	4.16 ± 0.84	31.88	< 0.0001
Diarrhea	3.76 ± 0.62	3.71 ± 0.77	3.54 ± 0.73	3.47 ± 0.58	6.585	0.0002
Financial problems	50.65 ± 5.60	52.54 ± 4.52	54.63 ± 5.47	54.98 ± 5.01	24.26	< 0.0001

**Table 2 Functional Assessment of Cancer Therapy-General Questionnaire scores of patients**

	1 week after surgery	1 month after surgery	3 months after surgery	6 months after surgery	<i>F</i>	<i>P</i> value
Physical well-being	20.19 ± 1.30	21.61 ± 1.47	23.69 ± 1.57	24.84 ± 1.26	351.0	< 0.0001
Social and family well-being	13.73 ± 1.40	18.17 ± 1.19	19.46 ± 1.23	20.17 ± 1.29	124.3	< 0.0001
Emotional well-being	18.24 ± 1.36	19.34 ± 1.11	20.24 ± 1.31	21.28 ± 1.38	159.1	< 0.0001
Functional well-being	14.58 ± 1.08	14.81 ± 1.07	16.13 ± 1.25	18.66 ± 1.38	387.7	< 0.0001
FACT-G total score	70.74 ± 2.43	73.93 ± 2.24	79.52 ± 2.86	84.94 ± 2.78	934.5	< 0.0001

FACT-G: Functional Assessment of Cancer Therapy-General Questionnaire.



**Figure 1 Self-rating anxiety scale and self-rating depression scale of patients.** A: Self-rating depression scale scores of patients 1 week and 1 month after surgery; B: Self-rating anxiety scale scores of patients 1 week and 1 month after surgery.<sup>a</sup>*P* < 0.0001. SDS: Self-rating depression scale; SAS: Self-rating anxiety scale.

Chinese patients with malignancies. A survey of 3497 adults with anxiety and depression in China revealed statistically higher rates of comorbid anxiety and depression among cancer patients than among adults without cancer (49.69% *vs* 18.37%; 54.90% *vs* 17.50%)[16]. This suggests a high incidence of anxiety and depression among patients with malignancies in China. To effectively treat malignancies and enhance the QoL in patients with cancer, considerable attention should be paid to the prevention and treatment of anxiety and depression.

**Table 3 Univariate analysis of influencing factors of anxiety**

	Anxiety (n = 30)	Non-anxiety (n = 130)	$\chi^2$	P value
Age (years)			0.401	0.527
< 45	14	69		
≥ 45	16	61		
Tumor type			0.489	0.783
Carcinoma of the cervix	10	48		
Carcinoma of the vulva	5	26		
Endometrial carcinoma	15	56		
Ethnicity			0.036	0.849
Han	20	89		
Ethnic minorities	10	41		
Education level			0.312	0.577
High school and below	17	87		
Bachelor's degree or above	13	43		
Residence			0.041	0.839
Rural	16	72		
Urban	14	58		
Payment mode for medical expenses			0.173	0.677
Medical insurance payouts	22	100		
Out-of-pocket payment	8	30		
Annual household income (ten thousand CNY)			9.842	0.002
< 5	20	46		
≥ 5	10	84		
Marital status			0.390	0.532
Married	19	90		
Unmarried, divorced, or widowed	11	40		
Number of children born			2.342	0.310
None	5	39		
1	16	62		
≥ 2	9	29		
Working status			6.333	0.012
Employed	14	92		
Unemployed or resigned	16	38		
Body pain			16.381	< 0.0001
With	22	43		
Without	8	87		
Daily sleep duration (hour)			15.511	< 0.0001
< 6	20	37		
≥ 6	10	93		

**Table 4 Univariate analysis of influencing factors of depression**

	Depression (n = 29)	Non-depressive (n = 131)	$\chi^2$	P value
Age (years)			1.563	0.211
< 45	12	71		
≥ 45	17	60		
Tumor type			0.064	0.969
Carcinoma of the cervix	10	48		
Carcinoma of the vulva	6	25		
Endometrial carcinoma	13	58		
Ethnicity			0.111	0.739
Han	19	90		
Ethnic minorities	10	41		
Education level			5.985	0.014
High school and below	8	69		
Bachelor's degree or above	21	62		
Residence			0.188	0.665
Rural	17	71		
Urban	12	60		
Payment mode for medical expenses			0.183	0.669
Medical insurance payouts	23	99		
Out-of-pocket payment	6	32		
Annual household income (ten thousand CNY)			4.410	0.036
< 5	17	49		
≥ 5	12	82		
Marital status			0.300	0.584
Married	21	88		
Single, divorced, or widowed	8	43		
Number of children born			0.204	0.903
None	8	36		
1	15	63		
≥ 2	6	32		
Working status			0.063	0.801
Employed	19	89		
Unemployed or resigned	10	42		
Body pain			30.511	< 0.0001
Yes	25	40		
No	4	91		
Daily sleep duration (hour)			25.011	< 0.0001
< 6	22	35		
≥ 6	7	96		

**Table 5** Logistic regression analysis of influencing factors of anxiety and depression

Variables	$\beta$	SE	Wald	P value	HR	95%CI
Anxiety						
Annual household income $\geq$ 50000 CNY	-0.792	0.481	2.710	0.100	0.453	0.176-1.163
Employed	-0.853	0.500	2.915	0.088	0.426	0.160-1.134
Presence of body pain	1.551	0.486	10.172	0.001	4.716	1.818-12.232
Sleep duration $\geq$ 6 hours	-1.581	0.496	10.147	0.001	0.206	0.078-0.544
Depression						
Educational level: Bachelor's degree or above	0.461	0.563	0.671	0.413	1.586	0.526-4.784
Presence of body pain	2.861	0.626	20.455	0.000	16.964	4.974-57.857
Sleep duration $\geq$ 6 hours	-2.278	0.572	15.861	0.000	0.103	0.033-0.315

$\beta$ : Intercept; SE: Standard error; Wald: Chi-square value; HR: Hazard ratio; 95%CI: 95% confidence interval.

Anxiety, depression, and concurrent anxiety and depression were documented in 30 (18.75%), 29 (18.13%), and 17 (10.63%) of the 160 patients with gynecological cancer in this study, respectively. Six months after surgery, the global health status of these patients was  $76.39 \pm 3.63$ , in which the levels of social and emotional functioning were low and the symptoms of fatigue and pain were serious. In terms of the FACT-G scale, the scores of related parameters, such as physical, functional, emotional, social, and family well-being, exhibited an upward trend; however, the average mental health level of patients was relatively low after 1 month of surgery, which may be because of the transition from the ignorance period (incomplete understanding of the condition) to depression period (fully aware of the severity of the condition and developing obvious negative emotions) or the transition from the acceptance period (psychologically forced to accept) to loss period (falling into a pessimistic and desperate state). With continued treatment and time, physical functioning significantly improved at 3 months following surgery, and patients entered the recognition or acceptance period. After 6 months, the patients gradually entered the adaptation period, during which their mental health significantly improved.

In addition, we found that good sleep status was a protective factor for anxiety and depression in patients with gynecological cancer, whereas body pain was a risk factor. Sleep disturbance is a common and significant complaint in patients with cancer, with up to 95% complaining of sleep disturbance/disability during diagnosis, treatment, and even after surviving 10 years[17]. Savard *et al*[18] conducted a study on cancer survivors and found that 52% had difficulty sleeping, with 58% reporting cancer-induced or exacerbated sleep problems. In a study by Hajj *et al*[19], higher levels of anxiety and depression were observed in patients with breast cancer with cognitive impairment and poor sleep quality/insomnia. Therefore, good sleep quality and duration are protective factors against anxiety and depression in patients with gynecological cancer. Cancer pain is a multidimensional factor that goes far beyond a nociceptive biochemical signal, with up to half of all cancer patients regularly experiencing pain. Because of its complex etiology, pain manifests as nociceptive, neuropathic, nociceptive, and psychogenic[20,21]. Pain has a significant impact on overall QoL by affecting physical, psychological, and spiritual aspects[22]. In a study of the Austrian population by Unsel *et al*[23], increased pain levels were strongly associated with psychiatric symptoms in patients with cancer.

This study have several limitations. First, this was a retrospective study, which did not allow the randomization of patients in either group. Thus, the similarity of patients in groups is jeopardized and potentially results in selection bias. Moreover, this study had a small sample size from a single-center study, which may have resulted in differences between both groups. Second, the treatment variability should have been mentioned. This study did not account for variations in treatment modalities, such as surgery type, chemotherapy regimens, or radiation therapy. These treatments can differ in their efficacy, side effects, and impact on QoL, anxiety, and depression. Third, the follow-up time was too short to determine long-term outcomes. A longer follow-up period would provide a more comprehensive understanding of the observed changes in outcomes over time. Fourth, the study solely focused on quantitative measures, such as questionnaires. The absence of qualitative data, such as patient interviews or open-ended questions, limits the opportunity to gain further insight into the patient's experiences and perspectives regarding QoL, anxiety, and depression. Therefore, well-designed, randomized, and controlled trials with prospective data collection, long-term follow-up, and sample size calculation are required to confirm our findings.

## CONCLUSION

In summary, patients with gynecological malignancies often experience anxiety and depression. By analyzing the factors that affect their QoL, effective nursing measures may be provided to improve QoL. Mental health treatment options for such women should be strengthened to reduce the burden of increased mental symptoms.

## FOOTNOTES

**Author contributions:** Shang HX and Wu SH conceived and designed research; Shang HX, Ning WT, Sun JF, Guo N, Guo X, Zhang JN and Yu HX collected data and conducted research; Shang HX analyzed and interpreted data; Shang HX and Wu SH wrote the initial draft; Shang HX revised the manuscript; all authors read and approved the final version of the manuscript.

**Institutional review board statement:** This study was approved by the Ethic Committee of Shanxi Bethune Hospital (Approval No. YXLL-2023-053).

**Informed consent statement:** All study participants, or their legal guardian, provided informed written consent prior to study enrollment.

**Conflict-of-interest statement:** The authors declare no conflict of interest.

**Data sharing statement:** No additional data are available.

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**S-Editor:** Lin C

**L-Editor:** A

**P-Editor:** Zhang L

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