Article

Application Effects of Feedback-Based Health Education Combined With Psychological Support Nursing Based on the Rosenthal Effect in Patients With Postoperative Anxiety and Depression Following Gynecological Malignancy Surgery

Huiwen Dong[1]
Nan Xu[1]
Weiping Li[1,*]

[1]Department of Gynecology, Qingdao Municipal Hospital, 266000 Qingdao, Shandong, China

Abstract

Background: To investigate the application effects of feedback-based health education combined with psychological support nursing, based on the Rosenthal effect, in patients experiencing anxiety and depression after gynecological malignancy surgery.

Methods: This retrospective study included 150 patients treated at Qingdao Municipal Hospital (September 2023–September 2025), divided into a control group (n = 75, routine care) and a study group (n = 75, combined intervention). Outcomes assessed at baseline and 3 months post-care included negative emotions (Cancer Fatigue Scale (CFS), Depression Anxiety and Stress Scale-21 (DASS-C21)), psychological resilience (10-item Connor-Davidson Resilience Scale (CD-RISC-10)), post-traumatic growth (Posttraumatic Growth Inventory (PTGI)), self-disclosure (Distress Disclosure Index (DDI)), coping modes (Medical Coping Modes Questionnaire (MCMQ)), self-care agency (Exercise of Self-Care Agency Scale (ESCA)), and spiritual well-being (European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Spiritual Well-Being 32 (EORTC QLQ-SWB32)). Two-way repeated-measures analysis of variance (ANOVA) with Bonferroni correction was used.

Results: Using two-way repeated-measures ANOVA with Bonferroni post-hoc multiple comparison correction, intragroup comparisons revealed significant post-care reductions in CFS scores, all DASS-C21 subscale scores, and the avoidance and resignation domains of the MCMQ relative to baseline values in both cohorts (all adjusted $p < 0.001$). Concurrently, marked elevations were observed in scores for the CD-RISC-10, PTGI, DDI, the MCMQ confrontation domain, ESCA, and all domains of the EORTC QLQ-SWB32 within each group post-treatment (all adjusted $p < 0.001$). Intergroup analysis at the post-care timepoint indicated that patients in the study group achieved significantly lower scores on the CFS, DASS-C21 subscales, and the MCMQ avoidance and resignation subscales, coupled with significantly superior scores on the CD-RISC-10, PTGI, DDI, MCMQ confrontation subscale, ESCA, and EORTC QLQ-SWB32 subscales, when compared to their counterparts in the control group (all adjusted $p < 0.001$).

Conclusions: The combined nursing protocol was associated with reduced negative emotions, improved coping, and enhanced resilience, growth, self-disclosure, spiritual well-being, and self-care in this population, suggesting clinical promise. However, causal inference is limited by the retrospective, non-randomized design.

Keywords

gynaecology; malignancy; anxiety; depression

Introduction

Gynecological malignancies, including cervical cancer (CC) and endometrial cancer (EC), are common clinical conditions that pose severe threats to the life and quality of life of women worldwide. According to a study by Zhu

Submitted: 10 April 2026 Revised: 7 July 2026 Accepted: 10 July 2026 Online First: 29 October 2026
*Corresponding author details: Weiping Li, Department of Gynecology, Qingdao Municipal Hospital, 266000 Qingdao, Shandong, China. Email: 15092095156@163.com

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

et al. [1] based on the GLOBOCAN 2022 database of the International Agency for Research on Cancer (IARC), approximately 1.473 million new cases of gynecological malignancies and 680,000 related deaths were reported globally in 2022, with the overall disease burden exhibiting an upward trend. For these types of cancers, surgical resection followed by adjuvant chemotherapy remains the cornerstone of therapeutic management. Nevertheless, the invasive nature of such procedures predisposes patients to complications including postsurgical pain and infectious processes. Concurrently, chemotherapeutic agents frequently precipitate various treatment-related toxicities, such as nausea, emesis, hematopoietic suppression, and diminished appetite [2,3]. Concurrently, patients frequently experience negative emotions like anxiety and depression due to concerns regarding tumor recurrence and loss of fertility, which may diminish treatment adherence and severely impede the postoperative recovery process. Therefore, proactive nursing measures are imperative for this patient population. Although conventional nursing care can provide basic health education and emotional guidance, it often lacks attention to individual patient differences and timely feedback, leaving room for improvement in its overall effectiveness. Psychological support nursing, a crucial component of humanistic care, alleviates patients' negative emotions and assists in building rehabilitation confidence through methods such as emotional regulation training, cognitive-behavioral measures, and the establishment of social support systems [4]. The Rosenthal effect, a socio-psychological theory proposed by American psychologist Robert Rosenthal, posits that an individual's behavior and psychological state are positively influenced by the positive expectations and targeted feedback from others (particularly authority figures), thereby directing their development towards desired goals. Its application in nursing care for patients post-urological tumor surgery [5] and those undergoing breast surgery [6] has been demonstrated to improve psychological status, quality of life, and self-care agency. Currently, reports on the combined application of these two nursing protocols in patients following gynecological malignancy surgery remain scarce. Consequently, this study was conducted to investigate the application effects of feedback-based health education, grounded in the Rosenthal effect, combined with psychological support nursing in patients experiencing postoperative anxiety and depression after gynecological malignancy surgery.

Materials and Methods

General Data

A retrospective analysis was conducted on the clinical data of 150 patients diagnosed with postoperative anxiety and depression following gynecological malignancy surgery, who were admitted to Qingdao Municipal Hospital between September 2023 and September 2025. In accordance with the specific nursing measure received, participants were stratified into two cohorts: a control group (n = 75), which underwent standard postoperative care, and a study group (n = 75), which received a combination of feedback-based health education informed by the Rosenthal effect and psychological support nursing.

Inclusion and Exclusion Criteria

(1) The inclusion criteria were as follows: ① Diagnosis consistent with the established criteria for CC [7], ovarian cancer (OC) [8], EC [9], or primary fallopian tube cancer (PFTC) [10], confirmed pathologically as primary gynecological malignancy; ② Underwent surgical treatment and received postoperative chemotherapy; ③ Initial diagnosis and treatment, with a predicted survival time $>$ 6 months; ④ Met the diagnostic criteria for anxiety and depression as outlined in the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), published by the American Psychiatric Association (APA) [11]; ⑤ Possessed normal comprehension and communication abilities, enabling cooperation with scale assessments; ⑥ Had complete clinical data. (2) Patients were excluded based on the following criteria: ① Concurrent presence of other malignant tumors or severe diseases such as organ failure; ② Age $<$ 18 years; ③ Previous history of mental illnesses, including schizophrenia or bipolar disorder; ④ Withdrawal from the study during its course.

Methods

Control Group

Routine nursing care was administered to the control group, with the specific intervention components extracted from patients' historical medical records and nursing documentation. This standard protocol was formulated in accordance with the perioperative care recommendations set forth in the Enhanced Recovery After Surgery in Gynecologic Oncology (2023 Update) [12] issued by the Enhanced Recovery After Surgery Society (ERAS®), which primarily encompassed basic health education, dietary guidance, and emotional support from family members. The regimen was additionally informed by the postoperative recovery approach for patients undergoing gynecological cancer surgery, as described by Chiewhatpong *et al*. [13]. The

Actas Esp Psiquiatr 2026;1–12. https://doi.org/10.62641/aep.2284 | ISSN:1578-2735
© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

implemented measures included the distribution of health education booklets, oral instructions on postoperative precautions, treatment compliance, and medication adherence, as well as dietary counseling promoting the intake of foods rich in high-quality protein and vitamins, with easy digestibility. Furthermore, family members were advised to provide increased companionship and emotional care to the patients throughout the recovery period.

Study Group

The combined nursing protocol—comprising feedback-based health education underpinned by the Rosenthal effect and psychological support—was administered to the study group, with the specific intervention components retrieved from archived nursing records and patient charts. This protocol was developed by adopting the Rosenthal-effect-based psychological care framework proposed by Luo and Huang [14], incorporating the high-quality nursing strategies for psychological distress in OC patients described by Jin *et al*. [15], and drawing upon the feedback-oriented health education methodologies reported by Yuan *et al*. [16] and Choi and Choi [17]. The detailed procedures were as follows: (1) Feedback-based health education based on the Rosenthal effect: ① Development of a feedback-based health education protocol: Nursing staff created animated video materials presenting postoperative rehabilitation knowledge (including pain management, complication observation, incision care, activity guidance, and chemotherapy cooperation). Nursing procedures were broken down into detailed steps, with each educational video limited to 3–5 minutes. A nurse-patient communication WeChat (Tencent Co., Ltd., Shenzhen, China) group was established, through which the educational videos were distributed and also played regularly on ward televisions; patients were instructed to view these materials independently. Demonstration and hands-on practice sessions were employed by nurses to instruct patients in performing nursing procedures. A questionnaire assessing comprehension of the educational content was designed and administered on-site every three days to collect patient feedback. Questions frequently raised by patients ($\geq$3 occurrences) were addressed through targeted modifications to existing educational videos or the creation of new videos focusing on those specific issues. ② Establishment of positive expectations: During the initial postoperative communication, constructive language was used by nurses to convey positive expectations to patients (e.g., "Based on your current physical condition, as long as you gradually master the nursing skills, you will be able to perform basic independent activities within one week post-surgery"). Throughout postoperative nursing guidance, a timely feedback model was utilized by nursing staff to reinforce positive beliefs. Following demonstrations of nursing techniques—such as abdominal breathing for pain relief, correct perineal cleaning methods, and early postoperative ankle pump exercises using models—patients were guided to attempt these techniques on-site, and immediate feedback was provided (e.g., for patients performing movements correctly, feedback such as "This rhythm is excellent; persisting for 3 minutes will significantly reduce your pain" was given; for those with incorrect technique, feedback such as "You'll master it with a couple more practices; your improvement just now was already very noticeable" was offered). ③ Guidance for family collaboration in building positive expectations: Nurses actively communicated with patients' family members, encouraging them to provide positive emotional support and encouragement (e.g., suggesting that family members tell a patient during ambulation, "Seeing how well you're recovering, even the doctor would be impressed"). ④ Sharing of successful cases: Case examples of gynecological cancer patients who had recovered well or successfully adapted were incorporated into the health education. Positive messages were conveyed (e.g., "Many patients, just like you, have achieved good recovery outcomes by learning emotional regulation and self-care skills and actively cooperating with treatment"). ⑤ Honorary incentives: A "little red flower" reward system was implemented. Nurses publicly acknowledged patients' progress, informing them that those actively participating in rehabilitation exercises and demonstrating rapid postoperative recovery would receive this recognition. (2) Psychological support nursing: ① Individualized psychological counseling: Nurses conducted 15-minute one-on-one emotional support sessions daily. Open-ended questions were used to encourage patients to express their inner concerns and fears. After listening, nurses responded empathetically and provided positive guidance (e.g., when a patient expressed worry about burdening their family if the cancer recurs, the nurse might respond, "Such concerns are completely understandable; many patients have similar thoughts after surgery. However, patients who adhere to standardized postoperative care have a significantly reduced risk of recurrence. The active exercises you performed today are very helpful for a good recovery"). ② Emotional regulation training: Patients were instructed in mindfulness meditation and progressive muscle relaxation techniques. They were also guided to listen to relaxing music before sleep, such as soft instrumental music, music incorporating natural sounds, and alpha wave music. ③ Social support: Peer support groups consisting of patients of similar ages were organized. A group meeting was held weekly to facilitate

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

experience sharing and mutual assistance. During these meetings, patients were guided to discuss potential positive changes resulting from their illness experience (e.g., whether it had altered their perspectives on interpersonal relationships or life priorities) and were encouraged to reassess the value of life.

Nursing Adherence

Adherence to the care was monitored using attendance records for ward-based educational video viewing, video viewing check-in records from the WeChat group, and paper-based sign-in sheets for weekly peer support group meetings, all of which were retained by the nursing unit. In the control group, no standardized health education or group communication sessions were provided; accordingly, no corresponding records were available. Among patients in the study group, the completion rate for viewing the health education videos was 88.0% (66/75), and the average participation rate in the peer support group sessions was 89.33% (67/75). These findings indicate a satisfactory level of adherence to the nursing protocol.

Outcome Measures

The following indicators were assessed in both groups before nursing and after 3 months of nursing (data were extracted from historical documents such as patients' nursing records and medical charts):

(1) To evaluate negative emotional states, the Cancer Fatigue Scale (CFS) and the Depression Anxiety and Stress Scale-21 (DASS-C21) were administered. The CFS, which was originally developed by Okuyama *et al*. [18] and subsequently underwent cultural adaptation and validation for Chinese populations by Zhang *et al*. [19], is a 15-item instrument organized into three distinct subscales. Item responses are recorded on a 5-point Likert scale ranging from 0 to 4, encompassing cognitive fatigue (4 items; scoring range 0–16), affective fatigue (4 items; scoring range 0–16), and physical fatigue (7 items; scoring range 0–28). The aggregate CFS score falls between 0 and 60, with elevated scores reflecting a greater degree of cancer-related fatigue. The DASS-C21, originally formulated by Lovibond *et al*. [20], later abbreviated by Antony *et al*. [21], and subsequently translated and culturally adapted for Chinese respondents by Wang *et al*. [22], comprises 21 items distributed across three factors. Responses are rated on a 4-point Likert scale (0 to 3), addressing depression (7 items; score range 0–21), anxiety (7 items; score range 0–21), and stress (7 items; score range 0–21). Total possible scores range from 0 to 63, where higher values signify more pronounced levels of anxiety, depression, and perceived stress. The internal consistency of these instruments within the present sample was confirmed by Cronbach's α values of 0.863 for the CFS and 0.876 for the DASS-C21.

(2) For the assessment of psychological resilience and post-traumatic growth, the 10-item Connor-Davidson Resilience Scale (CD-RISC-10) and the Posttraumatic Growth Inventory (PTGI) were utilized, respectively. The CD-RISC-10, initially constructed by Connor *et al*. [23], subsequently refined by Campbell-Sills and Stein [24], and translated into Chinese by Cheng *et al*. [25], yields a total score ranging from 0 to 40. Higher scores on this scale are considered indicative of greater psychological resilience. The PTGI, which was initially created by Tedeschi and Calhoun [26] and later adapted for Chinese-speaking populations through translation and revision by Wang *et al*. [27], contains 20 items distributed across five domains. Item responses are scored on a 6-point Likert scale ranging from 0 to 5, encompassing the following dimensions: relating to others (6 items; scoring range 0–30), new possibilities (3 items; scoring range 0–15), personal strength (4 items; scoring range 0–20), spiritual change (3 items; scoring range 0–15), and appreciation of life (4 items; scoring range 0–20). The total PTGI score ranges from 0 to 100, with elevated scores reflecting more substantial post-traumatic growth. The internal consistency of these instruments within the current investigation was confirmed by Cronbach's α values of 0.831 for the CD-RISC-10 and 0.874 for the PTGI.

(3) To evaluate self-disclosure and coping patterns, the Distress Disclosure Index (DDI) and the Medical Coping Modes Questionnaire (MCMQ) were employed, respectively. The DDI, originally developed by Kahn and Hessling [28] and subsequently translated and culturally adapted for Chinese use by Song *et al*. [29], is a 12-item instrument. Items are scored on a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), producing total scores between 12 and 60. Higher DDI scores are interpreted as reflecting a greater propensity for self-disclosure. The MCMQ, initially formulated by Feifel *et al*. [30] and later validated in its Chinese version by Shen and Jiang [31], comprises 20 items across three domains. Responses are rated on a 4-point Likert scale (1 = never to 4 = always), with reverse scoring applied to specific items. The three domains include confrontation (8 items; scoring range 8–32), where higher scores denote more adaptive coping; avoidance (7 items; scoring range 7–28), with elevated scores indicating stronger avoidant tendencies; and resignation (5 items; scoring range 5–20), where increased scores signify more maladaptive coping strategies. In this study, Cronbach's α values were 0.866 for the DDI and

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

0.763 for the MCMQ, demonstrating acceptable internal consistency for both measures.

(4) The assessment of self-care abilities was performed utilizing the Exercise of Self-Care Agency Scale (ESCA), while spiritual well-being was evaluated through the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Spiritual Well-Being 32 (EORTC QLQ-SWB32). The ESCA, initially designed by Kearney and Fleischer [32] and subsequently rendered into Chinese by Wang and Laffrey [33], contains 43 items distributed across four domains. Each item receives a score from 0 to 4, generating a total score ranging from 0 to 172. Higher scores on this measure are interpreted as reflecting superior self-care agency. For spiritual well-being measurement, the EORTC QLQ-SWB32 was created by the European Organisation for Research and Treatment of Cancer [34] and later adapted for Chinese populations through translation and revision by Sun and Fan [35]. The Chinese adaptation comprises 27 items distributed across four domains (it should be noted that items 4, 7, 23, and 24 are not scored, and item 27, which assesses overall spiritual well-being, is likewise excluded from domain-specific calculations). Responses are recorded on a 4-point Likert scale, with 1 representing "not at all" and 4 representing "very much". The derived domains consist of relationship with self (4 items; possible scores 4–16), relationship with others (5 items; possible scores 5–20), relationship with something greater (5 items; possible scores 5–20), and existential concerns (8 items; possible scores 8–32). For each domain, superior scores correspond to a more favorable spiritual well-being status among patients. The internal consistency reliability for these instruments within the present investigation was established through Cronbach's α coefficients of 0.884 for the ESCA and 0.792 for the EORTC QLQ-SWB32.

Statistical Methods

Data were analyzed using SPSS 27.0 (IBM Corp., Armonk, NY, USA). Measurement data conforming to normal distribution are expressed as mean ± standard deviation ($\bar{x} \pm s$). A two-factor (group × time) repeated-measures analysis of variance (ANOVA) was applied to all scale and subscale scores to test the main effects of group (nursing protocol), time (pre- vs. post-nursing), and their interaction. When the sphericity assumption was violated (Mauchly's test $p < 0.05$), the Greenhouse–Geisser correction was applied. For significant effects, Bonferroni post-hoc multiple comparisons were performed with an adjusted significance level ($\alpha' = 0.05/3 = 0.0167$) to control type I error. Categorical data were expressed as frequencies and percentages [n (%)] and compared between groups using the chi-square test. All statistical tests were two-sided, with $p < 0.05$ considered statistically significant for non-adjusted analyses. If any expected cell frequency was <5, Fisher's exact test was used instead (two-sided Fisher's exact test for 2 × 2 tables, and Fisher-Freeman-Halton test for R × C tables).

Results

Baseline Data

There was no significant difference between the two groups in baseline data ($p > 0.05$; Table 1).

Negative Emotions

The two-way repeated-measures ANOVA revealed statistically significant between-group main effects, within-group (time) main effects, and group × time interaction effects for CFS scores and all DASS-C21 subscale scores (all $p < 0.001$). Bonferroni post-hoc multiple comparison adjustments demonstrated that, compared with baseline values within each group, both groups exhibited significant reductions in post-nursing CFS scores and all DASS-C21 subscale scores (all adjusted $p < 0.001$). Furthermore, relative to the control group at the post-nursing assessment, the study group showed significantly lower scores on the aforementioned measures (all adjusted $p < 0.001$; Table 2).

Psychological Resilience and Post-Traumatic Growth

The two-way repeated-measures ANOVA revealed statistically significant between-group main effects, within-group (time) main effects, and group × time interaction effects for both CD-RISC-10 scores and PTGI scores (all $p < 0.001$). Bonferroni post-hoc multiple comparison adjustments demonstrated that, compared with baseline values within each group, both groups exhibited significant increases in post-nursing CD-RISC-10 scores and PTGI scores (all adjusted $p < 0.001$). Furthermore, relative to the control group at the post-nursing assessment, the study group showed significantly higher scores on both measures (all adjusted $p < 0.001$; Table 3).

Self-Disclosure and Coping Modes

The two-way repeated-measures ANOVA revealed statistically significant between-group main effects, within-group (time) main effects, and group × time interaction effects for DDI scores and all MCMQ subscale scores (all

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

Table 1. Comparison of baseline data between the two patient groups.

Variable	Control group (n = 75)	Study group (n = 75)	χ^2/t	*p*
Age (years)	58.56 ± 7.43	57.19 ± 7.26	$t = 1.142$	0.255
Tumor type			$\chi^2 = 0.586$	0.931
CC	48 (64.00)	51 (68.00)		
OC	3 (4.00)	2 (2.67)		
EC	22 (29.33)	20 (26.67)		
PFTC	2 (2.67)	2 (2.67)		
BMI (kg/m^2)	21.78 ± 1.09	21.63 ± 1.02	$t = 0.870$	0.386
Educational level			$\chi^2 = 1.563$	0.458
Junior high school or below	8 (10.67)	13 (17.33)		
Technical secondary school/High school	15 (20.00)	12 (16.00)		
Associate degree or above	52 (69.33)	50 (66.67)		
Primary caregiver			$\chi^2 = 0.852$	0.356
Parents/Children	13 (17.33)	9 (12.00)		
Spouse	62 (82.67)	66 (88.00)		
Marital status			$\chi^2 = 0.498$	0.480
Married	63 (84.00)	66 (88.00)		
Unmarried/Divorced/Widowed	12 (16.00)	9 (12.00)		
FIGO surgical pathological stage			$\chi^2 = 0.283$	0.963
Stage I	28 (37.33)	26 (34.67)		
Stage II	24 (32.00)	23 (30.67)		
Stage III	17 (22.67)	19 (25.33)		
Stage IV	6 (8.00)	7 (9.33)		
Surgical approach			$\chi^2 = 0.255$	0.614
Laparotomy	48 (64.00)	45 (60.00)		
Laparoscopic surgery	27 (36.00)	30 (40.00)		
Chemotherapy regimen			$\chi^2 = 0.122$	0.989
Paclitaxel + Carboplatin	39 (52.00)	41 (54.67)		
Docetaxel + Carboplatin	18 (24.00)	17 (22.67)		
Paclitaxel + Cisplatin	12 (16.00)	11 (14.67)		
Other regimens	6 (8.00)	6 (8.00)		

BMI, body mass index; CC, cervical cancer; EC, endometrial cancer; OC, ovarian cancer; PFTC, primary fallopian tube cancer; FIGO, federation international of gynecology and obstetrics.

$p < 0.001$). Bonferroni post-hoc multiple comparison adjustments demonstrated that, compared with baseline values within each group, both groups exhibited significant increases in post-nursing DDI scores and MCMQ confrontation subscale scores, alongside significant decreases in MCMQ avoidance and resignation subscale scores (all adjusted $p < 0.001$). Furthermore, relative to the control group at the post-nursing assessment, the study group showed significantly higher DDI scores and MCMQ confrontation subscale scores, and significantly lower MCMQ avoidance and resignation subscale scores (all adjusted $p < 0.001$; Table 4).

Self-Care Agency and Spiritual Well-Being

Two-way repeated-measures ANOVA demonstrated significant main effects of group and time, as well as group-by-time interaction effects, for ESCA scores and all domain scores of the EORTC QLQ-SWB32 (all $p < 0.001$). Bonferroni-adjusted post-hoc pairwise comparisons revealed that, within each group, post-nursing scores on the ESCA and all EORTC QLQ-SWB32 domains were significantly higher than baseline values (all adjusted $p < 0.001$). Moreover, at the post-nursing assessment, the study group exhibited significantly higher scores on all these measures compared with the control group (all adjusted $p < 0.001$; Table 5).

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

Table 2. Comparison of CFS scores and DASS-C21 subscale scores between the two groups before and after nursing (points).

Group	CFS score		DASS-C21 depression subscale score		DASS-C21 anxiety subscale score		DASS-C21 stress subscale score	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Study group (n = 75)	45.48 ± 4.67	28.31 ± 3.29*#	12.21 ± 2.68	8.34 ± 1.25*#	8.87 ± 1.49	5.91 ± 0.87*#	15.52 ± 3.09	11.41 ± 1.92*#
Control group (n = 75)	44.39 ± 4.25	33.46 ± 3.82*	11.93 ± 2.15	9.58 ± 1.76*	8.93 ± 1.57	6.72 ± 0.94*	14.98 ± 2.85	12.69 ± 2.21*
Results of repeated-measures ANOVA (df = 1)								
Between-group main effect	F = 78.271, $p < 0.001$		F = 24.751, $p < 0.001$		F = 30.000, $p < 0.001$		F = 14.342, $p < 0.001$	
Within-group (time) main effect	F = 523.462, $p < 0.001$		F = 246.317, $p < 0.001$		F = 297.769, $p < 0.001$		F = 189.425, $p < 0.001$	
Group × Time interaction	F = 36.289, $p < 0.001$		F = 11.082, $p < 0.001$		F = 13.378, $p < 0.001$		F = 6.402, $p < 0.001$	

ANOVA, analysis of variance; CFS, Cancer Fatigue Scale; DASS-C21, Depression Anxiety and Stress Scale-21. *$p < 0.001$ vs. baseline within the same group after Bonferroni correction; #$p < 0.001$ vs. control group at post-nursing assessment after Bonferroni correction. Sphericity assumption was met for all measures (Mauchly's test $p > 0.05$), thus no degrees-of-freedom correction was applied.

Table 3. Comparison of CD-RISC-10 scores and PTGI scores between the two groups before and after nursing (points).

Group	CD-RISC-10 score		PTGI score	
	Before nursing	After nursing	Before nursing	After nursing
Study group (n = 75)	17.56 ± 2.79	28.25 ± 3.68*#	53.54 ± 6.89	78.75 ± 8.43*#
Control group (n = 75)	18.15 ± 2.26	24.34 ± 3.17*	52.71 ± 6.13	69.64 ± 7.22*
Results of repeated-measures ANOVA (df = 1)				
Between-group main effect	F = 48.609, $p < 0.001$		F = 50.524, $p < 0.001$	
Within-group (time) main effect	F = 426.735, $p < 0.001$		F = 628.319, $p < 0.001$	
Group × Time interaction	F = 24.304, $p < 0.001$		F = 25.263, $p < 0.001$	

*$p < 0.001$ vs. baseline within the same group after Bonferroni correction; #$p < 0.001$ vs. control group at post-nursing assessment after Bonferroni correction. Sphericity assumption was met for all measures (Mauchly's test $p > 0.05$), thus no degrees-of-freedom correction was applied. ANOVA, analysis of variance; CD-RISC-10, 10-item Connor-Davidson Resilience Scale; PTGI, Posttraumatic Growth Inventory.

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

Table 4. Comparison of DDI scores and MCMQ subscale scores between the two groups before and after nursing (points).

Group	DDI score		MCMQ confrontation subscale score		MCMQ avoidance subscale score		MCMQ resignation subscale score	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Study group (n = 75)	20.78 ± 2.62	48.45 ± 5.31*#	13.87 ± 2.36	24.21 ± 3.95*#	23.12 ± 3.54	14.63 ± 2.02*#	15.47 ± 2.18	9.41 ± 1.05*#
Control group (n = 75)	21.34 ± 2.95	40.82 ± 4.57*	14.02 ± 2.54	19.63 ± 3.18*	23.76 ± 3.82	17.51 ± 2.79*	16.03 ± 2.29	11.27 ± 1.63*
Results of repeated-measures ANOVA (df = 1)								
Between-group main effect	F = 88.963, $p < 0.001$		F = 61.184, $p < 0.001$		F = 52.432, $p < 0.001$		F = 69.023, $p < 0.001$	
Within-group (time) main effect	F = 1025.742, $p < 0.001$		F = 593.267, $p < 0.001$		F = 417.895, $p < 0.001$		F = 587.416, $p < 0.001$	
Group × Time interaction	F = 44.481, $p < 0.001$		F = 30.592, $p < 0.001$		F = 26.216, $p < 0.001$		F = 34.511, $p < 0.001$	

*$p < 0.001$ vs. baseline within the same group after Bonferroni correction; #$p < 0.001$ vs. control group at post-nursing assessment after Bonferroni correction. Sphericity assumption was met for all measures (Mauchly's test $p > 0.05$), thus no degrees-of-freedom correction was applied. ANOVA, analysis of variance; DDI, Distress Disclosure Index; MCMQ, Medical Coping Modes Questionnaire.

Table 5. Comparison of ESCA scores and EORTC QLQ-SWB32 domain scores between the two groups before and after nursing (points).

Group	ESCA score		EORTC QLQ-SWB32 Domain Scores							
			Existential		Relationship with others		Relationship with something greater		Relationship with self	
	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing	Before nursing	After nursing
Study group (n = 75)	94.16 ± 7.58	126.73 ± 10.21*#	16.71 ± 3.56	24.59 ± 4.27*#	10.32 ± 1.69	15.47 ± 2.23*#	10.86 ± 1.87	14.52 ± 2.19*#	8.29 ± 1.17	12.51 ± 2.03*#
Control group (n = 75)	95.22 ± 8.14	115.49 ± 9.36*	17.25 ± 3.84	21.33 ± 4.16*	10.06 ± 1.31	12.83 ± 2.05*	10.49 ± 1.54	12.77 ± 1.96*	8.53 ± 1.28	10.49 ± 1.87*
Results of repeated-measures ANOVA (df = 1)										
Between-group main effect (F, df = 1)	F = 49.393, $p < 0.001$		F = 22.430, $p < 0.001$		F = 26.972, $p < 0.001$		F = 26.593, $p < 0.001$		F = 40.170, $p < 0.001$	
Within-group (time) main effect (F, df = 1)	F = 512.684, $p < 0.001$		F = 215.793, $p < 0.001$		F = 382.457, $p < 0.001$		F = 257.318, $p < 0.001$		F = 324.679, $p < 0.001$	
Group × Time interaction (F, df = 1)	F = 24.696, $p < 0.001$		F = 11.215, $p < 0.001$		F = 28.486, $p < 0.001$		F = 13.296, $p < 0.001$		F = 20.085, $p < 0.001$	

*$p < 0.001$ vs. baseline within the same group after Bonferroni correction; #$p < 0.001$ vs. control group at post-nursing assessment after Bonferroni correction. Sphericity assumption was met for all measures (Mauchly's test $p > 0.05$), thus no degrees-of-freedom correction was applied. ANOVA, analysis of variance; ESCA, Exercise of Self-Care Agency Scale; EORTC QLQ-SWB32, European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire-Spiritual Well-Being 32.

Actas Esp Psiquiatr 2026;1–12. https://doi.org/10.62641/aep.2284 | ISSN:1578-2735

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

Discussion

Treatment for gynecological malignancies often involves the resection of organs integral to female identity, such as the uterus and ovaries [36]. Consequently, many patients, due to inadequate disease knowledge and concerns about tumor recurrence, are prone to postoperative complications including self-identity crisis and negative emotions like anxiety, which can adversely affect nursing compliance and overall effectiveness [37]. Therefore, the identification of scientifically sound and effective nursing protocols holds positive significance for enhancing comprehensive patient outcomes.

The findings of this study revealed that, following the nursing, the study group achieved lower scores on the CFS and on the DASS-C21 subscales for depression, anxiety, and stress compared with the control group. Concurrently, the study group exhibited higher scores on the CD-RISC-10 and the PTGI relative to the control group. These differences in scores suggest that application of the nursing protocol combining feedback-based health education based on the Rosenthal effect with psychological support is associated with reductions in negative emotional states and enhancements in psychological resilience and post-traumatic growth among patients with postoperative anxiety and depression following gynecological malignancy surgery. The underlying reasons may be attributed to the following considerations: (1) The Rosenthal effect elucidates a significant socio-psychological phenomenon wherein positive expectations held by significant others (e.g., healthcare providers), conveyed through verbal communication, attitude, and non-verbal cues, tend to be internalized by the individual. This process prompts the individual to adjust self-perception and behavior towards meeting these expectations, often culminating in improved outcomes. By meticulously deconstructing complex postoperative care knowledge into animated videos and employing demonstration-plus-practice methods to instruct patients in nursing techniques, nursing staff were able to convey positive beliefs through a timely feedback model during guidance. This approach likely assisted patients in establishing positive expectations that mastering nursing skills and actively cooperating with treatment would lead to favorable recovery outcomes. Furthermore, each instance of timely, positive feedback served to translate abstract expectations into tangible experiences of progress, thereby reinforcing patients' sense of self-efficacy and mastery. The feedback-based health education rooted in the Rosenthal effect is centered on positive expectations and, when combined with interactive educational methods, has previously been observed to correlate with reduced negative emotions in patients [38]; the present findings further support this association. The family constitutes a vital source of psychological resources for patients. Engaging family members in collaboratively fostering positive expectations and encouraging them to consistently use affirming language to acknowledge patients' rehabilitation efforts may, through close familial bonds, enhance patients' sense of security and thereby contribute to improved psychological resilience. The "little red flower" incentive is thought to operate by generating public, symbolic social recognition that stimulates patients' self-efficacy, guiding them to derive personal value from active recovery and to reframe their illness experience as a distinctive life growth opportunity—a mechanism that may help elevate levels of post-traumatic growth [39]. (2) Within psychological support nursing, daily one-on-one emotional counseling, structured around encouraging disclosure, empathic responses, and positive guidance, enables patients to feel heard and understood, thereby fostering a sense of safety and increasing emotional acceptance. Mindfulness meditation, progressive muscle relaxation training, and listening to calming music before sleep may assist patients in alleviating physical tension and reducing postoperative fatigue [40].

The results of this study demonstrated that, after the nursing, the study group exhibited higher scores than the control group on the DDI, the MCMQ confrontation subscale, the ESCA, and the EORTC QLQ-SWB32 domains of existential well-being, relationship with others, relationship with something greater, and relationship with self. Conversely, the study group showed lower scores than the control group on the MCMQ avoidance subscale and the resignation subscale. These differences in scores suggest that implementation of this combined nursing protocol is associated with reductions in maladaptive coping dimensions and improvements in self-disclosure, spiritual well-being, and self-care agency among patients. The underlying reasons may be as follows: (1) Within the feedback-based health education guided by the Rosenthal effect, the inclusion of cases involving gynecologic oncology patients who had already recovered or adapted well provides concrete social learning templates that closely resemble the patients' own circumstances. This may facilitate an expectation effect through role modeling, conveying to patients the positive expectation that active coping can likewise lead to similarly favorable recovery outcomes [41]. (2) Self-disclosure refers to the process by which individuals reveal personal information to others and sincerely share private thoughts and feelings, whereas spiritual well-being denotes an individual's perception of life's meaning and their sense of connectedness with self, others, and the world [42]. Weekly peer support group meetings among patients of similar ages may offer a safe and empathetic environ-

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

ment where participants can listen to and share their illness experiences, as well as insights into positive changes derived from those experiences; such a process is likely to enhance self-disclosure levels [43]. Moreover, the authentic experiences and practical care techniques shared among peers may resonate more strongly than abstract theoretical knowledge, potentially encouraging patients to adopt more positive coping strategies when confronting their disease, which in turn may be associated with improvements in self-care skills and spiritual well-being [44,45].

The main limitations of this study are as follows: (1) Retrospective, non-randomized design with selection bias due to nurse preferences and patient willingness. (2) Multi-component nursing (feedback education, psychological support, family collaboration, peer groups, honorary incentives) without dissection of individual elements, making it impossible to identify key active ingredients. (3) Confounding variables (family support, baseline psychological severity, chemotherapy adverse effects) not included. (4) Sample size not calculated based on effect size, resulting in insufficient statistical power; single-center sample limits generalizability. (5) Only 3-month follow-up, long-term effects unknown.

Conclusions

Data analysis from this retrospective observational study suggests that the nursing protocol combining feedback-based health education grounded in the Rosenthal effect with psychological support is associated with alleviated negative emotions, improved coping styles, and enhanced psychological resilience, post-traumatic growth, self-disclosure, spiritual well-being, and self-care agency in patients with postoperative anxiety and depression following gynecological malignancy surgery. Due to study limitations including retrospective non-randomized group assignment and the inability to fully control for confounding factors, a definitive causal relationship between the nursing and the observed improvements cannot be established.

Availability of Data and Materials

The datasets used and analysed during the current study were available from the corresponding author on reasonable request.

Author Contributions

HWD and WPL designed the study; NX and HWD collected and analyzed the data; WPL and NX participated in drafting the manuscript. All authors conducted the study and contributed to critical revision of the manuscript for important intellectual content. All authors gave final approval of the version to be published. All authors participated fully in the work, took public responsibility for appropriate portions of the content, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or completeness of any part of the work were appropriately investigated and resolved.

Ethics Approval and Consent to Participate

This study was approved by the Ethics Committee of Qingdao Municipal Hospital (institution review board number: 2026-KY-067) and was performed in accordance with the principles of the Declaration of Helsinki. All eligible participants signed an informed consent form.

Acknowledgment

Not applicable.

Funding

This research received no external funding.

Conflict of Interest

The authors declare no conflict of interest.

References

[1] Zhu B, Gu H, Mao Z, Beeraka NM, Zhao X, Anand MP, *et al*. Global burden of gynaecological cancers in 2022 and projections to 2050. Journal of Global Health. 2024; 14: 04155. https://doi.org/10.7189/jogh.14.04155.

[2] Doll KM, Barber EL, Bensen JT, Revilla MC, Snavely AC, Bennett AV, *et al*. The impact of surgical complications on health-related quality of life in women undergoing gynecologic and gynecologic oncology procedures: a prospective longitudinal cohort study. American Journal of Obstetrics and Gynecology. 2016; 215: 457.e1–457.e13. https://doi.org/10.1016/j.ajog.2016.04.025.

[3] Monk BJ, Colombo N, Tewari KS, Dubot C, Caceres MV, Hasegawa K, *et al*. First-Line Pembrolizumab + Chemotherapy Versus Placebo + Chemotherapy for Persistent, Recurrent, or Metastatic Cervical Cancer: Final Overall Survival Results of KEYNOTE-826. Journal

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

of Clinical Oncology: Official Journal of the American Society of Clinical Oncology. 2023; 41: 5505–5511. https://doi.org/10.1200/JCO.23.00914.

[4] Ownsworth T, Lion K, Sansom-Daly UM, Pike K, Koh ES, Halkett GKB, *et al*. Scoping the psychological support practices of Australian health professionals working with people with primary brain tumor and their families. Psycho-oncology. 2022; 31: 1313–1321. https://doi.org/10.1002/pon.5929.

[5] Zhou C, Zhang W, Qi R, Song Y. Psychological Nursing Model Based on the Rosenthal Effect can Effectively Improve the Psychological Status and Quality of Life of Postoperative Patients with Urological Tumours. Archivos Españoles de Urología. 2025; 78: 428–434. https://doi.org/10.56434/j.arch.esp.urol.20257804.57.

[6] Ye YY, Cao YC, Lu XJ, Xiang X. Impact of Rosenthal effect-based nursing intervention on self-care ability and hope level in patients undergoing breast surgery. BMC Surgery. 2025; 25: 68. https://doi.org/10.1186/s12893-025-02797-w.

[7] Marth C, Landoni F, Mahner S, McCormack M, Gonzalez-Martin A, Colombo N, *et al*. Cervical cancer: ESMO Clinical Practice Guidelines for diagnosis, treatment and follow-up. Annals of Oncology: Official Journal of the European Society for Medical Oncology/ESMO. 2017; 28: iv72–iv83. https://doi.org/10.1093/annonc/mdx220.

[8] Armstrong DK, Alvarez RD, Bakkum-Gamez JN, Barroilhet L, Behbakht K, Berchuck A, *et al*. Ovarian Cancer, Version 2.2020, NCCN Clinical Practice Guidelines in Oncology. Journal of the National Comprehensive Cancer Network: JNCCN. 2021; 19: 191–226. https://doi.org/10.6004/jnccn.2021.0007.

[9] Berek JS, Matias-Guiu X, Creutzberg C, Fotopoulou C, Gaffney D, Kehoe S, *et al*. FIGO staging of endometrial cancer: 2023. International Journal of Gynaecology and Obstetrics: The Official Organ of the International Federation of Gynaecology and Obstetrics. 2023; 162: 383–394. https://doi.org/10.1002/ijgo.14923.

[10] National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Ovarian Cancer Including Fallopian Tube Cancer and Primary Peritoneal Cancer (Version 3.2024). Plymouth Meeting, PA: NCCN. 2024. Available at: https://lcez.cogonline.com/info/133664355572976252 (Accessed: 15 August 2023).

[11] American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders (DSM-5). Washington, DC: American Psychiatric Association. 2013.

[12] Nelson G, Fotopoulou C, Taylor J, Glaser G, Bakkum-Gamez J, Meyer LA, *et al*. Enhanced recovery after surgery (ERAS®) society guidelines for gynecologic oncology: Addressing implementation challenges - 2023 update. Gynecologic Oncology. 2023; 173: 58–67. https://doi.org/10.1016/j.ygyno.2023.04.009.

[13] Chiewhatpong P, Charoenkwan K, Smithiseth K, Lapisatepun W, Lapisatepun P, Phimphilai M, *et al*. Effectiveness of enhanced recovery after surgery protocol in open gynecologic oncology surgery: A randomized controlled trial. International Journal of Gynaecology and Obstetrics: The Official Organ of the International Federation of Gynaecology and Obstetrics. 2022; 159: 568–576. https://doi.org/10.1002/ijgo.14211.

[14] Luo JM, Huang E. Effect of psychological nursing model based on Rosenthal effect on postoperative negative emotions, psychological resilience and coping styles of patients with colon cancer. International Journal of Nursing. 2022; 41: 3892–3895. https://doi.org/10.3760/cma.j.cn221370-20201231-00985. (In Chinese)

[15] Jin P, Sun LL, Li BX, Li M, Tian W. High-quality nursing care on psychological disorder in ovarian cancer during perioperative period: A systematic review and meta-analysis. Medicine. 2022; 101: e29849. https://doi.org/10.1097/MD.0000000000029849.

[16] Yuan Z, Gao L, Zheng M, Ye X, Sun S. Effect of Multimodal Health Education Combined with the Feedback Method in Perioperative Patients with Lung Cancer: A Randomised Controlled Study. Patient Preference and Adherence. 2023; 17: 413–420. https://doi.org/10.2147/PPA.S394826.

[17] Choi S, Choi J. Effects of the teach-back method among cancer patients: a systematic review of the literature. Supportive Care in Cancer: Official Journal of the Multinational Association of Supportive Care in Cancer. 2021; 29: 7259–7268. https://doi.org/10.1007/s00520-021-06445-w.

[18] Okuyama T, Akechi T, Kugaya A, Okamura H, Shima Y, Maruguchi M, *et al*. Development and validation of the cancer fatigue scale: a brief, three-dimensional, self-rating scale for assessment of fatigue in cancer patients. Journal of Pain and Symptom Management. 2000; 19: 5–14. https://doi.org/10.1016/s0885-3924(99)00138-4.

[19] Zhang FL, Ding Y, Han LS. Reliability and validity of Chinese version of Cancer Fatigue Scale. Chinese Mental Health Journal. 2011; 25: 810–813. https://doi.org/10.3969/j.issn.1000-6729.2011.11.003. (In Chinese)

[20] Lovibond PF, Lovibond SH. The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. Behaviour Research and Therapy. 1995; 33: 335–343. https://doi.org/10.1016/0005-7967(94)00075-u.

[21] Antony MM, Bieling PJ, Cox BJ, Enns MW, Swinson RP. Psychometric properties of the 42-item and 21-item versions of the Depression Anxiety Stress Scales in clinical groups and a community sample. Psychological Assessment. 1998; 10: 176–181. https://doi.org/10.1037/1040-3590.10.2.176.

[22] Wang K, Shi HS, Geng FL, Zou LQ, Tan SP, Wang Y, *et al*. Cross-cultural validation of the Depression Anxiety Stress Scale-21 in China. Psychological Assessment. 2016; 28: e88–e100. https://doi.org/10.1037/pas0000207.

[23] Connor KM, Davidson JR. Development of a new resilience scale: the Connor-Davidson Resilience Scale (CD-RISC). Depression and Anxiety. 2003; 18: 76–82. https://doi.org/10.1002/da.10113.

[24] Campbell-Sills L, Stein MB. Psychometric analysis and refinement of the Connor-davidson Resilience Scale (CD-RISC): Validation of a 10-item measure of resilience. Journal of Traumatic Stress. 2007; 20: 1019–1028. https://doi.org/10.1002/jts.20271.

[25] Cheng C, Dong D, He J, Zhong X, Yao S. Psychometric properties of the 10-item Connor-Davidson Resilience Scale (CD-RISC-10) in Chinese undergraduates and depressive patients. Journal of Affective Disorders. 2020; 261: 211–220. https://doi.org/10.1016/j.jad.2019.10.018.

[26] Tedeschi RG, Calhoun LG. The Posttraumatic Growth Inventory: measuring the positive legacy of trauma. Journal of Traumatic Stress. 1996; 9: 455–471. https://doi.org/10.1007/BF02103658.

[27] Wang J, Chen Y, Wang YB, Liu XH. Revision of the Posttraumatic Growth Inventory and testing its reliability and validity. Journal of Nursing Science: Surgical Edition. 2011; 26: 26–28. https://doi.org/10.3870/HLXZZ.2011.14.026. (In Chinese)

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.

[28] Kahn JH, Hessling RM. Measuring the Tendency to Conceal Versus Disclose Psychological Distress. Journal of Social and Clinical Psychology. 2001; 20: 41–65. https://doi.org/10.1521/jscp.20.1.41.22254.

[29] Song YY, Liu H, Wang S, Jiang XL. Dyadic effects of rumination and self-disclosure on posttraumatic growth in newly diagnosed gynecological cancer couples: an actor-partner interdependence modeling approach. Supportive Care in Cancer: Official Journal of the Multinational Association of Supportive Care in Cancer. 2022; 30: 5167–5174. https://doi.org/10.1007/s00520-022-06869-y.

[30] Feifel H, Strack S, Nagy VT. Coping strategies and associated features of medically ill patients. Psychosomatic Medicine. 1987; 49: 616–625. https://doi.org/10.1097/00006842-198711000-00007.

[31] Shen XH, Jiang GJ. Report on application of Chinese version of MCMQ in 701 patients. Chinese Journal of Behavioral Medicine Science. 2000; 9: 18–20. https://doi.org/10.3760/cma.j.issn.1674-6554.2000.01.008. (In Chinese)

[32] Kearney BY, Fleischer BJ. Development of an instrument to measure exercise of self-care agency. Research in Nursing & Health. 1979; 2: 25–34. https://doi.org/10.1002/nur.4770020105.

[33] Wang HH, Laffrey SC. Preliminary development and testing of instruments to measure self-care agency and social support of women in Taiwan. The Kaohsiung Journal of Medical Sciences. 2000; 16: 459–467.

[34] Vivat B, Young TE, Winstanley J, Arraras JI, Black K, Boyle F, *et al*. The international phase 4 validation study of the EORTC QLQ-SWB32: A stand-alone measure of spiritual well-being for people receiving palliative care for cancer. European Journal of Cancer Care. 2017; 26. https://doi.org/10.1111/ecc.12697.

[35] Sun XH, Fan L. The reliability and validity of the Chinese version of the European Quality of Life-Spiritual Health Scale for Cancer Therapy and Research in patients with advanced cancer. Chinese Nursing Management. 2020; 20: 826–830. https://doi.org/10.3969/j.issn.1672-1756.2020.06.006. (In Chinese)

[36] Gómez-Campelo P, Bragado-Álvarez C, Hernández-Lloreda MJ. Psychological distress in women with breast and gynecological cancer treated with radical surgery. Psycho-oncology. 2014; 23: 459–466. https://doi.org/10.1002/pon.3439.

[37] Lafuenti L, Ciccarone F, De Paola R, Sicco S, Sani L, Belella D, *et al*. Psychological distress, body image, and nutritional status during hospitalization for gynecological cancer surgery: a prospective observational study. Supportive Care in Cancer: Official Journal of the Multinational Association of Supportive Care in Cancer. 2025; 33: 802. https://doi.org/10.1007/s00520-025-09862-3.

[38] Wang X, Cheng B. Effect of a Nursing Health Education Model Based on the Rosenthal Effect on Posttraumatic Growth of Patients with a First Accidental Fracture. Alternative Therapies in Health and Medicine. 2024; 30: 408–413.

[39] Zhang S, Liu Y, Song S, Peng S, Xiong M. The Psychological Nursing Interventions Based on Pygmalion Effect Could Alleviate Negative Emotions of Patients with Suspected COVID-19 Patients: a Retrospective Analysis. International Journal of General Medicine. 2022; 15: 513–522. https://doi.org/10.2147/IJGM.S347439.

[40] Dhakal K, Chen C, Wang P, Mboineki JF, Adhikari B. Existing psychological supportive care interventions for cervical cancer patients: a systematic review and meta-analysis. BMC Public Health. 2024; 24: 1419. https://doi.org/10.1186/s12889-024-18634-3.

[41] Sun H, Chu C, Wang X, Gao F. The psychological intervention and clinical efficacy of Rosenthal effect and acupuncture bleeding on middle-aged and young patients with sudden hearing loss. Medicine. 2024; 103: e36820. https://doi.org/10.1097/MD.0000000000036820.

[42] Lee H, Jeong Y. Self-disclosure in Adult Patients With Cancer: Structural Equation Modeling. Cancer Nursing. 2025; 48: 289–297. https://doi.org/10.1097/NCC.0000000000001302.

[43] Liu X, Cheng X, Yang F, Tong H. The mediating roles of intimate relationships and constructive communication in the association between self-disclosure and benefit finding among patients with colorectal cancer. Asia-Pacific Journal of Oncology Nursing. 2025; 12: 100758. https://doi.org/10.1016/j.apjon.2025.100758.

[44] Schofield P, Gough K, Pascoe M, Bergin R, White K, Mileshkin L, *et al*. A nurse- and peer-led psycho-educational intervention to support women with gynaecological cancers receiving curative radiotherapy: The PeNTAGOn randomised controlled trial—ANZGOG 1102. Gynecologic Oncology. 2020; 159: 785–793. https://doi.org/10.1016/j.ygyno.2020.09.016.

[45] Moran HK, Brooks JV, Spoozak L. "There's somebody like me": perspectives of a peer-to-peer gynecologic cancer mentorship program. Supportive Care in Cancer: Official Journal of the Multinational Association of Supportive Care in Cancer. 2021; 29: 7679–7686. https://doi.org/10.1007/s00520-021-06348-w.

© 2026 The Author(s). This is an open access article under the CC BY 4.0 license.