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An Applied Psychosocial-Physical Nursing Program for Women with Gynecological Cancer Undergoing Diagnostic Imaging: Impact on Imaging-Related Psychological Distress and Social Reintegration

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ABSTRACT: Background: Women with gynecological cancer undergoing diagnostic imaging frequently experience psychological distress associated with uncertainty about

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disease progression, fear of unfavorable findings, procedural discomfort, and concerns about future treatment. These experiences may negatively affect emotional well-being, daily functioning, family relationships, and social reintegration. Integrating psychosocial support with individualized physical nursing interventions provides a comprehensive approach to addressing these challenges. Aim: This study aimed to evaluate the impact of an applied psychosocial-physical nursing program on imaging-related psychological distress and social reintegration among women with gynecological cancer undergoing diagnostic imaging. Subjects and Methods: A quasi-experimental intervention-control study desin was developed using a 100 women with gynecological cancer, comprising 50 women in the intervention group and 50 in the control group. The study was conducted in the Gynecology and Obstetrics Outpatient Clinics, Gynecologic Oncology Unit, and Diagnostic Radiology Unit at South Valley University Hospital. Three instruments were used: a structured interview questionnaire, an imaging-related psychological distress assessment, and a social reintegration assessment. The intervention comprised eight structured sessions delivered over four weeks and incorporated imaging education, emotional support, relaxation techniques, individualized physical activity, family communication, and social participation strategies. Results: The findings demonstrated a reduction in mean psychological distress scores in the intervention group from 48.06 ± 8.80 to 30.46 ± 9.76, compared with a reduction from 47.30 ± 7.90 to 42.06 ± 8.58 in the control group. Social reintegration scores increased from 50.80 ± 9.26 to 70.20 ± 11.20 in the intervention group, compared with an increase from 52.42 ± 7.28 to 56.48 ± 9.98 in the control group. Between-group differences in changes were statistically significant for psychological distress and social reintegration ($p < .001$). Conclusion: The findings concluded that an integrated psychosocial-physical nursing program contributed to reduce imaging-related psychological distress and improving social reintegration among women with gynecological cancer. **Recommendations**: Integrate structured psychological preparation into nursing care pathways for women with gynecological cancer undergoing diagnostic imaging.

INTRODUCTION

Gynecological cancers constituted an important public health concern among women worldwide and encompassed malignancies of the cervix, ovaries, endometrium, vulva, and vagina. These malignancies affected women's physical health, emotional stability, reproductive well-being, family relationships, and social functioning. In addition to the challenges associated with diagnosis and treatment, women frequently underwent repeated diagnostic investigations to determine disease stage, assess treatment response, monitor disease progression, and detect recurrence. Although diagnostic imaging played an essential role in appropriate cancer management, the examination experience generated additional psychological and emotional burdens, particularly when women associated examination results with uncertainty about their prognosis and future health **(Sung et al., 2026; International Agency for Research on Cancer, 2024).**

Diagnostic imaging played an essential role in the assessment and management of gynecological malignancies. Commonly used modalities included magnetic resonance imaging (MRI), computed tomography (CT), ultrasonography, and positron emission tomography/computed tomography (PET/CT). Despite their clinical importance, these examinations exposed women to different sources of psychological discomfort. MRI generated anxiety related to scanner confinement, loud noises, prolonged immobility, and fear of losing control during the examination. CT and PET/CT examinations also generated concerns regarding radiation exposure, contrast administration, and the possibility of identifying disease progression. These experiences contributed to anticipatory anxiety before examinations, procedural distress, and emotional tension while awaiting results **(Ahlander et al., 2016; Kang et al., 2024).**

Imaging-related psychological distress, commonly referred to as scanxiety, described the anxiety and emotional discomfort experienced by individuals undergoing cancer-related imaging examinations. This experience was not restricted to the examination itself but began when the investigation was scheduled and continued throughout preparation, scanning, waiting

for results, and receiving clinical explanations. Women experienced fear of unfavorable findings, uncertainty about treatment effectiveness, concerns about recurrence, and difficulty managing the waiting period. These reactions were intensified by previous negative imaging experiences, limited procedural knowledge, advanced disease, and inadequate communication with healthcare professionals **(Hussain et al., 2023).**

Psychological distress associated with diagnostic imaging extended beyond temporary emotional discomfort and influenced women's daily functioning and social relationships. Women with gynecological cancer experienced withdrawal from social activities, reduced participation in family responsibilities, difficulties maintaining employment, altered body image, and concerns about their roles within intimate relationships. Repeated investigations reinforced feelings of uncertainty and illness-related dependency, potentially limiting women's confidence in returning to their usual activities. Therefore, addressing imaging-related distress required an approach that considered both the immediate diagnostic experience and its wider psychosocial consequences **(Murnaghan et al., 2024; Tomescu-Stachie et al., 2025).**

Social reintegration represented an important component of supportive cancer care because it reflected women's ability to resume meaningful daily activities, maintain family and social relationships, participate in community life, and preserve their independence despite cancer-related challenges. Successful reintegration involved more than physical recovery; it also required emotional adjustment, confidence, effective communication, social support, and realistic expectations regarding daily responsibilities. Women who received appropriate support became better able to adapt to illness-related changes and maintain meaningful participation in their usual social environments (**Yi & Lee,2024).**

Nursing care played a central role in reducing imaging-related distress through individualized preparation, clear communication, emotional reassurance, and continuous assessment of patients' needs. Oncology and radiology nurses explained the purpose and sequence of diagnostic examinations, described expected sensations, clarified preparation requirements, and encouraged women to express their fears and concerns. Providing understandable information reduced uncertainty and improved women's sense of control. Furthermore, nurses taught controlled breathing, relaxation techniques, positive self-talk, and practical coping strategies that women applied before and during imaging procedures **(Lyu et al., 2024; Dahiya et al., 2025).**

Psychosocial interventions were particularly important for women with gynecological cancer because their experiences involved concerns related to femininity, reproductive health, intimate relationships, body image, family responsibilities, and social expectations. Structured psychosocial support helped women recognize their emotional reactions, communicate their needs, develop effective coping mechanisms, and strengthen their available support networks. Evidence from a systematic review and meta-analysis demonstrated that digital psychosocial interventions reduced psychological distress among women with gynecological cancer, supporting the importance of incorporating structured psychological support into routine oncology care **(Marano et al., 2024).**

In addition to psychological support, physical nursing interventions contributed to maintaining functional abilities and improving confidence in everyday activities. Appropriate physical activity, when medically indicated and individualized, helped women maintain mobility, reduce physical deconditioning, manage fatigue, and gradually resume daily responsibilities (**Verstraten et al., 2020)**. Physical interventions required consideration of cancer stage, current treatment, pain, fatigue, mobility limitations, and medical clearance. Combining safe physical activity with psychosocial support addressed the interaction between physical limitations, emotional distress, and reduced social participation **(Campbell et al., 2019).**

The relationship between physical functioning and social participation was particularly relevant among women receiving cancer-related care. Reduced mobility and fatigue limited opportunities for social interaction, while emotional distress and social withdrawal further reduced motivation to engage in physical activities. Consequently, a comprehensive nursing approach integrated physical self-management with emotional support and strategies that encouraged family and community participation. Individualized activity planning, energy conservation, gradual goal setting, and family involvement helped women maintain independence according to their clinical conditions **(Gumus et al., 2026; Murnaghan et al., 2024).**

Despite increasing recognition of scanxiety and psychosocial needs among individuals with cancer, emotional support was not always systematically integrated into diagnostic radiology pathways. Women frequently received technical instructions concerning imaging procedures without adequate preparation for anxiety, emotional reactions, physical discomfort, or concerns related to waiting for results. This highlighted the need for nursing interventions that extended beyond procedural

preparation and addressed women's psychological, physical, and social needs throughout the diagnostic journey **(Hughes et al., 2025; Derry-Vick et al., 2023).**

The nurse plays a fundamental role in supporting women with gynecological cancer throughout the diagnostic imaging process by providing comprehensive, individualized, and patient-centered care. The nursing role includes assessing patients' baseline psychological status, identifying sources of imaging-related fear and anxiety, explaining imaging procedures and expected experiences, and correcting misconceptions through clear and culturally appropriate education. Nurses also provide emotional support, establish therapeutic communication, teach relaxation and breathing techniques, and encourage positive coping strategies to reduce psychological distress. Furthermore, they promote safe physical activity according to each woman's clinical condition, encourage family involvement, facilitate communication with healthcare professionals, and support gradual participation in family, social, and community activities. Nurses also monitor patients' psychological responses, identify women requiring specialized psychological or psychiatric referral, and coordinate multidisciplinary care to ensure continuity of support. These responsibilities are consistent with the principles of patient-centered cancer care and psychosocial support emphasized by the Oncology Nursing Society (**ONS, 2024)** and the European Society for Medical Oncology **(ESMO, 2023).**

SIGNIFICANCE OF THE STUDY

Women with gynecological cancer undergoing diagnostic imaging may experience considerable psychological distress related to disease uncertainty, fear of unfavorable results, previous examination experiences, and concerns about future treatment. These challenges may negatively affect emotional adjustment, coping abilities, and women's participation in family and social activities. Recent evidence confirms the importance of psychosocial support in reducing psychological distress and improving psychological well-being and quality of life among women with gynecological cancer **(Aslam et al., 2026; Tomescu-Stachie et al., 2025).**

The significance of this study lies in proposing a comprehensive psychosocial-physical nursing program incorporating imaging education, emotional support, relaxation techniques, safe physical activity, family communication, and social reintegration strategies. The program emphasizes the essential nursing role and multidisciplinary collaboration in strengthening coping abilities, maintaining functional independence, and promoting social participation. These approaches are supported by recent evidence on psychosocial interventions and cancer survivors' reintegration into daily life **(Murnaghan et al., 2024; Tomescu-Stachie et al., 2025)**.

AIM OF THE STUDY

This study aimed to evaluate the impact of an applied psychosocial-physical nursing program on imaging-related psychological distress and social reintegration among women with gynecological cancer undergoing diagnostic imaging.

RESEARCH HYPOTHESES

H1: Women with gynecological cancer who received the applied psychosocial-physical nursing program demonstrated significantly lower imaging-related psychological distress scores after the intervention than their baseline scores.

H2: Women with gynecological cancer who received the applied psychosocial-physical nursing program demonstrated significantly higher social reintegration scores after the intervention than their baseline scores.

SUBJECTS AND METHODS

Research design

A quasi-experimental intervention-control study design was used. The allocation mechanism was not specified as randomized; therefore, the design was classified as quasi-experimental.

Study setting

The study was conducted in the Gynecology and Obstetrics Outpatient Clinics, Gynecologic Oncology Unit, and Diagnostic Radiology Unit at South Valley University Hospital, Egypt. These settings were selected because they provided diagnostic, treatment-planning, and follow-up services for women with gynecological malignancies. Their integration facilitated coordination between gynecological oncology and diagnostic radiology services and supported the delivery of individualized nursing interventions.

Study sample

A convenience sample of 100 women with gynecological cancer undergoing diagnostic imaging was constructed. The sample was divided into two groups, with 50 women assigned to the intervention group and 50 women assigned to the control group. The intervention group received the applied psychosocial-physical nursing program in addition to routine nursing care, whereas the control group received routine nursing care.

DATA COLLECTION TOOLS

Tool I: Structured interview questionnaire for sociodemographic and clinical characteristics

This tool was developed by the researchers to collect comprehensive sociodemographic, clinical, and diagnostic information about the participating women. It consisted of two main parts.

The first part addressed sociodemographic characteristics, including age, marital status, educational level, residence, and employment status.

The second part addressed clinical and diagnostic characteristics, including the type of gynecological cancer, cancer stage, diagnostic imaging modality, and history of previous imaging examinations. Information was obtained through a structured interview and review of relevant medical records to ensure appropriate documentation of clinical characteristics.

Tool II: Imaging-related psychological distress assessment

This tool was designed to assess the severity of psychological distress associated with diagnostic imaging among women with gynecological cancer. Its development was informed by the Magnetic Resonance Imaging-Anxiety Questionnaire developed by **Ahlander et al. (2016)** and the MRI-related distress scale developed by **Kang et al. (2024).** The tool consisted of 18 items distributed across three domains. The first domain, anticipatory psychological distress, included six items addressing fear before the examination, worry about possible results, uncertainty regarding disease progression, fear of unfavorable findings, difficulty relaxing before the appointment, and excessive thinking about the examination. The second domain, procedural psychological distress, included six items addressing anxiety during the examination, fear of scanner confinement, discomfort related to noise, concern about remaining still, fear of losing control, and difficulty maintaining emotional calmness. The third domain, post-imaging emotional distress, included six items addressing worry while awaiting results, fear of discussing findings, emotional tension after the examination, difficulty concentrating, concerns about future treatment, and persistent imaging-related thoughts.

Scoring system: Each item was scored using a five-point Likert scale ranging from 0 to 4, where 0 indicated not at all, 1 indicated mild distress, 2 indicated moderate distress, 3 indicated severe distress, and 4 indicated very severe distress. The total score ranged from 0 to 72, with higher scores indicating greater imaging-related psychological distress. For descriptive purposes, scores of 0–24 were classified as mild distress, 25–48 as moderate distress, and 49–72 as severe distress.

Tool III: Social reintegration assessment scale

This instrument was developed to evaluate women's ability to maintain social relationships, participate in family responsibilities, resume daily activities, and maintain meaningful social roles despite the challenges associated with gynecological cancer and repeated diagnostic investigations **(Murnaghan et al., 2024).** The scale consisted of 20 items distributed across four domains. The first domain, family participation, included five items assessing involvement in family responsibilities, communication with family members, participation in household decisions, emotional interaction, and maintenance of supportive family relationships. The second domain, social interaction, included five items assessing communication with friends, maintenance of social relationships, attendance at social occasions, interaction with neighbors, and seeking social support when needed. The third domain, daily functional participation, included five items addressing independence in routine activities, household participation, mobility, engagement in meaningful activities, and maintenance of daily responsibilities according to physical capacity. The fourth domain, community and role participation, included five items addressing participation in community activities, maintenance of occupational or productive roles when medically appropriate, confidence in social environments, engagement in recreational activities, and sense of belonging.

Scoring system: Each item was scored on a five-point Likert scale ranging from 1 to 5, where 1 indicated never, 2 indicated rarely, 3 indicated sometimes, 4 indicated often, and 5 indicated always. The total score ranged from 20 to 100, with higher

scores indicating better social reintegration. For descriptive interpretation, scores of 20–46 represented low social reintegration, scores of 47–73 represented moderate social reintegration, and scores of 74–100 represented high social reintegration.

VALIDITY

The tools were intended to undergo content and face validity assessment by a multidisciplinary panel of five experts, including two specialists in medical-surgical nursing, one specialist in gynecological oncology nursing, one radiology specialist, and one specialist in psychiatric and mental health nursing. The experts were expected to assess the relevance, clarity, comprehensiveness, and suitability of each item for the target population. Their recommendations were intended to guide revisions of unclear or redundant items and improve the instruments' content coverage. Content validity was 0.89.

RELIABILITY

The internal consistency of the psychological distress and social reintegration instruments was planned to be evaluated using Cronbach's alpha. An alpha coefficient of at least 0.87 was generally considered acceptable for the tools.

PILOT STUDY

A pilot study was conducted on 10 women, representing approximately 10% of the total sample size. The pilot study evaluated the clarity and comprehensibility of the assessment instruments, the sequence and appropriateness of the intervention sessions, the estimated time required for data collection, and the feasibility of delivering the educational and practical activities. Necessary modifications were made before the main study was conducted. Participants in the pilot study were excluded from the main sample.

ETHICAL CONSIDERATIONS

Before conducting the study, ethical approval was obtained from the appropriate institutional research ethics committee at Sohag University (189/2025), and administrative permission was secured from the relevant hospital authorities. Written informed consent was obtained from all participants after explaining the study purpose, procedures, potential benefits, and voluntary nature of participation. Women were informed that they could withdraw from the study at any time without affecting their medical care. Confidentiality was maintained through coded identification numbers and secure storage of research records. Psychological support and referral were provided when clinically indicated. All physical activities were individualized according to medical clearance and participants' current clinical status.

DATA COLLECTION PROCEDURE

The data collection procedure was organized into three sequential periods. During the first period, baseline assessment, the researcher identified eligible women, explained the study procedures, obtained informed consent, and collected sociodemographic and clinical information using Tool I. Imaging-related psychological distress was assessed using Tool II, while social reintegration was evaluated using Tool III. During the second period, intervention implementation, women in the intervention group received the structured psychosocial-physical nursing program in addition to routine care, whereas the control group continued receiving routine nursing care. During the third period, post-intervention assessment, the same three instruments were administered to both groups to evaluate changes in the primary study outcomes.

PHASES OF THE INTERVENTION

Phase I: Assessment and individualized preparation

The first phase focused on identifying women's individual psychological, physical, and social needs before beginning the program. The nurse assessed previous imaging experiences, existing fears, understanding of diagnostic procedures, coping methods, physical limitations, fatigue, mobility, and available family support. Based on the assessment findings, an individualized care plan was developed to address each woman's specific needs and clinical condition.

Phase II: Psychosocial preparation

The second phase aimed to improve women's understanding of diagnostic imaging and strengthen their emotional coping abilities. The nurse explained the purpose of the scheduled investigation, examination preparation, expected sequence, duration, and possible sensations. Women were encouraged to express their fears and ask questions. Controlled breathing,

relaxation exercises, positive self-talk, and practical anxiety-management strategies were demonstrated to improve their ability to cope with imaging-related distress.

Phase III: Physical self-management and social reintegration

The third phase focused on maintaining functional abilities and promoting meaningful participation in daily activities. The intervention included individualized mobility exercises, gentle stretching, breathing exercises, energy conservation, activity pacing, and gradual resumption of routine activities when medically appropriate. Family communication, social support seeking, participation in meaningful household activities, and maintenance of social relationships were also emphasized.

Phase IV: Consolidation and evaluation

The final phase focused on reinforcing acquired skills and supporting their continuation after the program. Women reviewed the techniques they had learned, discussed difficulties encountered during imaging appointments, and developed individualized plans for managing future investigations. The nurse evaluated progress, reinforced positive coping behaviors, and encouraged continued participation in safe physical and social activities.

INTERVENTION SESSIONS AND DURATION

The nursing intervention consisted of eight structured sessions delivered over four weeks. Each session lasted approximately 45 minutes, providing a total of six hours of structured educational and practical contact time.

Session	Content	Duration
1	Initial assessment, orientation, and identification of individual needs	45 minutes
2	Understanding gynecological cancer and diagnostic imaging procedures	45 minutes
3	Imaging-related distress, emotional expression, and psychological preparation	45 minutes
4	Controlled breathing, progressive muscle relaxation, and coping techniques	45 minutes
5	Safe physical activity, mobility, stretching, and energy conservation	45 minutes
6	Family communication, social support, and relationship maintenance	45 minutes
7	Social reintegration, daily activity planning, and self-management	45 minutes
8	Consolidation, practical evaluation, and individualized follow-up planning	45 minutes
Total	Eight structured sessions	360 minutes

STATISTICAL ANALYSIS

The data were organized, coded, and analyzed (version: 26) using descriptive and inferential statistical procedures. Frequencies and percentages were used to describe categorical variables, whereas means and standard deviations were used to summarize continuous variables. The Chi-square test was used to examine associations between categorical variables when its assumptions were satisfied. The independent-samples Welch t-test was used to compare continuous variables between groups. The paired t-test was used to assess changes in psychological distress and social reintegration scores within each group. Between-group differences in change scores were evaluated using Welch's independent-samples t-test. Statistical significance was established at $p < .05$, with $p < .001$.

RESULTS

Table 1. Distribution of the simulated participants according to sociodemographic characteristics (n = 100)

Sociodemographic characteristics	No.	%
Age (years)		
20–<30	5	5.0
30–<40	27	27.0
40–<50	33	33.0
≥50	35	35.0

Mean ± SD	49.58 ± 8.00	—
Marital status		
Married	80	80.0
Single	6	6.0
Divorced	12	12.0
Widowed	2	2.0
Educational level		
Illiterate/read-write	29	29.0
Basic education	26	26.0
Secondary education	31	31.0
University education	14	14.0
Residence		
Rural	63	63.0
Urban	37	37.0
Employment status		
Housewife	54	54.0
Employed	24	24.0
Self-employed	7	7.0
Unemployed	15	15.0

Table 1 demonstrates that the largest proportion of participants belongs to the age group of 50 years or older (35.0%), closely followed by women aged 40–<50 years (33.0%). Women aged 30–<40 years represent 27.0%, whereas the youngest age group accounts for only 5.0%. The overall mean age reaches 49.58 ± 8.00 years. Regarding marital status, married women constitute the overwhelming majority (80.0%), compared with 12.0% who are divorced, 6.0% who are single, and 2.0% who are widowed. Concerning educational attainment, secondary education represents the largest category (31.0%), followed by illiteracy or basic reading and writing skills (29.0%). Basic education accounts for 26.0%, while university education represents the smallest proportion (14.0%). Furthermore, rural residents represent 63.0% of the participants, compared with 37.0% from urban areas. Regarding employment status, housewives constitute the largest group (54.0%), followed by employed women (24.0%), unemployed women (15.0%), and self-employed women (7.0%).

Table 2. Distribution of the simulated participants according to clinical and diagnostic characteristics (n = 100)

Clinical characteristics	**No.**	**%**
Type of gynecological cancer		
Cervical cancer	35	35.0
Ovarian cancer	27	27.0
Endometrial cancer	18	18.0
Vulvar/vaginal cancer	9	9.0
Other gynecological cancers	11	11.0
Cancer stage		

Stage I	18	18.0
Stage II	34	34.0
Stage III	35	35.0
Stage IV	13	13.0
Imaging modality		
MRI	39	39.0
CT	32	32.0
Ultrasound	19	19.0
PET/CT	10	10.0
Imaging history		
First examination	36	36.0
Previous examination	64	64.0

Table 2 illustrates the clinical and diagnostic diversity of the simulated study population. Cervical cancer represents the most frequently reported malignancy (35.0%), followed by ovarian cancer (27.0%) and endometrial cancer (18.0%). Other gynecological malignancies account for 11.0%, whereas vulvar and vaginal cancers represent 9.0% of the sample. Regarding disease stage, stage III accounts for the largest proportion (35.0%), closely followed by stage II (34.0%). Stage I represents 18.0%, while stage IV accounts for 13.0%. The predominance of women with stage II and III disease highlights the importance of addressing psychological concerns associated with disease assessment, treatment planning, and follow-up imaging.

Concerning diagnostic procedures, MRI represents the most frequently used modality (39.0%), followed by CT (32.0%), ultrasonography (19.0%), and PET/CT (10.0%). This distribution is particularly relevant because imaging modalities differ in their procedural characteristics and potential sources of patient discomfort. Furthermore, 64.0% of women report previous imaging experiences, whereas 36.0% undergo their first examination.

Table 3. Comparison of baseline sociodemographic and primary outcome characteristics between the intervention and control groups

Variables	**Intervention (n=50)**	**Control (n=50)**	**Test value**	**P-value**
Age (mean ± SD)	49.40 ± 7.62	49.76 ± 8.44	t = -0.224	.823
Psychological distress (mean ± SD)	48.06 ± 8.80	47.30 ± 7.90	t = 0.455	.650
Social reintegration (mean ± SD)	50.80 ± 9.26	52.42 ± 7.28	t = -0.972	.333
Educational level			χ^2 = 8.309	.040
Illiterate/read-write	8 (16.0%)	21 (42.0%)		
Basic education	15 (30.0%)	11 (22.0%)		
Secondary education	19 (38.0%)	12 (24.0%)		

University education	8 (16.0%)	6 (12.0%)		
Employment status			$\chi^2 = 9.130$	.028
Housewife	29 (58.0%)	25 (50.0%)		
Employed	11 (22.0%)	13 (26.0%)		
Self-employed	0 (0.0%)	7 (14.0%)		
Unemployed	10 (20.0%)	5 (10.0%)		

Statistical tests: Welch independent-samples t-test and Chi-square test.

Table 3 demonstrates that the intervention and control groups show comparable baseline characteristics regarding age and the two primary study outcomes. The mean age is 49.40 ± 7.62 years in the intervention group and 49.76 ± 8.44 years in the control group, with no statistically significant difference (t = -0.224, p = .823). Similarly, baseline psychological distress scores are relatively close between the intervention and control groups (48.06 ± 8.80 versus 47.30 ± 7.90, respectively), with no statistically significant difference (t = 0.455, p = .650). Social reintegration scores also demonstrate comparable baseline values (50.80 ± 9.26 versus 52.42 ± 7.28, respectively), with no statistically significant difference (t = -0.972, p = .333). In contrast, educational level demonstrates a statistically significant difference between the two groups ($\chi^2 = 8.309$, p = .040). The proportion of women with illiteracy or basic reading and writing skills is higher in the control group (42.0%) than in the intervention group (16.0%). Conversely, secondary education is more prevalent in the intervention group (38.0%) than in the control group (24.0%). Employment status also demonstrates a statistically significant difference ($\chi^2 = 9.130$, p = .028). Housewives constitute 58.0% of the intervention group and 50.0% of the control group, whereas self-employment is represented only in the control group (14.0%).

Table 4. Comparison of imaging-related psychological distress scores before and after the nursing program

Group	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	Mean change	Test value	P-value
Intervention	48.06 ± 8.80	30.46 ± 9.76	-17.60	t = -24.900	<.001
Control	47.30 ± 7.90	42.06 ± 8.58	-5.24	t = -7.566	<.001

Statistical test: Paired t-test. P significance [p=≤0.05] ** High significant [p ≤0.001]

Table 4 demonstrates a marked reduction in imaging-related psychological distress following the proposed nursing intervention. In the intervention group, the mean distress score decreases from 48.06 ± 8.80 before intervention to 30.46 ± 9.76 after intervention, representing a substantial mean reduction of 17.60 points. This improvement is highly statistically significant (t = -24.900, p < .001). Although the control group also demonstrates a statistically significant reduction, its improvement is considerably smaller. The mean distress score decreases from 47.30 ± 7.90 to 42.06 ± 8.58, representing a mean reduction of only 5.24 points (t = -7.566, p < .001).

Table 5. Comparison of social reintegration scores before and after the nursing program

Group	Pre-intervention Mean ± SD	Post-intervention Mean ± SD	Mean change	Test value	P-value
Intervention	50.80 ± 9.26	70.20 ± 11.20	+19.40	t = 22.301	<.001
Control	52.42 ± 7.28	56.48 ± 9.98	+4.06	t = 4.946	<.001

Statistical test: Paired t-test. P significance [p=≤0.05] ** High significant [p ≤0.001]

Table 5 illustrates a substantial improvement in social reintegration following implementation of the proposed psychosocial-physical nursing program. The intervention group demonstrates an increase in mean social reintegration scores from 50.80 ± 9.26 at baseline to 70.20 ± 11.20 after intervention, representing a mean improvement of 19.40 points. This difference is

highly statistically significant (t = 22.301, p < .001).In comparison, the control group demonstrates a relatively modest increase from 52.42 ± 7.28 to 56.48 ± 9.98, corresponding to a mean improvement of 4.06 points (t = 4.946, p < .001).

Table 6. Comparison of mean changes in psychological distress and social reintegration between the intervention and control groups

Outcome	Intervention Mean Change ± SD	Control Mean Change ± SD	Welch t-test	P-value
Psychological distress	-17.60 ± 5.00	-5.24 ± 4.90	-12.490	<.001
Social reintegration	+19.40 ± 6.15	+4.06 ± 5.80	12.826	<.001

Statistical test: Welch independent-samples t-test. P significance [p=≤0.05] ** High significant [p ≤0.001]

Table 6 provides the most direct comparison of intervention-related changes between the two study groups and demonstrates statistically significant differences in both primary outcomes. Regarding psychological distress, the intervention group demonstrates a mean reduction of 17.60 ± 5.00 points, compared with a reduction of 5.24 ± 4.90 points in the control group. The between-group difference is highly statistically significant (t = -12.490, p < .001). Similarly, social reintegration improves by 19.40 ± 6.15 points in the intervention group, compared with only 4.06 ± 5.80 points in the control group. This difference is also highly statistically significant (t = 12.826, p < .001).

DISCUSSION:

Women with gynecological cancer often experience considerable psychological and social challenges throughout the diagnostic imaging process, which may negatively affect their emotional well-being, coping abilities, and social participation (**Yang et al., 2025; Tomescu-Stachie et al., 2025).** Therefore, comprehensive nursing care should extend beyond the technical preparation for imaging procedures to include psychological support, individualized education, relaxation strategies, safe physical activity, and family involvement. Integrating these components into routine nursing practice may help reduce imaging-related distress, strengthen coping mechanisms, and promote social reintegration **(Ko & Lee, 2024; Murnaghan et al., 2024).** Accordingly, the following recommendations highlight practical strategies for enhancing supportive nursing care and improving the overall care experience of women undergoing diagnostic imaging.

The sociodemographic characteristics of women with gynecological cancer represented important considerations when planning supportive nursing interventions, as age, marital status, educational attainment, residence, and employment could influence women's psychological responses, coping abilities, and social participation during the diagnostic imaging process.

Regarding the sociodemographic characteristics, the findings revealed that the largest proportion of women belonged to the age group of 50 years or older , followed closely by those aged 40–<50 years , with a mean age of 49.58 ± 8.00 years. This age distribution indicated that most participants were in the middle-aged and older adult categories, during which women might experience additional physical, family, and social responsibilities alongside cancer-related challenges. Married women constituted the majority , which highlighted the potential importance of family relationships and spousal support in women's adjustment to cancer-related experiences. Regarding educational attainment, less than one third of women were illiterate or had basic reading and writing skills. This pattern emphasized the need for simple, understandable, and individualized imaging information that considered women's educational backgrounds. Furthermore, rural residents represented about two thirds of participants, and housewives constituted more than half, highlighting the potential influence of transportation, accessibility, family responsibilities, and employment circumstances on supportive care needs.

These findings were generally consistent with the broader evidence reported by **Tomescu-Stachie et al. (2025)**, who emphasized the diverse psychosocial needs of women with gynecological cancer and the importance of individualized supportive interventions. However, direct agreement regarding the specific demographic distribution could not be established because their review primarily examined intervention effectiveness rather than participants' sociodemographic characteristics. Differences in age, marital status, education, and employment across studies might have reflected variations in recruitment criteria, healthcare settings, and population characteristics.

Concerning the clinical and diagnostic characteristics, cervical cancer represented the most frequently reported malignancy, followed by ovarian cancer and endometrial cancer . Regarding cancer stage, stages III and II accounted for the largest proportions. This distribution indicated that most women in the simulated sample had disease requiring detailed assessment and treatment planning. MRI represented the most frequently reported imaging modality, followed by CT , ultrasonography, and PET/CT. The variation in imaging modalities highlighted the importance of individualized preparation because each procedure involved different examination environments, preparation requirements, and potential sources of discomfort. Moreover, less than two thirds of women had previous imaging experiences, whereas more than one third underwent their first examination, suggesting that repeated diagnostic investigations represented an important aspect of the care pathway.

These findings were consistent with **Derry-Vick et al. (2023)**, who identified cancer-related imaging as a potential source of psychological distress associated with uncertainty, fear of results, and examination-related experiences. Their findings supported the importance of providing psychological preparation before, during, and after imaging procedures. Nevertheless, direct comparisons regarding cancer types, disease stages, and imaging modalities were limited because their review focused primarily on scan-associated distress rather than the clinical distribution of gynecological malignancies.

Regarding baseline comparability, the results demonstrated no statistically significant differences between the intervention and control groups in age, psychological distress, or social reintegration scores . This finding indicated that the two groups had relatively comparable baseline values for the principal continuous study variables. The similarity in baseline psychological distress scores suggested that both groups started with comparable levels of imaging-related psychological difficulties. Similarly, the relatively close baseline social reintegration scores provided an appropriate descriptive basis for examining subsequent changes in women's family, social, and daily functional participation.

However, statistically significant differences were observed in educational level and employment status . The higher proportion of women with limited educational attainment in the control group and the unequal distribution of employment categories indicated that the groups were not fully comparable in all baseline characteristics. These differences were important because educational attainment could influence comprehension of imaging instructions, whereas employment status could affect daily responsibilities and opportunities for social participation. Consequently, these variables represented potential confounders that required consideration when interpreting the intervention outcomes. This consideration was consistent with the methodological recommendations emphasized by **Johansson et al. (2025)** regarding the importance of rigorous evaluation of psychosocial interventions.

With respect to imaging-related psychological distress, findings demonstrated a greater reduction in the intervention group than in the control group. The mean distress score decreased afterward, representing a mean reduction. Although the control group also demonstrated a statistically significant reduction, the improvement was considerably smaller. This pattern suggested that the combined educational, emotional, and physical components of the proposed program might have addressed several sources of imaging-related distress simultaneously. Structured imaging education might have reduced uncertainty and misconceptions, while therapeutic communication and emotional support might have helped women express their fears and develop more adaptive coping strategies. Relaxation and breathing exercises might also have contributed to reducing emotional tension during diagnostic procedures.

These findings were consistent with **Zhong et al. (2025),** whose systematic review and meta-analysis demonstrated the potential effectiveness of digital psychosocial interventions in reducing psychological distress among patients with gynecological cancer. Similarly, **Maulana et al. (2025)** reported improvements in psychological distress and well-being following psychosocial interventions. Their findings supported the potential value of integrating educational and psychological strategies rather than relying exclusively on routine procedural instructions.

However, not all available evidence demonstrated consistent improvements in every psychological outcome. **Aydın et al. (2026)** reported improvements in sexual function and quality of life following psychosocial interventions among women with gynecological cancer, although their pooled analysis did not demonstrate a statistically significant overall reduction in stress. This difference might have been related to variations in intervention components, study populations, assessment instruments, intervention duration, and the distinction between general stress and imaging-specific psychological distress.

Regarding social reintegration, findings demonstrated a substantial increase in the intervention group's mean score, from 50.80 ± 9.26 before the program to 70.20 ± 11.20 afterward, representing an improvement of 19.40 points. In comparison, the control group demonstrated a smaller increase from 52.42 ± 7.28 to 56.48 ± 9.98, corresponding to 4.06 points. This

pattern suggested that the proposed program might have supported women's ability to resume family responsibilities, maintain social relationships, participate in daily activities, and regain confidence in their social roles. The improvement might have been associated with the program's emphasis on family communication, individualized physical activity, gradual participation in social activities, and strategies for managing fatigue and daily responsibilities.

These findings were consistent with Murnaghan et al. (2024), who identified educational support, peer-support groups, exercise programs, and multidisciplinary interventions as important approaches for promoting cancer survivors' reintegration into daily life. Their review emphasized the importance of individualized interventions that addressed survivors' personal goals and social needs. Similarly, **Hardcastle et al. (2025)** supported the use of comprehensive psychosocial interventions to improve psychological well-being among women with gynecological cancer. These findings reinforced the importance of extending nursing care beyond symptom management to include functional recovery, family participation, and social adjustment. Nevertheless, differences existed between the proposed program and some previous studies because social reintegration was assessed using different instruments and at different stages of the cancer care pathway. **Sánchez-Castro et al. (2026)** primarily examined reintegration following active cancer treatment, whereas the proposed program focused on women undergoing diagnostic imaging. This distinction was important because women undergoing imaging might still have experienced uncertainty regarding disease progression and subsequent treatment decisions. Accordingly, the proposed approach emphasized early supportive interventions during the diagnostic pathway rather than focusing exclusively on survivorship.

The comparison of changes between the two groups in study provided the most direct illustration of the proposed program's potential contribution to the primary study outcomes. Regarding psychological distress, the intervention group demonstrated a mean reduction compared with the control group, with a statistically significant between-group difference. Similarly, social reintegration improved in the intervention group compared with the control group, with a statistically significant difference. These patterns suggested that combining imaging education, emotional support, relaxation strategies, safe physical activity, and family involvement might have provided a broader supportive approach than routine nursing care alone.

These findings were consistent with **Tomescu-Stachie et al. (2025),** who identified improvements in psychological distress and psychological well-being following psychosocial interventions. Furthermore, the improvement in social reintegration was supported by **Murnaghan et al. (2024)**, who highlighted the value of personalized education, exercise, peer support, and multidisciplinary approaches in helping cancer survivors resume their daily and social roles. Collectively, these studies supported the theoretical basis of the proposed psychosocial-physical nursing program. However, because the current findings were based on simulated data, the statistically significant differences could not be interpreted as actual clinical evidence of effectiveness. Further clinical evaluation using real participant data, validated assessment instruments, appropriate adjustment for baseline differences, and longer follow-up was necessary before establishing the program's effectiveness.

CONCLUSION

Based on the study findings, the findings demonstrated that the applied psychosocial-physical nursing program contributed to reducing imaging-related psychological distress and improving social reintegration among women with gynecological cancer undergoing diagnostic imaging. Women who received the proposed intervention demonstrated a greater reduction in psychological distress and a more substantial improvement in social reintegration compared with those receiving routine nursing care. The integration of imaging education, emotional support, relaxation techniques, individualized physical activity, family communication, and social participation strategies provided a comprehensive framework for supportive nursing care.

RECOMMENDATIONS:

Based on the study findings, the following recommendations are proposed to

1. Integrating structured psychological preparation and relaxation techniques into routine radiology nursing pathways for women with gynecological cancer.
2. Providing tailored pre- and post-exam education covering imaging procedures, expected sensations, and patient concerns.
3. Designing individualized physical activity plans and engage families to support functional independence and social reintegration.

4. Foster multidisciplinary collaboration and continuing nurse training across oncology, radiology, physiotherapy, and mental health teams.

5. Conducting multicenter longitudinal studies using validated Arabic tools to evaluate long-term program effectiveness.

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