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Developing and validating a functional social relationships enhancement program for cancer patients: A Delphi method

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Abstract:

BACKGROUND: Disruptions in key functional aspects of social relationships, such as reduced support, social distress, loneliness, and isolation, contribute significantly to negative patient outcomes. An evidence-based program was designed and evaluated using the Delphi technique to enhance social relationships.

MATERIALS AND METHODS: This developmental mixed-methods study, conducted in Isfahan during 2024–2025, designed and validated a program based on the Ewles and Simnett model using a three-round Delphi technique. Healthcare and psychosocial specialists participated, employing structured checklists in all rounds. Needs were prioritized in the first round ($n = 10$), operational activities evaluated in the second ($n = 10$), and the program validated in the third ($n = 10$). Data were analyzed with SPSS 23 using descriptive statistics.

RESULTS: In the first Delphi round, 10 priority needs were selected out of 51, each receiving at least 70% of the total expert scores based on their importance. In the second round, 77 operational activities were selected from 105, meeting $\geq 80\%$ consensus on importance, feasibility, and cost-effectiveness. In the final round, expert consensus exceeded 90% across all evaluated dimensions, confirming the overall credibility and acceptance of the program.

CONCLUSION: Experts reached consensus through the Delphi technique to develop and validate evidence-based interventions aimed at improving functional social relationships, providing a practical framework to enhance psychosocial well-being, and strengthening supportive care for cancer patients in clinical and research settings.

Keywords:

Cancer, Delphi technique, program development, psychosocial intervention, social relationship

Introduction

Social relationships refer to meaningful and sustained connections formed through repeated interactions, typically involving spouses, family, friends, and acquaintances, whereas transient encounters are excluded. In behavioral medicine, the focus is on informal social networks that are integral to daily life, with formal connections, such as healthcare providers or legal advisors,

considered peripheral. Researchers are particularly interested in both specific interactions within these networks and the broader perceptions shaped by past and present encounters. While social networks often provide emotional support, material aid, companionship, and encouragement for health-promoting behaviors, they can also involve negative interactions, such as neglect, insensitivity, and conflict.^[1] A growing body of research differentiates between the structural and functional aspects of social relationships, both of which

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essential for understanding their impact on health and informing strategies to enhance social connectedness.^[2] The structural aspect focuses on network characteristics such as the number of individuals, relationship types, and interaction frequency.^[1-3] In contrast, the functional aspect emphasizes the emotional quality of these relationships, with value lying in their ability to provide support or create stress. Emotional outcomes from these interactions significantly affect life satisfaction and psychosocial well-being.^[1-3] Functional relationships are often framed through constructs such as perceived social support, social distress, and companionship, directly influencing health and emotional resilience.^[4] Social support refers to an individual's perception of being cared for and valued within their social environment,^[4,5] while social distress reflects negative, unsupportive, or psychologically burdensome interactions.^[4] Companionship, distinct from support, involves the intrinsic value of shared presence and social engagement, with components like friendship and loneliness representing accessible social ties and perceived isolation.^[4,6]

Within the context of chronic illnesses, such as cancer, the role of social relationships becomes even more salient. Cancer is not only a physical illness requiring complex, multidisciplinary treatment, but also a profoundly stressful experience with substantial psychosocial impacts across physical, emotional, spiritual, and interpersonal dimensions.^[7] Regarding romantic relationships, studies show that young, single cancer patients often delay initiating romantic partnerships and are less likely to marry compared to their peers and siblings.^[8] However, in married individuals, the influence of cancer on intimate relationships presents mixed results. Some research indicates that cancer may introduce marital distress and diminish the overall quality of the relationship.^[9,10] In one survey, 13.1% of respondents reported experiencing challenges in their marital and sexual lives.^[9] In terms of family dynamics, cancer significantly alters family functioning. Most families affected by cancer exhibit low emotional expressiveness, with supportive and detached family types being the most common.^[11] On a broader societal level, cancer patients frequently face social isolation and additional challenges such as social constraints (e.g. avoidance and criticism) and cancer-related loneliness, in which patients feel disconnected from their social circles.^[12] These social experiences are influenced by cultural norms, systemic structures, and personal circumstances, with stigma and prejudice often leading to social marginalization and weakening of relationships. Continuous social support is vital but often inadequate due to misinformation, cultural taboos, and lack of public understanding.^[13,14]

Given the profound psychosocial impact of cancer, addressing these challenges requires implementing

comprehensive, evidence-based interventions that are multifaceted and precisely tailored.^[15] Educational programs that enhance communication skills and coping mechanisms in both patients and caregivers can play a pivotal role in reducing social stressors and improving interpersonal relationships. Concurrently, a structured approach to providing psychological services, social support programs, and training in interpersonal skills is essential for alleviating social isolation, improving relational functioning, and ultimately enhancing the overall quality of life for cancer patients.^[16-18] A comprehensive review of major scientific databases and clinical guidelines reveals that no current intervention specifically addresses the functional aspects of social relationships in cancer patients. This gap highlights the urgent need for targeted, evidence-based interventions tailored to these specific social needs. Existing psychosocial care frameworks often treat social needs as secondary or peripheral, resulting in fragmented and inadequate strategies that overlook the central role of social connectedness in cancer care. Addressing this issue requires both empirical grounding and the integration of multidisciplinary expertise. To this end, the present study employed the Delphi technique, a systematic consensus-building method well suited for areas where empirical data are limited and expert insight is essential.^[19] Contributions from specialists in medicine, nursing, psychology, and counseling were instrumental in developing comprehensive interventions. Accordingly, a program to enhance the functional aspects of social relationships among cancer patients was designed and evaluated using the Delphi technique.

Materials and Methods

Study design and setting

This developmental mixed-methods study, conducted in 2024–2025 in Isfahan, was part of a larger research project. The present article delineates the process through which the program was systematically developed and validated using the Delphi technique. The program was developed based on the planning framework proposed by Ewles and Simnett, a comprehensive model comprising several critical stages: identifying and prioritizing needs; defining general and specific objectives; selecting evidence-based intervention strategies; specifying operational activities; allocating required resources; and establishing robust monitoring and evaluation mechanisms to assess both implementation processes and program outcomes.^[20]

Procedure

As previously outlined, the program development followed a structured, multiphase approach. It utilized three iterative rounds of the modified Delphi technique administered through email correspondence. This

method is a systematic, iterative approach designed to gather expert opinions and reach a consensus on specific topics through multiple rounds of anonymous surveys.^[21] The Delphi technique typically involves two to five rounds of questioning and is most commonly conducted via online platforms or a hybrid model combining both online and in-person interactions.^[21,22] In the modified Delphi approach, a team of researchers first identifies key themes from the existing literature, which are then sent to a panel of experts for ranking according to their perceived importance.^[23] This method maintains respondent anonymity, thereby minimizing the influence of dominant voices and promoting independent judgment. Delphi studies generally involve fewer than 50 participants. Although there is no universally accepted sampling method for Delphi studies,^[24] purposive sampling is often used, especially when selecting experts with specific qualifications. Participants are typically required to possess relevant scientific expertise, subject-matter knowledge, a willingness to engage, and sufficient time to contribute to the evaluation process.^[24,25]

Delphi round 1: Prioritization of identified needs

The first round of the Delphi technique focused on prioritizing the needs related to functional social relationships among cancer patients, previously identified through a qualitative metasynthesis and a systematic review of quantitative and mixed-methods studies. A comprehensive literature search was conducted across major international databases, including PubMed, Web of Science, Scopus, and ScienceDirect, as well as national repositories including SID, NoorMags, and Magiran. The thematic domains were developed through a thematic synthesis based on the Thomas and Harden model (2008),^[26] combined with systematic review findings, and subsequently refined and finalized via iterative expert discussions within the research team.

A total of 51 needs, organized into nine thematic domains, were extracted from the literature and used to develop a structured survey instrument. This survey was distributed to a panel of 10 experts selected through purposive and snowball sampling. Expert qualifications were verified based on their prior publications and active involvement in cancer care programs. The expert panel included professionals specialized in various fields: psychiatric nursing (2 members), psycho-oncology (1 member), sexual therapy (1 member), health and family psychology (2 members), and palliative and supportive care for cancer patients (4 members). Experts were asked to evaluate each identified need using a 6-point Likert scale ranging from 0 (not important) to 5 (very important). Eligibility criteria for participation included proven expertise in cancer care, social networks and relationships, and supportive or palliative care, as well

as a commitment to complete all Delphi rounds. Experts who did not complete the evaluations or withdrew at any stage were excluded from the final analysis. Following data analysis, needs that received at least 70% of the maximum possible score were considered prioritized. These needs served as the foundation for subsequent stages of program development.

In-person expert panel session

To ensure the validity of the prioritized needs and integrate expert insights into program development, a structured expert panel session was conducted. The session aimed to refine the final list of needs and critically review the proposed objectives and strategies. The panel included eight specialists, including experts in psychiatric nursing (2 members), family psychology and sexual therapy (1 member), supportive or palliative care (5 members), each with substantial experience in oncology and psychosocial care. Participants were recruited through purposive and snowball sampling.

Held at the School of Nursing and Midwifery, Isfahan University of Medical Sciences, the session followed a structured agenda. The principal investigator presented a synthesis of findings from the metasynthesis, systematic review, and Delphi process. Panelists evaluated the relevance of the identified needs, proposed revisions to program objectives, and recommended evidence-based strategies to enhance the functional dimensions of social relationships in cancer patients. Discussions were audio-recorded and transcribed verbatim for thematic analysis. Expert feedback was then consolidated with previous findings to finalize both the prioritized needs and corresponding strategic interventions. Based on this integration, a comprehensive set of operational strategies was formulated. Each strategy was defined with specific, actionable steps to support structured, measurable, and context-sensitive implementation. Their design was reinforced by a targeted review of global evidence, particularly in the fields of psychosocial oncology, patient empowerment, and technology-supported care, ensuring scientific rigor and practical feasibility. The data obtained from this panel were used to revise and refine both the objectives and the operational activities in the subsequent Delphi rounds.

Delphi round 2: Prioritizing operational activities

The second round of the Delphi technique focused on prioritizing operational activities previously identified through a review of relevant studies and expert panel input. A comprehensive literature search was conducted across major international databases, including PubMed, Web of Science, Scopus, and ScienceDirect, as well as national repositories, including SID, NoorMags, and Magiran. The experts were the same as those who participated in the first round of the Delphi

process ($n = 10$). The operational activities were rated using a 6-point Likert scale based on three key criteria: importance, feasibility, and cost-effectiveness. Activities scoring 12 or higher out of 15 (80% of the maximum) were included in the final program; those below this threshold were excluded.

Following the completion of the second round of the Delphi process, the initial draft of the program was developed. The draft was structured into three core sections: Introduction, Program Overview, and Program Content.

Delphi round 3: Validation of the program

In the third round of the Delphi process, the program underwent validation. To this end, a comprehensive evaluation checklist accompanied the initial program draft, which was submitted to a panel of experts ($n = 10$). The expert panel consisted of professionals with advanced expertise in diverse fields: two specialists in psychiatric nursing, one expert in sexual therapy, one professional in health and family psychology, five specialists in palliative and supportive care for cancer patients, and one expert in content development and health information technology. Four members of this panel differed from those in previous rounds, as some original members declined to participate in the program evaluation. The new experts were selected using purposive and snowball sampling methods and met the same inclusion and exclusion criteria as in the earlier rounds. To ensure consistency in evaluation standards, the newly involved experts received a brief orientation. This included a summary of prior steps, an introduction to the standardized agreement percentage (SAP) index, detailed scoring criteria, and clarification of evaluation objectives—ensuring alignment with the standards from previous rounds.

The evaluation was based on a 6-point Likert scale, ranging from 1 (completely undesirable) to 6 (completely desirable). In this checklist, 18 critical elements were evaluated across three primary sections of the program. The first section, which encompasses the foundational and prerequisite elements for program development (Introduction), includes four items: the importance and necessity of the program, the current situation, existing documented programs, and relevant legal and policy frameworks. These elements provide the contextual and strategic rationale for the initiation of the program. The second section, outlining the conceptual and strategic framework of the program (Program Overview), consists of eight items: the program's mission and vision, core values and beliefs, the scope and boundaries of the program, the target population, intended audience, overarching goals, and key terminology. This section articulates the

program's direction, philosophical underpinnings, and intended impact. The third section, which addresses the operational design and implementation system of the program (Program Content), includes six items: needs assessment, general and specific objectives, intervention strategies, operational activities, detailed implementation plans, and monitoring and evaluation indicators.

To assess the level of agreement among evaluators, the SAP index was used to measure how closely expert opinions aligned with the ideal outcome. First, the actual score obtained for each section of the program was calculated by summing the scores given by all evaluators. Then, the maximum possible score was determined by multiplying the number of evaluators, the number of criteria, and the highest possible score (6). The minimum possible score was calculated based on the assumption that all evaluators assigned the lowest score (1) to each item. The scores of the three sections are independent of each other and there is no overall score for the tool.

To compute the agreement percentage, the following formula was used:

$$\text{SAP} = \left(\frac{[\text{obtained score} - \text{minimum possible score}]}{(\text{maximum possible score} - \text{minimum possible score})} \right) \times 100$$

- Maximum possible score = Number of items in the section $\times$ number of evaluators $\times$ 6 (completely desirable)
- Minimum possible score = Number of items in the section $\times$ number of evaluators $\times$ 1 (completely undesirable)

For example, in the first section comprising 4 items evaluated by 10 experts, the scoring limits are:

$$\text{Maximum possible score} = 4 \times 10 \times 6 = 240$$

$$\text{Minimum possible score} = 4 \times 10 \times 1 = 40$$

If the total obtained score is 221, the SAP is calculated as follows:

$$\frac{221 - 40}{240 - 40} \times 100 = \frac{181}{200} \times 100 = 90.5 \%$$

This percentage reflects the degree of expert consensus regarding the desirability of each program section. A consensus score above 70% was considered acceptable for content validity. Sections scoring below this threshold were revised or adjusted accordingly.^[27]

Data analysis

Quantitative data were analyzed using SPSS software (version 23.0; SPSS Inc., Chicago, IL, USA).

Descriptive statistics, including frequencies and percentages, were used to describe the data.

Ethical considerations

The study was reviewed and approved by the Ethics Committee of Isfahan University of Medical Sciences (IUMS), Iran (approval code: IR.MUI.NUREMA.REC.1402.081).

Results

After identifying and categorizing 51 distinct needs across 9 domains, the list was evaluated in the first round of the Delphi process by 10 subject-matter experts, all of whom responded using a structured scoring form (100% response rate). Each need was rated on a 50-point scale, with a cut-off score of 35 (70% of the maximum) set as the threshold for prioritization. Based on this criterion, 10 high-priority needs across 8 core domains were identified. These domains included issues such as strain in intimate relationships, mismatches in received versus expected support, social isolation and reintegration challenges, social support needs, experiences of stigma or rejection, reluctance to seek support, discomfort from pity or excessive sympathy, and difficulties in sharing personal information. The ninth domain, empowerment, was initially identified but excluded during subsequent Delphi rounds. The 10 high-priority needs are presented in Table 1.

Based on the identified priorities, the research team developed general and specific objectives, which were subsequently refined during an in-person expert panel session with eight specialists. The panel recommended consolidating and rephrasing some objectives to enhance

clinical relevance and ensure contextual appropriateness. Additionally, the experts contributed valuable input on potential intervention strategies.

In the second round of the Delphi process, all prior experts assessed these activities based on importance, feasibility, and cost-effectiveness. Only those scoring at least 12 out of 15 points (80%) were retained in the final intervention model (77 operational activities from 105). Table 1 presents a summary of the prioritized activities for each identified need. It also includes the highest- and lowest-scoring operational activities corresponding to each need.

In the third Delphi round, experts evaluated the initial draft using a structured checklist to assess the quality, clarity, and coherence of the program content and organization. The validity of the final version was confirmed by consistently high scores exceeding 90% across all three sections, with full expert participation (100% response rate) [Table 2]. Ratings on a scale from 1 (completely inappropriate) to 6 (completely appropriate) demonstrated strong consensus, with agreement levels of 90.5%, 96%, and 95.7% for the first, second, and third sections, respectively. These findings highlight the program's strong content validity, conceptual clarity, and contextual relevance, supporting its overall suitability for implementation.

In summary, throughout the three Delphi rounds, enhancing emotional and sexual relationships emerged as the highest-priority need, achieving a perfect score of 100% (50 out of 50). Among intervention activities, multidisciplinary training sessions received the highest expert ratings with 92.7% (13.90 out of 15). Finally, the

Table 1: Overview of prioritized operational activities corresponding to each goal

Needs	Number of activities prioritized/proposed	Top-rated activities (score)	Lowest-rated activities (score)
Enhancing emotional and sexual relationships	10/13	Couple's therapy workshop (13.70)	Dialogue-based website (12.00)
Facilitating illness acceptance and resilience	10/13	Multidisciplinary training sessions (13.60)	Virtual peer-support group (12.00)
Reducing interpersonal conflict	4/8	Blended educational sessions (12.60)	Educational booklet (12.00)
Restructuring social relationships	12/17	Multidisciplinary training sessions (13.90)	Videos and podcasts (12.00)
Enhancing consistent social support	5/8	Individual counseling (12.70)	Mobile app-based content (12.20)
Reinforcing sense of belonging to general population	10/12	Hands-on participatory workshops (13.50)	Recreational/bonding programs (12.00)
Coping with changes in physical appearance	8/8	Multidimensional Education program (13.70)	Instructional booklet (12.20)
Alleviating feelings of being a burden	9/13	Multidisciplinary Virtual workshops (13.00)	Patient follow-up service (12.00)
Promoting received and perceived empathy over pity/sympathy	5/7	Virtual educational workshops (12.50)	Educational brochure (12.00)
Managing disclosure of health information	5/6	Interactive webinars (13.00)	Educational podcasts (12.10)

Activity scores are out of 15

Table 2: Results of validity assessment of the Functional Social Relationships Promotion Program (Score 1=completely inappropriate to Score 6=completely appropriate)

Section	Items	E1	E2	E3	E4	E5	E6	E7	E8	E9	E0	Item total score	Section total score	Expert agreement (%)
First	Importance and necessity of developing the program	6	6	6	5	6	6	6	6	5	6	57	221	90.5
	Current status	6	6	6	5	5	6	6	6	5	6	56		
	Existing documented programs	6	6	6	5	5	6	6	6	5	5	55		
	Relevant laws and upper-level documents	6	6	6	5	5	6	6	4	5	5	53		
Second	Program mission	6	6	6	5	6	6	6	6	6	6	58	464	96
	Program vision	6	6	6	5	6	6	6	6	5	6	57		
	Core values and beliefs	6	6	6	5	6	6	6	6	6	4	57		
	Scope and boundaries	6	6	6	5	6	6	6	6	5	6	58		
	Target population	6	6	6	5	6	6	6	5	6	6	58		
	Intended audience	6	6	6	5	6	6	6	6	6	6	59		
	Final goals of the program	6	6	6	5	6	6	6	6	5	6	58		
	Keywords	6	6	6	5	6	6	6	6	6	6	59		
	Needs assessment	6	6	6	5	6	6	6	6	5	6	58		
	General and specific goals	6	6	6	5	6	6	6	6	5	5	58		
Third	Intervention strategies	6	6	6	5	6	6	6	6	5	6	58	347	95.67
	Operational activities	6	6	6	5	6	6	6	6	5	6	58		
	Activity implementation details	6	6	6	5	6	6	6	6	5	6	58		
	Monitoring and evaluation indicators	5	6	6	5	6	6	6	6	5	6	57		

E=Expert

program's second section, which included the mission, vision, core values, scope, target population, intended audience, final goals, and keywords, garnered the greatest expert consensus at 96% among all evaluated sections.

Discussion

In this study, a program aimed at improving the functional aspects of social relationships was developed based on the Ewles and Simnett model. The development process of the program involved three rounds of the Delphi technique.

During the first Delphi round, an expert panel assessed and prioritized the identified needs based on their importance. As a result, 10 key needs were retained to guide program development. To promote clarity and facilitate structured discussion, these needs were categorized into four primary groups: interpersonal functioning, psychological well-being, social participation and inclusion, and communication challenges.

The first needs group, interpersonal functioning, included enhancing emotional and sexual relationships and reducing interpersonal conflicts. The highest-priority need identified in this study aligns with well-established psychosocial challenges encountered in oncology care. Cancer patients often face considerable disruptions in emotional and intimate relationships, with many studies documenting the prevalence of sexual dysfunction and relationship strain as consequences of cancer and its

treatment.^[28] Reducing interpersonal conflict was also highlighted as a critical need. According to Laing *et al.*, cancer patients often experience psychosocial distress rooted in interpersonal difficulties, typically arising from disrupted social roles and mismatched expectations, which can hinder emotional adjustment throughout the illness trajectory.^[29]

The second group, psychological well-being, encompassed fostering of illness acceptance and psychological resilience, coping with changes in physical appearance, and alleviating the feeling of being a burden. Acceptance and resilience are essential for emotional stability and sustaining positive affective experiences.^[30] According to the broaden-and-build theory, positive emotions expand cognitive and behavioral repertoires, facilitating the development of enduring psychological and social resources.^[31] Changes in physical appearance were another major concern, as they can contribute to emotional distress and social withdrawal due to heightened self-consciousness and fear of negative judgment.^[32] Furthermore, addressing the internalized perception of being a burden was crucial, given that 19%–65% of terminally ill patients report such feelings, as shown in a systematic review by McPherson *et al.*^[33]

The third group, social participation and inclusion, involves restructuring social relationships, enhancing consistent social support, and reinforcing a sense of belonging to the broader community. Ruan *et al.* emphasized the complexity of post-treatment social reintegration, which contributes to improving

functioning and fosters positive perspectives on illness and personal growth.^[34] Given that social support often diminishes over time,^[35] the program prioritized strategies for sustaining both received and perceived support throughout the cancer treatment. Reinforcing a sense of belonging to the general population was another prioritized need in our program. Although well-meant, sympathy can feel patronizing and deepen feelings of inadequacy, challenging survivors' self-worth and identity. Public attitudes play a crucial role in emotional recovery and quality of life.^[36] By fostering connection to the broader community, the program aims to reduce these negative effects and enhance survivors' confidence and quality of life.

The fourth group, communication challenges, addressed the promotion of received and perceived empathy rather than pity and sympathy and the management of health information disclosure. In a study by Darabos *et al.*, young adults' support preferences during cancer-related conversations were explored. The study found that empathetic listening was the most valued form of support (81.4%), while expressions of pity or sympathy were most commonly perceived as unhelpful or unwelcome (33.9%).^[37] Disclosure management was also prioritized, as evidence shows that patients and families often adopt nondisclosure strategies, as a coping mechanism to mitigate unsolicited expressions of sympathy and to minimize exposure to information that could be emotionally harmful or psychologically distressing.^[38] However, nondisclosure may also deprive patients and families of access to vital information and necessary supportive behaviors.

In the second Delphi round, the highest-rated interventions for each need were systematically integrated into the final version of the program. The selected interventions were inspired by prior evidence. For example, the Multidimensional Education Program for improving body image was based on MaGee and Gammage's Body Image Awareness Seminars (BIAS). Their findings demonstrated the efficacy of the adapted BIAS model in enhancing body image outcomes across cancer populations.^[39]

The high level of expert consensus (exceeding 90%) achieved in the third round of the Delphi process regarding the program's content validity strongly supports its credibility and reliability as an intervention within the domain of psychosocial care for cancer patients. This robust agreement underscores the program's alignment with the lived needs of patients and its coherence with both scientific evidence and cultural considerations. Crucially, an extensive review of national and international databases yielded no existing programs that directly and systematically address the functional

dimensions of social relationships among cancer patients, including consistent emotional support, companionship, and the alleviation of social distress. This significant gap highlights the novelty of the present program and emphasizes its potential to fulfill a critical unmet need in psychosocial oncology.

To contextualize this innovation within the broader landscape of psychosocial intervention research, it is instructive to consider comparable Delphi-based efforts in cancer care. For instance, Donachie *et al.* conducted a three-round modified Delphi study to identify appropriate psychosocial interventions for prostate cancer patients undergoing active surveillance, establishing consensus when over 75% of participants agreed on adjustment or removal of items.^[40]

Limitation and recommendation

While the literature review incorporated international sources, the design and validation of the final intervention model were conducted within a specific national context, which may limit the generalizability of the implementation strategies to other healthcare systems. A key limitation of this study is the absence of pilot testing for the proposed activities, restricting the ability to evaluate their feasibility and preliminary effectiveness prior to wider application. To enhance broader applicability and facilitate international validation, the educational content has been translated into English. Future research should prioritize pilot testing and cultural adaptation of the interventions across diverse clinical settings and populations. Furthermore, long-term studies are needed to rigorously assess the sustained effectiveness of the proposed activities. It is also recommended that these evidence-based strategies be integrated into national and institutional cancer care policies to promote holistic, patient-centered care.

Conclusion

Using the Delphi method, expert consensus validated an evidence-based program targeting the functional aspects of social relationships in cancer patients, aiming to improve psychosocial health and quality of life, with over 90% agreement among experts.

This program supports key health benchmarks by promoting patient-centered care, strengthening social support networks, and enhancing psychological resilience among cancer patients. Integrating it into national cancer care policies can facilitate a holistic and coordinated approach to care, thereby improving overall patient outcomes. To maximize effectiveness and relevance, future research should prioritize pilot testing and cultural adaptation across diverse healthcare contexts to ensure broad applicability and sustainability.

We recommend adopting this program within healthcare systems, emphasizing multidisciplinary training and continuous support for patients to achieve sustained psychosocial benefits.

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Conflicts of interest

There are no conflicts of interest.

References

- August KJ, Rook KS. Social relationships. In: Gellman MD, Turner JR, editors. *Encyclopedia of Behavioral Medicine*. New York, NY: Springer New York; 2013. p. 1838-42.
- Berkman LF, Glass T, Brissette I, Seeman TE. From social integration to health: Durkheim in the new millennium. *Soc Sci Med* 2000;51:843-57.
- House JS, Umberson D, Landis KR. Structures and processes of social support. *Annu Rev Sociol* 1988;14:293-318.
- Cyranowski JM, Zill N, Bode R, Butt Z, Kelly MA, Pilkonis PA, et al. Assessing social support, companionship, and distress: National Institute of Health (NIH) Toolbox Adult Social Relationship Scales. *Health Psychol* 2013;32:293-301.
- Cohen S, Syme SL. Issues in the study and application of social support. In: Cohen S, Syme SL, editors. *Social Support and Health*. San Francisco: Academic Press Inc; 1985. p. 3-22.
- Fromm-Reichmann F. Loneliness. *Psychiatry* 1959;22:1-15.
- Grassi L, Spiegel D, Riba M. Advancing psychosocial care in cancer patients. *F1000Res* 2017;6:2083.
- Rabin C. Impact of cancer on romantic relationships among young adults: A systematic review. *J Clin Psychol Med Settings* 2019;26:1-12.
- Vandendorpe B, Drouet Y, Ramiandrisoa F, Guilbert P, Costa B, Servagi-Vernat S. Psychological and physical impact in women treated for breast cancer: Need for multidisciplinary surveillance and care provision. *Cancer Radiother* 2021;25:330-9.
- Manne SL, Kissane D, Zaider T, Kashy D, Lee D, Heckman C, et al. Holding back, intimacy, and psychological and relationship outcomes among couples coping with prostate cancer. *J Fam Psychol* 2015;29:708-19.
- Nissen KG, Trevino K, Lange T, Prigerson HG. Family relationships and psychosocial dysfunction among family caregivers of patients with advanced cancer. *J Pain Symptom Manage* 2016;52:841-9.e1.
- Adams RN, Mosher CE, Winger JG, Abonour R, Kroenke K. Cancer-related loneliness mediates the relationships between social constraints and symptoms among cancer patients. *J Behav Med* 2018; 41:243-52.
- Corovic S, Vucic V, Mihaljevic O, Djordjevic J, Colovic S, Radovanovic S, et al. Social support score in patients with malignant diseases-with sociodemographic and medical characteristics. *Front Psychol* 2023;14:1160020.
- Doyle DM, Barreto M. Relational consequences of stigma: Bridging research on social stigma with relationship science. *J Soc Issues* 2023;79:7-20.
- Zhu H, Yang L, Yin H, Yuan X, Gu J, Yang Y. The influencing factors of psychosocial adaptation of cancer patients: A systematic review and meta-analysis. *Health Serv Insights* 2024;17:11786329241278814.
- Šprah L, Šoštarčič M. Psychosocial coping strategies in cancer patients. *Radiol Oncol* 2004;38:35-42.
- Schapira L. Communication skills training in clinical oncology: The ASCO position reviewed and optimistic personal perspective. *Crit Rev Oncol Hematol* 2003;46:25-31.
- Spiegel D. Mind matters-group therapy and survival in breast cancer. *N Engl J Med* 2001;345:1767-8.
- McKenna HP. The Delphi technique: A worthwhile research approach for nursing? *J Adv Nurs* 1994;19:1221-5.
- Scriven A. *Promoting Health: A Practical Guide-E-Book*: Forewords: Linda Ewles and Ina Simnett; Richard Parish. Bailliere Tindall; 2010.
- Corrao S, Amico G, Licata G. Deciding in conditions of uncertainty: The Delphi method and its use in the formulation of guidelines. *Recent Prog Med* 2000;91:628-31.
- Borg WR, Gall MD. *Educational Research: An Introduction*. 4thed. New York: Longman; 1983.
- Keil M, Tiwana A, Bush A. Reconciling user and project manager perceptions of IT project risk: A Delphi study. *Inf Syst J* 2002;12:103-19.
- Habibi A, Sarafrazi A, Izadyar S. Delphi technique theoretical framework in qualitative research. *Int J Eng Sci* 2014;3:8-13.
- Landeta J. Current validity of the Delphi method in social sciences. *Technol Forecast Soc Change* 2006;73:467-82.
- Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Med Res Methodol* 2008;8:45.
- Brouwers MC, Kho ME, Browman GP, Burgers JS, Cluzeau F, Feder G, et al. AGREE II: Advancing guideline development, reporting and evaluation in health care. *Can Med Assoc J* 2010;182:E839-42.
- Wang Y, Feng W. Cancer-related psychosocial challenges. *Gen Psychiatr* 2022;35:e100871.
- Laing EM, Heinen JM, Acebo de Arriba R, Schäffeler N, Zipfel S, Stengel A, et al. Adaptations of interpersonal psychotherapy in psycho-oncology and its effects on distress, depression, and anxiety in patients with cancer: A systematic review. *Front Psychol* 2024;15:1367807.
- Huai P, Liu P, Wang X, Wang Y, Yang H, Yan M, et al. The relationship between interpersonal emotional regulation and psychological resilience in nursing undergraduates: A cross-sectional study and network analysis. *Front Psychol* 2025;16:1546042.
- Fredrickson BL. The role of positive emotions in positive psychology. The broaden-and-build theory of positive emotions. *Am Psychol* 2001;56:218-26.
- James W. The consciousness of self. *J Cosmol*. 2011;14:4633-83.

33. McPherson CJ, Wilson KG, Murray MA. Feeling like a burden to others: A systematic review focusing on the end of life. *Palliat Med* 2007;21:115-28.
34. Ruan J, Liu C, Ren R, Xing W. Post-treatment cancer survivors' experience of social reintegration: A systematic review and meta-synthesis. *Psychooncology* 2025;34:e70065.
35. van Roij J, Brom L, Youssef-El Soud M, van de Poll-Franse L, Raijmakers NJ. Social consequences of advanced cancer in patients and their informal caregivers: A qualitative study. *Support Care Cancer* 2019;27:1187-95.
36. Wojtyna E, Pasek M, Nowakowska A, Goździalska A, Jochymek M. Self at risk: Self-esteem and quality of life in cancer patients undergoing surgical treatment and experiencing bodily deformities. *Healthcare (Basel)* 2023;11:2203.
37. Darabos K, Berger AJ, Ford JS. "Empathy without sympathy:" An analysis of support-related preferences among young adult cancer survivors. *J Psychosoc Oncol* 2022;40:457-72.
38. Mohabbat-Bahar S, Bigdeli I, Mashhadi A, Moradi-Joo M. Investigation of stigma phenomenon in cancer: A grounded theory study. *Int J Cancer Manag* 2017;10:e6596.
39. MaGee CA, Gammage KL. The impact of a positive body image program (body image awareness seminars) on the positive and negative body image of individuals living with cancer. *Cancer Rep (Hoboken)* 2025;8:e70161.
40. Donachie K, Adriaansen M, Nieuwboer M, Cornel E, Bakker E, Lechner L. Selecting interventions for a psychosocial support program for prostate cancer patients undergoing active surveillance: A modified Delphi study. *Psychooncology* 2022;31:2132-40.