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Original Article

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Psycho-educational program for enhancing resilience among family caregivers of patients with leukemia in Egypt: a quasi-experimental study

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ABSTRACT

Introduction: Caring for a loved one with leukemia presents significant challenges and often leads to a substantial caregiver burden. Resilience, adapting and coping effectively with adversity, is crucial for caregivers' well-being. Psychoeducational interventions incorporating coping strategies, stress management, and decision-making skills have been widely recognized to foster resilience. This study evaluated the effectiveness of a structured psychoeducational program to enhance resilience among family caregivers of patients with leukemia.

Methods: This quasi-experimental pre-post study assessed the effectiveness of a psychoeducational program among 57 family caregivers of patients with leukemia at the National Cancer Institute in Egypt. The Family Resilience Assessment Scale (FRAS) was administered before and after a structured 21-session program. Data were analyzed using IBM SPSS Statistics 23, paired t-tests assessing resilience changes, and Spearman's correlation to examine associations with demographic and psychological factors. The reliability of the FRAS was confirmed using Cronbach's alpha (≥0.70).

Results: 66.7% of caregivers were female, 36.8% were aged 25–30, 49.1% were married, and 66.7% provided care for more than eight hours daily. Statistically significant improvements ($p < 0.01$) were observed in communication, emotional expression, problem solving, resource utilization, maintaining a positive outlook, family connectedness, spirituality, meaning making, and flexibility after the intervention.

Conclusions: The psychoeducational program significantly improved resilience among family caregivers of patients with leukemia. These findings highlight the importance of integrating such interventions into caregiver support programs to reduce stress and promote well-being. Future studies should examine the long-term sustainability of these benefits.

Keywords: burden, family caregivers, leukemia, psycho-educational program, resilience

Introduction

Leukemia is a hematological malignancy affecting approximately 2.3 million individuals worldwide, resulting in 311,594 new deaths annually (Qiu and Wu, 2024). Beyond its impact on patients, leukemia imposes significant challenges on family caregivers, who are critical in providing support and managing care (Suttorp et al., 2021). In Egypt, leukemia is the sixth most common cancer, with an estimated 6,194 new cases annually, accounting for 4.1% of all cancer cases (Ibrahim et al., 2014). Family caregivers provide voluntary support to relatives diagnosed with leukemia, enhancing the patient's health and quality of life. However, their caregiving role can lead to significant physical, psychological, and social challenges (Rezaei et al., 2024).

Family caregivers care for patients, from simple tasks such as helping with bathing and dressing, to more complex activities such as medication administration or overseeing medical appointments (Rostami et al., 2023). In addition, caregivers play a crucial role in supporting patients by assisting with decision making, offering emotional reassurance, and providing spiritual guidance. They help patients navigate treatment choices, manage stress, and find meaning during difficult times, enhancing their overall well-being (Bechthold *et al.* 2023). Providing care for a leukemia patient is a demanding and stressful responsibility, yet family caregivers often receive less public recognition than the patients they support (Yucel, Zhang, and Panjabi, 2021). Hence, family caregivers usually experience anxiety, depression, and social isolation, which can negatively affect their quality of life and lead to psychological distress if they are not well-adapted (Al Ali, Eid, and Aljada, 2023).

Resilience refers to the capacity to adapt to caregiving challenges through mental, emotional, and behavioral flexibility, integrating protective factors, effective coping strategies, and opportunities for personal growth (Thalappil, Pulickal, and Krishnan, 2024). Resilience in caregivers refers to their capacity to utilize personal and community resources to overcome the challenges associated with caregiving. It is a multidimensional construct that explains how individuals experiencing adversity and stress can achieve positive outcomes (Palacio *et al.*, 2020). Resilience is associated with reduced depression, improved health, and positive social support, a protective factor for caregivers (Chesak *et al.*, 2023). Resilient caregivers have better morale and maintain satisfying relationships with their family members (Huang *et al.*, 2023). So, resilience plays a significant role in establishing realistic goals, enhancing psychological well-being, promoting effective problem-solving, and nurturing individual relationships that positively impact their lives (Opsomer *et al.*, 2022).

Educational intervention programs are essential in supporting family caregivers of leukemia patients by providing critical knowledge, coping strategies, and emotional support. These programs enhance caregivers' resilience, enabling them to manage stress, make informed decisions, and maintain overall well-being (Guo *et al.*, 2024).

Several studies have evaluated the effectiveness of psychoeducational interventions aimed at enhancing resilience among family caregivers of cancer patients, including those with leukemia. For instance, a pilot randomized controlled trial assessed a psychoeducational intervention for family caregivers of patients with advanced cancer (Mirhosseini et al., 2025).

In Egypt, several studies have explored the impact of educational interventions on caregivers of cancer patients, particularly within pediatric oncology settings. A quasi-experimental study conducted in Port Said City demonstrated that a structured health education program significantly enhanced caregivers’ knowledge and caregiving practices related to palliative care (Ibrahim et al., 2024). Similarly, at the Minia Oncology Center, an educational program significantly enhanced the knowledge and performance of caregivers of children undergoing chemotherapy (Hasan et al., 2020). Furthermore, a psychoeducational program at the National Cancer Institute of Cairo University positively influenced the coping strategies of mothers caring for children newly diagnosed with cancer (Elfeky, 2023). Research on the challenges faced by caregivers of adult leukemia patients remains limited. Unlike pediatric caregivers, they deal with prolonged treatments, complex decisions, and financial burdens. Given Egypt’s cultural and socioeconomic context, tailored psychoeducational programs are essential to support this population effectively.

Nurses play a crucial role in equipping family caregivers with essential knowledge and skills to manage health-related challenges, seek social support, and provide adequate care, all contributing to enhanced resilience (Kajiwara *et al.*, 2023). Therefore, educational intervention programs led by nurses should focus on increasing caregivers’ awareness of resilience as a protective factor against psychological distress (Alfaro-Díaz *et al.*, 2022). Hence, this study evaluated the effectiveness of a structured psychoeducational program to enhance resilience among family caregivers of patients with leukemia.

Materials and Methods

This study aimed to evaluate the effectiveness of a structured psychoeducational nursing intervention in enhancing the resilience of family caregivers of patients with leukemia. It was hypothesized that this intervention would have a positive impact on caregivers' resilience.

Research design

A quasi-experimental design was utilized to evaluate the impact of a psycho-educational program on enhancing resilience among family caregivers of patients with leukemia. According to Maciejewski (2020), quasi-experimental studies play a crucial role in research while lacking the rigorous control of actual experiments. They are particularly valuable in situations where random assignment of participants is impractical. This approach was helpful, suitable, and aided in assessing the effect of a psycho-educational program on enhancing resilience among family caregivers of patients with leukemia. Responses from family caregivers were collected through questionnaires administered both before and after the intervention—the psychoeducational program aimed at delivering structured education and supportive tools to improve understanding and adherence to resilience.

This study used a quasi-experimental pre-post intervention design to assess participants' resilience levels before and after the psychoeducational program to evaluate its effectiveness. The psychoeducational program was administered to 57 family caregivers and comprised 21 structured sessions totaling 21 hours, 5 hours of theoretical instruction, 14 hours of practical activities, and 2 hours allocated for data collection. Various instructional methodologies were employed, including facilitated discussions, role-playing exercises, video presentations, and instructional handouts. Furthermore, tailored written materials were developed to address key thematic areas, including resilience-building, coping strategies, stress management, and decision-making. Interactive components were systematically integrated to enhance participant engagement and facilitate the acquisition of relevant skills.

The sample size for this study was determined based on a rigorous power analysis to ensure enough statistical power to detect significant effects. The calculation was conducted using a paired t-test design with an effect size (Cohen's d) of 0.38, a significance level (α) of 0.05, and a statistical power of 80%. Based on these parameters, the required sample size was determined to be 57 participants (Brydges, 2019). This methodological approach ensures that the study is adequately powered to detect meaningful changes in resilience levels among family caregivers of patients with leukemia following the psychoeducational intervention while minimizing the risk of committing a Type II error.

Research Setting and Participants

The study was conducted in the inpatient wards on the seventh and eighth floors of the National Cancer Institute, affiliated with Cairo University in Egypt. The researchers obtained significant data from family caregivers of leukemia patients who voluntarily joined the study. A purposive sampling approach was used in this quantitative research, as participants were selected based on specific eligibility criteria: they were primary caregivers, free from psychological illness, and caring for one patient only. This approach ensured that the chosen caregivers met the study's objectives while maintaining methodological rigor.

The letters of approval were obtained from the dean of the Faculty of Nursing affiliated to Ain Shams University to the Vice Dean for Postgraduate Studies and Research at the National Cancer Institute affiliated to Cairo University to get the approval for data collection. Before conducting the study, the researcher began making frequent trips to find family caregivers who decided to participate in the program. Following their expression of interest in taking part in the study, participants were selected using simple random sampling. Twenty-five of the 100 family caregivers evaluated for suitability were deemed unfit, and eighteen declined to participate. As a result, 57 qualified caregivers consented to participate in the study and were assigned to the intervention group. To accommodate the available space, the intervention group was further divided into four smaller groups to deliver the psychoeducational program. Participants were informed of the study's purpose and given assurances regarding their privacy and confidentiality. The secrecy of the information gathered was maintained by putting a code number on the questionnaire. Respondents' rights were protected by guaranteeing their voluntary involvement; each participant's informed consent was obtained following explanation of the study's purpose, possible advantages, procedures for using data collection instruments, and expected results. Participants were informed of their freedom to leave the program whenever they wanted, and the tool's content would only be used for research.

Instruments

Semi-structured interviews were used to collect data. The program was established by the first research, directed by another team of researchers, and based on earlier literature. Four experts with academic experience from the faculty of nursing at Ain Shams University reviewed the program. Based on a review of recent related literature, the tool was translated into Arabic. The researcher directed the participants to an extended discussion, during which relevant topics were covered. The questionnaire, consisting of three sections, was developed:

Section (A): Demographic Data

Demographic data were collected using a form designed by ,(Mohamed Mustafa, Mustafa El-Ashry and Mahmoud, 2019). The form included the following variables: sex, relation with the patient, age, residence, marital status, educational level, monthly income, person helping in providing care, presence of physical or psychological disorders, caregiver job, and presence of another family member suffering from leukemia.

This form was used to gather essential background information about the caregivers, which helped contextualize the outcomes of the psychoeducational program and assess factors that may influence family resilience.

The data were collected to identify potential relationships between caregivers' demographic characteristics and their resilience levels and to explore how certain factors (e.g., educational level, presence of psychological disorders) might impact their caregiving experience.

Section (B): Family Resilience Assessment Scale (FRAS)

The Family Resilience Assessment Scale (FRAS), developed by (Walsh, 2003) and the researchers, was adapted into Arabic to measure family resilience among caregivers of leukemia patients. The FRAS comprises 54 items divided into three primary theoretical domains and three specific features linked to each domain. These domains and features assess various dimensions of family resilience, including family organization, communication, and problem-solving abilities in adversity.

The FRAS has been widely used in studies to measure resilience among family caregivers, particularly those caring for leukemia patients. Reliability assessments of the FRAS have consistently demonstrated high internal consistency across diverse populations.

Reliability Across Languages: In studies involving family caregivers, the FRAS exhibited Cronbach's alpha values ranging from 0.87 to 0.93 for English versions, reflecting strong reliability (Nadrowska, Błażek and Lewandowska-Walter, 2017).

In Chinese versions of the FRAS, Cronbach's alpha values ranged from 0.88 to 0.96, further demonstrating the scale's robust internal consistency across different cultural contexts (Xu et al., 2024).

In a study focusing on family caregivers of children with cancer, the Mexican Measurement Scale of Resilience, a similar tool to the FRAS, demonstrated excellent reliability with an overall Cronbach's alpha of 0.976 (Toledano-Toledano et al., 2019).

Local Adaptation Process: To ensure that the FRAS was culturally relevant and appropriately measured family resilience in Egyptian caregivers of leukemia patients, the following adaptation process was carried out: Translation: The FRAS was translated into Arabic by bilingual experts with nursing knowledge. This ensured that the terms used were accurate and culturally appropriate; Expert Review: A panel of healthcare professionals reviewed the translated scale to confirm that it accurately captured the intended constructs of resilience in the local caregiving context; Pilot Testing: The adapted version of the FRAS was tested on a small sample of Egyptian caregivers. Feedback was collected to assess the items' clarity, cultural relevance, and appropriateness, and adjustments were made accordingly; Validation: The psychometric properties of the adapted FRAS, including its internal consistency, were assessed. The Cronbach's alpha for the Arabic version was found to be 0.90, indicating good reliability for this specific population.

Section (C): Psychoeducational Program Design

This section describes the psychoeducational program designed to enhance resilience among family caregivers of patients with leukemia. The program was developed based on a comprehensive review of relevant literature and consisted of 21 sessions. It commenced with an introductory acquaintance session and concluded with a closure and post-intervention assessment session. The program aimed to improve caregivers' knowledge, skills, and psychological resilience to help them effectively manage the challenges associated with caregiving. The program comprised two core components: Part (1) – Theoretical Component: This component delivered essential knowledge about leukemia, psychological resilience, and strategies to strengthen resilience. Topics included an overview of leukemia, its psychosocial impact on caregivers, and resilience's foundational concepts and significance in caregiving contexts; Part (2) – Practical Component: This component provided caregivers practical strategies to enhance their well-being and caregiving capabilities. Topics included accessing social support, developing communication and coping skills, accepting life changes, managing stress, maintaining family relationships, practicing relaxation techniques, engaging in physical activity, expressing gratitude, time management, and employing effective problem-solving techniques.

The effectiveness of the psychoeducational program was evaluated using the FRAS, a standardized, validated, self-administered instrument designed to assess resilience across various dimensions of family functioning. The FRAS was administered to participants as a pre-test and post-test to measure changes in family resilience following the intervention. To minimize potential assessment bias, the following precautions were implemented: all participants completed the FRAS independently without intervention or interpretation from the researcher. Consistent administration procedures were followed during both assessment periods, with standardized written and verbal instructions provided to all participants. Additionally, caregivers were explicitly informed that there were no right or wrong answers, and they were encouraged to respond truthfully and reflectively based on their personal experiences.

Data collection

Upon obtaining institutional approval, the data collection and implementation of the psychoeducational program were carried out over six months, beginning in May 2024 and concluding in October 2024. This period was systematically divided into three distinct phases: the pre-intervention phase, lasting two weeks; the intervention phase, spanning five months; and the post-intervention phase, extending over two weeks.

The principal researcher introduced the study to family caregivers of patients with leukemia, providing a detailed explanation of its objectives and purpose. Informed consent was secured from all family caregivers to ensure voluntary participation. Additionally, family caregivers were assured of the confidentiality of their personal information, which was used exclusively for research purposes. They were also explicitly informed of their right to withdraw from the study without justification.

All interviews were conducted in Arabic, the native language of the family caregivers, to ensure uniformity in data collection and eliminate potential linguistic biases. Each session was standardized to approximately 50 to 60 minutes to maintain participant consistency. The

Table 1. Demographic characteristics of family caregivers of leukemia patients (n = 57)

Items	n	%
Gender		
Male	19	33.3%
Female	38	66.7%
Age		
25 to 30 years	21	36.8%
31 to 40 years	19	33.3%
41 to 50 years	17	29.8%
Marital Status		
Married	28	49.1%
Divorced	6	10.5%
Widower	4	7.0%
Single	19	33.3%
Educational level		
Illiterate	13	22.8%
Basic education	12	21.1%
Intermediate education	11	19.3%
High education	21	36.8%
Employment		
Employed	17	29.8%
Unemployed	40	70.2%
Monthly income		
Enough	26	45.6%
Not enough	31	54.4%
Residence		
City	31	54.4%
Village	26	45.6%
Presence of another person helping in providing care		
No	40	70.2%
Yes	17	29.8%

psychoeducational program, comprising 21 structured sessions, was designed to facilitate a rigorous quantitative assessment of resilience levels. The Family Resilience Assessment Scale (FRAS) was used to evaluate the intervention's effectiveness. This validated psychometric instrument measures multiple dimensions of family resilience, including communication, problem solving, connectedness, and the ability to adapt to adversity. The FRAS was translated into Arabic and culturally adapted to suit the Egyptian context, ensuring linguistic accuracy and conceptual relevance.

Pre- and post-intervention resilience scores were systematically documented and subjected to statistical analysis to assess the efficacy of the intervention. Data collection followed a standardized methodology to ensure statistical reliability and minimize measurement variability. The Family Resilience Assessment Scale (FRAS) was used to assess resilience outcomes, and all caregiver responses were quantitatively analyzed to facilitate objective comparisons and ensure methodological rigor. The researcher who administered the intervention also conducted the pre- and post-intervention assessments. A structured and validated instrument (FRAS) was employed to mitigate potential assessment bias, and standardized procedures were strictly adhered to throughout the data collection process. Furthermore, to minimize the impact of any bias, the researcher employed consistent and transparent scoring protocols, which included detailed guidelines for interpreting responses, ensuring uniformity in scoring, and cross-checking the results for accuracy. This approach enhanced the objectivity and reliability of the outcome data.

Data analysis

The Statistical Package for the Social Sciences (SPSS Inc., version 27; IBM Corp., Armonk, NY, USA) was used to enter the data. While quantitative data were displayed as means, standard deviations, and ranges, qualitative data were represented by percentages and numbers. The Chi-square test was used to compare groups with qualitative data. Two paired groups with quantitative data with a parametric distribution were compared using the Paired t-test. Spearman correlation coefficients were used to evaluate the relationship between two quantitative factors within the same group. The Cronbach alpha test was used to conduct reliability analyses for the Family Resilience Assessment Scale. A 95% confidence interval and a 5% acceptable margin of error were established.

Trustworthiness

Several methodological strategies were employed to ensure the reliability and validity of this quasi-experimental study. Internal validity was strengthened through pre- and post-intervention assessments of resilience levels among participants, allowing for the evaluation of changes over time within the same cohort. Although random assignment was not feasible due to the design, selection bias was minimized by recruiting participants who were representative of the target caregiver population and applying uniform inclusion criteria. Additionally, standardized intervention protocols were developed and used across all sessions to ensure consistent content delivery and exposure among participants (Hausner *et al.*, 2018).

To enhance external validity, the study provided a detailed and transparent description of the research setting, participant demographics, and intervention procedures. This comprehensive documentation allows for potential replication and supports the transferability of findings to similar caregiving populations (Stuart and Lesko, 2020).

Table 2. Family spirituality among family caregivers of leukemia patients

Family Spirituality	Pre intervention			Post intervention			X^2	Sig.
	Agree	Sometimes	Disagree	Agree	Sometimes	Disagree	(P-value)	
We attend prayers at mosque / church.	33 (57.9%)	9 (15.8%)	15 (26.3%)	35 (61.4%)	18 (31.6%)	4 (7.0%)	9.427 ($p < 0.01$*)	HS
We have faith in the God.	24 (42.1%)	12 (21.1%)	21 (36.8%)	40 (70.2%)	15 (26.3%)	2 (3.5%)	20.029 ($p < 0.001$**)	HS
We seek advice from religious advisors.	7 (12.3%)	20 (35.1%)	30 (52.6%)	37 (64.9%)	17 (29.8%)	3 (5.3%)	42.789 ($p < 0.001$**)	HS

$P < 0.05$ (Significant), $p < 0.01$ (Highly Significant), $p < 0.001$ (Very Highly Significant)

Table 3. Clarity of communication among family caregivers of leukemia patients

Clarity of Communication	Pre-intervention			Post-intervention			Chi-square test	
	Agree	Sometimes	Disagree	Agree	Sometimes	Disagree	X^2 (P-value)	Sig.
We are careful what we say to each other.	30 (52.6%)	12 (21.1%)	15 (26.3%)	43 (75.4%)	11 (19.3%)	3 (5.3%)	10.359 ($p < 0.01$*)	HS
We can ask for clarification if we don't understand each other.	24 (42.1%)	12 (21.1%)	21 (36.8%)	43 (75.4%)	9 (15.8%)	5 (8.8%)	15.663 ($p < 0.001$**)	HS
We are honest and direct each other in our family.	22 (38.6%)	16 (28.1%)	19 (33.3%)	38 (66.7%)	15 (26.3%)	4 (7.0%)	14.082 ($p < 0.01$*)	HS
We can question the meaning behind messages in our family.	15 (26.3%)	17 (29.8%)	25 (43.9%)	39 (68.4%)	13 (22.8%)	5 (8.8%)	24.533 ($p < 0.001$**)	HS
We can talk about the way we communicate in our family.	15 (26.3%)	20 (35.1%)	22 (38.6%)	31 (54.4%)	22 (38.6%)	4 (7.0%)	18.122 ($p < 0.001$**)	HS
We understand communication from other family member.	13 (22.8%)	19 (33.3%)	25 (43.9%)	30 (52.6%)	18 (31.6%)	9 (15.8%)	14.277 ($p < 0.01$*)	HS

$P < 0.05$ (Significant), $p < 0.01$ (Highly Significant), $p < 0.001$ (Very Highly Significant)

Validated psychometric instruments for measuring resilience ensured reliability, thereby enhancing the precision and accuracy of data collection. Additionally, standardized data collection procedures and uniform intervention delivery were maintained to minimize variability and ensure consistency in the results (Cook, Pedersen and Maloney, 2018).

Objectivity was maintained through appropriate statistical analyses to examine pre-post differences in resilience scores. The studies were conducted using rigorous procedures that minimized researcher bias in interpreting results. Furthermore, all data collection and analysis steps were systematically documented to promote transparency and reproducibility (Meijer *et al.*, 2025).

Ethical considerations

The ethics committee of Ain Shams University's nursing department granted research approval under the number (24.05.311). Caregivers provided written informed consent before participation in the study. Privacy and confidentiality were strictly maintained, with only the research team accessing participants' data.

Results

The study population is described in Table 1. The highest percentage (66.7%) of family caregivers were females, with more than one third (36.8%) in the age group of 25 to 30 years old, and nearly half (49.1%) of family caregivers were married. Regarding educational level, (36.8%) of family caregivers had a high education level; the majority of the study participants were unemployed and had insufficient funds, constituting (78.9%) and (54.4%) respectively. Finally, the table reveals that most family caregivers did not receive assistance in providing care (70.2%).

In terms of family spirituality, Table 2 shows that there were highly statistically significant differences between pre- and post-intervention. After the intervention, over half of the family caregivers attended prayers at a mosque or church, believed in God, and sought guidance from religious advisors, with 61.4%, 70.2%, and 64.9%, respectively. In contrast, pre-intervention, these figures were only 57.9%, 42.1%, and 12.3%, respectively.

Table 3 illustrates highly statistically significant differences between pre- and post-intervention regarding the clarity of communication. Post intervention, most family caregivers (75.4%) were careful about what they said to each other and asked for clarification if they did not understand each other. At the same time, pre-intervention, they constituted only 52.6% and 42.1%, respectively. Additionally, post-intervention, the highest proportion of caregivers were honest and direct with each other in their families and could discuss their communication styles, constituting 66.7% and 54.4% respectively. At the same time, pre-intervention, they comprised only 38.6% and 26.3%.

Table 4 shows that the differences in open emotional experience between before and after the intervention were statistically significant. Post-intervention, most family caregivers (49.1%) could express their feelings at home without upsetting someone, while pre-intervention, this constituted only 22.8%. Furthermore, pre-intervention, most family caregivers worked to certify that members of the family were not emotionally upset and felt free to express their opinions, constituting

Table 4. Open emotional experience among family caregivers of leukemia patients

Open Emotional Experience	Pre intervention			Post intervention			X^2 (P-value)	Sig.
	Agree	Sometimes	Disagree	Agree	Sometimes	Disagree		
We can ventilate our feelings at home without upsetting someone.	13 (22.8%)	19 (33.3%)	25 (43.9%)	28 (49.1%)	23 (40.4%)	6 (10.5%)	17.514 ($p < 0.001$**)	HS
We feel free to express our opinions.	14 (24.6%)	21 (36.8%)	22 (38.6%)	23 (40.4%)	24 (42.1%)	10 (17.5%)	6.889 ($P < 0.05$)	S
We get upset if someone complains in our family.	17 (29.8%)	22 (38.6%)	18 (31.6%)	22 (38.6%)	22 (38.6%)	13 (22.8%)	1.447 NS	NS
We tell each other how much we care for family.	19 (33.3%)	17 (29.8%)	21 (36.8%)	29 (50.9%)	16 (28.1%)	12 (21.1%)	4.568 NS	NS
We work to make sure family member are not emotionally or physically hurt.	15 (26.3%)	17 (29.8%)	25 (43.9%)	27 (47.4%)	21 (36.8%)	9 (15.8%)	11.379 ($p < 0.001$**)	HS

$P < 0.05$ (Significant), $p < 0.01$ (Highly Significant), $p < 0.001$ (Very Highly Significant), NS (Non-Significant)

Table 5. Family resilience assessment scale pre- & post-intervention for family caregivers of patients with leukemia

Family resilience assessment scale (FRAS)	Pre intervention n = 57	Post intervention n = 57	Test value•	P-value	Sig.
Low	10 (17.5%)	5 (8.8%)	32.219	(p <0.001**)	HS
Moderate	28 (49.1%)	4 (7.02%)			
High	19 (33.3%)	48 (84.21%)			

**T-test in pairs: P>0.05 indicates non-significant (NS); P<0.05 indicates significant (S); and P<0.01 indicates highly significant (HS).*

47.4% and 40.4%, while post-intervention constituted 26.3% and 24.6%, respectively.

Table 5 displays that the differences in the FRAS for family caregivers of leukemia patients between before and after the intervention were highly statistically significant.

Discussions

The current study's results reveal that most family caregivers were females. This may be related to the fact that females are considered obligated and responsible for domestic tasks and nurturing, unlike males, who are responsible for financial support, as is known in the Egyptian community. Also, more than one-third of caregivers had a high educational level, which may have helped them acquire knowledge and communication skills, meet patients' treatment needs, and respond effectively to the academic program. Moreover, most of the caregivers didn't have enough money. That is related to the majority of the sample being unemployed, coinciding with the high costs of medicine investigations, and feeding. These results align with (Elmeshad, Hanafy and Osman, 2025), who examined the effect of educational guidelines on caregivers' burden in patients with gynecological cancer. Their study reported that 58% of informal caregivers for cancer patients in Egypt were women, reflecting traditional gender roles where females are primarily responsible for domestic tasks and nurturing. Additionally, these findings are consistent with (Amin et al., 2024) those who indicated that caregivers with higher educational levels tend to have better knowledge and communication skills, allowing them to meet patients' treatment needs more effectively and respond well to academic programs.

According to the current study, there were highly statistically significant differences in communication clarity between the pre- and post-intervention. This may due to the positively effect of the psychoeducational nursing intervention that assist caregivers to discuss their thoughts and worries, encourage family caregivers for active listening that foster an empathetic environment, define caregiver's roles and responsibilities in caregiving to avoid confusion and overlap, and involving social worker from the national cancer institute to provide professional advice. Similarly, research carried out by (Park *et al.*, 2022)researchers who aimed to recognize family resilience that affects the adaptation of families of children with cancer reported that family communication skills were a protective factor and positively affected family resilience.

The results of this study indicate that there were highly statistically significant variations between the pre- and post-intervention about open emotional experience. That is may be related to the program helped caregivers to ventilate their negative feeling with trusted people, assisted family caregivers to make a vlog about daily routines of care, write daily diaries and create photo albums that document your caregiving journey, and active listening to the rest of the family members contributes significantly to expressing their feelings of distress because the family faces a lot of pressures that require support and listening, which these practices helped caregivers to express their opinions freely. This result is in accordance with (Mollaei *et al.*, 2024) those who aimed to examine resilience in caregivers of patients with cancer, and reported that caregivers who expressed their emotions could flexibly adapt to the caregiving role and had high levels of resilience.

According to the results of the current study, there were substantial statistical differences in family spirituality between the pre- and post-intervention, where there was a noticeable improvement in rates of family spirituality items post-intervention. This related to the effectiveness of the program that included mentioned profits of set aside time for prayer with family and meditation, discussing ways of controlling anger, give a brief about yoga, helping caregivers to join support groups of spiritual values, exchange experiences with other caregivers, and guiding them to volunteer work that can enhance a sense of purpose and spiritual fulfillment. The result is similar to that of those who assessed resilience in caregivers of cancer patients, and reported spirituality is a protective factor that enhances resilience in caregivers in the situation of cancer.

The results of the present study indicate a statistically significant relationship between family resilience pre-intervention and socio-demographic characteristics of family caregivers concerning marital status. This may be linked to the idea that marriage reduces loneliness; partners share caregiving responsibilities, assist in making crucial medical decisions, maintain a positive outlook, and provide hope during challenging times. Additionally, married individuals can pool their financial resources to cover medical expenses. This study contrasts with (Dionne-Odom *et al.*, 2021), who examined whether resilience is associated with distress among family caregivers of patients with cancer, which reported that higher resilience was statistically significantly associated with caregivers who were not married and had less responsibility toward family members.

The current study results demonstrate a statistically significant relationship between family resilience pre-intervention and socio-demographic characteristics of family caregivers regarding educational level, monthly income, and residence. From the researcher's perspective, regarding educational level, educated caregivers are more likely to comprehend medical terminology and the importance of adhering to medication schedules; they can effectively communicate with medical staff and are more likely to recognize early signs of complications or side effects from treatment. Education can equip caregivers with strategies to cope with the emotional burden, enhancing their resilience. Regarding monthly income, financial stability alleviates the anxiety linked to daily expenses, medical costs, and personal health, providing caregivers with the confidence and resources to make informed patient care decisions, enhancing their resilience. Regarding residence, location significantly impacts caregiver resilience; urban caregivers benefit from better access to healthcare services but may experience higher stress levels. Conversely, rural caregivers enjoy strong community support and lower living costs but encounter challenges related to healthcare access and geographic isolation. This finding aligns with (Shao *et al.*, 2023), who identified the key factors influencing family resilience in cancer treatment and reported that family caregivers with higher education levels and financial stability exhibited greater resilience.

Regarding the family resilience assessment scale, the results of this study show that, in terms of family resilience, there were highly statistically significant differences between the pre- and post-intervention periods. The outcomes reveal the constructive effects of the awareness program that encouraged caregivers to lean on their social networks and provided them with information about leukemia, its treatment, and how to reduce anxiety and increase their confidence. Besides, the program trained caregivers about managing medications, recognizing symptoms, and providing physical care. It encouraged caregivers to maintain their health through regular exercise, a balanced diet, and adequate sleep. The program also helped caregivers access financial support, teach caregivers effective time management and problem-solving skills, encouraged a positive outlook and focusing on small successes, and trained caregivers in effective communication with healthcare providers and family members. In the same link, a study by (Genter *et al.*, 2021) sought to assess how well the resilient caregivers' intervention worked to improve outcomes for distressed partner caregivers of cancer patients. They found that the program assisted caregivers in becoming more resilient by preventing debilitating conditions like depression and anxiety.

This study's findings explored the psychoeducational program's effect on enhancing resilience among family caregivers of leukemia patients. One of the research strengths is that the program can directly address the unique challenges and stressors faced by family caregivers, such as emotional burden, financial strain, and uncertainty about the future. It offers valuable information about leukemia and empowers caregivers to make informed decisions and better manage their responsibilities. One of the research limitations is that the small sample size may affect the reliability of the findings for larger populations of family caregivers, and the results may not apply to other populations because of the difference in geographic region or cultural context.

Conclusion

This study concludes that psychoeducational interventions are essential for strengthening resilience among family caregivers of leukemia patients. Comprehensive information about leukemia, reassurance, and resilience-focused guidance can help alleviate caregiving burdens. Equipping caregivers with skills in communication, stress management, problem-solving, and mindfulness enhances their ability to cope with challenges more effectively. Integrating evidence-based practices into psychoeducational programs ensures adequate support and training, ultimately improving the caregiving experience for both caregivers and their families.

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Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available due to ethical restrictions concerning participant confidentiality. However, anonymized data may be made available from the corresponding author upon reasonable request and with appropriate ethical approvals.

Authors' contributions

Ahmed Mohamed Mustafa Gaafr: Conceptualization, Methodology, Investigation, Project Administration, Resources, Writing – Original Draft, Writing – Review & Editing; Sahar Mahmoud Mohamed Elewa: Conceptualization, Methodology, Investigation, Project Administration, Resources, Writing – Original Draft; Writing – Review & Editing; Fatma Atta: Investigation, Data Curation, Formal Analysis, Writing – Original Draft; Shaimaa Saied Adam: Investigation, Data Curation, Formal Analysis, Writing – Original Draft.

Declaration of Interest

There are no conflicts of interest.

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