



Original Article

Factors influencing family resilience in adult patients with acute leukemia undergoing chemotherapy: A qualitative study

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ABSTRACT

Objective: To explore the factors influencing family resilience in adult patients with acute leukemia undergoing chemotherapy, with the aim of providing a theoretical basis for the development of strategies to strengthen their family resilience.

Methods: A descriptive phenomenological qualitative research method was used to select 11 adult acute leukemia chemotherapy patients for semi-structured interviews. Colaizzi 7-step analysis and NVivo 12.0 were used to summarize information and refine themes.

Results: The main outcomes consisted of two themes and 11 sub-themes: protective factors for family resilience (positive traits, cognitive restructuring, positive family beliefs, organizational flexibility, clear communication, and social support) and risk factors for family resilience (symptom burden, self-concealment, role overload, economic distress, and social alienation).

Conclusions: Health care professionals should pay attention to screening protective and risk factors for family resilience in adult acute leukemia chemotherapy patients, affirming the positive role of internal and external resources available in the family in stressful situations, alleviating patients' negative experiences, and promoting the recovery of family function.

Introduction

Acute leukemia (AL) is a highly heterogeneous hematologic malignancy with disease characteristics such as severe symptoms, easy relapse, and high mortality^{1,2} and mainly includes acute myeloid leukemia (AML) and acute lymphoblastic leukemia (ALL). Currently, the treatment regimen for AL patients is still dominated by chemotherapy. It has been reported that the complete remission (CR) rate of the first chemotherapy in young AL patients can reach 60%–80%, and the CR in elderly patients is about 40%–60%.³ However, chemotherapeutic agents that benefit patients' survival can cause gastrointestinal discomfort, cardiotoxicity, myelosuppression, and other toxic side effects, which seriously threaten patients' physical and mental health and quality of life.⁴ These negative consequences may further impact the normal order and functional balance of the patient's entire family system. Adults tend to have more important family responsibilities and social activities than minors and are also subject to more complex and varied disease stresses and challenges. However, fewer studies have been conducted on family coping in adults with AL than in children with AL. In this context, it is particularly critical

to promote family adaptation for adult AL patients undergoing chemotherapy.

Family resilience refers to the ability or process of a family to mobilize internal and external advantageous resources for self-adjustment and reconstruction in response to crises or challenges in their lives in order to restore the healthy functioning of the family.^{5,6} It has been shown that it can promote cancer patients and their families to effectively alleviate and positively cope with multiple stresses triggered by the disease, inspire their confidence and wish to withstand the risks, and have an important and positive implication in assisting patients and their families to accept the state of the disease and to successfully accommodate the crisis.^{7,8} At this phase, the relative contribution and potential moderating effects of relevant factors on family resilience in cancer patients have been examined nationally and internationally at multiple levels, mainly through cross-sectional studies at the individual, family, and societal levels. Previous research on the relationship between intrinsic personal traits and family resilience has shown that family resilience interplayed with positive psychological qualities such as posttraumatic growth⁹ and psychological resilience¹⁰ and that posttraumatic stress disorder,¹¹ caregiver

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burden,¹² and perceived stress¹³ were risk factors for family resilience. In addition, family factors (e.g., economic level,¹⁴ family communication¹⁵) and social support¹⁰ were also important factors influencing the level of family resilience among cancer patients. However, few qualitative studies have explored the concept of family resilience and the factors influencing it in adult patients with AL. Furthermore, the conceptualization of family in Chinese and Western cultures varies greatly, and considering the role of culture on family resilience, families from different cultural backgrounds assign different meanings to crises, which in turn affects the process and outcome of family resilience expression.¹⁶ Therefore, the present study adopted the descriptive phenomenological research method in a qualitative study to further examine the protective and risk factors of family resilience during chemotherapy in adult AL patients in the Chinese cultural context and to provide a reference for the construction of family resilience strengthening strategies for AL patients undergoing chemotherapy.

Methods

Design

The study involved a descriptive phenomenological research approach to conduct semi-structured interviews with patients and analyzed the data utilizing the Colaizzi 7-step analysis method.

Sample and setting

Adopting the purposive sampling method, patients with AL who underwent chemotherapy in the geriatric hematology department of a tertiary general hospital in Nanjing from May to July 2023 were selected as the interview subjects. The patient inclusion criteria were as follows: (1) diagnosed with AL and received chemotherapy; (2) age \geq 18 years old; and (3) provided informed consent. Exclusion criteria for patients included the following: (1) received a bone marrow transplant; (2) suffered from mental illness or hearing impairment; (3) experienced combined severe heart, lung, and brain failure; and (4) experienced other major stressful events. The number of interviews was established on the principle of data saturation,¹⁷ and 11 patients receiving AL chemotherapy were ultimately interviewed after the ending criterion of no new themes emerging.

Establishment of interview outline

A semi-structured interview outline was initially devised depending on the preliminary literature review, theoretical studies, and discussions with pertinent nursing specialists in the field of hematology. Pre-interviews were conducted on two patients, and the final outline was developed as follows after much deliberation and adjustments with respect to the findings of the preinterviews: (1) What was your reaction when you first learned of your disease? What has changed in your mindset during this period since the diagnosis? (2) Can you talk about your experience and feelings about the disease and treatment? (3) How has your daily life and that of your family changed after the disease? How did you adapt to these changes? (4) What difficulties or challenges did you and your family encounter during treatment? How did you and your family cope and solve them? If it was difficult to resolve, what do you think were the main reasons? (5) What factors do you think have played a positive role for you and your family in coping with the illness compared to other families? (6) What new perspectives do you have on life after the illness? Have you and your family grown as a result of coping with the challenges of illness?

Data collection

Patients receiving AL chemotherapy who met the inclusion criteria were assigned to face-to-face, semi-structured interviews. Before the

interview, the researcher explained to the patients the main goal of the interview, research content, time required, etc. The researcher then used audio recording equipment to record the entire conversation with the patients' informed consent. To avoid disturbing the interview participants, the interview was undertaken in a quiet ward or meeting room. Another researcher carefully observed and promptly recorded the non-verbal characteristics of the participants during the interviews, such as facial expressions, eyes, tone of voice, and body movements. The duration of each interview was 20–40 min.

Data analysis

Within 24 h of the interviews, the researcher transcribed the verbatim audio recordings into text data, adjusted the content via the field notes, and then inserted it into the NVivo 12.0 qualitative analytic program to facilitate analysis. The themes of the textual material were analyzed, summarized, refined, and integrated independently by two researchers using Colaizzi's 7-step analysis method,¹⁸ which consists of the following steps: (1) read all interview materials carefully and repeatedly in conjunction with field notes; (2) analyze statements of significance; (3) code recurring ideas to construct units of meaning; (4) gather the encoded viewpoints for topic clustering; (5) define and describe preliminary themes in detail; (6) repeat comparisons of similar themes, identify similar ideas, and develop thematic results; and (7) return the developed thematic structure to the participants for validation. The final results were formed after discussion and analyzed by members of the group and hematologists.

Quality control

The researchers were given training in communication techniques and theories associated with qualitative research. At the stage of interview implementation, the researchers talked to the participants impartially without offering any directional guidance. Within 24 h of the interview, one researcher first organized the data by handing them over to another for a secondary review. The researchers double-checked with participants to ensure the validity of the interview results when they came across ambiguous statements or meanings that made it difficult for them to harmonize their perspectives. During the data analysis phase, members of the research team held regularly scheduled discussion meetings to provide continuous feedback and adjustments to the content of the data by repeatedly comparing data, identifying statements, assembling codes, and analyzing themes.

Ethical considerations

The study was approved by the Hospital Ethics Committee (IRB No. 2022-SR-742) and complied with the ethical requirements of the Helsinki Declaration. All participants provided written informed consents. The patients' rights to privacy and informed consent were fully respected and protected throughout the study, and they were informed of their right to withdraw from the study at any time.

Results

Participant characteristics

Eleven patients with AL participating in the study were at different stages of the disease. Among them, three were ALL patients and eight were AML patients; nine were married, one was widowed, and one was unmarried; the type of family for seven persons was nuclear, two were joint, one was main, and one was single-parent; five were in the induction treatment period, five in the consolidation treatment period, and one in the maintenance treatment period; five were in complete remission; four were newly diagnosed, one relapsed, and one was in partial remission. In order to safeguard the patients' privacy, they were assigned numbers

from N1 to N11 based on the order in which they were interviewed. The patients' general information is detailed in Table 1.

Protective factors for family resilience

Positive traits

Optimistic patients were able to self-adjust and transform their inner emotions in time and were more inclined to eliminate the stress caused by the disease with a positive attitude, thus obtaining a higher sense of well-being in life and belief in recovery from the disease.

“A lot of people enjoyed being on the ward with me, why? Because I didn't have anything particularly sad to say, and even when I was sick, I was smiling and laughing.” (N9, 34 years old)

In addition, this study found that patients themselves or family members with a strong initiative and judgment are equally crucial to disease management, and they will make reasonable decisions and take immediate action within a short period of time. One participant reported that her husband took her to a hospital with a higher level of medical care in the first instance when she showed some easily overlooked signs of illness, such as bleeding gums, which effectively prevented further deterioration of her condition.

Cognitive restructuring

With the progress of treatment, patients realized the significance of regulating their state of mind, changed their previous negative cognition of the crisis event, and learned to cope with the psychogenic stress brought by AL through positive coping, self-suggestion, social comparison, and other individualized regulation strategies.

“You have to be in a good state of mind when you're sick, and all other problems can be solved... At the beginning, I felt that the future was dark, but now I'm just adjusting to it.” (N1, 21 years old); “Because this belongs to the lightest type of leukemia, called M3, so in my mind I think that I am just luckier than others, and some of the other people's subtypes need transplants and so on, and this one doesn't need a transplant...” (N9, 34 years old)

Most of the patients reported that after undergoing the disease crisis, they re-examined the meaning of life and philosophy of life, reflected on their original value orientation, remembered the emotional support and care support from their families and society, and explored and established new values such as respecting their inner needs and being altruistic and helpful to others.

“After all, the pressure of this work and life is relatively high, and usually the expectations of oneself, one's family, and one's children are too high, so I hope that I will slow down a little bit and not be so tired.” (N6, 43 years old); “Being able to learn a little bit while healing myself, and remembering a little bit myself, and then helping others as well.” (N7, 38 years old)

Positive family beliefs

Family beliefs refer to the consistent attitudes or values, among other things, of family members surviving in the same structural environment towards universal things.²⁰ Patients indicated that their families all showed common beliefs about coping with the disease positively, giving them confidence, support, and mental strength.

“Overall, the family is very united. For example, when something went wrong with you, they did not panic like other people but told you immediately that you could rest assured that you would be fine and that you did not have to think about money or about your two children, as your parents-in-law would raise very well. You just needed to concentrate on cooperating with the doctor and getting well and not think so much.” (N9, 34 years old)

Organizational flexibility

When the patient's disease diagnosis crisis occurred, families with high flexibility dynamically adjusted their internal organizational structure and arrangement pattern based on their respective actual

Table 1
General information of patients (N = 11).

Serial No.	Gender	Age (years)	Type of disease	Education	Marriage status	Type of health insurance	Type of family ^a	Therapeutic phase	Disease status
N1	Male	21	ALL	High school	Unmarried	Resident health insurance	Nuclear family	Consolidation treatment period	Complete remission
N2	Female	50	AML	Junior high school	Married	Employee health insurance	Joint family	Consolidation treatment period	Complete remission
N3	Female	62	AML	Middle school	Married	Employee health insurance	Nuclear family	Induction treatment period	Newly diagnosed
N4	Female	61	AML	High school	Widowed	Employee health insurance	Single-parent family	Consolidation treatment period	Relapse
N5	Male	70	AML	High school	Married	Employee health insurance	Nuclear family	Induction treatment period	Partial remission
N6	Male	43	AML	Master's degree	Married	Employee health insurance	Nuclear family	Consolidation treatment period	Complete remission
N7	Female	38	AML	Bachelor's degree	Married	Employee health insurance	Nuclear family	Induction treatment period	Newly diagnosed
N8	Male	58	ALL	High school	Married	Employee health insurance	Nuclear family	Induction treatment period	Newly diagnosed
N9	Female	34	AML	High school	Married	Employee health insurance	Main family	Maintenance treatment period	Complete remission
N10	Male	50	AML	Primary school	Married	New farmers' cooperative	Nuclear family	Consolidation treatment period	Complete remission
N11	Female	41	ALL	Junior high school	Married	Employee health insurance	Joint family	Induction treatment period	Newly diagnosed

ALL, acute lymphoblastic leukemia; AML, acute myeloid leukemia.

^a **Type of family:** Nuclear family means a family consisting of a couple with unmarried children; Joint family means a family that includes parents, married children, unmarried children, grandchildren, great-grandchildren, and so on, living together for several generations; Main family means a family consisting of two or more generations of couples, with no more than one couple per generation, and with no intervening generation breaks; Single-parent family means a family consisting of a divorced, widowed or unmarried single father or mother and their children or adopted children.¹⁹

situation, gradually constructing a new family pattern to adapt to the state of the disease crisis through the division of care, the transfer of housework, and the reassignment of raising young children.

“My parents basically do all the housework now; I still mainly live in the countryside when I go back, and now it's mainly my mom taking care of me, and then my husband is working and taking care of me at the same time.” (N11, 41 years old); “The problem of taking care of children is now slightly solved by getting help from the elderly, but they can only take care of the children's basic living and other aspects are omitted...” (N7, 38 years old)

Clear communication

The sudden crisis made the family more closely united, mainly reflected in the number and time of communication between the patient and family members after the illness had increased, which promoted the joint solution to the problem and effectively maintained and consolidated the relationship bond and emotional foundation between the family members.

“We would discuss with each other about things within the family, for example, the time I needed to be hospitalized over here, or to discuss and synthesize everyone's opinion, and it was not something that you decide by yourself. But the big things are still my own decision, and of course, they will also give some opinions.” (N6, 43 years old)

Social support

Emotional diversion or material support from heterogeneous groups such as relatives, friends, colleagues, health care workers, social groups, and so on had a certain alleviating effect on the psychological pressure and economic pressure of AL patients.

“Spiritual help, that is, those unit colleagues, friends, relatives, and some social groups and party organizations mentioned just now, all gave me care; that is, all the help that can be provided to me was provided to me.” (N6, 43 years old); “The first thing I felt when I came to this hospital is that whether it's the director or the doctors or the nurses, the attitude is very good, and it's like treating us like we're with family.” (N4, 61 years old)

Peer support was also one of the important sources of confidence and hope for patients, which helped patients and their families to fully understand knowledge of the disease, health issues, and information about chemotherapy, and enhanced the perceived control of physical and mental stress triggered by the disease.

“When people are communicating, it's less stressful, and then I can also know my healing process because sometimes I'm not sure and I don't learn things carefully, so through those treatment programs that they have, I can know what I'm going to do next.” (N7, 38 years old)

Risk factors for family resilience

Symptom burden

The disease itself and chemotherapy side effects in AL patients brought a variety of negative physiological symptoms, including subcutaneous bleeding, nausea, vomiting, oral mucositis, fatigue, alopecia, etc., which were the primary causes of physiological pain and somatic stress in the patients.

“During chemotherapy, it was just a big reaction... then I couldn't eat, vomiting and diarrhea, and once I vomited and passed out in the toilet.” (N1, 21 years old); “It was painful during chemotherapy, throwing up, not being able to eat, not being able to sleep.” (N5, 70 years old)

At the same time, some patients' ability to engage in somatic activity might be hampered by the use of chemotherapeutic drugs.

“I couldn't walk; I basically just kept just moving around in bed... (bitter smile) just floundering, walking floundering when I was on chemo.” (N3, 62 years old)

Self-concealment

When coping with the multiple pressures brought about by the disease, some patients or family members, due to factors such as traditional

thinking, personality, or fear of family members' worry, mostly opted to hide their negative emotions from themselves and did not easily reveal their true inner feelings, needs, and emotions to their family members or friends.

“I didn't share any of the difficulties I encountered with my family; I was afraid they would worry, so I basically solved them myself or found friends to work it out.” (N6, 43 years old)

Role overload

When economic problems were highlighted, some patients, out of consideration for the future of their children and families, had intense conflicts between their original family and social roles and the patient's role, which led to psychological overload and hindered the patient's role adaptation.

“It's hard; it's psychologically hard because a child has to get married and needs money; the girl is already married; plus, my wife is disabled; her legs are not convenient; and she is not able to earn money, so it's quite stressful.” (N10, 50 years old)

Economic distress

The high cost of treatment for AL is certainly a huge burden for the ordinary family. In particular, young and middle-aged patients were unable to continue to be engaged in work activities due to the need for treatment and their physical state. In addition, family members who took care of them were confronted with contradictions and pressures between their personal work and caring for the patients. These reduced the total income of the family and increased the financial burden of the family, greatly affecting the quality of life.

“This disease it's just perennial; you have to keep running to the hospital, you just keep throwing money at it, and for rural people, the cost is still quite big.” (N2, 50 years old)

Social alienation

Due to the patient's weakened body immunity caused by the disease, to avoid being infected by viruses or bacteria, the patient was forced to reduce contact with outside people or the environment and change their original social activities.

“You can't go to work and contact people outside. Even for meals, you have to eat separately from the family... because of this disease, I can't be in contact with other people. I'm just afraid of infection.” (N2, 50 years old)

Some patients were fearful of being looked at differently and treated differently by others, and out of defense, they would resent and avoid letting more people know the relevant inside information, and they would also consciously reduce walking around with others.

“I think I'm a sick person. If I sit with other people, although they don't say anything about it, it's not actually good.” (N5, 70 years old)

Discussion

This study explored the interactions between behavioral performance and influencing factors in families of adult AL chemotherapy patients during crisis events, with the goal of revealing protective and risk factors in the dynamic development of patients' family resilience. Positive or negative responses at the individual, family, and social levels aided or impeded patients' family resilience.

This study identified individual positive traits, cognitive restructuring, and other internal control elements as important protective factors for family resilience in AL patients. Positive personality traits such as optimism and doughtiness laid the endogenous foundation of positive coping, self-adjustment, and positive acceptance of the patients,²¹ which would also provide relief and encouragement to the family members, thus promoting the formation of a bi-directional cycle of benign interactions among the family internally. For example, patients with positive traits may cope with AL by focusing on what they already have (e.g., husbands' attentive care) or self-affirmation of details in their lives (e.g.,

considering oneself “strong” for independent hospitalization). This is familiar with the findings of Wang et al.²² which showed that hematologic cancer patients with high levels of positive psychological resources typically had fewer symptoms of psychological distress.

Patients were guided via cognitive restructuring to concentrate more on the situation at hand than on traumatic recollections, psychological anguish, or erroneous thinking from the past.²³ Self-determination theory holds that while being in trouble, people nevertheless make adjustments to their behavior to get back to an adaptive condition.²⁴ As a result, while crises triggered chaos for patients and their families, they also indirectly stimulated patients’ resilience and strength, prompting them to apply coping mechanisms such as mindset adjustment and positive reframing to accept their disease facts and adjust to the state of diagnosis and treatment. At the same time, participants emphasized that they made cognitive and health behavioral changes to their lives during long-term disease treatment, such as adjusting their life priorities and paying attention to their diets, which effectively contributed to personal growth as well as the achievement of family resilience, confirming the findings of previous studies.^{25,26}

Symptom burden was one of the risk factors for family resilience among patients. Symptom burden has been found in studies to have a negative impact on health-related quality of life in cancer patients.²⁷ It has also been discovered that survivors of AL treated with chemotherapy still experience an intrusive symptom burden years after the conclusion of treatment, and they do not totally recover.²⁸ Therefore, as crucial health managers, health care professionals must improve the dynamic assessment of symptom burden in AL patients and promptly offer stress relief.

Self-concealment is the act of concealing one’s genuine feelings, thoughts, and opinions from others, and it impedes the patient’s inter-family emotional communication. Due to the influence of traditional culture, Chinese families are frequently described as implicit. They struggle with verbalizing their genuine inner thoughts to their family members, refraining from discussing the disease diagnosis and how they are feeling about the journey, and typically keeping their love and concern hidden. Consistent with the study by Serçe and Günüşen,²⁹ patients and caregivers have been shown to try to hide their feelings and thoughts from each other when coping with unfavorable outcomes triggered by a crisis. However, in the long term, this is not conducive to maintaining and developing intimate relationships between family members of the patients but rather tends to create a gap in emotional communication between them.³⁰ Additionally, patients who were under the pressure of the social institutions that determine role positions experienced increased psychological suffering due to role overload brought on by the burden of disease.³¹ For example, the participant was distressed about preparing for his son’s marriage and often blamed himself for not being able to continue with his earnings because of his illness, which made it difficult for him to better fulfill his family responsibilities. When the demands of family and social roles were incompatible with those of the patient’s role, patients were prone to emotional depletion, which could also affect treatment adherence and collaboration.

This study discovered that positive family beliefs, flexible organizational adjustments, and open communication were important aspects that contribute to the recovery of family functioning in coping with stress in patient families. Previous studies have confirmed^{13,32,33} that positive family beliefs were cognitive precursors for family members to work together to cope with challenges and could guide the patient’s family to steadily recover from the broken state under crisis; adaptation of the family organization model relied on the cohesion and flexibility of the patient’s family organization to facilitate decision-making consensus and resolution of disease-related problems; family members who regularly express their emotions and perspectives might be more understanding and tolerant of each other, have greater cohesion and resilience in the face of stressful events, and in turn participate together in the management of the patient’s illness. Notably, they also emphasized the positive impact of intrafamily members working together to address disease

challenges on family functioning and disease adaptation, such as family unity and cohesion, similar to prior studies.³⁴ Therefore, health care professionals should follow the holistic thinking model to systematically identify, assess, and analyze the interactive characteristics of the patient’s family system, adopt patient-family-centered care strategies, fully explore and clarify the strengths of the patient’s family, and guide them to take positive coping strategies to enhance the patient’s family resilience level.

Economic distress was a vital risk factor for family resilience among the participants of this study. AL was treated over a long period of time, patients were hospitalized frequently and for days ranging from half a month to a month at a time, and medical costs increased with the number of days of hospitalization.³⁵ While clarifying diagnosis and prolonging survival, medical interventions such as genetic testing, bone marrow aspiration, and novel anticancer medications have caused a sharp increase in the direct cost of disease.³⁶ In addition, the economic distress of the patient’s family included nonmedical costs such as labor force decline during the treatment period and long-term care costs. To prevent financial distress from adversely affecting patients and families, health care professionals ought to establish trusting relationships with AL patients, spot patients who are having trouble paying their bills, and offer timely guidance to patients in selecting the best treatment plan.

The participants in this study all engaged in social basic medical insurance for AL, which, to a degree, could alleviate the financial burden of the patient’s family. There were discrepancies in the financing level of China’s basic medical insurance, and according to a survey,³⁷ the average financing level of employee health insurance in 2018 was more than six times higher than that of the resident health insurance and the new farmers’ cooperative medical insurance, respectively, whereas a higher level of financing corresponds to a stronger level of guaranteed benefits. As for the reimbursement mechanism, the rates of reimbursement for hospitalization, outpatient expenses, and self-acquired medicines under the employee health insurance were higher than those under the resident health insurance and the new farmers’ cooperative health insurance.³⁸ This may be due to the higher contribution rate and individual account payment rate for employee health insurance. Overall, the level of benefits and reimbursement rates for the employee health insurance were better than those for the resident health insurance and the new farmers’ cooperative health insurance. Therefore, in comparison with the other two types of health insurance, patients with the employee health insurance type experienced less pressure on their household medical expenses. However, as the level of medical coverage for adult AL in China is currently limited, the rate of inclusion of high-value drugs and special diagnostic and therapeutic items in the coverage of the medical insurance fund is relatively low. Many of the participants in this study with different types of health insurance indicated that health insurance was of restricted support to relieve the family’s financial hardship, with high out-of-pocket expenses and extreme financial burdens. Thus, the government should increase medical assistance and health insurance reimbursement for major diseases such as AL and optimize the health insurance payment methods and payment standards for AL, actively exploring payment modes such as by diagnosis-related group (DRG) and by type of disease to improve the quality of treatment and reduce patients’ direct economic costs of illness.

According to this study, strong social support lessened unpleasant experiences and disease distress among AL patients receiving chemotherapy, as well as the financial strain and caregiving load on the patients’ families. It has been suggested that perceived social support is one of the most important predictors of improvement in the quality of life of leukemia patients,³⁹ which is in agreement with the results of this study. Relief and support from friends, family, or coworkers, among others, might decrease patients’ anxiety, depression, and distress⁴⁰; at the time of initial diagnosis, the majority of families knew little about the course of AL or its prognosis and learned most of what they could about the condition from medical professionals or peer support.⁴¹ Thus, health care professionals, as patients’ health managers, information guides, and

social resource articulators, from the perspective of the supportive care requirements of AL patients and their families, should actively build and perfect the social support network with the participation of multiple subjects to promote the optimization and enhancement of patients' family resilience. Aside from that, the stigmatization of AL still exists at the social level, and patients are easily rejected and even marginalized by the public, resulting in negative states such as self-stigma and more negative impacts on patients' lives.⁴² Consequently, society should strengthen the education and publicity of disease knowledge to reduce public stereotyping, prejudice, and discrimination.

Implications for nursing practice and research

This study shed light on which factors impacted family resilience in AL adults receiving chemotherapy. In clinical practice, health care practitioners should identify risk and protective factors for family resilience, construct proactive interventions to prevent the detrimental impacts of risk factors, and enhance the facilitative role of existing resources. Health care professionals also need to recognize the importance of the family in alleviating the stress and problem-coping of chemotherapy patients, encourage family members to actively participate in the patient's treatment process, and enhance the sense of connection and cohesion among the patient's family members.

Limitations

The main limitations of this study were as follows: As the data in this study were mainly collected in one hospital, which reduced the representativeness of the sample to some extent, future follow-up studies should be conducted in different geographical areas, and the sample size should be further expanded to increase the comprehensiveness of the findings. This study was based only on a single patient perspective, which failed to reflect a holistic view of the family, and in the future, family members such as caregivers can be included in the study together in order to gain a more comprehensive understanding of the trajectory of developmental changes in family resilience and the factors influencing it in patients with AL.

Conclusions

This study employed a descriptive phenomenological research methodology to explore the protective and risk factors for family resilience in adult patients undergoing chemotherapy for AL. The balance and harmony in the families of the patients were moderated by protective factors such as positive traits, cognitive restructuring, positive family beliefs, organizational flexibility, clear communication, and social support, but they were also challenged by unfavorable factors including symptom burden, self-concealment, role overload, economic distress, and social alienation. It is suggested that health care professionals should start from the perspective of family strengths, take active measures to strengthen the protective factors and preventive risk factors of patients' family resilience, and tap the positive efficacy of family resilience in crises so as to enable patients' families to realize favorable adaptation to crises and to successfully overcome the challenges of illness.

Ethics statement

The study was approved by the Institutional Review Board of the Jiangsu Province Hospital (IRB No. 2022-SR-742) and complied with the ethical requirements of the Helsinki Declaration. All participants provided written, informed consent.

CRediT Authorship Contribution Statement

Xuhan Sun: Conceptualization, Methodology, Software, Investigation, Data Curation, Formal Analysis, Writing – Original Draft. **Yuqing**

Wang: Investigation, Data Curation, Data Analysis. **Xinyu Lu:** Data Analysis, Supervision. **Shuyu Zhang:** Data Analysis, Supervision. **Yuxi Zhang:** Funding Acquisition, Resources, Supervision, Writing – Review & Editing. All authors were granted complete access to all the data in the study, with the corresponding author bearing the final responsibility for the decision to submit for publication. The corresponding author affirms that all listed authors fulfill the authorship criteria and that no others meeting the criteria have been omitted.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability statement

The data supporting the results of this study are available upon request from the corresponding author, Yuxi Zhang. Data are not publicly available because they contain information that may compromise the privacy of the study participants.

Declaration of Generative AI and AI-assisted technologies in the writing process

No AI tools/services were used during the preparation of this work.

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