Coping strategies and their effect on fatigue among acute leukemic patients

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Abstract:

background Acute leukemia related fatigue is a symptom of fatigue that is experienced by nearly all cancer patients**.** Coping is crucial to the care of patients with cancer and is an integral part of patients' experiences in managing challenges that accompany a cancer diagnosis and treatment. **Aim:**To evaluate Coping strategies and their effect on fatigue among acute leukemic patients. **Design:** Quasi experimental research design was used in the present study . **setting :** This study was conducted at medical oncology intensive care unit at south Egypt cancer institute. **Sample:** Convenient sample of 60 adult patients (male and female) were participated in this study. **Tools: include two tools, tool one** demographic data, **tool two** fatigue assessment tool using two scale (fatigue assessment scale -fatigue severity scale**). Tool three,** coping strategies with the Brief COPE**. Results**: significant differences regarding fatigue severity in the study and control groups before and after implementation of Coping strategies . The mean fatigue severity score in the study group significantly decreased from 54.5±3.92 to 43.4±4.67 (p=0.000), coping scores in the study group increased from 3.77±1.19 to 5.47±1.28 (p=0.000), with significant enhancements observed in problem-focused coping (19.07±4.53 to 22.47±2.6, p=0.001) and emotion-focused coping (29.57±2.71 to 32.83±3.22, p=0.000). **Conclusions**: Coping strategies success in reduce fatigue among leukemic patients. **Recommendations**: Reapply this research on a larger sample size from other geographical areas in Egypt to ensure generalization.

Keywords: coping strategy, fatigue, intensive care unit, leukemia.

Introduction:

Leukemia is a kind of hematological cancer that is caused by an overproduction of white blood cell (WBC)forming tissues resulting in a marked increase in circulating immature or abnormal WBCs. As the number of abnormal WBCs in acute leukemia increases faster than that in chronic

leukemia, acute leukemia can be more deleterious **(AlFayyad et al., 2020 and Amany etal .,2024)**

Acute leukemia is a malignant clonal disease of one or more hematopoietic stem cells. The disease is characterized by abnormal proliferation of primary and naive cells, which inhibits the normal hematopoietic function of the bone marrow and can occur at different ages**(Chan et al., 2021).**

Acute leukemia related fatigue is a symptom of fatigue that is experienced by nearly all cancer patients. Among patients receiving cancer treatment other than surgery, it is essentially universal. Fatigue is a normal and expected side effect of most forms of chemotherapy, radiation therapy, and biotherapy. On average, cancer-related fatigue is "more severe, more distressing, and less likely to be relieved by rest" than fatigue experienced by healthy people. It can range from mild to severe, and may be either temporary or a long-term effect. Fatigue may be a symptom of the cancer, or it may be the result of treatments for the cancer. (**Nurhidayah et al., 2020).**

Acute leukemia related fatigue is a distressing, persistent, subjective sense of physical, emotional, and/or cognitive tiredness or exhaustion related to cancer or cancer treatment that is not proportional to recent activity and interferes with usual functioning. Fatigue is the most common side effect of cancer treatment with chemotherapy, radiation therapy, bone marrow transplantation, or selected biologic response modifiers. Clinically significant levels of fatigue may also negatively impact survival.Level of evidence: The specific mechanisms underlying a common pathophysiology for CRF are unknown. **(Bryant et al., 2018).**

Coping strategy is Non pharmacological interventions categories ;activity enhancement [exercise] physical therapy [massage] psychosocial intervention [coping behavior] ,music therapy, yoga, hypnosis, energy therapy, massage therapy, acupressure and relaxation technique **(Söntgerath et al., 2022).**

Comprehensive nursing intervention for patients with myelo suppression after chemotherapy for acute leukemia can effectively improve the patient's nursing experience, reduce the patient's complaint rate, alleviate the patient's physical pain, relieve the patient's anxiety, depression and other negative emotions, and reduce the patient's complications, suggesting that comprehensive nursing intervention presented better clinical efficacy and high safety, and merits promotion clinically **(Rodríguez-Almagro et al., 2018).**

Effective coping strategies are indispensable for adaptation, adjustment and improvement in survival . Coping strategies assist patients to deal with the problem that is causing the distress (problem-focused coping) and/or regulating stressful emotions (emotion-focused coping) (**McNair et al., 2022) (Omaima E M,.et al., 2021).**

Coping is crucial to the care of patients with acute leukemia have been postulated as one mechanism by which individuals respond to threats or stress. and is an integral part of patients' experiences in managing challenges that accompany a cancer diagnosis and treatment. Approach-oriented coping strategies (eg, positive framing, problem-solving, utilizing emotional support) are cognitive and behavioral approaches that directly address or aid in the management of stress and the illness experience, whereas avoidant coping strategies (eg, denial, avoidance, emotional suppression) involve withdrawing from the stress (**McNair et al., 2022).**

Nurses are an important part of the interdisciplinary team that treats these patients who have important technical and psychosocial role to ensure adequate care in ICU. The primary role of nurses is to maintain a safe environment for the patient in the ICU, close monitoring, prevention, increasing patients quality of because their role of health care providers is to continuously follow up life for early detections of any complications **(Patnaik, 2022)(Amany S.,et al., 2024)**.

Significant of the study:

Acute leukemia related fatigue is the most prevalent, persistent, and distressing symptoms among cancer patients and survivors .acute leukemia related fatigue is a debilitating symptom that interferes with physical and mental function and associated with reduced quality of life

World wide Acute leukemia related fatigue has been reported in patients with active chemotherapy between 59-90% and up to 100 in patients receiving radiotherapy and up to 25% among cancer survivors . Among cancer diseases,Acute leukemia related fatigue was experienced and frequently reported by leukemia patients than patients with solid tumors, with prevalence ranges between 33% and 69% . Fatigue continues after the completion of the treatment course, roughly in a quarter of treated patients and increasing up to 35% of long-term cancer survivors.

Fatigue in patient with Acute leukemia need special nursing care to improve the patients out comes and reduce complication.

Effective coping strategies are indispensable for adaptation and adjustment to BC and improvement in survival . Coping strategies assist patients to deal with the problem that is causing the distress (problem-focused coping) and/or regulating stressful emotions (emotion-focused coping) **(Weijs et al., 2018).**

Statistical reports of hematological malignancy at south Egypt cancer Institute in Assuit documented that 300 patients diagnosed with Leukemia

Research hypothesis:

Coping strategy for acute leukemic patients is expected to have appositive effect in reducing fatigue among these patients.

Patients and Method

Study design:

Quasi experimental research design was adopted to conduct this study.

Variables:

Independent variable: coping strategies.

Dependent variable : fatigue with acute Leukemic patients.

Setting:

This study was conducted at medical oncology intensive care unit at south Egypt cancer institute. .

Sample size was calculated according to Epi Info 2000. A sample size was be selected using a special formula based on prevalence of disease at a confidence interval of 95% and precision of (2%). The sample was increased by 10% to overcome problems related to non-responses and missing date. The power of study was 80%. Considering the following matching criteria age group, sex, and marital status, level of education .

- A purposive sample of 60 adult patients (male and female) with leukemia in ICU, were included in the study.
- They were divided randomly into two equal groups (30 patients as control group who received routine care and 30 as study group who received coping strategies).

Inclusion criteria:

- Newly admitted patients
- Both sex: (male and female)
- Patient age: (20-60 years).
- All patients diagnosed with acute Leukemia.

Exclusion criteria:

- Children.
- Pregnant women.

- Terminal stage of disease

Data Collection tools:

Three tools were developed by the researcher after review of literature:

Tool one: demographic data assessment tool;

This tool was developed by the researcher after reviewing of literature. It includes : (patients code, age, gender, marital status, educational level)

Tool two : fatigue assessment tool it consisted of two part:

Part I : Fatigue Severity Scale (FSS) Developed by **(Krupp et al., 1989; Schwart et al., 1993)**

The Fatigue Severity Scale (FSS) This scale is a method of evaluating the impact of fatigue by short questionnaire that requires rate and level of fatigue. The FSS questionnaire contains seven statements .a low value (1) indicates strong disagreement with the statement, --high value (7) indicates strong agreement.

A total score of fatigue Severity Scale 63:

- Mild fatigue less than 28
- Moderate fatigue between 28 and 40
- Sever fatigue between41and63

Part II : Fatigue Assessment Scale [FAS]) Developed by **Michielsen et al., (2003)** adopted from **Hendriks et al., (2018).**

- The Purpose of the FAS scale is refer to how you usualy feel to evaluate symptoms of fatigue.
- A total score of FAS was 60
- Normal less than 22
- Mild to moderate 22-34
- Severe 35-50

Tool three : coping strategies with the Brief COPE assessment tool:

This scale adopted from (Nipp et al., 2016) and developed by Carver, (1997). this scale consists of 28 items grouped into three primary dimensions and 14 sub-dimensions. The first dimension is problem-focused coping, which consists of sub-dimensions such as active coping, instrumental support, and planning. The second dimension is emotional-focused coping, which comprises sub-dimensions such as emotional support, positive reframing, acceptance, and religion. The final dimension is **Avoidant Coping**, which includes sub-dimensions such as self-distraction, denial, substance use, behavioral disengagement, catharsis, humor, and self-blame.

A total score of this scale equal 112 divided into

Problem-focused coping equal 32

Emotion- focused coping equal 48

Avoidant coping equal 32

Method:

The study was conducted throughout three phases, which are preparatory phase, implementing phase and evaluation phase.

1. Preparatory phase and administrative design:

- An official letter from the faculty of nursing was sent to the accountable authorities of the hospital, and approval was obtained to conduct this study after an explanation of the nature and aim of the study.
- The tools which used in the present study were developed by the researcher (tool **I).**

Content Validity:

By creating the tools, following a comprehensive review of relevant literature and then submitted to a panel of five experts in the fields of critical care and emergency nursing. The suggested modifications were made, and the final versions were ready for use.

Pilot Study:

A pilot study was done to test the feasibility and applicability of the tools, and the necessary modifications were made. **The pilot study included 6 patients (10%), with no major modifications made. This group of pilot study not included in the study sample.**

Reliability of the study tool:

The reliability of tools was done by using Cronbach's Alpha test to measure the internal consistency of the components of tools.

- The reliability of patient demographic data assessment tool was 0.850.

Ethical consideration:

Ethical approval for this study was granted by the scientific research ethics committee at the Faculty of Nursing, Assiut University. Informed consent was obtained from the participating patients after thoroughly explaining the study's aim and process. The researcher guaranteed the complete anonymity and confidentiality of the participants' data. Additionally, the patients were assured of their right to withdraw from the study at any phase.

Implementation phase:

In this stage nurses who worked in the medical oncology unit were informed about the scope of the study followed by a 2-hour training session on the use coping strategy to reduce fatigue of leukemic patients

1. The responsible nurse gave daily feedback to the researcher importance of coping strategy

Data collection:

Data were collected in ten months, approximately. The study was conducted from March 2023 to December 2023 with 60 patients who presented with acute leukemia at intensive care unit .

The researcher assigned studied patients (60 patients) to two equal groups (control group and study group).

Studied patients from both group were assessed daily by using **(Tool one, tool two and tool three).**

The data were collected from admission, and at the end of first week. Then the data recorded in the developed tools.

Regarding the control group : The control group was exposed to routine care at intensive care unit .

Regarding the study group: the study group were received **Coping Strategies a**nd care for fatigue by researcher.

Coping is crucial to the care of patients with acute leukemia have been postulated as one mechanism by which individuals respond to threats or stress. and is an integral part of patients' experiences in managing challenges that accompany a cancer diagnosis and treatment.

The Coping Strategies consisted of approaching participants 4 days a week, twice a day (9 am and 5 pm sessions). Coping Strategies include four component first self talk, second relaxation techniques for Natural Pain relief and stress ,third aerobic exercise (walking or stationary bike) and four resistance training (use of different strengths of resistance bands).

Self talk; Positive self-talk is a cognitive psychological technique used to stop negative cognitions that can cause anxiety, depression, and pessimism, and that can interfere with functioning and performance. Meichenbaum D (1988) Positive self-talk has frequently been used by athletes as a cognitive strategy to assist in maintaining focus, enhancing motivation, and coping with negative thoughts, emotions, and events. Researchers have found to be an effective performance enhancement strategy in a variety of sports and athletic tasks Van Raalte JL,et al.(1995).

Relaxation Techniques for Natural Pain Relief and stress.

Prepare patient to share in relaxation techniques and exercise to reduce fatigue related leukemia through;

Relaxation exercises calm the mind, lower the amount of stress hormones in the blood, relax the muscles, and elevate the sense of well-being. Using them regularly can lead to long-term changes in the body to counteract the harmful effects of stress.(**Reham E A.,et al., 2021**).

Exercise help the patients to:

- improve physical abilities, balance.
- prevent muscles wasting ,osteoporosis.
- reduce symptoms of fatigue, anxiety, depression.
- improve circulation, self esteam and control.

The researcher was explain the steps of the exercise and equipment was be used as bandage, stretched robe, and elastic ball to the patients .

Low intensity Exercise:

A. Resistance Exercise During and Following Treatment

Resistance exercise involves muscle contraction against resistance and leads to improvements in muscular function and bone density.

b. Aerobic Exercise During and Following Treatment

Aerobic exercise utilizes large muscle groups for prolonged periods of time.

c. Combined Aerobic and Resistance Exercise

d. Flexibility Exercises

Include stretching exercises

This progressive exercise model consisted of aerobic training of 5 to 15 minutes and resistance training of 10 to 20 minutes. The aerobic exercise intensity progressed from approximately 50% to 70% of heart rate reserve, and the resistance exercise intensity increased from lighter to heavier resistance bands .

3-Evaluation phase

Study and control groups were followed up at admission as a base line data and after one week by using study tools

Statistical Design:

The data were tested for normality using the Anderson-Darling test and for homogeneity variances prior to further statistical analysis. Categorical variables were described by number and percent (N, %), where continuous variables described by the mean and standard deviation (mean ± SD), Chi-square test, was used to compare between categorical variables while comparison between continuous variables was done by independent t-test. All analysis was performed with the IBM SPSS 20.0 software, Test of significance of < 0.05 was considered significant.

Results

Table (1):- Distribution of Socio demographic data Fore Patient's related to group (n=60)

	Study(n=30)		Control(n=30)		X2	P. value
	No	%	No	%		
Age						
18 > 30 years old	2	6.7	6	20.0	2.70	0.260
30> 40 years old	4	13.3	5	16.7		
40 and above	24	80.0	19	63.3		
Gender						
Male	21	70.0	19	63.3	0.30	0.584
Female	9	30.0	11	36.7		
Marital status						
Single	0	0.0	6	20.0	6.84	0.077
Married	20	66.7	16	53.3		
Divorced	2	6.7	1	3.3		
Widow or widower	8	26.7	7	23.3		
Level of education						
Secondary education	3	10.0	1	3.3	3.61	0.307
Basic education	9	30.0	9	30.0		
Read and write	3	10.0	8	26.7		
Illiterate	15	50.0	12	40.0		

Chi square test for qualitative data between the two groups

Significant level at P value < 0.05, **Significant level at P value < 0.01

This table shows that there was no significant differences between study and control groups regarding their demographic data. Most patients were aged 40 and above (80.0% in the study group vs. 63.3% in the control group, p=0.260), with no significant age-related difference. Males predominated in both groups (70.0% in the study group vs. 63.3% in the control group, p=0.584). Regarding marital status, the majority were married (66.7% study vs. 53.3% control), while no participants in the study group were single, compared to 20.0% in the control group (p=0.077). In terms of education, illiteracy was highest in both groups (50.0% study vs. 40.0% control, p=0.307),

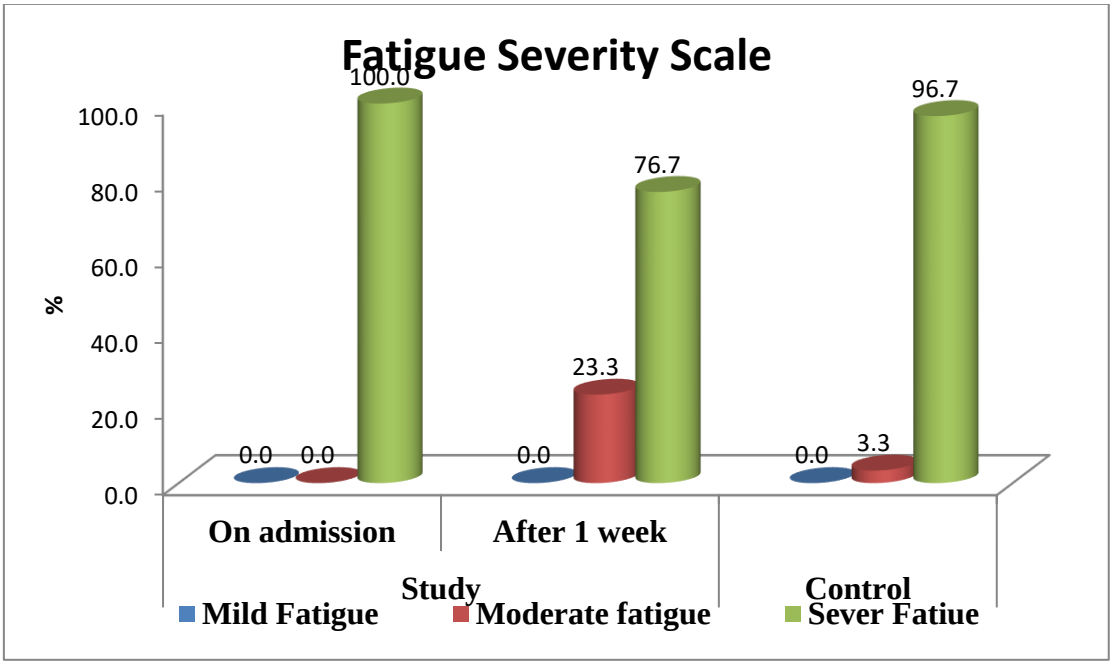

Figure (1) Relationship Between Study and control group related to fatigue Severity Scale Before and After coping strategy (n=60)

This figure highlights significant differences regarding fatigue severity in the study and control groups before and after education. On admission, all patients in both groups experienced severe fatigue (100% for both groups). After one week, the study group showed a notable reduction in severe fatigue cases, dropping to 76.7%, with 23.3% reporting moderate fatigue (p=0.011). In contrast, the control group had minimal change, with 96.7% still experiencing severe fatigue. The mean fatigue severity score in the study group significantly

decreased from 54.5±3.92 to 43.4±4.67 (p=0.000), while the control group showed no significant change (53.57±3.04; p=0.176).

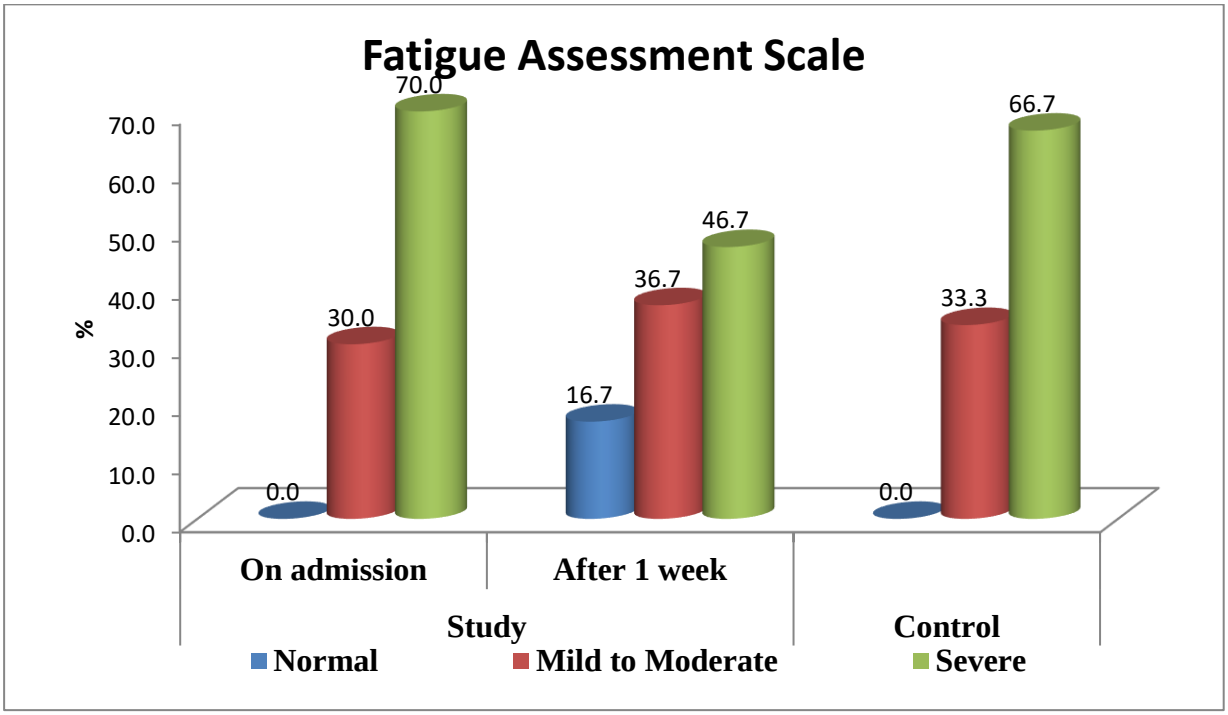

Fig (2):- Relationship Between Study group related to Fatigue Assessment Scale Level Before and After coping strategy (n=60)

This figure (2) indicate a significant improvement in fatigue levels in the study group following the education intervention. On admission, the study group had a higher percentage of severe fatigue (70%) compared to the control group (46.7%). After one week, the study group showed a notable reduction in severe fatigue, with 66.7% remaining in the severe category, while 30% shifted to a mild-to-moderate level. In contrast, the control group showed minimal change, with the majority staying in the severe fatigue category. The mean Fatigue Assessment Scale (FAS) score decreased from **38.37±6.04** to **31.04±6.32** in the study group, while the control group showed only a minor reduction (**36.61±3.67**). Statistical significance was observed in the comparison between the study and control group on admission (p=0.037*) and after one week (p=0.047*)

Table (2): Comparison Between Study and control group related to coping strategies with the Brief COPE Before and After coping strategy (n=60)

	Max Score	Study(n=30)		Control (n=30)	P1	P2	P3
		On admission (n=30)	After 1 week (n=30)				
		Mean±SD	Mean±SD	Mean±SD			
Problem-Focused Coping	32	19.07±4.53	22.47±2.6	19.83±2.84	0.001**	0.436	0.000**
Emotion-Focused Coping	48	29.57±2.71	32.83±3.22	29.33±3.25	0.000**	0.764	0.1**
Avoidant Coping	32	15.27±4.18	19.6±3.09	15.43±2.66	0.000**	0.855	0.1**
Total score of coping strategies with the Brief COPE	112	63.9±8.23	74.9±6.61	64.6±7.15	0.000**	0.726	0.1**

Paired Sample T-test quantitative data between the two groups-

Independent sample T-test quantitative data between the two groups

****Significant level at P value < 0.05, **Significant level at P value < 0.01***

P1:- Comparison Between Study group On admission &After 1 wee

P2:- Comparison Between Study group On admission &Control

P3:- Comparison Between Study group After 1 week &Control

This table highlights significant improvements in the study group after education regarding coping strategies using the Brief COPE scale. Active coping scores in the study group increased from 3.77±1.19 to 5.47±1.28 (p=0.000), with significant enhancements observed in problem-focused coping (19.07±4.53 to

22.47±2.6, p=0.001) and emotion-focused coping (29.57±2.71 to 32.83±3.22, p=0.000). Notable improvements were also seen in self-distraction (p=0.000), denial (p=0.006), and behavioral disengagement (p=0.000). While informational support and positive reframing showed modest increases (p=0.025 and p=0.032, respectively), there were no significant changes in planning, humor, religion, or substance use. The total coping strategies score for the study group significantly improved from 63.9±8.23 to 74.9±6.61 (p=0.000), contrasting with the control group, which showed no significant changes over time.

Table (3):- Correlation Co-efficient Between coping strategies with the Brief COPE With Defferent Parameters For Study and Control group On admission and After 1 week (n=60)

Correlations	On admission			After 1 week		
	A1	A2	A3	A1	A2	A3
coping strategies with the Brief COPE	1			1		
fatigue Severity Scale	-.409-*	1		-.381-*	1	
Fatigue Assessment Scale	0.178	0.081	1	-.415-*	0.073	1

****Statistically Significant Correlation at P. value <0.05***

*****Statistically Significant Correlation at P. value <0.01***

The table shows the correlation between coping strategies (measured by the Brief COPE) and various parameters in the study and control groups showed notable trends. On admission, coping strategies were negatively correlated with hospital depression and fatigue severity, and positively with hospital anxiety. After one week, significant negative correlations were observed between coping strategies and PTSD, hospital anxiety, and fatigue severity, indicating that improved coping strategies were associated with reduced symptoms of anxiety, depression, PTSD, and fatigue.

Discussion

Nurses in intensive care units play an important role in the prevention of fatigue and increasing patients' quality of life because their role as health care providers is to continuously follow up patients **.** In accordance with standards of nursing practice and quality clinical care, nurses are encouraged to used evidence-based clinical guidelines **(Amany s., et al., 2024).**

The present study found that there was no statistically significant difference between both groups before implementing nursing coping strategy. This interpretation is crucial for ensuring the validity of the study's findings, as it indicates that any differences observed after the intervention can likely be attributed to the coping strategies, rather than pre-existing differences between the groups.

Regarding to the demographic data ;

The present study found that there was no statistically significant difference between both groups before implementing coping strategy.

According to age

The present study showed that majority of studied patients with acute leukemia larger than forty years old . **This study supported by Zhou et al., (2021)** who mentioned that the average age of acute myeloid leukemia was 48.9±18.3 years old. **Lu et al., (2022)** monitored that Acute leukemia is now cured in approximately 35%–40% of patients younger than age 60 years old. .this difference may be due to small sample size

Concerning to gender

The current result of this study showed that males made up more than half of the sample**. This is on line with me Andersen et al., (2023)** who found that acute leukemia is most common in older people and affects males more than females.

This finding is not similar to study by **Wang et al., (2021)** investigated the demographic characteristics of patients with acute leukemia and found a higher proportion of females in the studied group. this difference may be due to small sample size and need to made more than one hospital.

Regarding to marital status:

the current investigation confirmed that the majority of the patients in the investigated age group were married .**this finding is similar** to a study done by **Tebbi, (2021)** also reported that married individuals constituted the majority of patients, aligning with the findings of the present study.

This findings disagree by **Bhatnagar et al., (2021)** explored the psychological impact of AML and noted that the emotional strain, coupled with the social and lifestyle limitations imposed by the disease, can lead to significant stress in marital relationships.

Regarding to education level:

The present study reported that the majority of the studied patients were illiterates.

This finding is similar to a study done by **Zhang et al., (2023)** found in a Canadian study AML affects individuals across all socioeconomic strata, with no significant correlation between education level or professional occupation and the incidence of the disease. **Zhou et al., (2024),** reported in a global study that AML is increasingly diagnosed in lower socioeconomic and educational groups, particularly in developing regions where access to education and professional careers might be limited.

This findings is not similar to **Sharmin et al., (2022)** conducted a study in the United States that found a higher prevalence of AML among individuals with higher educational attainment and professional occupations.

Concerning to fatigue severity:

The present study showed a significant reduction in fatigue severity in the study group after education compared to the control group. The mean fatigue score in the study group significantly decreased to 43.4±4.67 (p=0.000), indicating a notable improvement. In contrast, the control group showed minimal change. These results suggest that education plays a crucial role in managing fatigue severity.

This finding is similar to study done by **Han & Tian, (2022)** reported that coping strategy focused on energy conservation strategies significantly reduced fatigue severity in patients with hematologic malignancies, including acute leukemia.,**Castelli et al., (2022)** found that fatigue management programs incorporating education and counseling reduced severe fatigue in AML patients by addressing both physical and psychological factors. They concluded that education helps patients understand the cause of fatigue and adopt practical strategies to manage it.**This finding of the study disagree with, Tsatsou et al., (2021)** suggested that while education can raise awareness about fatigue, it does not significantly reduce severe fatigue unless combined with physical exercise programs. The study found that exercise-based interventions were more effective in reducing fatigue severity in AML patients.

Regarding to coping strategy:

implementing coping strategies by encouraging patients to use adaptive methods to handle the emotional and psychological stress of leukemia treatment. Through cognitive-behavioral approaches, psycho education, and peer support, nurses can help patients develop more effective coping mechanisms, such as problem-solving, seeking social support, and relaxation techniques These strategies have been shown to reduce feelings of helplessness and anxiety, thus fostering resilience and emotional stability. **(Wei & Li, 2022).**

The present study show regarding, coping strategies are negative correlated with lower fatigue levels after one week, emphasizing their role in

managing fatigue. Furthermore, the researcher opinion that the negative correlation between coping strategies and fatigue suggests that effective coping can help manage the physical symptoms of fatigue, which is common among Leukemic patients due to both the disease and its treatment..

On line with this study **Albrecht et al., (2022)** found that emotion-focused coping (e.g., acceptance and reframing) can significantly improve psychological well-being, which aligns with the current study's findings for Leukemic patients.

Zhang et al., (2023) found that leukemic patients, such as those with cancer, who employed better coping strategies, reported lower levels of fatigue and this reinforcing the importance of psychosocial support in managing physical symptoms like fatigue.

Wei & Li, (2022) agreed that effective coping strategies improve quality of life and mental health outcomes in AML patients and suggesting that those who manage their coping effectively experience less emotional distress.

Rabari et al., (2023) suggested that coping alone does not have a significant impact on the survival rate of AML patients and emphasized that medical treatments, such as chemotherapy and stem cell transplants, play a far more critical role in improving survival than coping strategies alone. This challenges the notion that coping strategies can entirely alleviate the severity of AML symptoms. **Dinsmore & Rosengarten, (2022)** highlighted that certain ruminative coping strategies, which involve excessive thinking about the negative aspects of a situation, could actually worsen depression and anxiety. **Potenza et al., (2022)** pointed out that fatigue in AML patients might be more influenced by medical interventions and treatment regimens than by coping mechanisms alone.

The present study showed a negative correlation between coping strategies and depression in AML patients, particularly with the use of adaptive

coping techniques. In this line, **Potenza et al., (2024)** noted that coping strategies like acceptance, seeking social support, and positive reframing significantly reduce depressive symptoms, particularly in chronic illness like AML.

Wei & Li, (2022) agreed that effective coping strategies improve quality of life and mental health outcomes in AML patients and suggesting that those who manage their coping effectively experience less emotional distress.

Waddington et al., (2024) suggested that coping strategies might not always alleviate depression in AML patients, especially when dealing with the severity and uncertainty of the diagnosis and treatment. **Yucel et al., (2021)** argued that avoidant coping strategies, such as denial or disengagement, can actually worsen depression in AML patients.

The present study illustrated a statistically significant correlation between coping strategies (measured by the Brief COPE) and fatigue severity (measured by the Fatigue Severity Scale) for a study group, with correlations on admission and after one week., another opinion by, **Andersen et al., (2023)** who suggested that fatigue is largely resistant to the influence of coping strategies, especially in diseases with debilitating symptoms like Acute leukemia. **Amonoo et al., (2022)** argued that, while coping strategies may influence mood and psychological distress, they have a limited effect on fatigue in patients with cancer or chronic illnesses.

Correlation between coping strategies and fatigue severity:

The present study revealed correlation between coping strategies and fatigue severity after one week. This means that, after a short period of time, patients with better coping strategies (e.g., engaging in problem-solving, seeking social support) tend to report lower levels of fatigue, suggesting that coping mechanisms may become more effective as patients adjust to their illness and treatment over time.

In this study is similar to study done by , **Andersen et al., (2023)** found that Leukemic patients who employed active coping strategies, such as problem-solving or seeking social support, reported lower levels of fatigue compared to those who used avoidant coping (e.g., denial). **,Ning et al., (2023)** demonstrated that patients who use adaptive coping strategies report less fatigue, particularly after the first few weeks of treatment, when the body begins to adjust to the demands of chemotherapy and other treatments.,According to **Avramut et al., (2023)** who reported that fatigue severity is more likely to decrease in Leukemic patients who employ positive coping strategies, as these strategies help manage stress, improve sleep and reduce the perception of fatigue. **Ning et al., (2023)** found that patients diagnosed with Leukemia reported significantly higher levels of fatigue, especially during initial treatment phases, due to chemotherapy and infection risks. **Avramut et al., (2023)** demonstrated that leukemia patients in the early stages of treatment often experience profound fatigue, which was strongly associated with the disease diagnosis and its treatments. In the other hand, **Zhou et al., (2023)** argued that fatigue is more influenced by treatment regimens (e.g., chemotherapy, radiation) rather than the diagnosis itself, and that certain types of leukemia may not be significantly associated with greater fatigue levels.

Conclusion:

Coping strategies success in reduce fatigue among leukemic patients.

Recommendation:

Reapply this research on a larger sample size from other geographical areas in Egypt to ensure generalization.

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