

Parental Stress and Quality of Life among Parents of Children with Leukemia

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Abstract

Background: A diagnosis of childhood leukemia is a devastating experience for any parent, which causes parental stress and has been shown to inflict a significant negative impact on their quality of life. **Aim of the study:** This study aimed to examine the relationship between parental stress and quality of life among parents of children with leukemia. **Research Design:** A descriptive design was utilized in this study. **Setting:** The study was conducted at the hematology and oncology clinic at a specialized Pediatric hospital in Benha city, Kaluobia Governorate and 57357 hospital for pediatric oncology. **Sample:** A purposive sample consisting of 100 parents of children with leukemia. **Tools:** Three tools were used for data collection: I) A structured interviewing questionnaire included socio-demographic data and clinical data. II) Parental Stress Scale (PSS). III) Quality of Life Scale (QOLS). **Results:** One half of the studied parents had high stress levels, less than half had moderate stress levels, and one tenth of studied parents had low stress. Furthermore, less than three quarter of the studied parents had a poor level of quality of life and less than one tenth of parents had a good level of quality of life. **Conclusion:** There was a highly statistically significant negative correlation between parental stress and total quality of life among the studied parents; the parents of children diagnosed of leukemia are more prone to face parental stress, and parents who have stress are likely to have impaired the quality of life. **Recommendations:** Psycho-educational programs should be integrated as a routine nursing intervention for parents of children with leukemia, to reduce their parental stress and improve the quality of life.

Key words: Leukemia, Parental stress, Quality of life, Nursing

Introduction

Leukemia is a disease of the blood- forming tissues that make up the bone marrow inside large bones. The diseased bone marrow cataracts the body with abnormal white cells. These cells don't perform the infection- fighting functions of healthy mature white cells. In addition, the product of red cells, which carry oxygen, and platelets, which help prevent bleeding, is dropped. Leukemia is the most common type of childhood malignancy. It reckoned for 30 % of all cancers are diagnosed in children youngish than 15 times. The two broad classifications of leukemia are acute and chronic; acute lymphoblastic leukemia is the most common type of leukemia found in children (*American cancer society, 2021*).

Childhood leukemia diagnosis is a ruinous experience for any parent and it has been shown to induce a significant negative impact on their quality of life. This impact might well extend beyond the parent's particular confines to negatively affect the good of the family. Children with habitual conditions like leukemia need to be kept under care and supervision for a long time. This causes parents who give long- term care to experience difficulty, stress, pressure, or burdens, due to the care for the sick person (*Elizabeth, 2020*).

Parental stress can be defined as redundant worry and pressure specifically related the part of a parent

and to parent- child relations. Parents of a child with leukemia are ensconced cases in the need of protection from physical and emotional detriment. Parents may witness stress anyhow of the stage of the child's sickness; Parents will be oppressively stressed after the opinion of leukemia in their children and this will be hard when the child is in ache, receives chemotherapy injections, and becomes rehabilitated. Under habitual exposure of stress, depression and anxiety may live as a perceived form of cerebral status caused by response towards stress (*Uludağ et al., 2020*).

Studies have shown that in the largely severe or habitual complaints, parents of children tend to have poorer quality of life and advanced stress position. Parents of pediatric cancer cases are at threat for experience stress and disabled quality of life, both during and after treatment, and the major determinants of adverse QoL issues are sleep problems and torture. Parents of cancer cases also endured fatigue, fear, passion shamefaced, anxiety, depression, despair, remorse, sleep problems, and high social insulation. In addition, parents felt their social connections were disintegrated because they only concentrated on their children so their requirements were neglected (*Mirzaei et al., 2019*). Quality of life implies the capability of people to serve typically every day and to be satisfied with their participation in everyday conditioning. The

capability of maintaining this diurnal conditioning includes maintaining physical mobility, independence from others, sufficient energy for tone- help, social connections, emotional stability, and absence of pain or other symptoms of discomfort, and acceptable sleep and rest. Treatment of children with leukemia can affect the diurnal lives of family members. This can disrupt places in social life, limit diurnal conditioning, disrupt health and physical and emotional balance as well as cause profitability problems and creating poor quality of life (Bektas et al., 2020).

Nursing role for children with leukemia is too grueling, because the children will have numerous physical and mental requirements. So that the pediatric oncology nanny not only gives specialized care, but also give care for complex critically ill cases and their parents. The parent's part, their liabilities, the diurnal functioning of family and the professional life of parents are negatively impacted and can induce stress and anxiety. Nurses mindfulness of mental problems and quality of life can affect the care of these cases and their parents and enhance their mental well- being. (Bovero et al., 2018).

Significance of the study

According to *World Health Organization (2021)*, Leukemia is the most common type of nonage cancer. Survival rates have reached over 90 % due to the establishment of violent chemotherapy rules and enhanced probative care. The global periodic prevalence of Acute Lymphoblastic Leukemia (ALL) is three per 100,000 children lower than 15 years. **In the United States**, the periodic of new cases of ALL was 5,930 and the mortality rate was 1,500 for both sexes. **In Egypt**, childhood leukemia is the most common childhood cancer; it represents 33.2% of all childhood malignancies. The complete new cases of leukemia were 4,314 and the full mortality rate was 3,752. (*National Cancer Institute, 2019*).

Parents of children with leukemia are key members of their children's health teams and serve as their primary nurse for them. They may face greater challenges in caring for their children than ordinary parents such as increased therapy expenditures and child care difficulties due to a scarcity of clinical resources and governmental support as well as their socioeconomic status. These issues may have an adverse effect on child care and increase parent's stress and affect their quality of life.

Aim of the study

This study aimed to assess the relationship between parental stress and quality of life among parents of children with leukemia.

Research Questions

1. What is the level of parental stress among parents of children with leukemia?

2. Is there a relation between parental stress and quality of life among parents of children with leukemia?

Subject and methods

Research design

A descriptive design was utilized in this study.

Research setting

The study was conducted at a hematology and oncology clinic at a specialized Pediatric hospital in Benha city, Kaluobia Governorate; patient clinic is composed of two clinics for general examination of children and treatment and 57357 hospital for pediatric oncology. The leukemia unit at 57357 hospitals includes one section for both sexes patients, the capacity of this is 40 beds.

Sampling

A purposive sample consisting of 100 parents (20 from specialized Pediatric hospital in Benha city and 80 from 57357 hospitals for pediatric oncology) of children diagnosed with leukemia according to medical team diagnoses who fulfilled the following criteria: - Primary care giver to child at least 6 months, both sexes, agreement to participate in the study, free from psychiatric disorders and free from mental disorders.

Tools of data collection

In order to achieve the aim of the study the following tools were being used:

Tool one: Structured Interview Questionnaire Sheet:

A structured interview questionnaire was developed by investigators based on a scientific review of literature which consists of three parts:

- **Part I:** Socio-demographic data of parents of children with leukemia which includes parents age, gender, marital status, educational level, occupation, & residence.
- **Part II:** Socio-demographic data of children with leukemia which includes child age, gender, educational level, child order, and family history of cancer.
- **Part III:** Clinical data for children with leukemia which includes the number of years of illness, the onset of disease, period of treatment, number of hospitalizations, and current treatment.

Tool two: - Parental Stress Scale (PSs):

The scale was first developed by Berry and Jones (1995), was used to assess parenting stress for both mothers and fathers. It contains 18 items. Parents were asked to rate each item on a five-point scale: strongly disagree (1) disagree (2), undecided (3), agree (4), strongly agree (5). To compute the parental stress score, items 1, 2, 5, 6, 7, 8, 17, and 18 should be reverse scored as follows: (strongly disagree = strongly agree) (disagree = agree) (undecided = undecided) (agree = disagree) (strongly agree = strongly disagree). The item scores are then summed.

Scoring system of PSSs

- 18-30 points indicate a low level of parental stress.
- 31-60 points indicate a moderate level of parental stress.
- 61-90 points indicate a high level of parental stress.

Tool three: - Quality of Life Scale (QOLS)

This scale was constructed by *World Health Organization Quality of Life Group, (1997)*; to assess the subjective opinion of family caregivers regarding the quality of life. It consisted of a total of 24 questions divided into four domains: physical health (7 items), psychological health (6 items), social relationships (3 items), and environment (8 items). All items are rated on a five-point scale (1= not at all, 2= a little, 3=a moderate amount, 4=very much, 5= an extreme amount). Higher scores indicate better quality of life. The four domains are scaled in a positive direction except for three items, which are reversed before scoring.

Scoring system of Quality of Life Scale (QOLS)

- score less than 60 (50%) denotes the poor quality of life.
- 60– 90 (50–75%) indicate the moderate quality of life.
- More than 90 (75%) denotes the good quality of life.

Content validity of the tools

The tools were reviewed for the appropriateness of items and measuring the concepts through 5 experts in psychiatric and mental health nursing to assure content validity and they were translated into the Arabic language then retranslated into the English language. The modification was done accordingly; some modification was done to the parental stress scale; modify some words to be easier and more understandable for study sample, for example item 14 was modified from "If I had it to do over again, I might decide not to have a child (ren)" to "If I had it to choose again, I might decide not to have a child (ren)"

Reliability of the tools

The study tools were tested for its internal consistency by Cronbach's Alpha. Reliability of PS scale is 87, while QOL scale is 85.

Ethical considerations

Approaches to insure the ethical issues were considered in the study regarding confidentiality and informed consent. Confidentiality was attained by the use of locked sheets without the names of the participants and implanted by numbers. All the participants were finked that the information they handed during the study would be kept nonpublic and used only for statistical aims and after completing the study. Each parent was informed that participation in the study was voluntary, and had the right to back away from the study at any time.

Pilot study

A pilot study was conducted to test the applicability of the instruments, the feasibility of the study and estimate the time needed for collecting the data. It was conducted on 10% of the total sample (10 parents) according to the selection criteria. All parents participated in the pilot study were included in the study sample.

Filed work

The investigator started data collection by introducing himself to the studied parents and the purpose of the study was simply explained to the parents who agree to participate in the study. Each participant was interviewed and assessed individually. Each parent was handed the questionnaire and answered it under the observation of the investigator. Parents who can't read well, the investigator helped them to write their answers. The first instrument (Parental Stress Scale) filled in about 10 minutes and the second instrument (Quality of Life Scale) filled in about 15-20 minutes. The process of data collection took about 5 months starting in the beginning of May 2021 and ending in the end of September 2021. During the first three months (May, June and July), the investigator collected 20 questionnaires at a specialized pediatric hospitals in Benha city during the morning shift from 10 am to 12pm, one day per week (Wednesday). (1-2 parents per week; 6-8 parents per month). During the last two months (August and September), the investigator collected 80 questionnaires at 57357 hospitals during the morning shift from 10am to 1pm, two days per week (Wednesday and Thursday). (10 parents per week; 40 parents per month).

Statistical analysis

Upon completion of data collection, the collected data were arranged, tabulated; statistically analyzed by using an IBM individualized computer with Statistical Package of Social Science (SPSS) version 22. Data were presented using descriptive statistics in form of number and percentage, mean, standard deviation, and Qualitative variables were comparing using the chi-square test. For quantitative data, person correlation coefficient(r) was used for correlation analysis and degree of significance was identified. A statistically significant difference was considered if p- value was <0.05. A highly statistically significant difference was considered if p- value was <0.001.

Results

Table (1) indicates that less than half (46%) of the children's age is <5 years with Mean \pm SD (8 \pm 5.24), more than two thirds (68%) of them are male, less than half (46%) of children are at preschool age, less than half (44%) of them are the first between siblings and most (88%) of them haven't a family history of cancer.

Table (2) shows that two third (66%) of the children have <1 year in regarding the number of years of illness, more than half (54%) of children is <5 years regarding their onset of disease, less than three quarters (70%) of them are <1year regarding the period of treatment, less than two third (64%) of them had hospitalized 1-3 times and more than half (52%) of their current treatment is chemotherapy.

Table (3) indicates that less than one third (32%) of the studied parents has 40 years and more regarding their age with Mean \pm SD (35 \pm 9. 77), more than half (60%) of them are female, the majority (80%) of parents are married, more than one third (38%) of them have intermediate education, less than two thirds (64%) of parents are not working, and less than three quarters (70%) of them live in the rural area.

Figure (1) indicates that one half (50%) of the studied parents had high stress and less than half (40%) of studied parents had moderate stress, and one tenth (10%) of studied parents had low stress.

Figure (2) illustrates that less than three quarter (70%) of the studied parents had a poor level of

quality of life and less than one tenth (8%) of parents had a good level of quality of life.

Table (4) illustrates that, there is a highly statistically significant relation between total stress levels among the studied parents and their marital status. Also, there is a statistically significant relation between parents' stress level and their age, gender and educational level, while there is no statistically significant relation between total stress level among the studied parents and their residence and occupation.

Table (5) illustrates that, there is a highly statistically significant relation between the total level of quality of life among the studied parents and their age, and gender. Also, there is a statistically significant relation between the total level of quality of life and their marital status, and occupation, while there is no statistically significant relation between the total level of quality of life and their educational level and residence.

Table (6) show that, there is a highly statistically significant negative correlation between total parental stress and total quality of life among the studied parents at P-value = <0.001.

Results

Table (1) Percentage distribution of socio-demographic characteristics of the children (n=100).

Socio-demographic characteristics	No.	%
Age (years)		
- <5 year	46	46
- 5 -<10 year	18	18
- 10 -<15 year	22	22
- 15-18 year	14	14
Mean \pm SD	8 \pm 5.24	
Gender		
- Male	68	68
- Female	32	32
Educational level		
- Preschool age	46	46
- Primary	22	22
- Preparatory	14	14
- Secondary	18	18
Birth order of the child		
- The first	44	44
- Middle	22	22
- The last	34	34
Family history of cancer?		
- Yes	12	12
- No	88	88

Table (2) Percentage distribution of clinical characteristics of the children (n=100).

Clinical characteristics	No.	%
The number of years of illness?		
- <1 year	66	66
- 1 -<5 year	30	30
- 5 year or more	4	4
Onset of disease		
- <5 year	54	54
- 5-<10 year	18	18
- 10-<15 year	14	14
- 15-18 year	14	14
The period of treatment for the disease		
- <1 year	70	70
- 1-<2 year	26	26
- 2 year or more	4	4
Number of hospitalizations		
- 1-3 times	64	64
- 4-6 times	30	30
- 7 times or more	6	6
Current treatment		
- Follow up or drugs	8	8
- Radiotherapy	4	4
- Chemotherapy	52	52
- Mixed therapy	36	36

Table (3) Percentage distribution of socio-demographic characteristics of the parents (n=100).

Socio-demographic characteristics	No.	%
Age (years)		
- <25 year	10	10
- 25 -<30 year	30	30
- 30 -<35 year	12	12
- 35-<40 year	16	16
- 40 year and more	32	32
Mean ± SD	35 ± 9.77	
Gender		
- Male	40	40
- Female	60	60
Marital status		
- Married	80	80
- Widowed	10	10
- Divorced	10	10
Educational level		
- Illiterate	32	32
- Basic education	22	22
- Intermediate education	38	38
- University education	8	8
Occupation		
- Employee	8	8
- Free business	28	28
- Not working	64	64
Residence		
- Rural	70	70
- Urban	30	30

Figure (1) Percentage distribution of total level of stress among the studied parents (n=100).

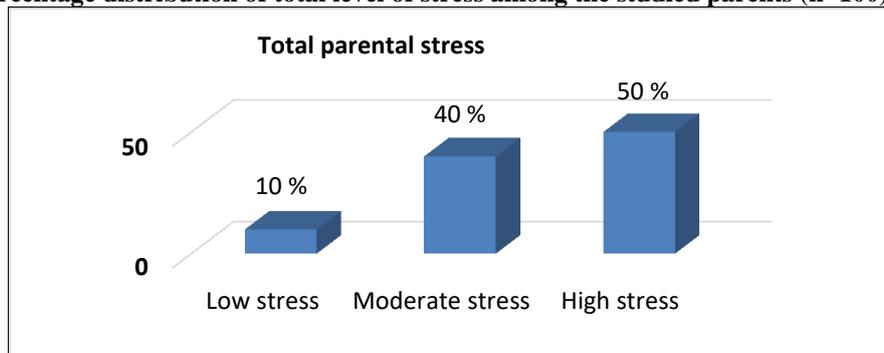


Figure (2) percentage distribution of total level of quality of life among the studied parents (n=100).

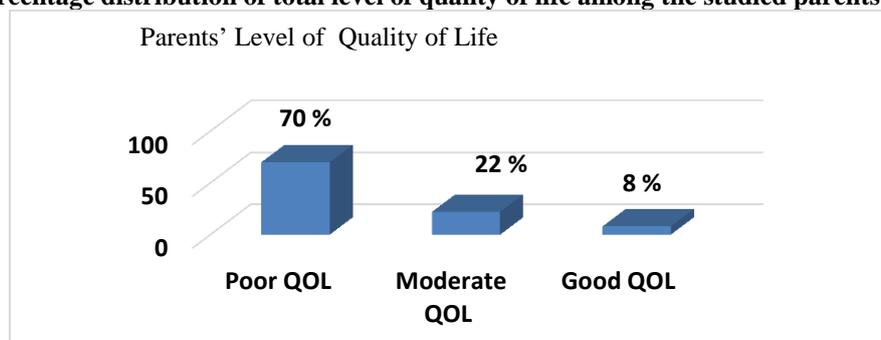


Table (4) relationship between parents' socio-demographic characteristics and total stress level (n=100)

Socio-demographic characteristics	No	Mild stress	Moderate stress	High stress	X ²	P-Value
Age (years)						
- <25 year	10	2	2	6	16.6	.034*
- 25 -<30 year	30	2	18	10		
- 30 -<35 year	12	2	4	6		
- 35 -<40 year	16	4	4	8		
- 40 year or more	32	0	12	20		
Gender						
- Male	40	2	22	16	6.7	.034*
- Female	60	8	18	34		
Marital status						
- Married	80	8	40	32	20.4	.000**
- Widowed	10	0	0	10		
- Divorced	10	2	0	8		
Educational level						
- Illiterate	32	6	16	10	15.4	.017*
- Basic education	22	2	6	14		
- Intermediate education	38	0	14	24		
- University education	8	2	4	2		
Occupation						
- Employee	8	0	4	4	5.61	.230
- Free business	28	2	12	14		
- Not working	64	8	24	32		
Residence						
- Rural	70	6	30	34	1.05	.592
- Urban	30	4	10	16		

Table (5) The relationship between parents' socio-demographic characteristics and total quality of life (n=100)

Socio-demographic characteristics	No	Poor QOL	Fair QOL	Good QOL	X ²	P-Value
Age (years)						
-<25 year	10	8	0	2	30.8	.000**
-25 -<30 year	30	8	20	2		
-30 -<35 year	12	10	2	0		
-35 -<40 year	16	8	4	4		
-40 year or more	32	16	16	0		
Gender						
-Male	40	12	24	4	10.8	.004**
-Female	60	38	18	4		
Marital status						
-Married	80	34	38	8	12.9	.012*
-Widowed	10	6	4	0		
-Divorced	10	10	0	0		
Educational level						
-Illiterate	32	14	14	4	10.4	.107
-Basic education	22	14	6	2		
-intermediate education	38	20	18	0		
-University education	8	2	4	2		
Occupation						
-Employee	8	2	6	0	12.7	.013*
-Free business	28	10	14	4		
-Not working	64	38	22	4		
Residence						
-Rural	70	34	32	4	2.4	.303
-Urban	30	16	10	4		

Table (6) Correlation between total parental stress and total quality of life among the studied parents (n=100).

Total parental stress	Quality of life scale	
	R	P
	-.653	.000**

Discussion

Parents with cancer children are at risk of experiencing a variety of psychological problems such as depression, anxiety, and acute stress disorder. Time since diagnosis of leukemia showed symptoms of stress in parents which constitutes a major challenge diminishing their quality of life. *Fertelli & Tuncay, (2019)*. So, the current study aimed to assess the relationship between parental stress and quality of life among parents of children with leukemia.

According to socio-demographic characteristics of the children with leukemia, the current study result showed that less than half of the studied children's age was less than 5 years with Mean \pm SD (8 ± 5.24). Regarding child gender, more than two thirds of them were boys, this result might be due to leukemia is more prevalence in

boys in young age less than 15 years old. This result was in agreement with *Al-Buraiki et al., (2021)* who conducted study titled "Association of parental, child, and environmental factors with the occurrence of childhood leukemia in Upper Egypt" and showed that more than two thirds of them were boys and the most affected age group was children 5 years or younger.

Regarding child level of education, less than half of the children were preschool age, and were younger child among their siblings and most of them hadn't a family history of cancer. This result was consistent with *Talaat, (2017)* who reported that more than one third of the children were the younger and the majority of them hadn't a family history of cancer. Conversely, this result was inconsistent with *Wang et al., (2018)* who reported in their study

on "Care burden and its predictive factors in parents of newly diagnosed children with acute lymphoblastic leukemia in academic hospitals in China", more than half of the children were of preschool age.

Concerning clinical characteristics of the studied children, the current study showed that two third of the children had less than 1 year in regarding the number of years of illness and more than half of children were less than 5 years regarding their onset of disease; this result was in disagree with *Vercasson et al., (2020)* who reported that only one tenth of the studied children had less than 1 year in regarding number of years of illness. As well, the current study showed that, less than three quarters of them were less than 1 year in regarding the period of treatment, less than two third of them had been hospitalized 1-3 times and more than half of their current treatment was chemotherapy. This results were similar to the study done by *El Desouky et al., (2018)* who reported that less than two third of the children had been hospitalized 1-3 times and more than half of their treatment was chemical.

Regarding socio-demographic characteristics of the studied parents, the current study result showed that, less than one third of the studied parents had 40 years or more regarding their age with Mean \pm SD (35 \pm 9. 77). Regarding their gender, more than half of them were female, this result might be due to mothers are considered the primary caregiver for their children and more responsible for caring than father related to Egyptian community. Regarding marital status, majority of parents were married, this result might be due to the nature of this study that assessed the variables for parents. This finding was similar to the study done by *Sutan et al., (2018)* who conducted a study on " Coping Strategies among Parents of Children with Acute Lymphoblastic Leukemia " and reported that mean of parents' age was 35, more than half were mothers, and the majority of parents were married. On the other hand, this result is in disagreement with *Wang et al., (2018)* who reported that more than half of the parents were 40 years old or more and more than half of them were male.

Also, the result of the current study revealed that more than one third of the studied parents had an intermediate levels of education. Less than two thirds of parents were not working, this result might be due to a higher percentage of studied parents was mothers who were housewives lived in a rural area. Less than three quarters of them lived in the rural areas, this result might be due to the life with their families and provide emotional support from life in the a rural areas. Benha children hospital serves a large sector of

villages around it. This finding was similar to the study done by *Al-Buraiki et al., (2021)* who reported that more than one third of the studied parents had intermediate education, less than two third of them were not working and the majority of them lived in the rural area. On the other hand, this result is in disagreement with *Talaat, (2017)* who reported that half of the studied parents were had job and the majority of them were lived in urban area.

Concerning to total level of stress among the studied parents, the current study showed that one half of the studied parents had high stress levels and less than half of them had moderate stress, while one tenth of them had low stress. From the investigator's point of view, this result might be due to leukemia diagnosis is a life threatening and its invasive treatment and side effects of treatment cause physical and psychological stress among the parents of those children. This result was in agreement with, *Sherief et al., (2018)* who conducted their study about "Psychological impact of chemotherapy for childhood acute lymphoblastic leukemia on patients and their parents" and stated that, one half of parents had severe stress. Conversely, this result disagree with *Irwanto et al., (2020)* who revealed that less than one fifth of parents who caring for their children with leukemia had severe stress and more than half of them had moderate stress.

According to the total level of quality of life among the studied parents, the result of the current study illustrated that less than three quarter of the studied parents had a poor level of quality of life and less than one tenth of parents had a good level of quality of life. From the investigator's point of view, this result might be due to after the child diagnosis with cancer, parents experience a feeling of physical, social and psychological problems. The problems include insomnia, fatigue, isolation, fear, stress, anxiety and depression, which may negatively affect the quality of life (QOL) of those parents. This result is supported with *Vercasson et al., (2020)* who reported that less than three quarters of parents of leukemic child had a poor level of quality of life. Conversely, this result is disagreement with the study of *Yu et al., (2018)* who showed good QOL of more than half of family caregivers for leukemia patients.

Concerning the relationship between parents' socio demographic characteristics and total stress level, the current study illustrated that, there was a highly statistically significant relation between total stress level among the studied parents and marital status. From the investigator's point of view, this result might be due to widowed or divorced parents having more

responsibility; the couple supports each other to tolerate responsibility of child care and treatment than divorced or widowed. This result is accordance with *Bemis et al., (2018)* who reported that there was a highly statistically significant relation between total stress level among the studied parents and their marital status. Conversely, this result is in disagreement with *Zarina et al., (2017)* who found that there was no statistically significant relation between total stress level and marital status.

As well, the result of the current study showed that, there was a statistically significant relation between parents' stress level and their age, gender and educational level. From the investigator's point of view, this result might be due to mothers assume the large part of child's care duties and home care than fathers, and younger parents might experience a greater burden. This result is in agreement with *McCarthy et al., (2018)* who reported the presence of a statistically significant relation between parents' stress level and their age and gender. Conversely, this result disagreed with *Zarina et al., (2017)* who found that there was no statistically significant relation between total stress level among the studied parents and their age, gender and educational level.

The result revealed, there was no statistically significant relation between total stress level among the studied parents and their residence and job. From the investigator's point of view, this result might be due to care and treatments of childhood leukemia being expensive and can cause a financial burdens for all parents. This result is accordance with *Sultan et al., (2018)* who reported that there was no significant relation between stress levels among the studied parents and their residence and job.

Concerning the relationship between parents' socio demographic characteristics and total quality of life, the current study illustrated that, there was a highly statistically significant relation between total quality of life among the studied parents and their age and gender. From the investigator's point of view, this result might be due to parents don't have awareness of leukemia and its consequences which locate a burden on their daily living activities which consequently affect their quality of life, also, woman has the main role in administration of children, households, and husbands. This result is accordance with *Mondal et al., (2020)* who reported that there was a highly statistically significant relation between total quality of life among the studied parents and their age and gender. Conversely, this result is in disagreement with *Rohmah et al., (2018)* who found that there was no statistically significant relation between

total quality of life among the studied parents and their age and gender.

As well, the result of the current study showed that, there was a statistically significant relation between parents' total quality of life and their marital status and occupation. From the investigator's point of view, this result might be due to the fact that marriage changes the life of each couple and affects their quality of life, and cancer treatment can cause a financial burdens which requires more financial resources. This result is in agreement with *Ganjiwale et al., (2018)* who reported presence of statistically significant relation between parents' QOL level and their marital status and job. Conversely, this result was in disagreement with *El Desouky et al., (2018)* who found that there was no statistically significant relation between the total QOL level among the studied parents and their marital status and job.

The result revealed, there were no statistically significant relation between total quality of life among the studied parents and their educational level and residence. From the investigator point of view, this result might be due to the culture taken about cancer which is a fatal disease with no cure until death. This result is accordance with *Choi et al., (2018)* who reported that there was no significant relation between QOL among the studied parents and their educational level and residence.

According to the correlation between the total quality of life and total parental stress among the studied parents, the current study showed that there was a highly statistically significant negative correlation between parental stress and total quality of life among the studied parents. From the investigator's point of view, This result agreement with, *Yildirim et al., (2021)* & *Haya et al., (2019)* who reported that there was highly statistically significant negative correlation between parental stress and total quality of life among the studied parents.

Conclusion

From the result of the present study, one can conclude that:

The study concluded that the parents of children diagnosed with leukemia are more prone to face parental stress, which parents who have stress are likely to have impaired quality of life. One half of the studied parents had high stress levels, less than half had moderate stress levels, and only one tenth of studied parents had low stress. Furthermore, less than three quarters of the studied parents had poor levels of quality of life and less than one tenth of parents had good level of quality of life. Also, there was a highly statistically significant negative correlation

between parental stress and total quality of life among the studied parents.

Recommendations

Based on the previous findings and conclusion of the present study the following recommendations were suggested:

1. Psycho-educational programs should be integrated as a routine nursing intervention for parents of children with leukemia, to reduce their parental stress and improve their quality of life.
2. Conducting counseling sessions for parents of children with leukemia, to enhance their wellbeing, reduce stress, and consequently, improve their quality of life.
3. Increasing parents' awareness about leukemia and coping strategies with its consequences.
4. Conducting spiritual and religious supporting group sessions to reduce psychological problems. This could provide parents of children with leukemia the power to overcome difficulties, and a more optimistic view of the future.
5. Liaison psychiatric nurses must be available to deal with the psychiatric problems of those parents and their children.
6. Palliative care should be an integral part of cancer treatment.
7. Further researches are necessary to assess and enhance the psychological conditions of children with leukemia.
8. Further studies by using larger probability sample for generalization of the results.

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