



Traditional Education versus Online Based Education Intervention: Effect on Family Care Givers of Children Suffering from Acute Lymphoblast Leukemia

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ABSTRACT

Background: The most prevalent childhood cancer is acute lymphoblastic leukemia (ALL). Due of ignorance of the disease's implications and how to appropriately care for a child, ALL causes the care provider enormous worry, dread, and guilt. To assess the effect of traditional education versus online based education intervention on family care givers of children suffering from acute lymphoblast leukemia. A quasi-experimental design was used. The study was conducted at the In-Patient Pediatric Hematology departments affiliated to Children's Cancer Hospital (57357) Egypt. A purposive sample of two hundred family care givers classified randomly into two equal groups traditional education group and online based education group with exclusion of family care givers of terminally ill children. Data collections were an assessment sheet and observational checklists for the family care givers to assess their knowledge and actual practices reporting.

Results: There was statistically significant difference between family care givers total level of knowledge regarding their children with ALL in traditional education versus online based education. There was a high statistically significant difference of the studied family care givers according to their total level of actual practices in traditional education versus online based education regarding care of their children with ALL.

Conclusion: Traditional education intervention was more effective than online based education intervention on knowledge and actual practices of family care givers having children suffering from acute lymphoblastic leukemia.

Recommendation: Designing and carrying out traditional educational programs for family care givers to promote the care of their children with ALL.

Keywords: *Acute Lymphatic leukemia, Pediatric, Nursing, Family Care Givers, Knowledge, Practice, Online Traditional Education*

INTRODUCTION

The biggest cause of death for Egyptian children and the second most common cause of death for those between the ages of 1 and 18 is childhood cancer, which is now regarded as a chronic disease. Although the incidence of cancer in this age group is roughly 129/Million Children, the population affected by pediatric cancer is younger than 15 years (Gurney & Bondy, 2012 and Wilson et al., 2015). Acute lymphoblastic leukemia (ALL) in children is a bone marrow and blood malignancy. If this type of cancer is not treated, it typically worsens swiftly (Nair et al., 2020). Due to the high number of children with cancer, the poor quality of care, and the lack of resources, juvenile cancer is a priority in Egypt (National Institutes of Health, 2019).

According to the research department at the Children's Cancer Hospital 57357 in Egypt (2020), it was reported that, the total number of children with ALL who enrolled from 2017 until the end of 2020 was 1947 children with an average of 486 new cases / year. Males are affected twice as often as females (Children's Cancer Hospital in Egypt 57357, 2020). In addition to providing specialized care, the nursing role in caring for children with ALL is crucial and necessary since the children have numerous physical and psychological requirements. Nurses can assist family careers in learning about the condition, its treatment, and how to deal with its adverse effects, hospitalization, and recovery (Barello et al., 2019).

By combining the practical guidelines for care for complications, enhancing consistency of care, and advocating an intervention of proven benefit, nurses caring for children with complications connected to ALL can significantly influence the treatment of the child. Additionally, nurses play a crucial part in assessment by assisting children receiving cancer treatment to practice self-care and educating both the kids and the adults who will be caring for them about their health. Additionally, offering psychosocial assistance and making the proper referrals (Stanhope et al., 2020).

Caring for children with ALL is difficult and time-consuming; it calls for a dedication to service that goes above and beyond that of standard ambulatory pediatrics care. To give the best care for children and families, one needs to have more information about children, improve interpersonal communication, and have organizational abilities (Allen & Treon, 2020). The primary individuals responsible for safeguarding the wellbeing of their young children should be the family careers (Cook & Steinert, 2020). Typically, they play a major role in making decisions that will impact the health of their kids. Additionally, family careers were viewed as role models by their children's (Elliott et al., 2019).

Traditional education is imparted verbally and in writing as articles, fact sheets, and booklets. face-to-face counseling sessions with Information on the prognosis, diagnosis, and treatment (Lippke et al., 2021). Worldwide adoption of online learning is rising quickly, and it has the potential to be a useful delivery method for interventions that help families caring for children with ALL throughout the caregiving process. Comparing online education to in-person support, there may be a number of benefits. Being able to learn whenever and wherever they want makes online education a more practical and effective support and education tool for family careers (Blom et al., 2019). Benefits of conventional education In the internet era, online learning has grown in popularity, but traditional classroom learning is still a strong competitor. Despite its benefits, traditional education cannot be replaced by online learning (Setzekorn, et al., 2020).

Having touch with instructors is one of the main ways that traditional family education can benefit from family education life. To talk about the lesson, their performance, or a practice, family can arrange in-person sessions with their teachers. Maintaining interpersonal bonds and family careers' involvement with many persons during their childcare are additional benefits of traditional schooling (Lodder & Roda Husman, 2020).

Significance of the study

A total of 474,519 new cases of leukemia were recorded globally in 2020; the age-standardized incidence rate was 5.4 per 100,000 people, with a range of roughly five times (Huang et al., 2022). The most prevalent form of pediatrics cancer in Egypt is childhood acute lymphoblastic leukemia (ALL), which makes up roughly one-third of all newly diagnosed cases. ALL cases per 100,000 kids each year. Male to female ratio in these instances is 2.3:1. The age range of 2 to 10 years makes up 68.5%. (El-Rashedy et al., 2017). A total of 542 children were given the diagnosis of acute lymphoblastic leukemia in 2020, according to the data, yearly report from the research center at Children's Cancer Hospital Foundation- Egypt.

This study would be a great value to the care givers of their children suffering from acute lymphoblastic leukemia. The care givers are usually the main care givers for their children suffering from acute lymphoblastic leukemia. They must be knowledgeable and competent in caring for their children, which consequently affects the care provided to their children. Therefore, the present study conducted to assess the effect of traditional education versus online based education intervention on family care givers of children suffering from acute lymphoblast leukemia.

Aim of the study

To assess the effect of traditional education versus online based education intervention on family care givers of children suffering from Acute Lymphoblast Leukemia (ALL). This aim was attained through the following objectives:

- 1-Assess the family care givers' knowledge and practices regarding ALL.
- 2-Design, implement and evaluate the effect of educational intervention (traditional versus online) on care givers for the children suffering from acute lymphoblast leukemia (ALL), based on their actual need assessment.

The Research Hypothesis

Online based education will be more effective compared with the traditional education

intervention on family care givers of children suffering from acute lymphoblast leukemia (ALL).

Research Design: A quasi-experimental design was utilized in this study.

Setting: The study was conducted at In-Patient Pediatric Hematology departments affiliated to Children's Cancer Hospital (57357) Egypt.

Subject

A purposive sample that composed of 200 family care givers who are regularly accompanying their children. The study subjects were divided randomly according to list of admitted children into two groups equally (traditional group and online group). However, the odd number was received the health education by traditional methods of education while, the even number received the health education via online based education.

The sample inclusion criteria of children and their accompanying family care givers (regardless their characteristic) were involved in the study according to a predetermined inclusion criterion. Children from both gender, in the age group from one month to 18 years and newly diagnosis of ALL. Family care givers accompanying their children, able to write and read and familiar with having the skills of information technology, availability and accessibility of IT devices such as internet, e-mails, call phone. In addition to Compacted Disk (CD), memory flash and Short Message Service (SMS). The critically and terminally ill children were excelled from the study.

Tools of Data Collection

Tool (1) Assessment sheet for the family care givers to gather data in relation to:

Part 1: a- Characteristics of the studied children included; age, gender, residence, level of education, ranking. Data about the disease history of the child cause of hospital admission, duration of illness and type of treatment, b- Characteristics of the studied family care givers included; age, level of education and work status.

Part 2: Concerned with the family care givers' knowledge regarding care of their children suffering from ALL:

Family care givers' knowledge regarding ALL including definition, causes, signs, symptoms, complications, diagnosis and components of blood & its functions.

Family care givers' knowledge regarding chemotherapy including goal, route of administration and complications.

Knowledge of family care givers about children's care related to complications of disease and treatment such as definition, causes, signs, complications and care.

Family care givers' knowledge regarding traditional and online education (meaning, advantage & disadvantage of traditional and online education).

Scoring system: According to family care givers' knowledge their answers were checked it's a model answer designed by the researcher where each correct answer had score 1 degree and both wrong answer and do not know had 0 degree. Accordingly, the total level of the studied family care givers' knowledge was categorized into three levels: Poor ($< 50\%$) & average ($50 - < 75\%$) and good ($75 \leq 100\%$).

Tool (2) Observational Checklists

To assess the actual family care givers' practices regarding care of their children suffering from ALL at Children's Cancer Hospital (57357). Four observational checklists were used including; hand washing (10 steps), mouth care (16 steps), cold compresses (9 steps) and axillary temperature measurement (9 steps). Each family caregiver was observed during the actual care for his/ her child.

Scoring system: According to the family care givers' actual practices, each step was scored as "One" grade if the step is done correctly and scored "Zero" if the step was not done or done incorrectly. The total scores were ranged from "0- 44" grades according to the family care givers' actual practice they were classified into: Satisfactory level of total actual practices (more

than or equal $60\% = \leq 10$ grade per procedure) and Unsatisfactory level of total actual practice (less than $60\% = > 10$ grade per procedure).

Content Validity and Reliability

The tools of data collection were ascertained by a jury of five experts in the field of pediatric oncology and nursing. Their opinions elicited regarding the format, layout, consistency, accuracy and relevancy of the tool & Also, testing reliability of the study tools was done using Cronbach alpha test for Tool (1) Assessment sheet for the family care givers equal 0.98 and Tool (11) Observational checklists equal 0.804.

Ethical Consideration

Ethical approval granted from the Scientific Research Ethical Committee from Faculty of Nursing, Ain Shams University. While in 57357 Children Cancer Hospital Egypt as a process to gain the approval to conduct the study, the researcher explained the aim and the nature of the study in Scientific Medical Advisory Committee (SMAC) to gain their acceptance and support. Additionally, the researcher obtained an approval from the Institutional Review Board (IRB) at the data collection setting. To conduct the study, the medical and nursing directors at the In- Patient Department gave their official permissions. Informed consent was obtained from the family care givers prior to data collection. The family care givers were informed about the purpose and outcome of the study.

Procedure

The study was carried out in the period from the beginning of January (2021) to the end of August (2021) at Children's Cancer Hospital Egypt, In-Patient Department. The researcher was available in the study setting five days/ week at morning shift (9 am to 4 pm) from Sunday to Thursday. The actual work started by interviewing each family care giver and her / his child individually at morning shift and the actual field work was divided into four phases; assessment, planning, implementation and evaluation.

The Assessment Phase

The researcher introduced herself to each family care givers and illustrated the study aim and its expected outcomes. Each family care giver was interviewed individually for 5 to 10 minutes.

Planning Phase

According to the actual need assessment of the family care givers, the content of the educational intervention was designed by the researcher, based on the relevant literature regarding family care givers needs and care for their children with ALL. An illustrated booklet for traditional group and recorded sessions for online group was designed by the researcher in an Arabic language to serve as referral guideline for family care givers educational needs, knowledge and care for the children with ALL. The total numbers of sessions were eight, (4 hours) theoretical sessions and (4 hours) practices sessions, each session took about 60 minutes.

Theoretical sessions covered the following items: objectives and overview about ALL such as; blood components, definition of ALL, causes, diagnostic test, bone marrow biopsy, complications related to disease and treatment, side effect of chemotherapy and care of children suffering from ALL. Practical sessions, covered the following items: actual care giver' practices regarding care of their children namely; hand washing, mouth care, cold compress and axillary temperature measurement.

The Implementation Phase

Traditional Education

The family care givers' education intervention was implemented in small groups where each group included 3-5 family care givers. Each session started with summary, feedback about previous sessions using simple words and Arabic language were used to suit the family care givers' level of understanding.

A teaching classroom was selected at the study setting. Different teaching methods were used such as; lecture, modified small group discussion, demonstration and re demonstration. Suitable media was used such as power point

presentation, lab top, real objects as thermometer, water & soup and oral care for practical skills.

The researcher answered all family care givers questions during sessions, solved any complain during hospitalization, and encourage family care givers to express their concerns and ask any questions related to their children's health care. Also gave a chance for all family care givers to participate and share their experience.

The researcher used communication techniques, active listening and respect relationships to increase knowledge of family care givers and encourage trust between the researcher, family care givers and their children. Additionally, a booklet copy was distributed among the family care givers to use as a reference about their care with ALL.

Online Education

The education intervention was prepared according to the actual needs assessment of the studied family care givers using multiple methods including recorded lecture, Compacted Disk (CD), internet, Short Message Service (SMS), mobile calls, e- mails, Whatsapp and flash memory.

Videos, CD and flash memory were used to demonstrate the management of complications of children with ALL, SMS and e- mail were sent weekly to the family care givers to refresh their knowledge about ALL. The researcher contacted with family care givers periodically by mobile call to ask about the child's condition and resolve any complain. Additionally, a soft copy was distributed among the family care givers to use as a reference about their care with ALL.

The Evaluating Phase

In this phase, the researcher evaluated the effect of study intervention using study tools. This phase was implemented before child's discharge from hospital, for both groups (Traditional education and online based education intervention).

Statistical Design: The collected data were organized, revised, scored, tabulated and analyzed using appropriate statistical tests.

RESULTS

Figure (1): Number and percentage distribution of the studied children in both groups according to their age in years (n= 200).

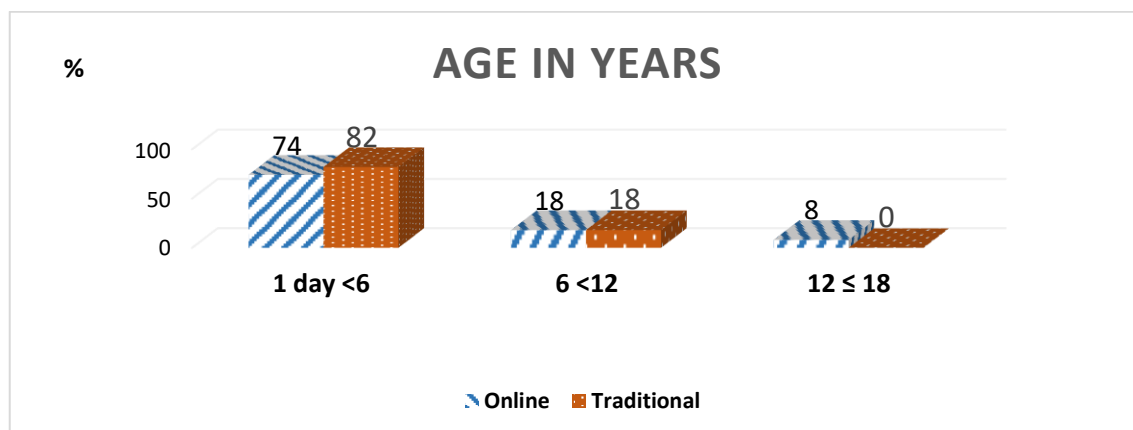


FIGURE 1: showed that, 82% and 74% of the studied children in traditional education and online based education group were 1 day < 6 in years respectively.

Figure (2): Number and percentage distribution of the studied children in both groups according to their gender (n= 200).

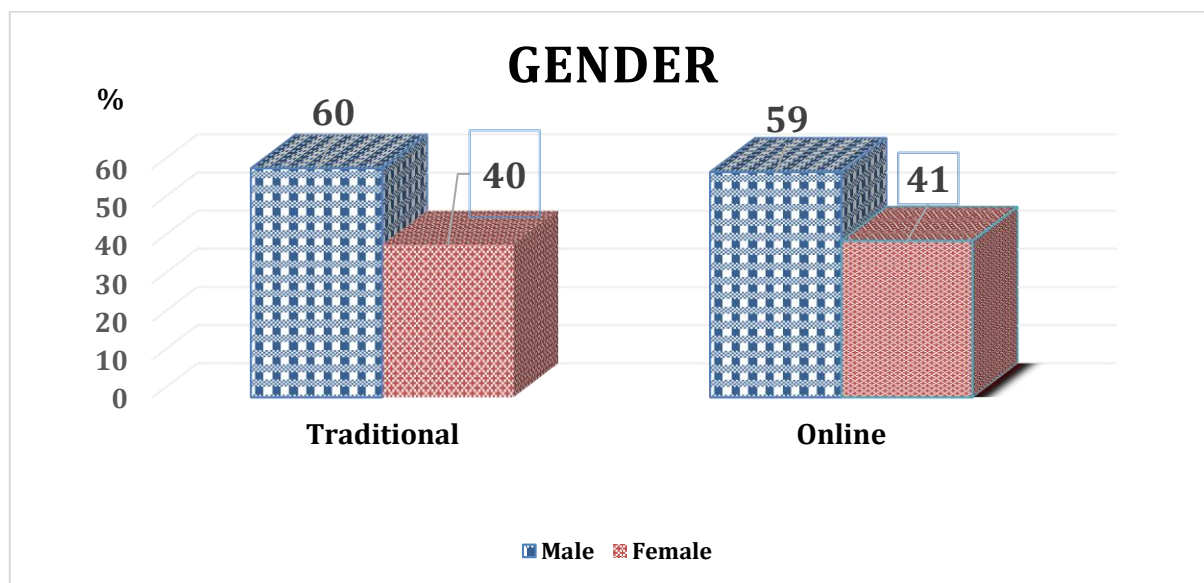


FIGURE 2: illustrated that, more than half (60%) and (59%) of the studied children in traditional education and online based education group were males respectively.

Figure (3): Number and percentage distribution of the studied children in both groups according to the assigned family care givers (n= 200).

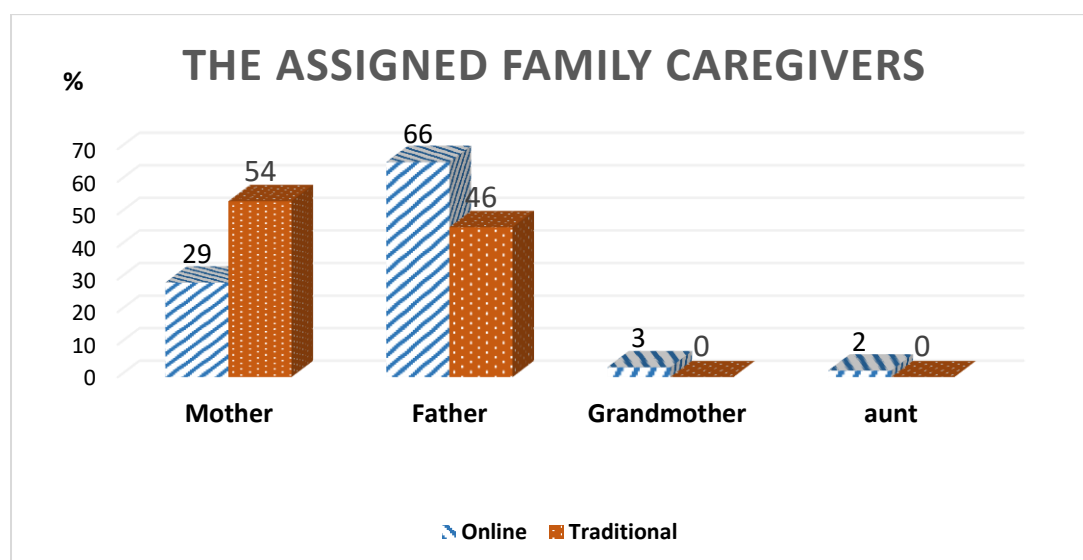


FIGURE 3: showed that, more than two thirds (66%) of the assigned family care givers were fathers in the traditional education group, while more than half (54%) were mothers in the online based education group

TABLE 1: Number and percentage distribution of the studied children in both study groups according to their disease history (n= 200).

Items	Traditional n:100		Online n:100		Test of Significant	
	No.	%	No.	%	X2	P value
Duration of illness in years						
< 1	50	50.0	54	54.0	11.7	0.003*
1 - <3	39	39.0	46	46.0		
3 - ≤ 6	11	11.0	0	0.0		
\bar{X} + SD	2.1±0.68		1.9±0.5			
Type of treatment						
Chemotherapy	88	88.0	67	67.0	22.0	0.0001**
Medical therapy (other than chemotherapy)	6	6.0	25	25.0		
Surgical procedure	4	4.0	0	0.0		
Multis specialist treatment	2	2.0	8	8.0		
Cause of admission					15.1	0.001*
Receiving chemotherapy	34	34.0	20	20.0		
Complications related to management therapy	55	55.0	80	80.0		
Investigations & follow-up	11	11.0	0	0.0		

* Statistically significant difference $P < 0.05$

**High statistical significant difference < 0.00

Table (1) illustrated that, the duration of illness was <1 year among half (50%) of children in the traditional group and more than half (54%) of children in the online group ($X^2=11.7$ & $p<0.003$). Also it was found that chemotherapy was the most common type of treatment ($X^2=22.0$ and $p< 0.0001^*$), among most (88%) of children in traditional group and more than two

thirds (67%) of children in online group. However, more than half (55%) of children in the traditional group and 80% of children in the online group were admitted because of complications related to management therapy ($X^2=15.1$ & $p<0.001^*$).

TABLE 2: Number and percentage distribution of the studied family care givers in both groups according to their characteristics (n =200).

Characteristics	Traditional (n;100)		Online (n:100)		X2	p-value
	No.	%	No.	%		
Age (years) :						
20 - < 30	1	1.0	0	0.0	5.7	0.046*
30 - < 40	50	50.0	36	36.0		
40 - < 50	34	34.0	48	48.0		
50 ≤ 60	15	15.0	16	16.0		
\bar{X} + SD	39±0.7		43±0.69			
Level of education :						
Illiterate	4	4.0	0	0.0	58.9	0.0001**
Read and write	3	3.0	36	36.0		
Secondary technical school	58	58.0	61	61.0		
University	35	35.0	3	3.0		

Table (2) indicated that, age of half (50%) of studied family care givers in traditional group was ranged from 30 - < 40 years and less than half (48%) in online group was ranged aged 40 - < 50 years. Also, 58% in traditional and 61% in online group are having secondary technical school.

TABLE 3: Number and percentage distribution of the family care givers' total level of knowledge regarding their children with ALL in traditional education versus online based education (post study intervention) (n = 200).

Care givers' level of knowledge	Traditional (n: 100)		Online (n: 100)		X2	p-value
	No.	%	No.	%		
Good (Score 75 ≤ 100%)	93	93	77	77	12.1	0.002
Average (Score 50 < 75%)	4	4	20	20		
Poor (Score < 50%)	3	3	3	3		

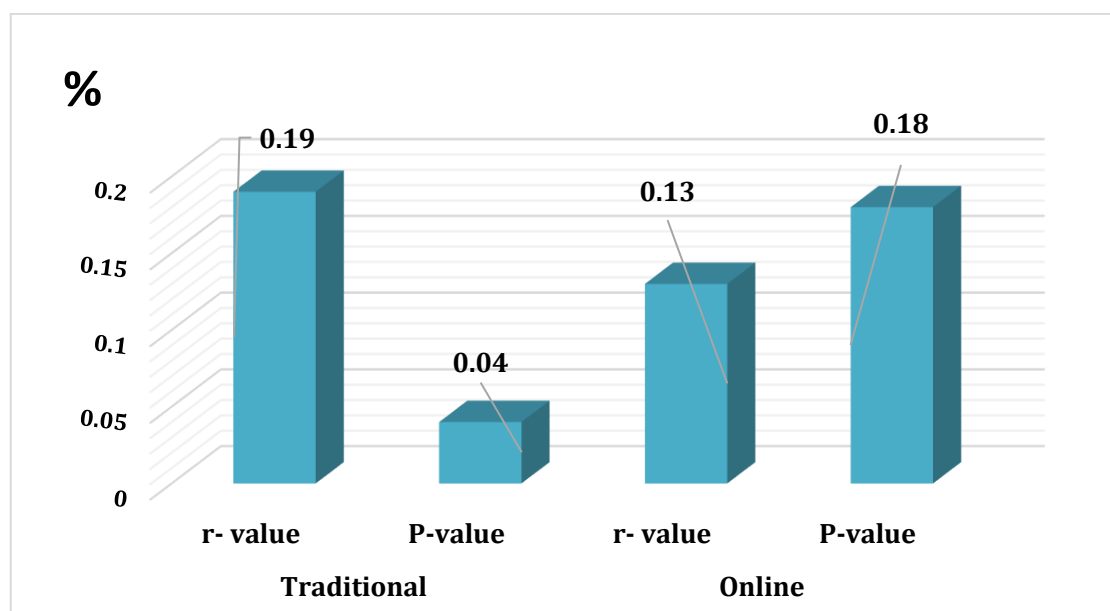
Table (3): illustrated that, there was statistically significant difference (X^2 12.1, $p < 0.002$) between family care givers total level of knowledge regarding their children with ALL in traditional education and online based education, where 93% in traditional education group versus 77% in online based education group had good level of knowledge.

TABLE 4: Distribution of the studied family care givers according to their total level of actual practices regarding care of their children with ALL in traditional education versus online based education (post study intervention) (n= 200).

Total level of actual practices	Traditional (n:100)		Online (n:100)		X2	p-value
	No.	%	No.	%		
Satisfactory	100	100.0	38	38.0	86.9	0.0001*
Unsatisfactory	0	0.0	62	62.0		

Table (4): illustrated that, there was a high statistically significant differences ($X^2= 86.9$, $P < 0.001$) of the studied family care givers according to their total level of actual practices in traditional education versus online based education regarding care of their children with

ALL, where all (100%) of the studied family care givers had satisfactory level of total actual practices in traditional education group, more than half (62%) had unsatisfactory in online group.



*Statistically significant difference $P < 0.05$

Insignificant statistically difference at $p\text{-value} > 0.05$

FIGURE 4: clarified that, there was a positive correlation ($r=0.19$ at $p < 0.04$) between family care givers' total level of knowledge and actual practices regarding care of their children with ALL in traditional education group, while there was a very weak correlation ($r=0.13$ at $p > 0.05$) between family care givers' total level of knowledge and actual practices regarding care of their children with ALL in online based education group.

DISCUSSION

Family care givers can positively influence care of children with Acute lymphoblastic leukemia (ALL) by incorporating the practical guidelines and knowledge, improving consistency of care and promoting intervention of care. Family care

givers play a central role in performing assessment, helping child with ALL to develop their self-care practice and provide supportive and psychosocial care with ALL (Craven et al., 2017).

This study aimed to assess the effect of traditional education versus online based education intervention on family care givers of children suffering from Acute Lymphoblast Leukemia. Family caregivers are usually the main care givers of their children suffering from ALL. It is important to educate about knowledge and practice that affect consequently the care provided to the children (Mohammed & Al-Karaki, 2018).

The result of present study (figure 1) revealed that, the highest percent of children in each group were aged 1 day < 6. The present study result was contrasted with Abd Elhamed (2018), who performed a study entitled "Discharge plan for mothers of children suffering from leukemia" and reported that, more than half of the studied children's age were between $12 \leq 18$ years. As mentioned by Parkin et al. (2020), acute lymphoblastic leukemia is a relatively common disease in children aged less than 15 years.

Regarding children's gender, more than half in each study group were males (figure 2). The present study result matched with Ali et al., (2015), who conducted a study entitled "Impact of educational health program on quality of life for family care givers of cancer children receiving chemotherapy" and reported that, approximately two-thirds of children were males.

The findings of the present study (figure 3) revealed that, fathers were the primary care givers among more than thirds of studied children in traditional education and online based education group. According to Olmstead (2013), who performed a study to entitled "Using technology to increase parent involvement in schools" that, father and mother were the most family caregivers. Meanwhile, the present finding is incongruent with Ahmed et al. (2018), who illustrated that "Effect of an intervention program for care givers of children suffering from acute lymphocytic leukemia on their coping patterns" that, two thirds of them were mothers and the rest of them were either the fathers. This is explained as the father and mother of sick children are considered the most primary health care providers around the world. Also, they take on enormous responsibilities in providing care

and managing their children conditions outside the health care institutions.

Regarding the disease history among the studied children (table 1) revealed that, more than half of them (55%) in traditional education group and 80% in online based education group were admitted due to complications related to management therapy. While half (50%) of the children in traditional education group and more than half (54%) of the children in online based education group chemotherapy was their type of treatment. the result of the present study was incongruent with Mohammed et al. (2022), who conducted a study entitled "Needs and problems of children undergoing chemotherapy and their care giver" reported that, the majority of the studied children in traditional education group had admitted because of complications related to management therapy. From the researcher's point of view, the current finding could be due to the fact that chemotherapy is the primary treatment for ALL, which has many complications and side effects.

Regarding family care givers' total level of knowledge regarding care of their children suffering from ALL post study intervention, the current study result (table 3) showed that, there was statistically significant difference between family care givers in traditional education and online-based education. Meanwhile, the good level of knowledge was found among family care givers in traditional educational group. The results also showed that the more than three quarters had good levels of knowledge was found among family care givers in the online -based education group. The present study finding results were in an agreement with Hassan (2021), who conducted study entitled " A comparison between the use of e-learning and traditional education in working with groups and developing the skills of master's students" reported that, there was statistically significant differences between the use of e-learning and traditional education in working with groups and developing professional skills.

From the researcher's point of view, this result might be due to the age and educational level of

family care givers among almost two thirds of them, was ranged from 40 to 50 years and had secondary technical school level of education, the focuses of family care givers the health care on the disease management aspects and missing their roles as health educator's knowledge part about it good knowledge about health care for their children. these differences may be explained as face to face interaction and availability of time to clarify the answers to all questions of family care givers, which are characterized by traditional education being more effective than online-based education.

Concerning the total level of actual practices of studied family care givers, the finding of the present (table 4) showed that, there was a highly statistically significant difference between traditional education versus online based education group. The present study results were in disagreement with Means et al., (2019), who conducted a study entitled "Evaluation of evidence-based practices in online learning: a meta-analysis and review of online learning studies" and reported that, average, students in online learning conditions performed better than those receiving face-to-face instruction.

From the researcher's point of view, these differences may be explained as face to face interaction and availability of time to clarify the answers to all questions of family care givers, which are characterized by traditional education being more effective than online-based education and may be due to availability of online resources about leukemia family care givers' education.

As regards correlation between family care givers' total level of knowledge and total level of actual practices in traditional education versus online based education post intervention study, (figure 4) there was a positive correlation between knowledge and practice in traditional education group, While there was a very weak correlation between total level of knowledge and total level of actual practices in online based education group. The present study findings were in an agreement with El-Sawy et al., (2013), who conducted a study titled "Knowledge and home practices of care givers having children with leukemia attending national cancer institute Cairo university" reported that, there was

statistically significant positive correlation between knowledge and practice in traditional education. The present study results reflected that, the family care giver's knowledge had an effect on their practices and the more knowledge they have, the better actual practices may provide. In the researcher's point of view traditional education considers beneficial for learning because care giver can interact in lectures, ask questions and receiving immediate answers that affect their practical performance.

CONCLUSION

Based on the findings of the current study it was concluded that, traditional education intervention was more effective than online based education intervention on knowledge and actual practices of family care givers having children suffering from acute lymphoblastic leukemia.

RECOMMENDATIONS

Continuous evaluation and monitoring for level of care givers' knowledge and actual practice regarding care of their children with ALL.

Periodical implementation of educational program using traditional methods of teaching for family care givers' based on advances in care of their children with ALL.

Emphasize on the importance of family care givers participation in care for their children suffering from Acute Lymphoblast Leukemia.

Replication of the study using a larger probability sample from different pediatric oncology departments to generalize the study results.

CONFLICT OF INTEREST

None

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