

Mothers' Role Towards Management of Their Children with Burkitt's Lymphoma

Hend Alaa Ahmed ^{*}, Fathia Ahmed Mersal ^{**}, Wafaa Khalil Ibrahim ^{***}

B.Sc. in Nursing, 2011, Faculty of Nursing Alexandria University ^{*}, Professor of Community Health Nursing Department Faculty of Nursing-Ain Shams University ^{**}, Assistant Professor of Community Health Nursing Department Faculty of Nursing-Ain Shams University ^{***}

Abstract

Background: Mothers of children with Burkitt lymphoma play a crucial role in the process of children's management and full fling the children's needs during the treatment period. **Aim:** This study aimed to assess the Mothers' Role towards Management of Their Children with Burkitt's Lymphoma. **Research Design:** A descriptive design was used to achieve the aim of this study. **Subjects:** A purposive sample consisted of 60 mothers with their children with Burkitt's lymphoma. **Tools of data collection:** Two tools were included: Tool I: A interviewing structure questionnaire and Tool II: Medical records. **Results:** 63.3% of children did not achieve their health needs, 97.7% of children did not have health problems, also, 91.7% of the mothers had an unsatisfactory level of knowledge, while 81.7% of mothers had total satisfactory practice, and 91.7% of the mothers had a negative attitude. **Conclusion:** Based on the present study findings it can be concluded that all the children achieved physical needs, and nearly most of them had health problems. Moreover, there was a positive correlation between mothers' practice and mothers' knowledge regarding the management of their children with Burkitt's lymphoma. **Recommendation:** Increase awareness of the mother's knowledge about Burkitt lymphoma in diagnosis and treatment. Also, increase the nursing instructions for mothers of children with Burkitt lymphoma on the health needs and problems of their children with Burkitt lymphoma.

Keywords: Burkitt's Lymphoma, Mother's role.

Introduction:

Burkitt lymphoma (BL) is an aggressive non-Hodgkin B-cell lymphoma. The disease is associated with Epstein Barr virus (EBV), human immunodeficiency virus (HIV), and chromosomal translocations that cause the overexpression of oncogene C-MYC. The World Health Organization (WHO) classifies BL into three clinical groups: endemic, sporadic, and immunodeficiency-related. (Haberl, et al., 2016).

It is more common in children, and the average age at diagnosis is 6 years old. This form of cancer is three to four times more likely to affect males than females. The exact cause of Burkitt lymphoma is unclear, but the risk of developing it is greater in certain people and certain geographical regions (Gabarda, et al., 2022).

The symptoms of Burkitt lymphoma depend on the type: The endemic (African) variant usually starts as tumors of the jaw or

other facial bones. It also can affect the gastrointestinal tract, ovaries, and breasts and can spread to the central nervous system, causing nerve damage, weakness, and paralysis. Other symptoms include Loss of appetite, Weight loss, Fatigue, Night sweats, and Unexplained fever. (Geng, et al., 2022).

Because Burkitt lymphoma spreads so quickly, prompt diagnosis is essential. If Burkitt lymphoma is suspected, all or part of an enlarged lymph node or another suspicious disease site will be biopsied. In a biopsy, a sample of tissue is examined under a microscope. This will confirm or rule out Burkitt lymphoma. (Bahashwan, et al. 2022).

Intensive intravenous chemotherapy, which usually involves a hospital stay is the preferred treatment for Burkitt lymphoma. Because Burkitt lymphoma can spread to the fluid surrounding the brain and spinal cord, chemotherapy drugs also may be injected directly into the cerebrospinal fluid, a treatment

known as intrathecal chemotherapy. (*Biegańska, and Wolski, 2022*)

Family Health Nurses play an indispensable role in caring for children with cancers. Family health nurses not only provide technical and scientific knowledge but also give humanized care to promote the health, quality of life, comfort, and well-being of the sick child. Family Health Nurses coordinated the care while the parents were the principal caregivers and physicians served as consultants. (*Burles, Holtslander, and Peternelj-Taylor, 2021*).

Significance of the study:

The incidence of NHL in Egyptians is several-fold higher, indicating that the national cancer burden was raised with Zagazig's economic progress. Burkitt lymphoma, also known as small non-cleaved cell lymphoma, in Egypt, accounts for about 40% of childhood non-Hodgkin's lymphomas when they are around 6 to 18 years old. (*Turki, et al., 2022*).

Aim of the study:

This study aimed to assess the Mothers' Role towards Management of Their Children with Burkitt's Lymphoma.

Research Questions:

- What are the health needs of the child with Burkitt's Lymphoma?
- What are the health problems of child with Burkitt's Lymphoma?
- What is the mother's attitude toward caring for those children with Burkitt's Lymphoma?
- Is there a relationship between mothers' knowledge and their practice toward caring for their children with Burkitt's Lymphoma?

Subject and Methods

Research Design:

A descriptive design was used to achieve the aim of this study.

Study Settings:

This study was carried out in the out-patients clinic in the pediatric oncology center at Borg Al-Arab university hospital affiliated with Alexandria University Hospitals.

Subject:

The purposive sample consisted of 60 cases of children with Burkitt's lymphoma from the out-patients clinic in the pediatric oncology center at Borg Al-Arab university hospital was recruited under the following criteria:

Children age from 6 to 18 years old received chemotherapy in the hospital.

Tools of Data Collection:

Data were collected by using the following two tools:

I-A structured interview questionnaire

It was designed by the researcher after reviewing the related National and International literature, (*Kanbar, et al. 2019; Fioretti, & Smorti, 2016; Bemis, et al, 2015*) it was written in simple Arabic language to suit mothers' level of understanding, and it consisted of the following five parts

Part I: A) It was concerned with the characteristics of mothers including (age, marital status, level of education, occupation etc.

B): It was concerned with the characteristics of children with Burkitt's lymphoma including (age, sex, educational grade, birth order etc.

Part II: Assess the health status of children with Burkitt's Lymphoma through (mass size, starts as tumors of the jaw or other facial bones)

Part III: Mother's knowledge regarding Burkitt's Lymphoma which include (definition, predisposing factors, clinical manifestations, diagnosis, treatment, and complications) (*Kanbar, et al. 2019*)

❖ Scoring system:

A scoring system was followed to assess mothers' knowledge of Burkitt's lymphoma. The scale score was 2 ranging from satisfied = 1, and unsatisfied = 0, The total was summed up and classified as 50% and above were considered satisfactory and less than 50% were considered unsatisfactory. The knowledge score was assigned 10 questions the maximum possible total score was 10 points.

Part IV: The mother's reported practice regarding the health needs and problems of their children with Burkitt's Lymphoma (nutrition, psychological support, exercises, protection from infection, follow-upetc) (*Fioretti, & Smorti, 2016*)

❖ Scoring system:

A scoring system was followed to evaluate the mother's practices towards the child with Burkitt's lymphoma according to his needs and problems, the reported practices score was assigned 85 questions the maximum possible total score was 18 points and the scale score was 3 ranging from always = 2, sometimes = 1, and never = 0 the total was summed up and classified as 60% and above were considered healthy practices y and less than 60% were considered unhealthy practices.

Part V: Mother's attitude regarding caring for their children with Burkitt's Lymphoma which includes (Anxiety, worry about the child's disease, afraid of letting the child play/run etc) (*Bemis, et al, 2015*)

❖ Scoring system:

The total score of Mother's attitudes regarding caring for their children with Burkitt's Lymphoma score was assigned 16 questions the maximum possible total score was 18 points and the scale score was 3 ranging from always = 2, sometimes = 1, and never = 0 the total was summed up and classified as 60% and above were considered positive attitude and less than 60% were considered negative attitude.

II- Medical records:

It was an assessment of children's status regarding their medical records, and included; staging (chemotherapy protocol) CT scan, PET scan, bone marrow biopsy, blood tests, and ultrasound. It was guided by (*Englund, et al. 2018*)

II-Operational Design:

The operational design includes the preparatory phase, content validity and reliability, pilot study, and Field Work

Preparatory phase

During this phase, the study tool was prepared by reviewing the available local and international related literature to be oriented with the various aspects of the research problem. The researcher designed a questionnaire to collect data from study participants (mothers) on their knowledge, practice, and attitudes toward their children with Burkitt's lymphoma.

During the preparatory phase, the researcher carefully considered the content and format of the questionnaire, as well as the mother's self-administered questionnaire. Moreover, another resource for data collection was medical records, the researcher planned and prepared the collected data about the studied children from available medical records during this phase.

Content validity and Reliability

It was ascertained by a group of five jury members having experience in nursing community health Faculty of Nursing, Ain Shams University, to review the tools for clarity, relevance, comprehensiveness, understanding, and applicability.

The reliability of the study tools was tested and ascertained by statistical analysis to examine its reliability. Cronbach's Alpha: for Reliability of Health needs = 0.875, Reliability of Health problems = 0.624, Reliability of knowledge= 0.646, Reliability of knowledge= 0.911, and Reliability of attitude = 0.783

Pilot study

It was carried out on 10% (10 mothers) of the study subject in the previously mentioned setting, to test the applicability of the constructed tools and the clarity of the included questions. The pilot study has also served to estimate the time needed for each mother to fill in the questions. According to the results of the pilot, no corrections or omissions of items were performed so the mothers in the pilot study were included in the main study sample.

Field Work

The actual fieldwork was carried out over 3 months, a period starting from the beginning of May 2022 till August 2022, the researcher was available in the study setting two days per week, which was (Tuesday, Wednesday, and Thursday) from 9.00 am to 3.00 pm.

The investigator distributed the tools to participants and explained the purpose, importance, and aim of the study to all of them before starting the data collection. The questionnaire sheets were filled individually for 20 minutes. The investigator checked each filled questionnaire to ensure its completeness.

III-Administration Design:

Official permission to carry out the study was obtained by submission of a formal letter issued from the Dean of the Faculty of Nursing, Alexandria University to the director of the previously mentioned setting to collect the necessary data for the current study after a brief explanation of the purpose of the study and its expected outcomes

Ethical Considerations:

Ethical approval was obtained from the scientific ethical committee of the Faculty of Nursing, Alexandria University. the investigator clarified the objective and aim of the study to the mothers included in the study before starting and oral approval was obtained from the mothers before inclusion in the study; a clear and simple explanation was given according to their level of understanding. They secured that

all the gathered data was confidential and used for research purposes only. The investigator was assuring maintaining anonymity and confidentiality of the subjects` data included in the study. The subjects were informed that they are allowed to choose to participate or not in the study and they have the right to withdraw from the study at any time.

IV-Statistical Design:

Data collected from the studied sample was revised, coded, and entered using PC. Computerized data entry and statistical analysis were fulfilled using the statistical package for social sciences (SPSS) version 26. Data were presented using descriptive statistics in the form of percentages, mean and standard deviation, independent T- test, F-test, and Pearson correlation). The chi-square test (X²) was used for comparisons between qualitative variables. So, the p-value was considered significant as the following:

- P-value <0.05 was considered significant
- P-value <0.01 was considered highly significant
- P-value >0.05 was considered insignificant

Results:

The main findings of this study were summarized as follows:

Table (1): Shows that two-thirds of mothers' age ranged from 25 to 34 years. The mothers' average age was 29.82±6.152. Also, the marital status analysis shows that 88.3% of them were married. Regarding education, less than half of mothers reported being secondary educated, while, more than half of their residence was in urban areas. Regarding the mothers' jobs, it shows that 23.3% of them work and 71.4% of them worked in nongovernmental organizations. Regarding their income, 85% of mothers reported not having enough income.

Table (2): Shows that, more than two-thirds of children's age ranged from 6 to less than 9 years and the mean age was (8.43±3.572) years, 70% of them were male. Regarding educational level, 50% of them were not

enrolled. In relation to birth order, it was found that 58.3% of them were the first child.

Figure (1); reveals that 91.7% of mothers had unsatisfactory knowledge while 8.3% of them had satisfactory knowledge.

Figure (2); reveals that 83.3% and 78.3% of mothers had satisfactory practice about child health needs and child health problems. Additionally, it shows that 81.7% of mothers had total satisfactory practice.

Figure (3); shows that 91.7% of mothers had a negative attitude toward the disease of

their children meanwhile 8.3% of them had a negative attitude toward the disease of their children.

Table (3): shows that highly positive correlation between mothers' practice and mothers' knowledge regarding the management of their children with Burkitt's lymphoma whereas P value < 0.001. Meanwhile, it shows that there was no significant correlation between mothers' attitudes and mothers' knowledge whereas P value > 0.05

Table (1): Demographic characteristics of mothers who had children with Burkitt's lymphoma. (n=60).

Items	No	%
Age/years		
<25	10	16.7
25-34	36	60.0
35-44	13	21.7
≥45	1	1.6
Mean and SD	29.82±6.152	
Marital status		
Married	53	88.3
Widow	3	5.0
Divorced	4	6.7
Educational level		
not read or write	10	16.7
Basic Education	15	25.0
Secondary education	27	45.0
Higher Education	8	13.3
Residence		
Urban	31	51.7
Rural	29	48.3
Mother's Job		
Work	14	23.3
Not work	46	76.7
Type of work (n=14)		
Governmental	2	14.3
Nongovernmental	10	71.4
Free Business	2	14.3
Family income		
Enough	9	15.0
Not enough	51	85.0

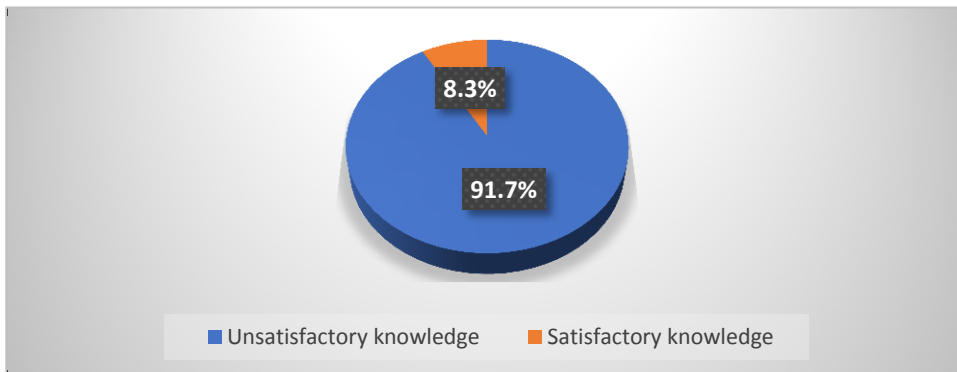


Figure (1): Mothers' total knowledge regarding the management of their children with Burkitt's lymphoma (N=60).

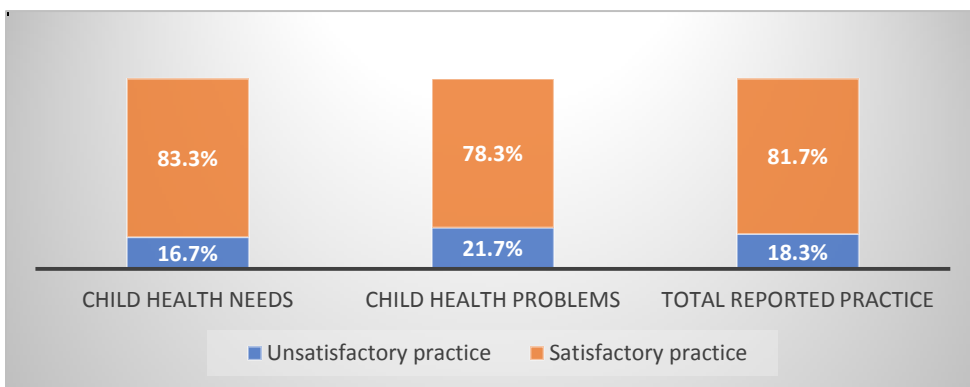


Figure (2): Mothers' total reported practice regarding the management of their children with Burkitt's lymphoma (N=60).

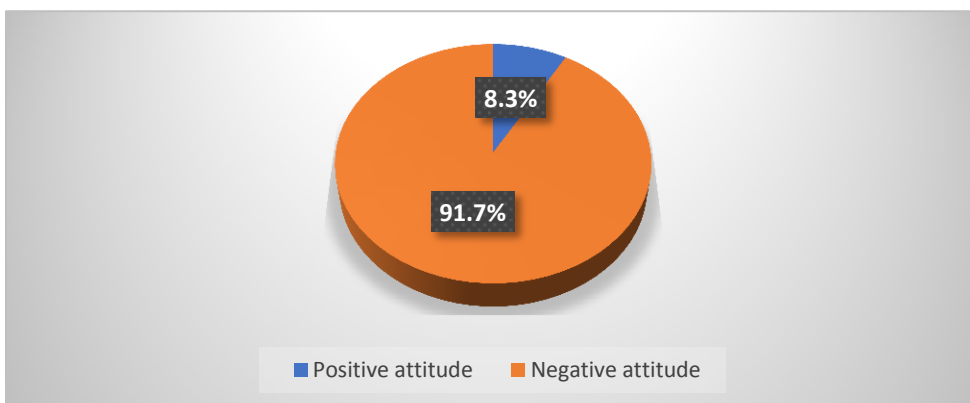


Figure (3): Mothers' total attitude regarding the management of their children with Burkitt's lymphoma (N=60).

Table (2): Demographic characteristics of Children with Burkitt's Lymphoma (N=60).

Items	No	%
Age/years		
6:<9	40	66.7
9-12	12	20.0
12: <18	8	13.3
Mean and SD		8.43±3.572
Gender		
Male	42	70.0
Female	18	30.0
Educational level		
Not Enrolled	30	50.0
primary education	20	33.3
preparatory education	4	6.7
Secondary school	6	10.0
Birth order		
First	35	58.3
Second	17	28.3
Third	8	13.4

Table (3): Correlation between mothers' total knowledge, total practices, and their total attitude related to the management of their children with Burkitt's lymphoma (N=60).

Items	Total Mothers' Knowledge	
	r	P value
Total Mothers' Practices	.493**	0.000
Total mothers' Attitude	.006	.965

** Correlation is significant at the 0.01 level (2-tailed).

Discussion:

Concerning characteristics of studied mothers, the results of the present study (Table 1), revealed that Two-thirds of them aged from twenty-five to thirty-four years. In addition, the majority of them were married and reported not having enough income. Furthermore, more than two third of them worked in the nongovernmental organization. As well as, less than half were secondary educated, while, more than half lived in urban areas.

These results were incongruent with the results of *Mahmoud, et al., (2022)*, who studied "Depression, Burden, and Self-Efficacy among Caregiving Parents of Children with Cancer", and carried out at the outpatient clinic of Sporting Students Hospital in Alexandria, Egypt. Who illustrated that less than half of the caregivers were from thirty-five to less than forty-five years. In addition, most of them were married, also, less than one quarter had secondary education. while more than one-third

of them had a university education and were employees. more than half of housewives.

On the other hand, these results were supported by *Khatun, Kim, and Park, (2016)*, whose study entitled 'Factors Affecting Maternal Coping in Korean Mothers of Children with Cancer', and was carried out at a health center in Korea. They revealed that the majority of mothers had no paid employment, so, did not have enough income.

The investigator believed that the Egypt population is depending on the very low economic status imposed by Covid-19. This makes it difficult for families to provide a basic health requirement for suffering children and depends on Governmental health insurance because it covers all costs of children with cancer from treatment, care, transfers to treatment, and medical investigation that are not available.

Also, the results of the present study were incongruent with *Tork and Mersal (2021)*

whose study entitled 'Effect of Pictorial Information Booklet on Mothers' Care of Their Children with Leukemia' and conducted at outpatient Clinic of pediatric oncology at the National Cancer Institute Cairo University, Egypt. They revealed that more than two-thirds of mothers were thirty < forty years, and more than half were can't read and write. Also, most of them were housewives while the majority did not have enough income.

As regards socio-demographic characteristics of the children; the present study found that: More than two-thirds of children six:< nine years. While less than two-thirds were the first child and half of them were not enrolled at any school, **table (2)**. This study finding was supported by, *Zhang, et al, (2020)*, whose study entitled "Identification of clinical molecular targets for childhood Burkitt lymphoma". The study was carried out at Shanghai Children's Hospital, China, and was conducted on: Nineteen patients with BL. They mentioned that: In childhood BL., the median age of the cohort was five and half years, ranging from one to eleven years old, and the male-to-female ratio was (one: zero. twenty-seven) in total cases.

According to the investigator's point of view, the incidence children Burkitt lymphoma increased in male children and children of school age. However, the incidence of Burkitt lymphoma decreased in adolescents.

Regarding total knowledge about mothers' management of their children with Burkitt's lymphoma, **Figure (1)** showed that most mothers had unsatisfactory knowledge. This result was supported by *Taha et al. (2019)*; whose stud entitled "Effect of Nursing Instructions on Knowledge and Practice of Mothers Having Children with Leukemia Undergoing Chemo-therapy", and was conducted in Pediatric Oncology Outpatient Clinic and Inpatient Department at National Cancer Institute (NCI), Cairo University, Egypt. They found that most mothers had wrong or incomplete knowledge related to etiologic, symptoms, and childhood cancer treatment.

According to the investigator's point of view, most mothers of children with Burkitt lymphoma had young age when married, had poor knowledge, and had an unhealthy lifestyle.

Regarding total reported practice regarding mothers' management for their children with Burkitt's lymphoma, **figure (2)**, revealed that the majority had satisfactory practice about child health needs and more than three quarters for child health problems, this result was incongruent with the result of *Saeed, Hamzah, and Nitavid (2021)* who's a study entitled "Structured teaching program enhances the knowledge of mothers to take care of children with leukemia", and conducted at the Cancer Research Institute, Sri Raghvendra Hospital, India. they illustrated that less than half of the mothers had inadequate knowledge and the same was for moderate knowledge.

From the investigators' point of view, mothers' performance was always due to children's love, not like caregivers' duties.

As regards the mother's attitude, the present study illustrated that most of them had a negative attitude toward the disease of their children meanwhile less of them had a negative attitude toward the disease of their children. **Figure (3)**.

This result was consistent with the results of *Mohammed, Hossein, Ahmed, and Eltomy, (2020)*: whose study entitled "Assessment of Knowledge and Attitudes of Caregivers Regarding Hearing Impairment among Children at Minia City", and carried out at Alamel School for the Deaf and Hearing impairment at Minia city, Egypt. they illustrated that: Domains of negative attitudes were in majority of caregivers toward children with hearing impairment.

While, *Hasan, (2018)*: whose study entitled "Assessment of Mothers' Attitude toward Chemotherapy Treatment for Pediatric in Oncology Units Hospital Margin in Babylon City, Iran "was conducted at the oncology margin Hospital, Iraq. Who found that half of the study participants have an intermediate

attitude toward children under chemotherapy by a percentage of half of them.

According to the investigator's point of view, mothers merely blamed themselves for the disease while not providing any support in taking care of the children. Mothers reported that cancer resulted in their children being misunderstood and isolated by others. They thought that strangers looked at their children through 'colored eyes' leading to a negative perception and being stressed.

While, these findings were incongruent with, *Monier, Elsharkawy, Adly, & Sidhom, (2022)*, whose study entitled "Assessment of chemotherapy safe handling among mothers of children with cancer at home". The study was carried out in the Children's Cancer Hospital Cairo, Egypt, and was conducted on: two-hundred mothers of children receiving chemotherapy at home. As regards the characteristics of their studied children, found that Less than two-fifths of children aged between 6 to less than twelve years, with $M \pm SD = 4.34 \pm 1.093$. Regarding the educational level of children, half of them were not registered yet.

According to the investigator's point of view incidence of Burkitt lymphoma increases in low and middle-income families and families living in rural communities. However, most mothers of children with Burkitt lymphoma had young age when married.

Concerning the correlation between mothers' total knowledge, and total practices related to the management of their children with Burkitt's lymphoma, was a highly positive correlation between mothers' practice and mothers' knowledge whereas a P value < 0.001., the study was congruent with results of *Monier, Elsharkawy, Adly, & Sidhom, (2022)*, who found that: There was a high statistically significant correlation between the studied mothers' knowledge & their reported practice.

Furthermore, *Mohammed, Ibrahim, and Abd Elmonem, (2022)*, whose study entitled "Effect of Health Coaching Intervention on Mothers' Performance and Quality of Life of

their Children with Beta Thalassemia ". The study was implemented in the Inpatient Pediatric Department at Mustafa Hassan Hospital affiliated with Fayoum University, Egypt, and conducted on seventy mothers. Their finding was a highly statistically significant positive correlation between total knowledge, and total practices, with $p < 0.001$

The investigator's point of view, positive and negative experiences toward their children's disease, going through hardships, perceived competence, and perceived social support. Also, the social standard for mothers influenced their performance in caring for their children.

Conclusion:

Based on the present study findings it can be concluded that all the children achieved physical needs and nearly most of them had health problems. Moreover, most of the studied mothers had a negative attitude toward the disease of their children. Also, there was a positive correlation between mothers' practice and mothers' knowledge regarding the management of their children with Burkitt's lymphoma.

Recommendations:

In light of the finding of the present study, the following recommendations are suggested:

- Nursing Instructions for mothers of children with Burkitt lymphoma on the health needs and problems of their children with Burkitt lymphoma.
- Increase awareness of mothers' knowledge about Burkitt lymphoma in diagnosis and treatment.
- Future studies should develop and establish an official system to address the mothers of children with Burkitt lymphoma problems in the community and enhance social support services

References:

Bahashwan, S.M., Radhwi, O.O., Alahwal, H.M., et al, (2022): Primary Central Nervous System Burkitt Lymphoma, Presenting with Long-Term Fluctuating Level of Consciousness: A Case Report and

- Literature Review on Challenges in Diagnosis and Management Am J Case Rep. 2022; 23: e936401-1–e936401-11. Published online 2022 Jun 21. doi: 10.12659/AJCR.936401
- Bemis, H., Yarboi, J., Gerhardt, C.A., et al, (2015):** Childhood Cancer in Context: Sociodemographic Factors, Stress, and Psychological Distress Among Mothers and Children, *J Pediatr Psychol*, 2015 Sep;40(8):733-43. doi: 10.1093/jpepsy/jsv024.
- Biegańska, E.A. and Wolski, M. (2022):** Intussusception as a presentation of Burkitt's Lymphoma: A Case Series. *Medical Science Pulse*. 2022, Vol. 16 Issue 3, p.6. DOI:10.5604/01.3001.0015.9665
- Burles, M., Holtslander, L., and Peternelj-Taylor, C., (2021):** Palliative and Hospice Care in Correctional Facilities, Integrating a Family Nursing Approach to Address Relational Barriers, *Cancer Nursing*, Vol. 44, No. 1, 2021, P.30. DOI: 10.1097/NCC.0000000000000754
- Englund, A., Glimelius, I., Rostgaard, K., et al. (2018):** Hodgkin lymphoma in children, adolescents, and young adults – a comparative study of clinical presentation and treatment outcome, *ACTA oncological*, 2018, VOL. 57, NO. 2, 276–282, <https://doi.org/10.1080/0284186X.2017.1355563>
- Fioretti, C., & Smorti, A., (2016):** Narrating positive versus negative memories of illness: does narrating influence the emotional tone of memories? First published: 08 June 2016, P. 3, <https://doi.org/10.1111/ecc.12524>
- Gabarda, O.S., Portu, N.A., Deza, D.C., et al, (2022):** Intestinal occlusion due to Burkitt lymphoma: an unusual cause, *Rev Esp Enferm Dig* 2022 Nov;114(11): P. 692. Doi 10.17235/reed.2022.8765/2022.
- Geng, S., Chu, Y., Zhou, P., and Zhu, H., (2022):** Primary gastric Burkitt's Lymphoma mimicking gastric cancer: a case report November 28th, 2022: <https://doi.org/10.21203/rs.3.rs-2301388/v1>
- Haberl, S., Haferlach, T., Stengel, A., et al, (2016):** MYC rearranged B-cell neoplasms: Impact of genetics on classification. *Cancer Genet*. 2016 Oct;209(10) :P. 431. DOI: 10.1016/j.cancergen.2016.08.007
- Hasan, A-M., (2018):** Assessment of Mothers' Attitude toward Chemotherapy Treatment for Pediatric in Oncology Units Hospital Margin in Babylon City, Iran, *Indian Journal of Public Health Research & Development*, March 2018, Vol.9, No. 3221, https://www.researchgate.net/publication/324042968_Assessment_of_Mothers%27_Attitude_toward_Chemotherapy
- Kanbar, A.H., Sacher, R.A., & Besa, E.C. (2019):** Burkitt Lymphoma and Burkitt-like Lymphoma, *Medscape*, updated at 2022, <https://emedicine.medscape.com/article/1447602-overview>
- Khatun, S., Kim, H.S., and Park, H-B., (2016):** Factors Affecting Maternal Coping in Korean Mothers of Children with Cancer, *Open Journal of Nursing*, 2016, 6, 751-766, <http://www.scirp.org/journal/ojn>
- Mahmoud, A.M., Osman, L.H., El- Sayed Gaafar, M. M. E-S., and gomaa, N.I.H., (2022):** Depression, Burden, and Self-Efficacy among Caregiving Parents of Children with Cancer, *Egyptian Journal of Health Care*, 2022 EJHC Vol 13. https://ejhc.journals.ekb.eg/article_230387_89d666f0aed6ef9ae52688f8984cd301.pdf
- Mohammed, E.H., Hossein, Y. E., Ahmed, E.R., and Eltomy, E.M., (2020):** Assessment of Knowledge and Attitudes of Caregivers Regarding Hearing Impairment among Children at Minia City, *Minia Scientific Nursing Journal (Print) (ISSN 2537-012X) Vol. (7) No. (1) June 2020*, <https://www.minia.edu.eg/nurse/Files/7th%20Edition.pdf>
- Mohammed, Y.A., Ibrahim, A.I.A., and Abd Elmonem, H.H. (2022):** Effect of Health Coaching Intervention on Mothers' Performance and Quality of Life of their Children with Beta Thalassemia, Vol, (01) No, (31), July 2022, pp (34- 65) Print Issn: 2314-8845 Online ISSN: 2682-3799, DOI: 10.21608/ASNJ.2022.137423.1378
- Monier, M. A. A., Elsharkawy, S. S., Adly, R. M., & Sidhom, E. A. E. (2022):** Assessment of chemotherapy safe handling

among mothers of children with cancer at home. *International Journal of Health Sciences*, 6(S6), 9649–9663. <https://doi.org/10.53730/ijhs.v6nS6.12500>

Saeed, N.A., Hamzah, I.H., & Nitavid, A. (2021): Structured teaching program enhances the knowledge of mothers to take care of children with leukemia. *Journal of Public Health*, 1-6. *Journal of Public Health: From Theory to Practice* (2021) 29:55–60 <https://doi.org/10.1007/s10389-019-01107-y>

Taha, M., Mohamed, S., Mahmoud, N, & Khalid W. (2019): Effect of Nursing Instructions on Knowledge and Practice of Mothers Having Children with Leukemia Undergoing Chemotherapy. *The Medical Journal of Cairo University*, 87(June), 2447-2458. Doi: 10.21608/mjcu.2019.54853

Tork, H.M., and Mersal, F. A. (2021); Effect of Pictorial Information Booklet on

Mothers' Care of Their Children with Leukemia, *Egyptian Journal of Health Care*, 2021 EJHC Vol. 12. No. 1, at: <https://www.researchgate.net/publication/359150619>

Turki, Z.A., Ibrahim, E.I., Abdelaziz, L.A., and Hafez, B.S., (2022): Epidemiological Characteristics of Non-Hodgkin Lymphoma in Clinical Oncology and Nuclear Medicine Department in Zagazig University hospital (2013-2017), *Article 17, Volume 28, Issue 1, January 2022, Page 145-150* DOI:10.21608/zumj.2019.17056.1525

Zhang, J., Meng, L., Jiang, W., et al, (2020): Identification of clinical molecular targets for childhood Burkitt lymphoma, *Transl Oncol.* 2020 Dec;13(12): PP.100855. Epub 2020 Sep 15. Doi: 10.1016/j.tranon.2020.100855.