

Effect of Self-Management Guidelines on Chemotherapy Associated Symptoms among Non-Hodgkin Lymphoma Patients

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Abstract

Background: Non-Hodgkin's lymphoma patients undergoing chemotherapy have symptoms that continue to place a significant burden and preventing them from living normally. This requires non-hodgkin's lymphoma patients to engage in a range of self-management actions. **The aim of this study** was to assess the effect of self-management guidelines on chemotherapy associated symptoms among non-Hodgkin lymphoma patients. **Design:** A quasi experimental design. **Setting:** the study was conducted at the hematology unit in Ain Shams University Hospital. **Subjects:** A purposive sample of 76 adult patients. **Data collection tools:** Three tools were used in this study, structured interview questionnaire for the non-hodgkin's lymphoma patients undergoing chemotherapy, self-care practices questionnaire, and symptoms experience tools. **Results:** Regarding total level knowledge, 28.9% of the studied patients had satisfactory level of total knowledge pre implementation of self-management guidelines which improved to 65.8% with a highly significant difference post implementation of self-management guidelines ($P \leq 0.001$). While 26.3% of the studied patients had satisfactory level of total self-care practices pre implementation of self-management guidelines which improved to 57.9% with a highly significant difference post implementation of self-management guidelines ($P \leq 0.001$). There was a significant improvement on patients' symptoms experience post implementation of self-management guidelines. **Conclusion:** The implementation of self-management guidelines for patients with non-Hodgkin's lymphoma undergoing chemotherapy has a statistically significant positive effect on their knowledge, self-care practice and associated symptoms which support the stated hypothesis. **Recommendation:** This study recommends the importance of developing tailored self-management programs for fatigue, nausea, vomiting and oral mucositis to understand and promote chemotherapy associated symptoms self-management in patients with non-hodgkin's lymphoma disease.

Key words: Non-Hodgkin's lymphoma, Associated symptoms, Self-management Guidelines

Introduction

Non-Hodgkin's lymphomas (NHLs) are a heterogeneous group of lymphoproliferative disorders originating in B, T, or natural killer (NK) lymphocytes. It represents the 10th most commonly diagnosed cancer Worldwide. There were an estimated 356 000 new cases of NHL and 192 000 deaths from

NHL worldwide and the disease accounts for ~5.1% of all cancer cases and 2.7% of all cancer deaths (*Boffetta, 2011*).

Non-Hodgkin's lymphoma can cause symptoms including swollen lymph nodes (for example, in the neck, armpits, or groin), fever, drenching night sweats, unintentional weight loss, fatigue, and discomfort. Treatments for this disease,

including chemotherapy, monoclonal antibodies, immunotherapy, radiation, and steroids (*American Cancer Society, 2017*).

Chemotherapy is the main treatment for most patients with NHL. Depending on the type and the stage of the lymphoma, chemotherapy treatment may be used alone or combined with other treatments, such as immunotherapy drugs or radiation therapy (*National Comprehensive Cancer Network (NCCN), 2018*).

The most important and the most common distressing side effects of chemotherapy are: fatigue, nausea, vomiting, and oral mucositis. Those associated symptoms have significant effects on many aspects of patients' lives, especially those related to eating, physical, emotional, and social functioning (*Lavdaniti, 2015*).

The optimal management of these symptoms is crucial to improving the chemotherapy treatment experiences of patients with NHL. Effective management of these symptoms requires comprehensive and multi-dimensional strategies to recognize the subjective and complex nature of each of these symptoms and manage them (*Lou, 2011*).

Self-management approach includes several techniques, such as, action plans, problem solving, self-monitoring, coping skills, stress management, sharing experiences, coaching, motivation and confidence building, positive feedback, and peer modeling to support and empower patients with NHL, so their quality of life will be enhanced (*Howell, Harth, Brown, Bennett & Boyko, 2016*).

In the self-management guidelines, the patient must assume more responsibility for achieving the best outcomes from their care. Providing educational content and strategies about self-management is very important to improve NHL patient's ability to carry out optimal self-care and promote confidence in their ability to perform a specific activity or skill (*Anderson, Steele & Coyle, 2013*).

Significance of the study

Fatigue, nausea, vomiting and oral mucositis are considered the most common symptoms that occurred for NHL patients undergoing chemotherapy and they have known as a distressing effect and therefore greatly influence treatment outcomes (*Hensley, 2009*). These symptoms continue to place a significant burden on many NHL patients undergoing chemotherapy and preventing them from living normally. This requires NHL patients to engage in a range of self-management actions (*Dicato, 2013*).

Advocating for Effective self-management strategies can help NHL patients to use coping strategies to manage symptoms and to take an active and positive approach to their NHL experiences (*King & Hinds, 2012*).

Aim of the study

This study aims to assess the effect of self-management guidelines on chemotherapy associated symptoms among non-Hodgkin lymphoma patients through the following:

1. Assess self-management of non-Hodgkin lymphoma patients undergoing chemotherapy related to

fatigue, nausea, vomiting and oral mucositis.

2. Develop and implement self-management guidelines on non-Hodgkin lymphoma patients undergoing chemotherapy related to fatigue, nausea, vomiting and oral mucositis.
3. Assess effect of self-management guidelines on non-Hodgkin lymphoma patients undergoing chemotherapy related to fatigue, nausea, vomiting and oral mucositis.

Research Hypothesis

The current study hypothesized that:

The implementation of self-management guidelines for NHL patients undergoing chemotherapy will affect positively on their knowledge, their self-care practice, and chemotherapy associated symptoms.

Subjects and Methods

1- Technical design:

The technical design includes research design, setting, subjects and tools of data collection used in this study.

Research design:

A quasi experimental design that is defined as an **empirical** interventional study used to estimate the **causal** impact of an intervention on its target population without **random assignment** was used to achieve the aim of the present study (*Silverman, 2016*).

Setting:

This study was conducted in Hematology Unit that is located in the third floor which consists of 14 rooms, among them there are 4 isolated rooms and each room contains 2 beds at Ain Shams University Hospital.

Subject:

Based on retrospective statistical dataa number of NHL patients that admitted to the previous mentioned setting (2014-2015) were 438, A purposive sample was (76) patients.

The sample size calculation done based on power analysis/

- Type I error with significant level (α) = 0.5
- Type II error by power test (1-B) = 90%
- Found the minimum sample (76) cases.

Inclusion Criteria:

- Adult patients aged ≥ 35 years diagnosed with Non-Hodgkin lymphoma undergoing chemotherapy, free from any other chronic diseases that may be interfere with self management, who don't receive any self management guidelines or educational instructions and agree to participate in the study.

Tools of data Collection:

The tools used in this study were:

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- 1- Structured Interview Questionnaire for the NHL patients undergoing chemotherapy.
- 2- Self-care practices questionnaire.
- 3- Symptoms experience tools (Fatigue, nausea, vomiting, and oral mucositis).

1- Structured Interview Questionnaire for the NHL patients undergoing chemotherapy (Appendix I)

It was designed by the researcher and written in simple Arabic language. It was filled by the researcher and it included 3 parts as follows:

❖ Part 1: Socio-demographic Data of the NHL patients undergoing chemotherapy.

This part was included 11 variable questions (closed ended questions, true and false questions). It was concerned with assessment of socio-demographic characteristics of the NHL patients under study such as patients' age, gender, occupation, marital status, level of education, income, cost of treatment, residence, home condition, and smoking.

▪ Part 2: Medical Health Profile of the NHL patients undergoing chemotherapy.

It was developed based on the related literature (*Black & Hawks, (2008); Berger, Shuster & Roenn, 2013*). It was included 15 true and false questions. It was concerned with NHL patients' history which include present history (time of discovering disease, causes of hospital admission, lab investigations, chemotherapy treatment regimen), and past history (family history,

surgical history, medication not related disease).

▪ Part 3: patients' Knowledge regarding NHL disease and its management:

It was developed based on the related literature (*Canellos, Lister & Young, 2006; Gates & Fink, 2008; Carpenito-Moyet, 2010*). This part was included 29 MCQ questions. It divided into three sections as the following:

- **Section I-** Assess patients' knowledge regarding non-Hodgkin lymphoma disease (pre and post test format) (as definition, risk factor, diagnosis, signs and symptoms, treatment, and complication) (7 questions),
- **Section II-** Assess patients' knowledge regarding chemotherapy treatment (pre and post test format) (as definition, purpose, methods of administration, precautions, and complications) (6 questions).
- **Section III-** Assess patients' knowledge regarding self-management related to fatigue, nausea, vomiting and oral mucositis (pre and post test format) (as definition and importance of self-management, definition and causes of fatigue, nausea, vomiting, oral mucositis, and self-management of those associated symptoms) (16 questions).

Scoring system:

The total score of knowledge was 29 grades. Each correct answer was given one grade and the incorrect answer was given zero.

It was considered as follows:

- $\geq 60\%$ satisfactory level of knowledge when the total grades were ≥ 17 grades.
- $< 60\%$ unsatisfactory level of knowledge when the total grades were < 17 grades.

2- Self-care practices questionnaire (Appendix II):

It was developed based on the related literature (*Daniels, Nicoll, & John 2007; Courneya & Friedenreich, 2011; Decker & Lee, 2011; Dunphy & Winland-Brown, 2012; Bauer, 2014*). It was assessed NHL patients' self-care practices related to management of fatigue, nausea, vomiting and oral mucositis (pre and post test format) (58 true and false questions).

Scoring system:

The total score of self-care practices was 58 grades. Each correct answer was given one grade and the incorrect answer was given zero.

It was considered as follows

- $\geq 60\%$ satisfactory level of knowledge when the total grades were ≥ 35 grades.
 - $< 60\%$ unsatisfactory level of knowledge when the total grades were < 35 grades.
- ### 3- Symptoms experience tools (Fatigue, nausea, and oral mucositis) (Appendix III):

It included 3 parts as follows:

Part 1. Functional assessment fatigue scale: this scale was adapted from *Lou, (2011)*. It included 37 items to assess patients' fatigue experience and its effect on physical (13 items), psychological (7 items), social (8 items), and functional wellbeing (9 items) (pre and post test format).

Scoring system:

The functional assessment fatigue scale included 37 items ranged from 1 grade (rarely) = good, 2 grade (sometimes) = average, and 3 grade (always) = poor.

The scores of the items in each subgroup were summed up and the total scores were divided by the number of items in each subgroup, giving a mean score for the subgroup, also, the total mean for the functional assessment fatigue scale was calculated.

- Poor functional assessment fatigue scale = $0 < 50\%$
- Average functional assessment fatigue scale = $50 < 75\%$
- Good functional assessment fatigue scale = 75% and more

Part 2. Multinational Association for Supportive Care in Cancer (MASCC) Antiemesis scale: it was adopted from *Klastersky & Paesmans, (2013)* to measure the incidence of nausea and vomiting, frequency of nausea and vomiting (4 items for the first 24 hours and 4 items after 24 hours from received chemotherapy) (pre and post test format).

Scoring system:

The patients' response MASCC Antiemesis scale (4 items of frequency of nausea and vomiting) was made on a 10 point likert response scale, where 0 = no problem, from 1 < 3 = mild problem, from 4 < 6 = moderate problem, from 7 < 10 = severe problem.

The scores of the items in each subgroup were summed up and the total scores were divided by the number of items in each subgroup, giving a mean score for the subgroup, also, the total mean for MASCC Antiemesis scale was calculated.

Part 3. The oral mucositis quality of life scale: this scale will be adapted from *Lou, (2011)*. It included 31 items and was used to assess the symptoms related to oral mucositis (9 items), their effect on diet (10 items), social life (7 items) and swallowing function (5 items).

Scoring system:

The oral mucositis quality of life scale included 31 items ranged from 1 grade (rarely) = good, 2 grade (sometimes) = average, and 3 grade = poor (always).

The scores of the items in each subgroup were summed up and the total scores were divided by the number of items in each subgroup, giving a mean score for the subgroup, also, the total mean for the oral mucositis quality of life scale was calculated.

- Poor quality of life for patients with oral mucositis = 0 - < 50%.
- Average quality of life for patients with oral mucositis = 50% < 75%.

- Good quality of life for patients with oral mucositis = 75% and more.

2-Operational Design:

It includes preparatory phase, content validity and reliability, pilot study and field work.

A. The preparatory Phase:

This phase was carried out through the following steps:

1- Reviewing of related literature, and theoretical knowledge of various aspects of the study using books, articles, internet, periodicals and magazines to develop data collection tools.

2- Outlining all areas to be included in the self-management guidelines through extensive review of the literature and other available resources.

3- Designing the self-management guidelines, preparation and developing of its content as the following:

- Definition, components, and functions of the lymphatic system.
- Definitions, risk factors, signs, symptoms, diagnosis, stages, types, and medical treatments of Non-Hodgkin's lymphoma disease.
- Chemotherapy, its side effects, and follow up.
- Self-management of fatigue, nausea & vomiting, and oral mucositis.

4- Obtaining experts' opinion to ensure self-management guidelines contents validity.

B. Validity and Reliability

Testing validity of the proposed tools by inspecting the items to determine whether the tools measure what supposed to measure (*Sharma, 2014*). The stage developed by a jury of 7 experts from different academic categories (professors and assistant professors) of the medical – surgical nursing at the faculty of nursing, Ain Shams University. The expertise reviewed the tools for clarity, relevance, comprehensiveness, simplicity and minor modification was done.

Testing reliability of the proposed tools was done statistically by Cronbach alpha test. Reliability is defined as the overall consistency of a measure. A measure is said to have a high reliability if it produces similar results under consistent conditions (*Sharma, 2014*). See appendix IV

- Cronbach alpha for knowledge was 0.840.
- Cronbach alpha for self care practices was 0.850.
- Cronbach alpha for functional assesment fatigue scale was 0.876.
- Cronbach alpha for oral mucositis quality of life scale was 0.893.

C. Pilot Study:

Before performing the actual study, a pilot study carried out for 8 patients with NHL (10%) with chemotherapy associated symptoms in the

hematological unit in Ain Shams University hospital to test clarity, applicability of tools used in this study. Some modifications were done based on pilot study. The patients who included in the pilot study were excluded from the main study group.

D. Field Work:

The study was started and finished through the following phases.

Assessment and planning phase:

- The researcher met the patients with NHL at the Hematology Unit of Ain Shams University Hospital.
- The patients who fulfilled the inclusion criteria were selected.
- The researcher obtained the patients' oral consent for participating in this study after explaining the aim of the study.
- Filling in the previous mentioned tools was done by the researcher before implementation of the self-management guidelines.
- These tools were completed within an average time 70 minutes.
- All information collected through data collection tools were interpreted for identifying individualized teaching needs.
- The researcher set up teaching plan covering all objectives (equipping, acquiring, and demonstrating knowledge, practice about disease, chemotherapy, associated

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symptoms, and self –management guidelines)

- The resources and facilities for applying self-management guidelines were allocated (printed material, power point presentation, videos and location of session that best serve the learners).
- The appointment for starting teaching sessions was determined and scheduled with the patients (Monday, Wednesday weekly).

Implementation phase:

- The teaching sessions were conducted in a classroom in Hematology unit. The Classroom was conditioned, quite, had adequate lighting, well ventilated and furnished, and had adequate spacing for the place for implementing self-management guidelines.
- Each session of self-management guidelines had taken two hour/ day for 2 days (Monday, Wednesday) per week. These sessions were conducted for small group; each group number didn't exceed 10 patients.
- At the beginning of the each session, an orientation of the importance of self-management guidelines was explained to the patients to motivate them to follow these guidelines.
- Each session started by greeting the patients, assessing patients' motivation for learning, present the objectives, showing, and explaining the topic by using simple language to suit the educational level of the patients. Getting feedback about

what was explaining and given through the session and facilitate for asking any questions about the topic.

- The researcher emphasized the importance of adherence to each step of self-management guidelines on chemotherapy related fatigue, nausea, vomiting, and oral mucositis through building a supportive environment. The researcher encouraged patients to express his/her readiness for changing the behavior.
- Implementation of self-management guidelines on chemotherapy related fatigue, nausea, vomiting, and oral mucositis lasted over a period of 4 months for all patients.
- The collection of data and application of self-management guidelines lasted over a period of twelve months; starting at February 2017 and ending in February 2018.

Evaluation phase:

- The evaluation phase emphasized on determining the effect of self-management guidelines on chemotherapy related fatigue, nausea, vomiting and oral mucositis among patients with NHL through filling in the tools concerned with knowledge, self-care practices, and symptoms experience again after implementation of the self-management guidelines. Comparing the collected data before, after (three months) application of self-management guidelines.

3- Administrative Design:

An official letter was issued from the faculty of nursing-Ain Shams

University to the medical and nursing director of El- Demerdash hospital and the medical and nursing director of hematology unit, explaining the purpose of the study and requesting the permission for data collection from the study patients.

Ethical Considerations

The ethical research considerations in this study included the following:

- The research approval was obtained from the faculty ethical committee before starting the study.
- The researcher clarified the objectives and aim of the study to patients included in the study before starting
- The researcher assured maintaining anonymity and confidentiality of subjects' data of the patients included in the study
- Patients were informed that they were allowed to choose to participate or not in the study and they had the right to withdraw from the study at any time.

Statistical Design:

All data were collected, tabulated and subjected to statistical analysis. Statistical analysis is performed by SPSS in general (version 17), also Microsoft Office Excel is used for data handling and graphical presentation. Quantitative variables are described by the Mean, Standard Deviation (SD), while qualitative categorical variables are described by proportions and percentages.

Chi-squared test of independence is used for categorical variables. Test of significance was used and regarding significance of the result, the observed differences and associations were considered as follows:

Non-significant (NS) $P > 0.05$

Significant (S) $P \leq 0.05$

Highly significant (HS) $P \leq 0.01$

Result

Table (1): Shows that the mean age of the studied patients was 46.57 ± 5.89 and 78.9% of studied patients were males affected with non-hodgkin's lymphoma and working, 96.1% were married and 50.0% had basic education.

Figure (1): shows that, 28.9% of the studied patients had satisfactory level of total knowledge pre implementation of self-management guidelines which improved to 65.8% post implementation of self-management guidelines.

In relation to patients' knowledge about NHL disease and chemotherapy pre implementation of self-management guidelines table 2, revealed that patients had satisfactory level of knowledge (21.1%, & 44.7% respectively), which improved to (65.8%, & 78.9%) post implementation of self-management guidelines with a highly significant difference at ($P \leq 0.001$).

In relation to patients' level of knowledge regarding self-management related to fatigue, nausea, vomiting, and oral mucositis pre implementation of self-management guidelines table 3, showed that 21.1% of patients had satisfactory

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level of knowledge which improved to 53.9% post implementation of self-management guidelines with a highly significant difference at ($P \leq 0.001$).

Figure (2): Shows that, 26.3% of the studied patients had satisfactory level of total self-care practices pre implementation of self-management guidelines which improved to 57.9% post implementation of self-management guidelines.

Table (4): shows that 40.8% of the studied patients had poor physical, social, emotional, and functional wellbeing of fatigue which improved to 17.1% post implementation of self-management

Table (1): Number and percentage distribution of socio-demographic characteristics of the patients under study (n=76).

guidelines with a significant difference at ($P < 0.05$).

Table (5): revealed that 11.8% of the studied patients had good quality of life for oral mucositis which improved to 52.6% post implementation of self-management guidelines with a highly significant difference at ($P \leq 0.001$).

Table (6): Shows that, there was highly statistically significant relation between patients` total level of knowledge and their total level of self-care practices related to fatigue, nausea, vomiting, and oral mucositis at ($P \leq 0.001$) post implementation of self-management guidelines.

Socio-demographic characteristics	No.	%
Age		
35 < 45	8	10.5
45 < 55	56	73.7
55 and more	12	15.8
Mean±SD	46.57±5.89	
Gender		
Male	60	78.9
Female	16	21.1
Occupation		
Work	60	78.9
doesn` t work	16	21.1
Marital status		
Married	73	96.1
Un married	3	3.9
Educational level		
Illiterate	6	7.9
Reads & writes	15	19.7
Basic	38	50.0
Bachelor	17	22.4

Figure(1):Patients` total level of knowledge pre and post implementation of self-management guidelines

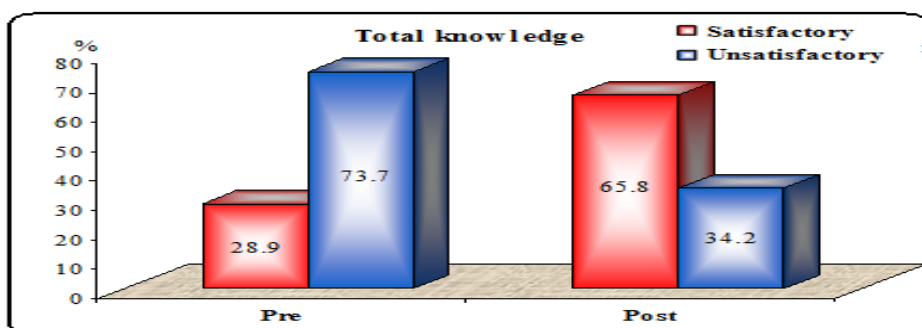


Table (2):Patients` level of knowledge regarding NHL disease, chemotherapy treatment, pre and post implementation of self-management guidelines. (n =76).

Knowledge	Pre		Post		Chi-square X ²	P-value
	Satisfactory %	Unsatisfactory %	Satisfactory %	Unsatisfactory %		
Patients` knowledge about non- Hodgkin's lymphoma						
Definition non Hodgkin lymphoma	14.5	85.5	42.1	57.9	14.302	0.001**
Signs and symptoms	31.6	68.4	42.1	57.9	1.810	0.179
The risk factors	21.1	78.9	100.0	0.0	99.130	0.001**
Test to confirm the diagnosis	3.9	96.1	31.6	68.4	19.861	0.001**
test to determine the stage of the disease	3.9	96.1	42.1	57.9	31.217	0.001**
complications	22.4	77.6	100.0	0.0	96.430	0.001**
The main treatment options	47.4	52.6	100.0	0.0	54.286	0.001**
Total	21.1	78.9	65.8	34.2	30.957	0.001**
Patients' knowledge about chemotherapy						
Definition chemotherapy	27.6	72.4	89.5	10.5	59.884	0.001**
the purpose of chemotherapy	0.0	100.0	31.6	68.4	28.500	0.001**
chemotherapy is given through	27.6	72.4	88.2	11.8	57.108	0.001**
Before taking the necessary dose, patient should	84.2	15.8	100.0	0.0	13.029	0.001**
After taking the dose, patient should inform the doctor immediately when	3.9	96.1	63.2	36.8	59.755	0.001**
complications of chemotherapy	80.3	19.7	100.0	0.0	16.642	0.001**
Total	44.7	63.2	78.9	21.1	22.997	0.001**

P> 0.05 non-significant **P ≤ 0.001 highly significant

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Table (3): Patients` level of knowledge regarding self-management related to fatigue, nausea, vomiting, and oral mucositis pre and post implementation of self-management guidelines. (n =76).

Knowledge	Pre Satisfactory	Unsatisfactory	Post Satisfactory	Unsatisfactory	Chi-square	P-value
	%	%	%	%	X ²	
Self-management to deal with fatigue						
Definition fatigue	7.9	92.1	44.7	55.3	26.600	0.001*
Cause of fatigue	7.9	92.1	75.0	25.0	70.510	0.001*
Avoiding fatigue	5.26	94.74	31.6	68.4	17.512	0.001*
Self-management to deal with nausea and vomiting						
Definition nausea	17.1	82.9	53.9	46.1	22.519	0.001*
Definition vomiting	35.5	64.5	88.2	11.8	44.607	0.001*
Acute nausea and vomiting	3.94	96.06	31.6	68.4	19.861	0.001*
Delayed nausea and vomiting	21.1	78.9	76.3	23.7	46.453	0.001*
The vomiting occurred through	32.9	67.1	52.6	47.4	6.048	0.014*
Measure for avoiding nausea and vomiting	27.6	72.4	47.4	52.6	6.316	0.012*
Self- management to deal with oral mucositis						
Definition oral mucositis	22.4	77.6	44.7	55.3	8.528	0.003*
Oral mucositis associated with	15.8	84.2	76.3	23.7	56.033	0.001*
Cause of oral mucositis	40.8	59.2	100.0	0.0	63.925	0.001*
Dealing with oral mucositis	47.4	52.6	63.2	36.8	3.832	0.050*
Total	21.1	78.9	53.9	46.1	17.544	0.001*

*P ≤ 0.05 significant **P ≤ 0.001 highly significant

Figure(2):Patients` total level of self-care practices pre and post implementation of self-management guidelines

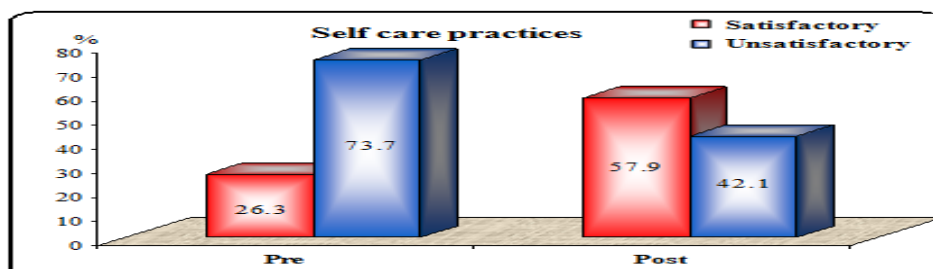


Table (4):Total patients' fatigue experience pre and post implementation of self-management guidelines (n=76).

Functional Assessment Fatigue Scale	Pre			Post			Chi-square	
	Good %	Average %	Poor %	Good %	Average %	Poor %	X ²	P-value
Physical Well-being	0.0	9.2	90.8	19.7	51.3	28.9	61.536	0.001**
Social Well-being	59.2	30.3	10.5	78.9	21.1	0.0	62.120	0.001**
Emotional well-being	0.0	64.5	35.5	56.6	27.6	15.8	39.895	0.001**
Functional Well-being	5.3	18.4	76.3	25.0	39.5	35.5	19.598	0.001**
Total	21.1	38.2	40.8	53.9	28.9	17.1	6.222	0.045*

*P<0.05 significant **P≤ 0.001 highly significant

Table (5): Total patients` oral mucositis quality of life pre and post implementation of self-management guidelines (n=76).

Oral Mucositis Quality of life	Pre			Post			Chi-square	
	Good %	Average %	Poor %	Good %	Average %	Poor %	X ²	P-value
Symptoms	2.6	69.7	27.6	39.5	32.9	27.6	33.086	0.001**
Diet	5.3	48.7	46.1	48.7	28.9	22.4	22.201	0.001**
Social function	31.6	56.6	11.8	72.4	19.7	7.9	25.080	0.001**
Swallowing	6.6	77.6	15.8	48.7	43.4	7.9	67.070	0.001**
Total	11.8	63.2	25.0	52.6	31.6	15.8	25.549	0.001**

**P≤ 0.001 highly significant

Table (6): Relation between patients` level of knowledge and their self-care practices related to fatigue, nausea, vomiting, and oral mucositis post implementation of self-management guidelines (n=76).

Total practice	Total knowledge			Chi-square	
	Satisfactory %	Unsatisfactory %	Total %	X ²	P-value
Satisfactory	95.5	4.5	100.0	40.859	0.001**
Unsatisfactory	25.0	75.0	100.0		
Total	65.8	34.2	100.0		

**P≤0.001 highly significant

Discussion

Non-Hodgkin lymphoma is one of the more aggressive forms of lymphoma types. In non-Hodgkin lymphoma, the affected lymphocytes lose their infection-fighting properties, making patients more vulnerable to infection (Cheson et al., 2014).

Chemotherapy is the most common treatment options of NHL patients, although they reported deteriorated symptoms as fatigue, nausea, vomiting, and oral mucositis with this treatment. So it is important to apply self-management education interventions to support NHL patients undergoing chemotherapy (Hibbard & Greene, 2013).

Concerning the studied patients' socio-demographic characteristics, the results of the present study revealed that the mean age of the studied patients was 46.57 ± 5.89 , this finding is inconsistent with the study conducted in **South Egypt Cancer Institute (Assiut) about descriptive study of lymphomas by Gomaa, (2011)**, who founded that the mean age of the studied patients was 24.8 ± 23.8 .

While more than three fourth of the studied patients were males. This might be due to increase incidence of NHL disease among males. This finding is consistent with the study about **descriptive study of lymphomas by Gomaa, (2011)**, who showed that more than one half of his studied patients were males.

Related to occupation, more than three fourth of the studied patients were working, and regarding to marital status, the majority of them were married. These findings are in agreement with the study about **clinical presentation and predictive criteria for preoperative diagnosis of primary ovarian lymphoma among NHL patients in Kasr El -Aini hospital by Mahmoud, Nabil, El Desouky & Khorshed, (2017)**. As more than two third of their studied patients were working and married.

As regard to educational level, one half of the studied patients had basic education, and this result contradicted with the research conducted about **descriptive study of lymphomas by Gomaa, (2011)**, who stated that more than one third of the studied patients had basic education.

Concerning patients' level of total knowledge regarding NHL disease, the current study revealed that less than one forth of the studied patients had satisfactory knowledge about disease. While about two

third of them had satisfactory level of knowledge post implementation self-management guidelines with highly statistically significant difference at ($P \leq 0.001$). This might attribute to effectiveness of self-management guidelines on enhancing knowledge and empower patients to better manage their disease and related problems.

This finding is consistent with **Elfeky, (2014)**, who studied **assessment of biopsychological needs of NHL patients undergoing chemotherapy**, and reported that that one half of the studied patients had unsatisfactory level of total knowledge regarding disease, chemotherapy and how to deal with the side effects of chemotherapy.

Also this finding is supported by the study conducted on **lymphoma intervention: patient-reported outcome feedback and a web-based self-management intervention for patients with lymphoma: study protocol for a randomised controlled trial, by Arts et al., (2017)**, who showed that increasing self-management skills and satisfaction with information were effective on the living with lymphoma disease.

Concerning patients' level of total knowledge regarding chemotherapy. The current study showed that less than one half of the studied patients had satisfactory level of total knowledge about chemotherapy. While more than three fourth of them had satisfactory level of total knowledge about chemotherapy with highly statistically significant difference at ($P \leq 0.001$) post implementation self-management guidelines. This is assuring that the importance of patients' active participation in self-management guidelines in seeking acquiring knowledge about chemotherapy, and improving patient satisfaction.

This finding is consistent with the study about **patient education: its effect on quality of life of patients with cancer on chemotherapy** by Aziz, (2011) in Egypt who founded that, there were highly statistically significant differences in patient's level of knowledge pre/ post one month and post six months from the educational intervention about cancer in relation to all items (definition & causes of cancer, treatment of cancer, definition and purpose of chemotherapy, side effects, care to overcome these side effects, and relaxation techniques to reduce the side effects).

Also this finding is supported by the study conducted about **chemotherapy discharge education class improves patient safety**, by Goodman, (2017), who founded that education class about chemotherapy had a positive impact on patient safety at home.

In relation to patients` level of knowledge regarding self-management related to fatigue, nausea, vomiting, and oral mucositis. The current study revealed that less than one forth of the studied patients had satisfactory level of knowledge regarding self-management related to fatigue, nausea, vomiting, and oral mucositis pre implementation self-management guidelines which improved to more than one half with a highly significant difference post implementation self-management guidelines at ($P \leq 0.001$). This finding highlight the importance of self management guidelines in enhancing patients' knowledge regarding self-management related to fatigue, nausea, vomiting and oral mucositis.

In this finding **Loerzel, (2017)** founded that the positive impact of self-management strategies on symptom

management and patient outcomes, in article entitled **symptom self-management strategies used by older adults receiving treatment for cancer**.

The current study revealed that more than one forth of the studied patients had satisfactory level of self-care practices related to fatigue, nausea, vomiting, and oral mucositis which improved to more than one half with a highly significant difference post implementation self-management guidelines at ($P \leq 0.001$). This might be due to application of self management guidelines and its importance in improving patients` self-care practices.

This finding supported by the study conducted in **China** about **self-management of cancer treatment-related fatigue, nausea, vomiting and oral mucositis in Chinese cancer patients** by Lou, (2011) who recommended that developing tailored self-management programs for fatigue, nausea, vomiting and oral mucositis to increase relief and control level on these symptoms.

On the other hand, the study conducted in **China** about **self-management of chemotherapy-related nausea and vomiting: a cross-sectional survey of chinese cancer patients** by Lou, Yates, McCarthy & Wang, (2014), who stated that patients should be supported to engage in behaviors including taking antiemetics, modifying their diet, using psychological strategies, and creating a pleasant environment to enhance chinese patients' self-management of chemotherapy-related nausea and vomiting .

The current study revealed that less than one forth of the studied patients had good physical, social, emotional, and functional wellbeing of fatigue which

improved to more than one half with a significant difference post implementation self-management guidelines at ($P < 0.045$). This might attribute to the influence of self management guidelines on improving patient symptom experience related to fatigue and its effect on physical, social, emotional, and functional wellbeing.

This finding is on the same line with the study about **cancer-related fatigue: impact on patient quality of life and management approaches by Yeo & Cannaday, (2015)** who revealed that cancer treatment-related fatigue is a common and distressing symptom that is present in the majority of cancer patients and has a profound influence on patients, affecting functional performance, mood, and one's overall quality of life. Also they recommended for management from national and international cancer experts and societies focus on patient and family education regarding cancer-related fatigue, exercise and physical activity, and psychosocial interventions.

Moreover the study about **assessment and management of cancer-related fatigue by Borneman, (2013)** who stated that fatigue is one of the most common symptoms experienced by patients with cancer treated with chemotherapy and/or radiation. So clinicians need to assess and readjust the management of fatigue along the patient's cancer experience and empowering patient and family education in the areas of pain control, proper nutrition and hydration, exercise, and energy conservation to improve a sense of control over fatigue.

Regarding assessment of quality of life (symptoms associated with oral mucositis, diet, social function, swallowing) of patients with oral mucositis pre implementation of self-management

guidelines, the current study revealed that more than one tenth of the studied patients had good quality of life of oral mucosa which increased to more than one half with a highly significant difference post implementation self-management guidelines at ($P \leq 0.001$). This might be due to that self-management guidelines focusing on palliative measures such as pain management, nutritional support and maintenance of good oral hygiene was very important in alleviating complications and severity of oral mucositis.

This finding is agreed with the study conducted in **China** about **the effectiveness of a self-efficacy-enhancing intervention for chinese patients with colorectal cancer: A randomized controlled trial with 6-month follow up by Zhang et al., (2014)**, they found that the patients who engage in self-management programs had significant improvement in their self-efficacy ($F = 7.26, p = 0.003$) and a reduction of oral mucositis severity ($F = 5.30, p = 0.01$), and oral mucositis interference ($F = 4.06, p = 0.025$), at three and six months, compared with the control group.

Also **Lalla, Sonis & Peterson, (2008)** stated in the study about **management of oral mucositis in patients with cancer** that mucositis lesions can be painful, affect nutrition and quality of life, and have a significant economic impact. So the self management strategies are very important in alleviating symptoms associated with oral mucositis and improving quality of life.

Concerning relations between patients' level of knowledge, and their self-care practices. The current study showed that there was highly statistically significant relation between patients' total level of knowledge and their total level of self-care

practices related to fatigue, nausea, vomiting, and oral mucositis at ($P \leq 0.001$) post implementation of self-management guidelines. This might attribute those patients who obtained further information on their disease conditions lead to assume the responsibility for their own health and their participation in self-care.

This finding is in the line with the study about **self-care concept analysis in cancer patients, by Hasanpour-Dehkordi, (2016)** who showed that patients with higher education about disease and treatment did self-care more frequently and had a higher quality of life compared to those with lower or no education.

Also

Howell, Harth, Brown, Bennett & Boyko, (2017) showed that the effectiveness of self-management education on supporting patients with cancer and developing the skills needed for effective self-management of their disease and the acute or immediate, long-term, and late harmful effects of treatments in the study about **self-management education interventions for patients with cancer: a systematic review.**

Conclusion

Based on findings of the present study, it can be concluded that:

There was a significant improvement on patients' knowledge, self-care practices and symptoms experience related to fatigue, nausea, vomiting, and oral mucositis post implementation of self-management guidelines with a highly significant difference pre and post implementation self-management guidelines. The implementation of self-management guidelines for patients with NHL undergoing chemotherapy has a statistically

significant positive effect on their knowledge, self-care practice and associated symptoms which support the stated hypothesis.

Recommendations

Based on the results of the current research, the following suggestions for future research and practice are proposed:

1. Full-day educational programs that provide the latest information about non-hodgkin's lymphoma, chemotherapy treatment, and self-management approach to support patients and manage their disease effectively.
2. Specific assessment and innovative approaches for management of fatigue, nausea, vomiting, and oral mucositis associated with chemotherapy treatment are highly needed to better understand patients' needs and concerns when experiencing these symptoms.
3. Developing tailored self-management programs for fatigue, nausea, vomiting and oral mucositis to understand and promote chemotherapy associated symptoms self-management in patients with NHL disease.
4. Further studies about the effect of the self-management guidelines on the NHL patients' quality of life and outcomes.

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