

Research Article

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A Study to Assess the Effect of Structured Teaching Programme on Knowledge of Patients with Acute Myeloid Leukaemia on Chemotherapy Schedule, Side Effects and its Management at a Tertiary Cancer Centre

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ABSTRACT

Acute myeloid leukemia (AML) is a hematopoietic stem cell disorder characterized by a block in differentiation of hematopoiesis, resulting in growth of a clonal population of neoplastic cells or blasts. Chemotherapeutics leads to side effects. To minimize potential toxicities and to maximize the optimal quality of life, nurse can assist the patient by providing instructions and making the care provider equipped with knowledge. The aim of the study was to assess the knowledge regarding chemotherapy, its side effects and its management in patients with AML and to assess the effect of structured teaching programme in experimental and control group. Quantitative, quasi-experimental pretest posttest control group design study was done

It was found that there is significant improvement in posttest knowledge score in experimental group (P value -0.000) and number of participants correctly answered to the items in questionnaire increased after the structured teaching program in experimental group.

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Key Message: Patient education during chemotherapy is as vital as chemotherapy therefore each and every patient undergoing chemotherapy should be educated about it.

Introduction

Acute myeloid leukemia (AML) is a hematopoietic stem cell disorder characterized by a block in differentiation of hematopoiesis, resulting in unregulated growth of malignant cells. This malignant alteration in hematopoietic stem cells leads to a loss of normal hematopoietic function, which, if left untreated, leads to death within weeks to months of its clinical presentation [1-3].

The incidence of AML progressively increases with age and in adults over the age of 65 years. The reasons behind increase in the incidence of AML is the age, genetic predisposition, radiation exposure and chemical exposure in form of pesticide in agriculture [4-6].

As per the cancer statistics in US (SEER database) in the year 2017, the estimated new cases of AML were 21380 and 5 year survival was 26.9 % [7].

Population-based cancer registry shows an alarming rise in cases of blood cancer in Mumbai and Delhi.9 Chemotherapy is one of the best modality of treatment but it has its own side effects like fatigue, nausea and vomiting, anorexia, diarrhea, weight loss, constipation, mucositis and cytopenia [5].

It can also lead to cardiac and renal dysfunction. Mollaoglu M stated that patients undergoing myelo-suppressive chemotherapy are at risk of developing neutropenia resulting in severe infections, treatment delays and adversely affecting patient's outcome and also the economic impact of neutropenia is considerable [8-11].

To minimize potential toxicities and to maximize the optimal quality of life, nurse can assist the patient & care provider by providing instructions [10].

This study assesses the effectiveness of a structured teaching programme on the knowledge of patients on chemotherapy schedule, side effects and its management in AML.

The Objectives

1. To assess the knowledge regarding chemotherapy, its side effects and its management in patients with AML in experimental and control group
2. To assess the effect of structured teaching programme on

chemotherapy, its side effects and its management in patients with AML in experimental and control group

- To find the association between knowledge scores and selected demographic variables of patients with AML.

Materials and Methods

Quantitative research approach was used for the study. The selected setting at Tata Memorial Hospital was general and private outpatient and inpatient department of Adult Medical oncology services unit. Data collection was started only after the clearance of institutional Review board, Institutional ethical committee, and Disease management group of Adult Medical oncology.

The research design selected for the present study was quasi-experimental pretest posttest control group design. The samples were 44 participants planned and receiving 3+7 chemotherapy diagnosed with acute myeloid leukemia (22 participants in the experimental group and 22 participants in the control group). Non probability convenient Sampling technique was used for the study. Informed written consent was obtained. Questionnaire was used to collect the data from the participants. Content validity and reliability($r=0.07$) of the tool was ensured. Pretest was conducted for both the experimental and control group. Structured teaching education was administered as per their convenience to the participants in the experimental group. The structured education was not given to the participants in the control group. The duration of the teaching was 40-45 minutes. The posttest was conducted on seventh day using same questionnaire in both the group.

Pilot study was conducted on Ten participants (Five participant in experimental group and Five participants in control group) to assess the feasibility of the study and was found to be feasible. The main study was conducted with 44 participants 22 participant in experimental group and 22 participants in control group at Tata Memorial Hospital, Parel from 19/03/2018 to 28/04/2018.

Data gathered were analyzed by using descriptive statistics and inferential statistics. Based on the analysis, interpretation was made. The analysis was made on the basis of objective of the study and hypothesis to be studied. The researcher decided to analyze the data using descriptive analysis and inferential statistics to present the data in tables and graphs with the help of SPSS software.

The Data Collected Has Been Analyzed and Presented in Sections Considering the Objective of the Study

Section 1: This section deals with analysis of distribution of participants based on demographic variables. The analysis is done in terms of frequency and percentage

Section 2: This section deals with analysis of distribution of participants in experimental/control group on the basis of obtained knowledge scores before and after the structured teaching program

Section 3: This section deals with the analysis and interpretation of data to compare the effect of Structured Teaching Programme on knowledge of patients with Acute Myeloid Leukemia within the experimental group and also between experimental and control group

Section 4: This section deals with association of post-test knowledge scores and selected demographic variables of experimental and control group

Results

Table 1: Distribution of participants according to demographic variables. N = 44

Demographic characteristics	Experimental n = 22		Control n = 22	
Age				
18 - 30 years	7	31.8	7	31.8
31 - 45 years	9	40.9	7	31.8
46 - 60 years	6	27.3	7	31.8
>60 years	0	0	1	4.5
Category				
NC-General	4	18.2	7	31.8
C-General	8	36.4	8	36.4
B - Private	10	45.5	7	31.8
Educational status				
No formal education	1	4.5	0	0
Primary	1	4.5	2	9.1
Secondary	13	59.1	8	36.4
Graduate and above	7	31.8	12	54.5
Informant				
Doctor	22	100	22	100
Nurse	0	0	0	0
Any other person	0	0	0	0

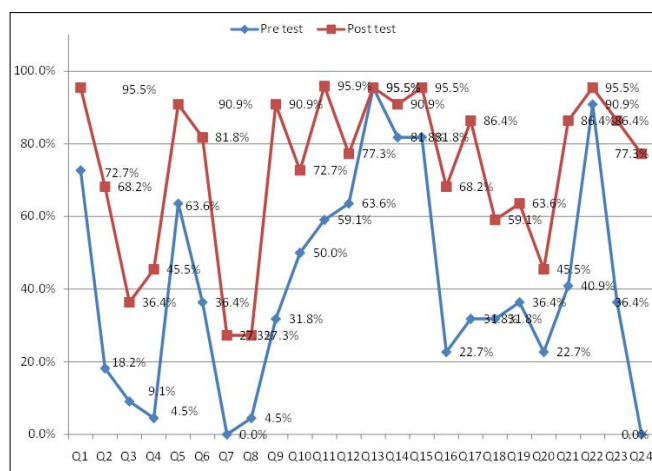


Figure 1: Represents the Assessment of pre and post knowledge of Patients regarding AML in experimental group, Knowledge regarding chemotherapy schedule and Knowledge regarding side effects of chemotherapy and its management which was improved and was statistically significant.

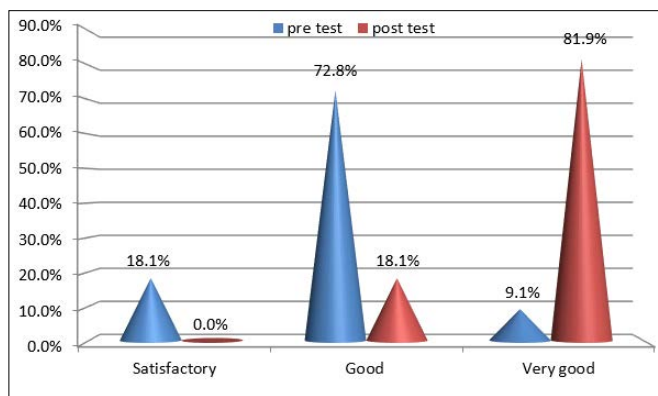


Figure 2: Represents distribution of knowledge level of participants regarding AML in experimental group. Overall increase in knowledge was seen in the last group of very good knowledge indicating a rise from 9.1% in the pre test group when compared with the 81.9% of the post test in the experimental group indicating a rise in the knowledge.

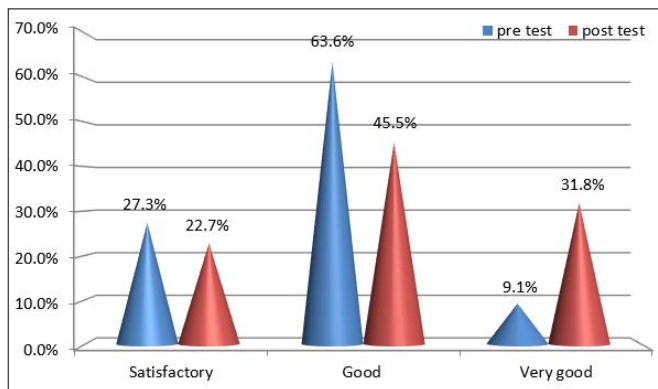


Figure 3: Represents distribution of knowledge level of participants regarding AML in control group. Otherwise above results show there is not much improvement in post knowledge of patients with Acute Myeloid Leukemia among control group samples in absence of any teaching programme.

Table 2: Comparison of mean pre-test scores and post test scores in experimental group
N- 22

Knowledge regarding AML in experimental group		MEAN	S. D.	M.D.	SEMD	t value	p value
About AML	Pre test	1.68	1.09	1.86	0.24	7.77	0.00
	Post test	3.55	0.96				
Chemotherapy Schedule in AML	Pre test	0.82	0.85	1.59	0.20	7.78	0.00
	Post test	2.41	0.59				
Side effects and its management in AML	Pre test	7.86	2.74	4.73	0.55	8.58	0.00
	Post test	12.59	1.84				
Overall knowledge	Pre test	10.36	3.95	8.18	0.73	11.28	0.00
	Post test	18.55	2.35				

df= 21 for a level of significance is 0.05 for table value of 2.08

As the calculated values for all the knowledge areas and overall knowledge is statistically greater than the table 't' value of 2.08 at 0.05 level of significance. So null hypothesis (H0) is rejected and alternate hypothesis (H1) is accepted for all knowledge areas and overall knowledge. Hence statistically there is a significant mean difference between pretest and post knowledge mean for all areas in the experimental group. The post test mean is significantly higher than pretest mean for all the knowledge areas and overall knowledge. Above results support the effectiveness of structured teaching program in increasing the knowledge of patients with Acute Myeloid Leukemia on chemotherapy schedule, its side effects and management at a tertiary cancer center within the experimental group.

Table 3: Comparison of posttest knowledge mean between experimental and control group N = 44

KNOWLEDGE		Mean	S. D.	M.D.	SEMD	t value	p value
About AML	Experimental	3.55	0.96	1.50	0.31	4.84	0.000
	Control	2.05	1.09				
Chemotherapy Schedule in AML	Experimental	2.41	0.59	0.82	0.24	3.41	0.001
	Control	1.59	0.96				
Side effects and its management in AML	Experimental	12.59	1.84	3.36	0.74	4.53	0.000
	Control	9.23	2.96				
Overall knowledge	Experimental	18.55	2.35	5.68	1.06	5.37	0.000
	Control	12.86	4.38				

df= 42 for a level of significance is 0.05 for table value of 2.02

Comparison of post test knowledge mean between experimental and control group

As the calculated values for all the knowledge areas and overall knowledge is statistically greater than the table ‘t’ value of 2.02 at 0.05 level of significance so null hypothesis (H01) is rejected and alternate hypothesis (H1) is accepted for all knowledge areas and overall knowledge. Hence statistically there is a significant mean difference between post knowledge mean of experimental and control group samples for all areas. The post test mean of experimental group is significantly higher than post test mean of control group samples for all the knowledge areas and overall knowledge.

Therefore, this proves that structured teaching programme was effective in increasing the knowledge of patients with Acute Myeloid Leukemia on Chemotherapy schedule, its side effects and management at a tertiary cancer center between the experimental group and control group.

Table 4: Association between post test knowledge scores of participants and selected demographic variables in experimental group N = 22

Demographic variable		N	Mean	Df	Calc. F value	Table F value	p value
Age	18 - 30 years	7	19.14	2,19	0.86	3.52	0.441
	31 - 45 years	9	18.78				
	46 - 60 years	6	17.50				
Category	NC-General	4	20.25	2, 19	1.34	3.52	0.287
	C-General	8	18.13				
	B – Private	10	18.20				
Education	No formal education	1	19.00	3, 18	1.58	2.93	0.230
	Primary	1	14.00				
	Secondary	13	19.00				
	Graduate & above	7	18.29				

The above table shows that based on the ‘F’ test for unpaired sample the calculated ‘F’ value is less than its respective ‘F’ table value at 0.05 levels. Thus there is no statistical significant difference between the groups of the above demographic variables with respect to their post test knowledge mean scores. Hence the null Hypothesis (H02) is accepted and alternate Hypothesis (H2) is rejected for age, category and education.

Table 5: Association between posttest knowledge scores of participants and selected demographic variables in control group N = 22

Demographic variable		N	Mean	Df	Calc. F value	Table F value	p value
Age	18 - 30 yrs	7	14.29	3, 18	1.29	2.93	0.309
	31 - 45 yrs	7	14.00				
	46 - 60 yrs	7	11.00				
	Above 60 yrs	1	8.00				
Category	NC-General	7	14.14	2, 19	0.89	3.52	0.427
	C-General	8	11.25				
	B – Private	7	13.43				
Education	Primary	2	8.50	2, 19	1.28	3.52	0.300
	Secondary	8	12.63				
	Graduate & above	12	13.75				

The above table shows that based on the ‘F’ test for unpaired sample the calculated ‘F’ value which is less than its respective ‘F’ table value at 0.05 levels. Hence there is no statistical significant difference between the groups of the above demographic variables with respect to their posttest knowledge mean scores. Hence the null Hypothesis (H02) is accepted and alternate Hypothesis (H2) is rejected for Age, Category and Education.

Discussion

A review of literature reveals that patients undergoing chemotherapy therapy are a risk of developing various side effects. A prospective study was conducted by Susan mani et al to evaluate the adverse effects occurring during chemotherapy of acute myeloid leukemia (AML) with cytarabine & daunorubicin 3+7 induction Three fourth of the patients attained complete remission after two course of induction chemotherapy. Out of the 35 patients enrolled, 17 died during the course of chemotherapy as a result of infection and bleeding. Myelosuppression, gastrointestinal manifestations, fever and alopecia, were the common adverse effects [12,13].

In a similar study a survey on Oncology patients’ knowledge about side-effects of chemotherapy and their management was conducted to know the effectiveness of a Nursing Intervention Protocol for Chemotherapy Induced Neutropenia. The survey established that more than a half of patients who were treated with chemotherapy reported fatigue (62.5%), alopecia (61.5%), nausea and vomit (51%) whereas constipation (41.7%), taste changes (29.2%), ulceration of oral mucosa (22.9%) and diarrhea (20.8%) were mentioned more rarely. Only 2.1% of the patients didn’t report any side-effect of chemotherapy. The results show that patients undergoing myelo-suppressive chemotherapy are at risk of developing neutropenia which may lead to life-threatening infections that may quickly lead to sepsis, and death. Severe neutropenia and febrile neutropenia are therefore major causes of morbidity, treatment interruptions and dose reductions in patients undergoing chemotherapy. Study also revealed that information about side effects of chemotherapy in oncology patients were received mostly from the doctors but still, given information was insufficient [2].

A study done by Carol S Viele stated that apart from the physical and physiological problems, knowledge deficit is one of the major problem found in patients with acute leukemia [4].

Acute myeloid leukemia patients are highly susceptible for infections resulting in decreased capacity of body to fight infection. This can lead to treatment interruptions which can affect overall

cancer related outcome. They are also prone to develop bleeding manifestations and tumor lysis syndrome which can be prevented by adequate counselling [12].

Patient’s education and knowledge is primary one. Chemotherapy treatment should be understood by the patient. It is important that patients treated with chemotherapy are educated about expected side effects. It is mandatory to understand the correct use of supportive care management at home. In addition to patient education, it is equally important to determine any barriers that may hinder their understanding of the information. By this way, there will be better acceptance to treatment and can avoid treatment defaults. It is important that patients are educated about their chemotherapy and management of adverse effects prior to and during subsequent cycles of treatment to abate the anxiety and distress that may be associated with a lack of knowledge [6].

A study revealed that to minimize potential toxicities and to maximize the optimal quality of life, Nurse can assist the patient by providing instructions and making the care provider equipped with knowledge [8].

Adenipekun clearly states in his study that patient education should include teaching about the potential for and consequences of neutropenia, preventive measures to decrease the risk of infection, reportable signs and symptoms of infection and early management of symptoms [1].

Similarly in this study patients were given the knowledge about AML, Chemotherapy schedule, and side effects and its management. It was observed that in experimental group there were significant improvement in the percentage of correct responses to knowledge during posttest in comparison with pretest which showed that structured teaching programme was effective in improving the knowledge of patients related to AML, chemotherapy schedule, side effects and its management (P-0.000)

This study revealed that the instruction by the medical oncologist in the OPD during first visit can be reinforced by detailed counselling by a staff nurse. The study population was aware about diet during neutropenia. However, the baseline knowledge regarding side effect of daunomycin, blast percentage as the prognosis and knowledge regarding child birth after completion of treatment was very poor and after the teaching programme there was significant improvement in the knowledge.

Limitations

- The study has focused on effect of structured teaching program in terms of only knowledge and not practice.
- The sample size was small (N=22) in each arm.
- It was not a randomized controlled trial.
- Study can be generalized only to sample under the study.

Nursing Implications

The implications for this study are discussed under the headings of nursing practice, nursing education, nursing administration and nursing research.

Nursing Practice

The study revealed that structured teaching program was effective in improving the knowledge of participants. Hence, nurses can play an important role in supportive care and educating participants related to chemotherapy schedule, its side effects and management for patients receiving chemotherapy for AML. This can assist in early detection and management of side effects due to chemotherapy which will reduce treatment interruption, minimize the cost and maximize the optimal quality of life. Nurses can plan and implement educational programs to educate the patients related to chemotherapy side effects and its management

Nursing Education

One of the most important functions of nursing is imparting education. Nursing education is the means through which nurses are prepared to practice in various settings. There is a vital need to plan the educational program according to the level of understanding of beneficiaries. The findings of this study should be used as a basis for incorporating newer concepts in nursing curriculum at various levels about chemotherapy, its side effects and management.

1. The structured teaching program can be used by the students for providing health education and counseling to the patients.
2. It can be included in the curriculum.

Nursing Administration

The nursing administrators are facing various newer challenges, where they need to know recent developments in technologies and methods. Knowing evidenced based new findings will strengthen her as administrator. This study will help nursing administrators in preparation of standard protocols/ policy manual or information booklet or handouts for participants which gives them information about chemotherapy schedule, side effects and its management in acute myeloid leukemia patients.

Conclusion

On the basis of findings of the study, the conclusion drawn was that structured teaching program was effective in providing education about Acute Myeloid Leukemia its chemotherapy schedule, side effects and its management at a tertiary cancer center.

Recommendation for Future Research

Based on the findings of the study, the investigator wants to recommend further studies:

- A similar study can be done using different teaching modalities like video assisted teaching, information booklet, preparation of handouts on Chemotherapy side effects and its management among patients planned for chemotherapy in acute myeloid leukemia.
- A similar study can be conducted by using a large sample size using randomization.

- A study can be conducted to find the association between knowledge and compliance of participants receiving chemotherapy for acute myeloid leukemia.
- A similar study can be replicated in different setting to strengthen the findings as the practice in different setting may vary and it will also give broader perspective on chemotherapy, side effects and its management.

Personal Experience of the Investigator

- The investigator had developed a broadened insight about the comprehension of the nature of the research, motivation for participating actively in research and derived a feeling of great pleasure and satisfaction from the accomplishment.
- The investigator had developed self confidence in handling challenges of research, understood the research technique in detail and statistical principles involved in the research.
- The investigator had realized that research in practice and research as described in textbooks differed notably and the experience was a learning adventure.
- The investigator had got internal strength and confidence with clarity of concepts to conduct with depth of involvement for future research.
- The investigator learned to deal with participants from various categories and cultural background in an effective manner.
- The investigator had derived a feeling of great satisfaction from the accomplishment that with interventions participants were benefited.

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Author contributions

PJ conceived and designed the study, RM contributed to acquiring, analyzing and interpreting the data. RM wrote the manuscript. PJ contributed as a guide. All the authors have read and approved the final manuscript.

Conflict of interest

The authors declare that they have no conflict of interests.

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