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Nurses' Knowledge About The Safe Administration of Chemotherapy in The Oncology Center at Tishreen University Hospital in Lattakia

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ABSTRACT— Chemotherapy is a proven prodigy for the treatment of carcinoma but it can possess certain deleterious effects on the healthcare professionals while on constant exposure. Being frontline workers, nursing officers continuously come in contact with these chemotherapeutic agents. Determine of Nurses' Knowledge About chemotherapy drugs (CDs) and The Safe Administration. The current study was conducted in Tishreen University Hospital in Lattakia City- Syria. The study comprised of 50 nurses in chemotherapy department. The tools used in the study was constructed by the researchers to achieve the purpose of the study which include three parts; part one consist of demographic data of the nurses (5) items, part two consist of general information regarding chemotherapy drugs (15) items, part three consist of nurses' knowledge regarding safe chemotherapy administration (16) items. The current study showed that the majority of nurses do not know that chemotherapy leads to delayed wound healing, and that it works to destroy cancer cells and healthy cells in the body. 74% of nurses had poor level of general knowledge about (CDs). Also this study showed that most of nurses do not know that(CDs) should not be stored in the preparation room, and the (CDs) should be prepared on a high table surface. Most of nurses had poor level of general knowledge regarding chemotherapy drugs, also majority of them had a poor level knowledge regarding safe chemotherapy administration.

KEYWORDS: Nurses' Knowledge, Safe Administration, Chemotherapy

1. INTRODUCTION

Cancer is a disease characterized by uncontrolled and unregulated growth of cells in a living organism impartially affecting people from all races, age and/or ethnicities. It is one amongst second largest killer diseases after cardiac disorders. About 18 million cases were reported in 2018, out of which, 9.5 million were male and 8.5 million were female [1]. Approximately, 1in 6 death occurs due to cancer which further adds 9.6 million cases to mortality rates. It is projected that almost two-third of all cancer cases may occur in the developing countries with 70% current death rates [2- 4]. To take the edge of this life threating illness, there are multiple treatments available ranging from radiation therapy, surgery, immunotherapy, monoclonal antibody therapy to chemotherapy depending upon the location, grade and stage of the tumors. However, systemic treatment modality in these times is becoming major choice of treatment and it is prudent that chemotherapy has brought revolution to the treatment of cancer and kept this fatal disease under tight rein [5]. Chemotherapy drugs (CDs) are administered either by injection or orally. Occupational exposure to CDs may occur during drug preparation and admixture [6]. Or during administration by intravenous (IV) routes, or during specialized procedures of administration such as intra-peritoneal, pleural or pericardial, and cerebrospinal fluid (CSF) routes [7]. Or transport, and during cleaning spills and waste

disposal [8]. Thus significant amounts of CDs can be contaminated food absorbed via(i) inhalation of the powder and liquid aerosols, (ii) unprotected skin and mucus membranes, (iii) Oral exposure may occur from hand-to-mouth contact or ingestion of or drinks and (iv) needle stick injury [9]. Although guidelines for safe handling of CDs were introduced more than 20 years ago, contamination of both the working environment as well as the HCWs is still reported in several recent studies particularly in developing countries [10]. Lack of knowledge, economic and socio-cultural factors are major determinants of unsafe behavior related to handling of CDs by health care workers(HCWs) [11]. An epidemiological study in 2016 determined the immediate and contributing causes of exposure of HCWs to anti-neoplastic drugs. These were classified into 4 categories for immediate causes such as: direct contact with CDs without personal protective equipments, needle stick injury, spills, and other unintended exposures; and 3 categories of contributing causes such as: lack of training, inadequate controls and poor communication [12]. Acute health hazards associated with occupational exposure to CDs include skin rashes, sore throat, cough, dizziness, headache, eye irritation, hair loss, and allergic reactions; while chronic health effects in unprotected HCWs who handle these drugs without following safety measures include genotoxicity, mutagenicity, carcinogenicity, adverse reproductive outcomes such as: spontaneous abortion, infertility and poor neonatal outcome; and organ toxicity such as bone marrow, liver, kidney, lung, and cardiac toxicity [9].

The harmful effects caused by these mutagens and teratogens due to recurrent exposure are unerring and hence, frontline health workers coming repeatedly in contact with chemotherapeutic agents are most vulnerable. Despite the risk, many healthcare personnel fail to follow the recommended guidelines when handling these drugs. An Indian cross-sectional study revealed that almost 40% of the staff working in a tertiary care institution had insufficient knowledge regarding CDs handling [13]. A study by [14] reported that majority 55% of nursing officers had poor level of knowledge and nearly half 51.7% had average practice skills. Overall, it is reported that cytotoxic drug preparation and handling was consistently identified as a greatest risk to health. Nursing personnel’s play a significant role during chemotherapy preparation and administration [14]. This group of health care professionals should possess high levels of knowledge and positive behaviors towards the safe management of chemotherapy. Therefore, the level of knowledge and practice techniques of safe handling of chemotherapeutic drugs becomes a major safety concern. Hence, the present study was conducted with the aim to assess the nurses' knowledge about the safe administration of chemotherapy in the oncology center at Tishreen University Hospital in Lattakia.

Aim of the Study

The aim of this study is to assess the nurses' knowledge about the safe administration of chemotherapy.

2. Materials and Method Materials

Design: A Quantitative design using descriptive approach used to conduct this study.

Setting: The study carried out at Tishreen University Hospital in Lattakia city,

Subjects: A non-probability (purposive sampling) sample was used; including (50) nurses at the oncology center working in inpatients and outpatients and chemotherapy department.

Tools: The tools used in the study was constructed by the researchers to achieve the purpose of the study which include three parts; part one consist of demographic data of the nurses (5) items, part two consist of general information regarding chemotherapy drugs (15) items, part three consist of nurses knowledge regarding safe chemotherapy administration (16) items. These questions were scaled and rated of dichotomous rating scale; correct (2), and incorrect (1). The data. The data was collected by self-reporting

administration technique. A panel of (5) experts was included in the determination of the questionnaire items content validity. The data were analyzed through utilization of the application of descriptive statistical and inferential analysis which includes (frequency and percentage) to the results of the study. A pilot study was carried out with the purpose of assessing the comprehensiveness and appropriateness of the research instrument to the Syrian health care setting. For reliability measurement, a test-retest was used. The questionnaire was distributed twice among five subjects of the population with two weeks interval. In both times, Cronbach's alpha the reliability coefficient was 0.80.

2.1 Ethical Consideration

-Numerically coded made to all questionnaires before being given to the nurses.
-Nurses' anonymity and confidentiality of information were assured.

2.2 Methods

The official approvals from the competentauthority were obtained., All studied nurses surveyed to identify those fulfilling the study criteria. Informed consent of the nurses obtained after explanation of the purpose of the study. Nurses were asked to answer the questionnaire through 45 minutes after receiving them. The data collection procedure was conducted from the period of 14 st of March 2021 up to the 20 st April 2022. Statistical analysis performed using Stata (version23).

3. Results

Table (1) shows the socio-demographic characteristics of the nurses; their age ranged from 18 to 59 years, nurses aged 18-24 years constituted 40% of them, and the rest 26%, 24% and 10% were either 25-29 years or 30-35 years or more than 35 years respectively. In relation to gender most of nurses were female 42%, and in relation to educational level 66% of studied sample had nursing school graduate while only 4% had nursing bachelor graduate.

Table (1): Distribution of the nurses according to their socio-demographic characteristics

Socio-demographic Characteristics	**Frequency N=50**	**% 100**
Age in years:		
18-24	20	40
25-29	13	26
30-35	12	24
More than 35 years	5	10
Gender:		
Male	8	16
Female	42	84
Level of education:		

Nursing school graduate	33	66
Nursing Diploma graduate.	15	30
Nursing Bachelor graduate and more	2	4
Years of experience in chemotherapy department		
Less than 1 year	2	4
1-5 years	35	70
6-10 years	10	20
More than 10 years	3	6
Training Session		
Not present	34	68
Present	16	32

Table (2) shows general nurse's knowledge regarding chemotherapy drugs: this table indicates that the most incorrect answer found in items (2, 11 and 14). and most correct answer found in items (4, 7, 13 and 15)

Table (2): General Nurse's knowledge regarding chemotherapy drugs

No	Items	Correct		Incorrect	
		n	%	n	%
1	There is a special drug or a special vaccine to prevent of cancer.	12	24	38	76
2	Physicians are the only person to dispense the chemotherapy.	8	16	42	84
3	The nurse can give chemotherapy by verbal order from the physician or pharmacist	18	36	32	64
4	Chemotherapy works to destroy cancer cells in some parts of the body.	26	52	24	48
5	Chemotherapy works to kill cancer cells by intervening to DNA synthesis	15	30	35	70
6	Cancer cells have resistance to chemotherapy	23	46	27	54
7	Chemotherapy can give only in the hospital	26	52	24	48
8	Chemotherapy works to destroy cancer cells and	5	10	45	90

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	healthy cells in the body				
9	Chemotherapy can recognize between fast-growing cancer cells and fast-growing healthy cells	26	52	24	48
10	Side effects of chemotherapy, vomiting and nausea	27	54	23	46
11	Chemotherapy leads to delayed wound healing	4	8	46	92
12	Analgesics can used before chemotherapy drug	13	26	37	74
13	Chemotherapy does not effect on vital signs of the patient.	29	58	21	42
14	The dose of chemotherapy is measured in grams (gr)	12	24	38	76
15	Chemotherapy cannot be given with radiotherapy	30	60	20	40

Table (3) shows Nurse's knowledge regarding safe chemotherapy administration: this table indicates that the most incorrect answer found in items (3, 5 and 14). and most correct answer found initems(10,12,13and13).

Table (3): Nurse's knowledge regarding safe chemotherapy administration

No	Items	Correct		Incorrect	
		n	%	n	%
1	The chemical drugs (CDs) must be prepared in the preparation room	27	54	23	46
2	Do not drink or eat food in the preparation room of (CDs)	10	20	40	80
3	(CDs) should not be stored in the preparation room	7	14	43	86
4	Before and after giving chemotherapy, should wash Hands with soap and water	9	18	41	82
5	Personal protective equipment must be worn when administering the chemotherapy	8	16	42	84
6	Personal protective equipment must be worn during administering the chemotherapy	13	26	37	74
7	Personal protective equipment must be worn while transporting the (CDs)	16	32	34	68
8	(CDs)should not be exposed to light	28	56	22	44
9	The nurse should monitors the patient's condition when receiving chemotherapy	24	48	26	52
10	Before giving chemotherapy, be sure to check patient vital signs	34	68	16	32
11	The drug package should be hung at least 50 cm above the patient's head	28	56	22	44
12	(CDs) tablets should not be crushed or divided	38	76	12	24
13	The chemical medicine should be prepared on a clean, elevated table surface	31	62	19	38
14	The chemical medicine should be prepared on a high table surface	8	16	42	84
15	(CDs) tablets should not be dissolved in a glass of water	15	30	35	70
16	The dose of (CDs) depends on the degree of tumor and the weight	18	36	32	64

	of the patient				

Table (4) shows Distribution of the nurses according to their level of knowledge regarding chemotherapy drugs, In relation to the general knowledge regarding chemotherapy drugs most of nurses had poor level constituted 74%. Also concerning their knowledge regarding safe chemotherapy administration, the table shows that the majority of them had a poor level constituted 78%.

Table (4): Distribution of the nurses according to their level of knowledge regarding chemotherapy drugs

Domain	Level			
	Good		Poor	
	n	%	n	%
General knowledge regarding chemotherapy drugs	13	26	37	74
knowledge regarding safe chemotherapy administration	11	22	39	78

4. Discussion

Clinical nurses have complex and multifaceted roles in medication management. These roles include administering medication efficiently and safely, monitoring and assessing desirable and unwanted effects, giving patient education, and planning for discharge [15]. The study conducted to assess the nurses' knowledge regarding safe chemotherapy administration among nursing staff that working at oncology center. The study also connects the knowledge of the nurses in relation to chemotherapy drugs with the knowledge of its administration. According to the results of the study it indicated that the nurses have poor knowledge regarding the drugs of chemotherapy and the administration of chemotherapy, this finding is important for nursing care to cancer patients because if oncology nurses did not have advance knowledge and they have less competent in their practice will be considered as unsafe for providing chemotherapy drug administration safely to cancer patients and chances for medication administration errors can be high as various studies in past already emphasized these issues [16], [17]. Nurses' information regarding chemotherapy and knowledge about administration of chemotherapy about the handling of cytotoxic drugs remains a concern linked to advance in safety standards. Efficient nurses' knowledge about uses the safety measures in their practices has positive affect on cancer patients' response to treatment process. Literatures and previous studies reports that there is a gap between the nurses' knowledge and their actual competency with respect to the use of protective measures [18], [19]. The findings show that the level of knowledge of the nurses on this concern is not adequately satisfied. In previous studies conducted by [20], [21] they are reported that the staff of nursing handling the chemotherapy drugs don't have a satisfactory level of knowledge regarding the chemotherapy drugs. The results also similar with the results of the study conducted by [22] in which their results indicate poor knowledge in relation to personal protective equipment uses during chemotherapy drug administration. As is evident of the result, the most common of the nursing staff was not oncology trained and had poor knowledge about the use of chemotherapy and importance of cytotoxic drugs and the management of their physical and psychological side effects experienced by cancer patients. Therefore, may have developed some negative attitude towards chemotherapy administration. In consistent with the recent study findings other studies found that the nurses were inadequately prepared to care for cancer patients and consequently, held negative views about the disease and its treatment [23].

The results of the present study also, supported by the finding conducted by [24] which was concluded that the total overall result of the study indicated that the participants have poor knowledge and skills. This lack of knowledge on preventive measures is of concern because it increases the health workers' unsafe behavior. Encouraging to Joining in a training program created significant difference on the level of knowledge; the training of all staff involved with any aspect of the handling of hazardous drugs is one of the essential elements described in the occupational safety and health administration guidelines [21].

5. Conclusion

It can be concluded from the study that the knowledge of nurses regarding safe chemotherapy administration was poor. And Nurses' general information regarding chemotherapy drug was also poor.

6. Recommendations

1. Emphasize on participating nurses in training session program specialized in chemotherapy administration to increases the knowledge and competency of the nurse.
2. Chemotherapy safety administration standards must be applied for nurses that working in oncology center.
3. Nursing faculty and school should pay more attention for cancer disease and chemotherapy administration subject in the curriculum.
4. Establish postgraduate studies specialized in oncology nursing

Conflict of Interest: The authors declare that they have no conflict of interest.

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