

Developing and Validating Nursing Care Standards for Patients with Cancer Receiving Chemotherapy at South Egypt Cancer Institute at Assiut University

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Abstract: The descriptive study aimed at developing and validating nursing care standards for patients with cancer receiving chemotherapy at South Egypt Cancer Institute through determining the nurses' performance in South Egypt cancer institute, developing standards based on the nurses' performance, and validating the developed standards based on the jury opinions. The collection of data was achieved by using **two developed tools**. **The first observation checklist:** this tool aims at asserting performance of the nurses working in the designated settings. This tool consisted of two parts. **Part I:** Entailed personal and job characteristics of the studied nurses such as age, sex, qualification, and years of experience. **Part II:** It was developed to assess the nursing care for patients with cancer receiving chemotherapy through an initial list of performance. **The second a structured opininaire sheet** aims at investigation opinion of the nursing and medical experts regarding the developed standards. It includes queries regarding personal and job characteristics of respondents. **The results** of the study showed that the initial checklist entailing nursing care for patients with cancer receiving chemotherapy was valid through full acceptance by experts, and nursing care provided for patients with cancer receiving chemotherapy was inadequate. **Based on** the finding of the study nursing care standards for patients with cancer receiving chemotherapy was developed.

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1.Introduction

Standard of care is a valid and acceptable definition of the quality of nursing care. In other words, standards are statements of what good nursing care should be (*Sale, 1999*). Standards for nursing practice also define the scope and dimension of professional nursing (*Marquis & Huston, 2003*). The purposes of standards are stated according to a systematic approach to nursing practice, the assessment of patients' status, the plan of nursing action, the implementation of the plan, and the evaluation (*Maggs, 1999*). Standard statements are agreed levels of performance. These levels are appropriated to the population addressed, which reflects what is acceptable, achievable, realistic and measurable (*Swansburg & Swansburg, 2003*).

Nursing care standards are an important part of the care planning process. They include broad, universal principles that are applied to patient safety, comfort, and nutrition. In addition, special areas of nursing such as oncology, gynecology, cardiovascular, and respiratory hold themselves accountable for standards. Each nurse is accountable for his/ her own quality of practice, and is responsible for the use of these standards to ensure knowledge, safety and comprehensive nursing care mean while, the standard

allows nurses to carry out professional roles, and serving as protection for the nurse, the patient, and the institution where health care is given (*American Nurses Association, 1998*). Standards cannot be valid unless they contain criteria to enable care to be measured and evaluated in terms of effectiveness and quality (*Green and Katz, 1997*). Criteria make standards work because they are detailed indicators of the standards and can be specific to the area or type of patient. They are measurable stated in behavioral terms, realistic, and achievable with reasonable effort (*Green and Katz, 1997*).

Chemotherapy is the treatment of cancer with drugs (anti cancer drugs) that destroy cancer cells. It interferes with cell division in various possible ways, e. g. duplication of DNA or the separation of newly formed chromosomes. Most forms of chemotherapy target all rapidly dividing cells and are not specific for cancer (*Vogel & Costantino, 2006*). Cancer chemotherapy has principally been used in the management of advanced or metastatic disease, following failed local therapies, or in disease for which no alternative therapy is effective (*Day & Adjei, 2006*).

Aim of the study:

This study aims to develop and validate nursing care standards for patients with cancer receiving chemotherapy at South Egypt Cancer Institute at Assiut University through: determining the nurses' performance in South Egypt Cancer Institute, developing standards based on the nurses' performance, validating the developed standards based on the jury opinions.

2. Subject and methods:

Setting: The study was conducted in governmental and private oncology units at south Egypt Cancer Institute at Assiut University.

Subjects: Subjects included in this study were two categories, nursing and medical experts and staff nurses.

B. Experts: This group served as a jury to assess the face and content validity of the developed standards, they consisted of three categories.

1-Eight from Faculty of Nursing representing (four professors, two assistant professors and two lecturers) in the field of education from medical surgical and administration departments at Assiut and Ain Shams universities.

2- Medical Faculty representing physicians (three professors, one assistant professor) working at the oncology department in Assiut University Hospital and (four lecturers) working at South Egypt Cancer Institute.

3-Thirteen head nurses representing nursing administrators in the field of services at South Egypt Cancer Institute and in different private and general units rendering nursing care for patients with cancer

II. Nurses: A total coverage for all responded nurses in the study setting who are currently assigned and provide care for patients with cancer receiving chemotherapy were (26 nurses) from male oncology unit, (23 nurses) from female oncology unit and (16 nurses) from private oncology unit.

Data collection tools:

The collection of data was achieved by using two developed tools, **namely an observation checklist and opinionnaire sheet** for validation of the developed standards. **Observation checklist:** This tool aims at asserting performance of the nurses working in the designated settings. It was developed by the researcher based on review of related literature for different standards (*Cancer Care Ontario, 1996; Mohammed, 1999; American Cancer College of Surgeon, 2004; Joint Commission on Accreditation of Health Care Organization, 2005 and Association Commission Cancer Center Guidelines, 2006*). This tool consisted of two parts.

Part I: This entailed Socio-demographic characteristics of the studied nurses such as age, sex, qualification, and years of experience.

Part II: It was developed to assess the nursing care for patients with cancer receiving chemotherapy through an initial list of performance. It includes 177 criteria under 14 heading that identify nursing care for patient with cancer receiving chemotherapy as the following.

1- Admission.	13 items
2- Assessment.	15 items
3- Prepare room.	6 items
4- Laboratory investigation.	6 items
5- Nursing care during receiving chemotherapy.	58 items
6- Supportive and psychological care.	6 items
7- Nutrition.	11 items
8- Handling chemotherapy.	8 items
9- Skin care.	6 items
10- Neurotoxicity.	10 items
11- Extravasation.	15 items
12-Transfer.	5 items
13-Discharge and	13 items
14- Death.	5 items

Scoring system:

Scoring system for checklist was items scored one when activity was done and scored zero when the activity was not done. The total score of the checklist was 177.

The second tool Opinionnaire sheet: A structured opinionnaire sheet aims at investigating opinion of the nursing and medical experts regarding the developed standards. It includes queries regarding personal and job characteristics of respondents. The standards developed based on the data obtained from the observation checklist analysis.

Operational design: This included the pilot study and the field work.

Pilot study:

A pilot study was conducted on a sample of 10 % of nurses (excluded from study nurses) aiming determining the applicability of the tools, and to test the clarity of the language. It also helped to test the feasibility and suitability of the study settings, and to determine time needed to collect data needed for the study. Data obtained from the pilot were analyzed and necessary modifications were done.

Field work:

Field work included two stages for conducting the study. **The first one** is the development of the observation checklist to collect data regarding nurses' performance (observation checklist) which is used for

the development of the proposed nursing care standards for patients with cancer receiving chemotherapy. **The second stage** is the standards construction and validation, this stage was concerned with designing the proposed standards based on data analysis of the observation checklist.

Administration design:

To carry out the study at the selected settings an official permission was obtained from the Dean of South Egypt Cancer Institute, head of male, female, and private oncology units as well as from the director of nursing through a formal letter from the faculty of nursing at Assiut University. This was carried out at the time of observation process. Confidentiality of the obtained information was ensured after explanation of its purpose.

Statistical design:

Data were collected and fed into computer for analysis and presentation. Data were entered and analyzed by SPSS statistical analysis computer software. Data were presented descriptive statistics in the form of frequencies and percentages, as the reliability, data were paired *e.g.* intra-rater. Statistical significance was considered at p value < 0.05 .

Reliability of the observed performance: reliability of the observed nurses' performance was done by using:

1- The intra-rater reliability test which required the nurses to observe two times at the same time, but independently. This was applied to the nurses available at the time of the data collection.

2-The second test of reliability of the nurses' performance for the items included in the checklist was intra-rater reliability test-re-test technique, where the researcher repeated the process of observation to test stability of tool over the time of 14 days period between the first and the second time of observation.

3. Results:

Table 1. Socio-demographic characteristics of nurses in the observation samples (n= 65)

	Frequency	Percent
Age (years):		
<25	50	76.9
25+	15	23.1
Range	19-32	
Mean±SD	23.4±2.3	
Sex:		
Male	23	35.4
Female	42	64.6
Qualification: nursing secondary school diploma	65	100.0
Unit:		
Male	26	40.0
Female	24	36.9
Private	15	23.1
Experience (years):		
<5	32	49.2
5+	33	50.8
Range	2.0-13.0	
Mean±SD	5.1±2.2	

Table 2. Intra-rater test-re-test reliability of observation checklist for oncology nurses performance as base for standards related to assessment of fever, anemia, and thrombocytopenia (n= 65)

Items	Time				X ² Test	p-value
	1		2			
	No.	%	No.	%		
9.2. Assessment of fever:						
Assessment of fever and signs of infection						
If fever is ≤ 38.2 comfort measure are provided	43	66.2	53	81.5	3.98	0.046
If is ≥ 38.2 the physician should be notified	59	90.8	62	95.4	Fisher	0.49
9.3. Assessment for anemia: check:						
9.3.1. Hemoglobin level	59	90.8	62	95.4	0.10	0.75
9.3.2. Platelets count	12	18.5	12	18.5	0.00	1.00
9.3.3. Differential count	6	9.2	9	13.8	0.68	0.41
9.4. Assessment for thrombocytopenia						
9.4.1. Assess symptoms and signs of bleeding such as:						
Petechia	24	36.9	30	46.2	1.14	0.29
Ecchymosis	16	24.6	17	26.2	0.029	0.44
Consciousness level	49	75.4	53	81.5	0.73	0.39
Headache	51	78.5	56	86.2	1.32	0.25
Active bleeding	58	89.2	64	98.5	Fisher	0.06

(*) Statistically significant at $p < 0.05$

Table 3. Intra-rater test-re-test reliability of observation checklist for oncology nurses performance as base for standards related to handling chemotherapeutic agents (n= 65)

Items	Time				X ² Test	p- value
	1		2			
	No.	%	No.	%		
12. Nursing care before handling chemotherapeutic agents:						
12.1. Wear disposable latex gloves	37	56.9	39	60.0	0.13	0.72
12.2. Mask to cover nose and mouth	0	0.0	0	0.0	0.0	0.0
12.3. Wear eye protectors	0	0.0	1	1.5	Fisher	1.00
12.4. Avoid spills of drugs	55	84.6	57	87.7	0.26	0.61
12.5. Aerosolization when drawing up from a vial	52	80.0	58	89.2	2.13	0.14
12.6. Expel excess drugs from syringes into air	55	84.6	59	90.8	1.14	0.29
12.7. Dispose of needles and syringes in special containers	44	67.7	58	89.2	8.92	0.003*
12.8. Always be familiar with the drugs	58	89.2	63	96.9	Fisher	0.16

(*) Statistically significant at $p < 0.05$

Table 4. Intra-rater test-re-test reliability of observation checklist for oncology nurses performance as base for standards related to extravasation. (n= 65)

Items	Time				X ² Test	p- value
	1		2			
	No.	%	No.	%		
15- Nursing care when extravasation occurs includes:						
15.1. Stop chemotherapy administration	64	98.5	64	98.5	Fisher	1.00
15.2. Notify the physician	12	18.8	12	18.8	0.51	0.47
15.3. Try to aspirate residual chemo-therapeutic agent from the site and the cannula	43	66.2	55	84.6	5.97	0.01*
15.4. Instill antidote by existing cannula if indicated (hydrocortisone, hyaluronidase and sodium bicarbonate as ordered)	18	27.7	21	32.3	0.33	0.57
15.5. No undue pressure is applied	15	23.1	24	36.9	2.97	0.08
15.6. If unable to aspirate vesicant drug from tubing remove cannula	60	92.3	63	96.9	Fisher	0.44
15.7. Apply:						
Ethylchloride locally to the site	23	35.4	26	40.0	0.29	0.59
Ice packs for at least 30 min / 4times /daily	24	36.9	30	46.2	1.14	0.29
15.8. Apply a bandage without pressure	21	32.3	27	41.5	1.19	0.28
15.9. Elevate the arm for days	37	56.9	39	60.0	0.13	0.72
15.10. Observe regularly for:						
Pain	14	21.5	38	58.5	18.46	<0.001*
Erythema	37	56.9	39	60.0	0.13	0.72
Infection	6	9.2	8	12.3	0.32	0.57
15.11. Consider plastic surgery consultation if pain persists after 72 hrs	5	7.7	11	16.9	2.57	0.11
15.12. Document the occurrence in patient chart	1	1.5	1	1.5	Fisher	1.00

(*) Statistically significant at $p < 0.05$

Table 5. Content validity by the jury for the proposed standards based on the performance checklist as related to gastro-intestinal problems (n=29)

Standards	Agree	
	No.	%
9.5. Nursing care regarding gastrointestinal tract includes:		
9.5.1. Nursing care for nausea /vomiting:		
9.5.1.1. Observe number of emesis/24hours	29	100.0
9.5.1.2. Observe oral intake /24hours	29	100.0
9.5.1.3. Give antiemetics treatment as ordered	29	100.0
9.5.1.4. Observe weight loss	29	100.0
9.5.2. Nursing care for diarrhea:		
9.5.2.1. Observe number of defecation /24, character, consistency	29	100.0
9.5.2.2. Identify food allergies	29	100.0
9.5.2.3. Fever/24 hrs	29	100.0
9.5.2.4. Give antidiarrheal medication	29	100.0
9.5.2.5. Assess patient weight loss	29	100.0
9.5.2.6. Determine level of activity	29	100.0
9.5.2.7. Assess vital signs to rule out dehydration	29	100.0
9.5.2.8. Provide comfort measures such as hygiene to perineum after bowel movement	29	100.0
9.5.2.9. Perform stool culture as ordered	29	100.0
9.5.3. Nursing care for constipation:		
9.5.3.1. Encourage small, frequent meals, high fiber diet, increased fluid intake	29	100.0
9.5.3.2. Weekly weights	29	100.0
9.5.3.3. Gives patient oral softeners daily according to doctor order	29	100.0
9.5.3.6. Administers suppositories minutes before defecation time as order	29	100.0
9.5.4. Nursing care for stomatitis:		
9.5.4.1. Observe dry mouth	29	100.0
9.5.4.2. Observe bleeding gum	29	100.0
9.5.4.3. Provide mouth care every 4 to 6 hours with normal saline	29	100.0
9.5.4.4. Avoid lemon or glycerin swabs	29	100.0
9.5.4.5. Apply topical viscous anesthetic as lidocaine before meals as ordered	29	100.0
9.5.4.6. Consult dietitian to provide blend of food at medium temperature	28	96.6

Table 6. Content validity by the jury for the proposed standards based on the performance checklist as related to psychological problems and nutrition (n=29)

Standards	Agree	
	No.	%
10- Supportive and psychological nursing care rendered by the oncology nurse for patient with cancer includes:		
10.1. Explain the expected outcome and side effects for chemotherapy	27	93.1
10.2. Encourage verbalization and identification of fears	29	100.0
10.3. Help patient to explore ways to cope with fear	29	100.0
10.4. Assess spiritual needs	29	100.0
10.5. Offer support by active listening	29	100.0
10.6. Offer hope in some form, and being there for patient and relatives	29	100.0
11. Nursing care for improving nutrition includes:		
11.1. Assess taste alteration	29	100.0
11.2. Evaluate patient appetite	29	100.0
11.3. Give instructions for improving appetite	29	100.0
11.4. Keep patient room free from bad odor	29	100.0
11.5. Give ordered antiemetics before and after chemo/ radiotherapy	29	100.0
11.6. Give small frequent meals	29	100.0
11.7. Give meticulous mouth care every two hours	29	100.0
11.8. Encourage added calories in meals, vitamins, carbohydrates and supplements between meals	29	100.0
11.9. Advise patient to use plastic utensils instead of metals	28	96.6
11.10. Advise patient to take protein from eggs, beans instead of meat	29	100.0
11.11. Advise patient to increase sugar and sweets intake	29	100.0

Table 1 shows the sociodemographic characteristics of staff nurses observed. Data in this table reveals that the study nurses were 65, more than two thirds (76.9%) had their age less than 25 years, more than a half of them (64.6%) were females while (35.4%) of the observed nurses were males. It was noticed that all of them had nursing secondary school diploma, working in male, female, and private oncology units, about (50.8%) of them had 5 and even more years of experience in nursing with a mean of (5.1± 2.2).

Table 2 shows the results of intra-rater test, retest reliability of observation checklist for oncology nurses performance related to assessment of fever, anemia, and thrombocytopenia. The data in this table shows that there is agreement between the results obtained in the first and second times of observation.

Table 3 shows the results of intra-rater test, retest reliability of observation checklist for oncology nurses performance related to handling of chemotherapeutic agents. The data in this table shows that there is conformity between the results obtained in the first and second times of observation the only exception for the item " disposal of needles and syringes in special container" (*P*-value 0.003).

Table 4 shows the results of intra-rater test, retest reliability of observation checklist for oncology nurses performance related to extravasation. The data in this table shows that there is concurrence between the results obtained in the first and second times of observation except for two items: trying to aspirate residual chemotherapy from the site and cannula (*P*-value 0.01) and observing pain regularly (*P*-value <0.001).

Table 5 shows content validity by the jury for the proposed standards based on the performance checklist as related to gastro-intestinal problems. The data in this table shows that all of them agreed on all items. The only exception was for the item consulting dietitian to provide blend of food at medium temperature (96.6%).

Table 6 shows content validity by the jury for the proposed standards based on the performance checklist as related to psychological problems and nutrition. It is noticed that all of them agreed on all items except for "explaining the expected outcome and side effects for chemotherapy" (93.1%) and advising patients to use plastic utensils instead of metals (96.6%).

4. Discussion

Nurses are the key to quality in the health care delivery system, holding a unique role as care coordinators at the interdisciplinary interaction of patients care delivery. Nurses manage quality issues and do much of the quality surveillance and

monitoring (*Huber, 2003*). The delivery of chemotherapy is primarily responsibility of oncology nurse; the nurse must have knowledge of pharmacology of antineoplastic agent, proper techniques of drugs preparation and administration systems, drug interactions and possible adverse effects. (*Thompson et al., 2004; Polovich, M., Whitford, J.M., & Olsen, M. (2009)*). In addition, before starting chemotherapy the nurse should assess the patient's knowledge of cancer and chemotherapy, determine the patient's general, physical health, prepare the patient and his/her family to manage anticipated side effects of chemotherapy and to report symptoms of potentially side effects early.

The subjects of study were 29 nursing and medical experts and 65 staff nurses from male, female and private oncology units at South Egypt Cancer Institute. Data was collected using an observation checklist of nurses' performance in addition to a validation questionnaire (optionnaire sheet).

Concerning the reliability of the proposed tool, it was tested in the present study through intra observer test retest method. The findings showed high intra observer reliability as evidence by the absence of statistically significant difference between the findings obtained in the first and second times of observation. However, there were significant statistical differences for some items in relation to the nurses' performance these findings were confirmed by (*Saad, 2004*).

The results showed consistency of the tool regarding to nursing care for patients with cancer have infection, fever, anemia, and thrombocytopenia, the results showed that the majority of the nurses in study setting don't perform the majority of nursing activities; this indicated the lack of nurses' knowledge about the importance of these activities. This finding disagree with the findings of *Linton & Maehius (2003)* who pointed out that the patient with cancer become at risk of infection, and monitoring blood cell count frequently is essential, as it is protecting the patient from infection and injury.

Concerning nurses' performance related to handling chemotherapeutic agents, the results showed consistency of the tool except for, dispose needles and syringe in special container, the results revealed that all nurses don't wear mask to cover nose and mouth and eye protector. This could be attributed to deficiency of equipment and supplies, this in contrast with *Daniels (2004)* who emphasized that used needles should not be recapped, bent, or broken; needles should be placed in a puncture resistant marked or color, coded container close to the work site, correct disposal decrease the risk of needle punctures to caregivers, replace container when two thirds full. Moreover, Central for *Disease Control and Prevention (CDC) (2009)* reported that standards

precautions must be practiced with all patients since this is the most effective method to decrease the risk of infection for patients and care givers.

Regarding the nursing care for patient with cancer when extravasation occurs the results showed a consistency of the study tool, however there is a statistical significant difference for two items namely; try to aspirate residual of chemotherapeutic agent from the site and cannula, and observe pain. The findings indicated that the nursing care provided for patient with cancer were inadequate, this attributed to insufficient number of nursing staff and heavy workload. In contrast with these findings, **Ruppens (2007)** recommended that the nurse must provide immediate and specific nursing care for patients with cancer when extravasation occur.

As for as validation of the standards of nursing care for patients with cancer developed based on the nurses' performance checklist, the majority of experts in the present study have agreed upon the proposed items of nursing assessment. During the assessment phase, the relationship between patient and nurses is build, hence, the nurse must have the ability to fulfill the items of assessment, this finding is in line with (**Hilkemeys, 2005**) who emphasized that the nurse should perform a complete physical and emotional assessment for patient with cancer, this would include, collecting data about chief patient complaints, current medications, history of present illness, medical/dental treatments, allergies and past medical history.

Concerning nursing care for cancer patients with nausea/vomiting, all the experts in present study have agreed upon all proposed items, this finding is in agreement with **Beyers and Dudass (2001)** who stressed that the nurses must assess characteristics of vomiting through observing its amount, color, blood and foreign substances. In addition, **Rhodes & McDaniel (2003)** added that the nurses should restrict food for patients and give antiemetics drugs according to doctors' orders.

Concerning care for constipation, all experts in the present study agreed upon all the proposed items. This is in line with **Thompson et al. (2003)** and **Yakobowish (2003)** who emphasized that the nurse should assess bowel movement of patients, frequently and consistency of stool and provide the patients with well balanced diet with roughage, fresh fruit and adequate fluid intake, encourage physical exercise. In this respect **Avritscher et al. (2004)** added that the altered bowel nutrition must be managed in a scientific manner through a regime acceptable to the patients. Based on the patients usual pattern of elimination to avoid fecal impaction, the nurse could administer described stool softeners, suppositories and laxative as per regime and educate the patient regarding necessarily of daily roughage and fluid intake in the

diet.

Regarding the nursing care for diarrhea, all experts in the present study have agreed upon all items. These findings is at one with **Cope (2005)** who reported that the nurses should assess and observe the patient stools in term of frequency, consistency, odor and presence of foreign material. Also **Haberman (2003)** pointed out that the nurse should assist patients with physical, psychological, and hygienic care and provides patients with proper diet.

In relation to nursing care for stomatitis, the nurse must inspect mouth daily, provide mouth care for patient every 4 hours with normal saline, provide small frequent meals and apply topical viscous anesthetic according physician order **Strohi (2004)**. The majority of experts in the present study have agreed upon most these items.

In addition, **Abdel Ghany (2006)** reported that oncology nurses can perform an essential role in promoting oral hygiene and optimal status of oral cavity during cancer and its treatment. Nurses play a key role in the assessment of oral cavity changes using valid and reliable measures with fostering the ability to predict risk for mucositis and test the effectiveness of protocols for its prevention and treatment. He added that nurses had an integral role in implementing and evaluating the oral care guidelines. The nurse's role in helping patient to cope with mucositis should encompass more than providing pharmacologic pain relief.

In relation to psychological nursing care for patients with cancer receiving chemotherapy, all the experts in the present study have agreed upon all the proposed standard. This is in accordance with **Dryden (2003)** who stressed that nurses are ones who can legitimize people as patient and as persons, they are ones who assure others that his/her feelings are normal in their situation. Also nurses are socialized to be care giver to be able to handle human feelings and complex human situations. In addition **Alaa-Eldeen (1995)** stated that educational and psychological supports are necessary to help the patient to regain a positive self concept.

Conclusion

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

To develop standards of nursing care for patient with cancer receiving chemotherapy, a nurses' performance was determined based on observation checklist. Items of the checklist was examined for its reliability, and validity

- In order to provide good quality nursing care for patients with cancer receiving chemotherapy, this requires applying standards of nursing care to allow organization objectively measuring units and

individual performance.

Recommendations

In order to improve nursing care for patients with cancer receiving chemotherapy at South Egypt Cancer Institute and Based on the results of this study, emphasis should be directed to the following recommendations.

1-The developed standards of nursing care for patients with cancer receiving chemotherapy, is recommended to be applied in the oncology units for guiding nurses performance, and developing their job description.

2-Standards should be available located in each unit and accessible for all nurses working at each oncology unit in the form of pamphlets or booklet in simple language.

3. Nurses must be oriented with the standards of nursing practice for oncology patients in the different units at the institute through communicating its contents by the in-service education unit.

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