Assessment of Nurses' Knowledge and Practice Regarding Implanted Port-A-Catheter Care for Patients Undergoing Chemotherapy

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Abstract

Background: *Implantable Port-A- Catheter is a vascular access device that provides direct access to large blood vessels. The device has become an integral part of daily oncology nursing clinical care, mandating a knowledgeable and competent nurse who is able to meet specific patient's needs and prevent serious complications.* ***Aim:*** *To assess nurses' knowledge and practice regarding implanted port-A-Catheter care for patients undergoing chemotherapy.* ***Settings:*** *The In-patient Medical Unit of the Damanhur Oncology Center; affiliated to Ministry of Health and Population at El-Beheira Governorate, Egypt.* ***Subjects:*** *All available (60) oncology nurses involved in direct implanted port-A-catheter care for patients undergoing chemotherapy were included.* ***Tools:*** *two tools were used. Tool one: "Oncology Nurses' Knowledge Structured Interview Questionnaire". Tool two: "Oncology Nurses' Practices regarding Implanted Port-A-Catheter Care for Patients undergoing Chemotherapy Observational Checklist".* ***Results:*** *More than half (56.7%) of the studied nurses had* ***fair*** *overall knowledge level, and almost all (96.7%) of the studied nurses had* ***poor*** *level of practice regarding implanted Port -A-Catheter care for patients undergoing chemotherapy. Moreover, there was a positive statistical significant correlation between nurses' overall knowledge and overall practices.* ***Conclusion:*** *The study concluded that nurses' knowledge regarding implanted Port -A-Catheter care for patients undergoing chemotherapy were fair while their practices were poor.* ***Recommendations:*** *Implement in-service education program for nurses to update their knowledge and practices concerning implanted Port -A-Catheter care.*

Keywords: Implanted Port-A-Catheter, Chemotherapy, Nurses' Knowledge and Practice, Port-A-Catheter Nursing care.

Introduction

Cancer is a proliferative, invasive, and metastatic disease that is caused by an accumulation of genetic abnormalities that randomly produce a malignant cell. Such abnormalities can be induced by chemical carcinogens, chronic inflammation, exposure to radiation, or by genetic predisposition **(Rossi et al., 2020).**

It is a major worldwide public health problem and the second leading cause of death in the United States **(Siegel et al., 2019).** According to the **World Health Organization (WHO) 2020**, the global cancer burden has been raised to 19.3 million new cases and 10.0 million deaths. In Egypt,

according to **Global Cancer Observatory (GCO) 2020,** number of new cancer cases was134, 632, and the number of deaths due to cancer was 89, 042.

Chemotherapy is the most commonly prescribed cancer treatment modality, which utilizes chemical agents or drugs that destroy cancer cells in the cell cycle and inhibit the growth and spread of cancerous cells. It may be combined with surgery or radiation therapy, or both to reduce tumor size preoperatively and to destroy remaining tumor cell postoperatively **(Memorial Sloan Kettering Cancer Center, 2021).**

Chemotherapy can be administered thought various routes; the most common utilized route is the intravenous (IV) administration. Modern chemotherapeutic management depends upon repeated and safe access to the venous system for the delivery of drugs, fluids and blood products. Hence, Peripheral veins are rapidly destroyed by repeated venipuncture and by long term chemotherapy; the long-term venous access devices (VADs) have helped to overcome this issue. The frequently employed type of venous access system is the Port -A-Catheter system **(Ancona-Lezama et al., 2020).**

Port -A- Catheter is a medical device that provides direct access to large blood vessels which consisting of a reservoir compartment (portal) and a catheter implanted into a surgically created pocket on the chest wall or upper arm. The "portal" is a chamber that is implanted subcutaneously and connected to the catheter with a special lock. Placement of the port-A-catheter might be done under local anesthesia in the inpatient or outpatient setting; where patients are discharged within few hours. The port is utilized for chemotherapy after 12-24 hours of insertion. A port-A-catheter usually remains in place for an average two to six years **(Hoa, 2019).**

The main advantages of ports are the easier venous access especially for patients with small or damaged veins or poor venous access, lower risk of chemotherapeutic agents' extravasation and the capability to inject irritants agents **(McLoughlin et al., 2017).** In spite of all Port-A-Catheter advantages, there are some complications which are divided into either early or delayed complications based on the time of onset. Early complications include venous malpositioning, pneumothorax, hemothorax, thoracic duct injury, or even cardiac tamponade **(Park et al., 2021)**. While, delayed complications include: catheter related infection, thrombosis, stenosis, and catheter fracture with extravasation or migration **(Li et al., 2022).**

Nursing care and maintenance of implanted ports require continuous vigilance and attention to maintain their patency and prevent complications; which includes flushing, heparin locking, dressing, changing of needle, and minimizing the risk of contamination by scrubbing the access port with an appropriate antiseptic solution **(Voog et al., 2018)**.

Oncology nurses play a pivotal role in caring of Port-A-Catheter, being responsible for maintaining access integrity, preventing its failure and reducing access related complications. They are also responsible for applying their knowledge to reduce the occurrence of infections, where non-compliance with recommended evidence-based practice guidelines would accelerate catheter-related bloodstream infections (CRBSI) **(Al Qadire, 2017).**

Furthermore, nursing staff can help prevent catheter-related infections by following Centers for Disease Control (CDC) guidelines during catheter insertion, accessing/de-accessing procedures, and insertion site dressing procedures. These guidelines recommend hand hygiene, maximal sterile personnel protection equipment, chlorhexidine for skin preparation, catheter site dressing regimens, and specific sites for catheter placement, and daily checks for signs of infection. **(Bayoumi & Mahmoud, 2017).**

Significance of the Study:

Since the number of patients with a port-A-catheter in hospitals is increasing; thus, it is necessary for the nurses who work with this port device to update their technical-scientific base of knowledge and improve their clinical practices in an articulated and standardized way.

Aims of the Study

The study aims to assess nurses' knowledge and practice regarding implanted port-A-Catheter care for patients undergoing chemotherapy.

Research questions:

- What is the nurses' knowledge regarding implanted port-A-Catheter care for patients undergoing chemotherapy?
- What are the nurses' practices regarding implanted port-A-Catheter care for patients undergoing chemotherapy?

Materials and Method

Materials

Research design: A descriptive research design was utilized to accomplish the aim of the present study.

Settings: This study was conducted at In-patient Medical Unit of the Damanhur Oncology Center, affiliated to Ministry of Health and Population at El-Beheira Governorate, Egypt. The In -Patient Medical Unit was composed of 9 rooms: 5 rooms for males, 3 rooms for females and 1 private room; the whole 9 rooms' capacity was 35 beds.

Subjects: All available oncology nurses (A convenience sample) involved in providing direct care for implanted port-A-catheter among patients undergoing chemotherapy were included in the present study. They comprised 60 nurses who were mutually working in the Inpatient and Outpatient units (in the form of rotating); at the previous mentioned setting.

Inclusion criteria: -

Nurses were included in the study according to the following criteria: aged from 25 years to less than 60 years old; work currently at the above-mentioned setting for a minimum period of one year of experience; and agreed to participate in the study.

Tools: In order to collect the necessary data for the study two tools were used:

Tool one: "Oncology Nurses' Knowledge Structured Interview Questionnaire"

The **s**tructured questionnaire was developed by the researchers in English language based on a review of relevant recent literature, and was translated into Arabic language to be easily answered by nurses (**Khalil et al., 2017; Ahmed& Kafl, 2019; Hassanien et al., 2019; Hoa, 2019).** It aimed to assess nurses' knowledge regarding implanted port-A-Catheter care for patients undergoing chemotherapy. It consisted of two parts as the following:

Part I: Oncology Nurses' Socio-demographic Characteristics:

This part of the questionnaire was designed to collect socio demographic characteristics of the studied nurses including: age, gender, marital status, level of education, years of experience in oncology unit, number of daily working hours, average number of assigned patients caring per day, as well as attendance of pre- or in-service training program(s) related to implanted Port-A-Catheter care for patients undergoing chemotherapy.

Part II: Nurses' knowledge regarding implanted port-A-Catheter care for patients undergoing Chemotherapy "Structured Interview Questionnaire".

This part was concerning with assessing nurses' knowledge about implanted port -A-Catheter care for patients undergoing chemotherapy. It included "thirty-eight" multiple choice questions; which covered the following: "ten" questions were in relation to "General Nurses' knowledge about implanted port -A-Catheter", fourteen

questions were about "Catheter connection and disconnection nursing care", "three" questions concerning "Catheter exit site care", "two" questions regarding "Port-A-Catheter removal, "one" question about "patient documentation" and "eight" questions related to "Port-A-Catheter infection and complications".

Tool I scoring system: -

Each "correct" answer took "One" score; and "incorrect" or "don't know" answers had a score of "zero"; thus the total scores were "38" grades.

The **total** nurses' knowledge score for all questions was calculated and transferred in to "three levels" according to the following percentages:-

"Less than 60%" was considered as "Poor knowledge".

"60% - less than75%" was considered as "Fair knowledge".

While; "75% and more" was reflecting "Good knowledge ".

<u>Tool two</u>: "Oncology Nurses' Practices regarding Implanted Port-A-Catheter Care for Patients undergoing Chemotherapy Observational Checklist".

This tool was developed by the researchers based on a review of relevant recent literature **(Hoa, 2019; Mersal et al., 2019; El-Metwaly and Abd-El Salam, 2020).** It consisted of "One hundred and seventeen" items of nursing practices which were utilized to assess oncology nurse's practices concerning implanted Port -A-Catheter care for patients undergoing chemotherapy.

The tool included four parts as follows:

1. Nursing care for Port-A-Catheter before connections to chemotherapy.
2. Nursing care for Port-A-Catheter during connections to chemotherapy.
3. Nursing care for Port-A-Catheter disconnection/ de-accessing.
4. Nursing care for Port-A-Catheter exit site.

Tool II scoring system:

Each item was checked as: "Done correctly" took "One" score and "Not done" or "Incorrectly done" had "Zero", with a total score of "117" grades.

The **total** nurses' practices score was calculated and transferred to percentage reflecting the levels of practices as follows:

"Less than 60%" was considered "Poor practice level"

"From 60% -75 %" reflected "Fair practice level"

"More than 75%" denoted "Good practice level"

Method

- Approval from the Research Ethics Committee of Faculty of Nursing, Alexandria University; has been obtained before conducting the study.
- An official permission from the Faculty of Nursing, Alexandria University has been obtained and directed to the responsible authorities of the previously mentioned setting; to attain their permission to conduct the study after explaining its aim.
- An official written permission for data collection was obtained from the directors of the selected setting after explanation of the aim of the study.
- Tool (I) & tool (II) were developed by the researchers after reviewing of recent relevant literatures to collect the necessary data. The two study tools were submitted to a jury of five experts in the field of Medical-Surgical Nursing, Faculty of Nursing, Alexandria University, and two of the academic staff at the Oncology Department, Damanhur Oncology Center; to assure the content validity, completeness, appropriateness, and clarity of items, and accordingly; all necessary modifications were done.
- Arabic version of Tool I and Tool II were tested for their reliability on a sample of 10% of subjects using Cronbach's Alpha statistical test, and for assuring items' internal consistency. Reliability was 0.721, and 0.708 regarding tool I and II; respectively, revealing good reliability.
- A pilot study was carried out on 10% of nurses who were fulfilling the inclusion

criteria, and were working at the Outpatient Chemotherapy Clinics in the previously mentioned setting; to ascertain the clarity, feasibility and applicability of the developed tools. The necessary modifications were done accordingly. However, these nurses were excluded from the study subjects.

- Concerning nurses' knowledge assessment regarding implanted Port-A-Catheter care for patients undergoing chemotherapy; all nurses were asked by the researchers to fill Tool I questionnaire individually through face to face interview for each nurse once at the previously mentioned setting, during morning shifts for 30-45 minutes after explaining the study purpose.
- Moreover, every nurse was observed individually twice through concealed observation by the researchers during their implementation of Port-A-Catheter care before and during connections to chemotherapy, catheter disconnection/ de-accessing as well as exit site care. Each concealed observation lasted 20-30 minutes for each nurse.

- The first observation of each nurse's practices was done while performing care of Implanted Port-A-Catheter in the morning shift. While the second observation was done for the same nurse in the evening shift on his/her time schedule of the same setting; utilizing tool II. The average mean of the two observations was calculated and obtained.
- Data were collected throughout a period of four months from the beginning of January up to the end of April 2022.

Ethical considerations:

- Written informed consent for the knowledge assessment questionnaire was obtained from nurses before data collection and after explanation of the study aim.
- Witness written consent was obtained from the Head Nurse before data collection for nurses' performance observation; being a concealed type.
- Confidentiality of data in addition to anonymity and privacy of study participants were asserted.
- The subjects were assured that their participation was voluntary, and they had the right to withdraw from the study at any time.

Statistical Analysis

Collected data were analyzed using IBM SPSS software package version 20.0 (Armonk, NY: IBM Corp) to assess nurses' knowledge and practice regarding implanted port -A-catheter care for patients undergoing chemotherapy.

Results

Table 1: Displays the distribution of the studied nurses according to their socio-demographic characteristics. In relation to **gender** and **marital status,** the results revealed that; two thirds (66.7%) of studied nurses were females and around three quarters (73.3%) were **married**. Regarding **age,** more than half (60%) of the studied nurses were in the age group of 25 to less than 30 years with a mean age of (30.67 ± 4.74) years.

It was noticed that; less than half (46.7%) of studied nurses worked 6 hours per day, **Furthermore**, the majority (81.7%) of studied nurses were responsible for 5 patients or more per one shift.

As regards **level of education and years of experiences** it was observed that; nearly half (51.7%) of the nurses were graduated from technical institute of nursing; but few (10%) of them hold a diploma degree. Additionally less than half (48.3%) of them had experience from 5 - less than 10 years with a mean years of 6.72 ± 3.76.

Finally, the minor proportion (20%) of studied nurses attended **training programs** related to implanted port-A-

Catheter care among patients undergoing chemotherapy.

Table 2: Reveals the distribution of the studied nurses, according to their overall mean percent score of knowledge level regarding implanted Port -A-Catheter care for patients undergoing chemotherapy. The table demonstrated that, more than half (56.7%) of the studied nurses had **fair** overall knowledge level, while 35% of them had **poor** overall knowledge level, and only 8.3% had good overall knowledge level regarding implanted Port -A-Catheter care for patients undergoing chemotherapy; with a total mean ± SD percent score (60.96 ± 9.58).

Table 3: Shows distribution of the studied nurses' according to their levels of practices regarding implanted port-a-catheter care for patients undergoing chemotherapy. Where, almost all of the studied nurses (96.7%) had **poor** level of practice score, while only (3.3%) of them had **fair** level of practice score; with an overall nurses' practice mean ± SD percent score (49.11 ± 5.06).

Table 4: Demonstrates the correlation between nurses' overall knowledge and overall practices mean percent score. The table showed a positive statistically significant correlation between nurses' overall knowledge and overall practices at ($p<0.001^{*}$).

Discussion

Intravenous (IV) chemotherapy administration is an essential component of modern medicine and nursing; where more than one million infusions of chemotherapy were performed each day worldwide. Previously, the peripheral IV cannula was the only device available; today there are short-intermediate and long-term central venous catheters (CVC) namely: implantable port catheters (PCs). Nevertheless, implantable PCs have provided a great degree of convenience for the treatment of oncology patients worldwide **(Mulemba et al., 2021).**

As regards to **socio demographic characteristics of the studied nurses:** Concerning **''age"** it was noted that; more than half of the nurses were in the age group from 25 to less than 30 years. This result may be explained as; the young nurses are mainly occupied on oncology units to tolerate the nature of the stressful work environment and to acquire more experience acquaint them for chemotherapy patient management. However, this finding was in agreement with the study done by **Manal et al. (2018)** at different oncology units at Cairo University Hospitals and founded that, more than one thirds of the studied subjects ranged between 20-29 years.

Concerning "**level of education",** the present study revealed that; more than half of the studied nurses had technical institute of nursing graduation. This may be due to in Egypt; most oncology nurses have technical education while nurses who have bachelor's degree work at the intensive care units. This finding agreed with the study done by **Ahmed and Kafl (2019)** at Suez Canal University in Egypt who showed that; more than half of their studied nurses had technical health institute education. While, this finding was contradicted with the study done by **Mokadem and Shimaa (2019)** at Menoufia University in Egypt who found that; about two thirds of their study participants had a bachelor's degree in nursing.

Concerning nurses' **"years of experience"** in oncology unit, it was observed that; less than half of studied nurses had experience ranging between 5 to less than 10 years. This result was congruent with **Khalil et al. (2017)** who illustrated that; more than half of their study nurses had 5-10 years of experience in oncology unit. However, this finding disagreed with **Rajih (2020)** findings who found that; more than half of the nurses have experience ranging from one to three years in oncology units.

Regarding "**Attending training programs"** the present study revealed that; the majority of the studied nurses didn't

attend training programs related to implanted Port-A-Catheter care among patients undergoing chemotherapy. This may be interpreted by the lacking of in-service training programs, In addition, due to the occupied and heavy workload on nursing staff throughout their shifts; thus the nurses were not aware of the time lapsed necessitating implanted port process education. This finding was consistent with **Mohamed et al. (2019)** in Egypt who found that; the majority of nurses didn't receive training about an implanted port care because there is no time for attending any training program as a result of work overload. On contrary, **Khalil et al. (2017)** and **Aydoğdu and Akgün (2020)** who reported that; more than half of their studied nurses attended previous training courses regarding implantable port-A-catheter insertion and care.

As regards **overall nurses' knowledge** related to implanted Port -A-Catheter care for patients undergoing chemotherapy that covers, general knowledge about Port -A-catheter, catheter connections and disconnections, exit site care, catheter removal, documentation, infections and complications. The results of the present study revealed that; more than half of the studied nurses had **fair** overall knowledge level. From the researcher point of view this may refer to; that the majority of the studied nurses did not receive previous in-service training program regarding port-A-cath. Other reasons might be work overload, increased number of patients, lack of nurses' incentives to improve their knowledge and lack of desire to update their knowledge.

This finding was corresponded with the results of **Ahmed et al. (2019)** who demonstrated that; more than half of nurses had **fair** level of knowledge and the lowest percentage of nurses had **good** level concerning CVC care. Moreover, this result agreed with the study done by **AL-Naeli and Hassan (2021)** who found that; knowledge of the nursing staff regarding the prevention of vascular access device (VAD) and Peripheral IV catheter (PIVC) complications in their study's pretest test was **fair** in both the study and control groups**.**

However, contradicting findings were revealed by **Hassanien et al. (2019)** who found that; more than two thirds of nurses had an **unsatisfactory** level of knowledge regarding caring of implanted port for patient undergoing chemotherapy.

Portraying **overall nurses' practices level regarding implanted Port -A-Catheter care for patients undergoing chemotherapy:**

The results of the current study revealed that; almost all of the studied nurses had **poor** level of practices regarding implanted Port -A-Catheter care for patients undergoing chemotherapy which covered nursing care for catheter before, and during connections to chemotherapy, disconnections/de-accessing in addition to exit site care. This result could be interpreted by the inadequate continuing nurses' monitoring and supervision, lack of conducted training courses about Port-A-Catheter care in oncology departments, and work overload.

This finding was matching with **Hassanien et al. (2019)** study in the Oncology unit at Ain Shams University in Egypt who found that; more than three quarters of nurses had unsatisfactory level of practice regarding implanted Port -A-Catheter care for patients undergoing chemotherapy. Also, this result was in the same line with **Atia (2017); Mersal et al. (2019)** in Egypt who showed that; almost all of nurses had **unsatisfactory** practice scores related to Port-A-Catheter care in the pre-test.

Regarding the **correlation between nurses' overall knowledge and overall practices** mean percent score; the present study results revealed statistical significant relation between nurses' overall knowledge and overall practices. This result was supported by **Mohammed et al. (2017)** and

Qalawa (2017) who revealed that; there was a significant statistical correlation between the total knowledge scores and total practices scores of nursing personnel regarding CVC care.

However, this study finding was mismatched with results of **Mamdouh (2021)** which displayed that; there were no a statistically significant relation between nurses' knowledge and practice, where all studied nurses who had unsatisfactory level of knowledge conversely had competent level of practice.

Conclusion

Based on the study findings, it was concluded that: more than half of the studied nurses had **fair** level of knowledge regarding implanted Port -A-Catheter care for patients undergoing chemotherapy. As well almost all of the studied nurses had **poor** level of practice.

Furthermore, there was a positive statistically significant correlation between nurses' overall knowledge and overall practices scores. Also, there were positive significant statistical relations between all items of nurses' socio demographic characteristics and their overall knowledge except marital status, and average patients caring per shift. In addition, statistically significant relations were found between all items of nurses' socio demographic characteristics and their overall practice except for; marital status, and gender.

Recommendations

- The implementation of pre-service and in- service education programs for nurses to update their knowledge and practices concerning implanted Port -A-Catheter care.

- Newly employed nurses in oncology and chemotherapeutic units are required to successfully complete a test of basic knowledge and skills before assuming independent responsibility for patient care.

- Regular staff scheduled scientific meetings, conferences and workshops must be conducted to keep pace with the rapidly growing wealth of knowledge and practice that necessary for proper implanted Port -A-Catheter nursing care.

- Replicate the study on a large probability sampling and on different geographical settings for generalization of the result.

- Explore factors that affect nurses' knowledge and practices regarding implanted Port-A-Catheter care.

Table (1): Distribution of the studied nurses' according to their socio-demographic characteristics (n = 60)

Nurses' socio-demographic characteristics	No.	%
Gender		
Male	20	33.3
Female	40	**66.7**
Age (years)		
25 < 30	36	**60.0**
30 < 40	22	36.7
40+	2	3.3
Min. – Max.	26.0 – 46.0	
Mean ± SD	30.67 ± 4.74	
Marital status		
Single	14	23.3
Married	44	**73.3**
Divorced	2	3.3
Widow	0	0.0
Level of education		
Diploma degree	6	10.0
Technical nurse	31	**51.7**
Bachelor	23	38.3
Years of experience in oncology unit		
<5	24	40.0
5 < 10	29	**48.3**
10 ≤ 15	7	11.7
Min. – Max.	2.0 – 17.0	
Mean ± SD	6.72 ± 3.76	
Number of daily working hours		
6	28	**46.7**
12	21	35.0
Others//24	11	**18.3**
Average patients caring per shift:		
1 – 2	0	0.0
3 – 4	11	18.3
5 or more	49	**81.7**
Previous attendance of training program (s) related to implanted port-A-Catheter care among patients undergoing chemotherapy:		
Yes	12	20.0
No	48	80.0
If yes specify, How many times?	**(n = 12)**	
One time	9	**75.0**
Two times	2	16.7
Three times	1	8.3
More than three	0	0.0
When was training program (s) taken?	**(n = 12)**	
Pre-service	1	8.3
In-service	11	**91.7**

Table (2): Distribution of the studied nurses' according to their overall mean percent score of knowledge level regarding implanted Port -A-Catheter care for patients undergoing chemotherapy (n = 60)

Nurses' knowledge items	Levels of knowledge (n = 60)						Mean ± SD percent Score
	Good (75%)		Fair (60 – <75%)		Poor (<60%)		
	No.	%	No.	%	No.	%	
1- General knowledge about implanted port -A-Catheter	15	**25.0**	24	**40.0**	21	**35.0**	60.33 ± 16.05
2-Knowledge about nursing care of Port-A-Catheter connection and disconnection	2	**3.3**	27	**45.0**	31	**51.7**	58.10 ± 11.94
3- Knowledge about Port-A-Catheter exit site care	15	**25.0**	11	**18.3**	34	**56.7**	51.11 ± 34.43
4-Knowledge about Port-A-Catheter removal	24	**40.0**	0	0.0	36	**60.0**	67.50 ± 28.86
5-Knowledge about patient documentation	52	**86.7**	0	0.0	8	**13.3**	86.67 ± 34.28
6-Knowledge related to Port-A-Catheter infection and complications.	29	**48.3**	15	**25.0**	16	**26.7**	65.63 ± 15.03
Overall knowledge level	5	**8. 3**	34	**56.7**	21	**35.0**	**60.96 ± 9.58**

Table (3): Distribution of the studied nurses' according to their levels of practices regarding implanted port-a-catheter care for patients undergoing chemotherapy.

Items	Level of Nurses' practices						Mean ± SD percent Score
	Good (>75%)		Fair (60 – 75%)		Poor (<60%)		
	No.	%	No.	%	No.	%	
I- Nursing care for Port-A-Catheter before connections to chemotherapy	0	0.0	3	5.0	57	95.0	48.25 ± 6.93
II- Nursing care for Port-A- Catheter during connections to chemotherapy	0	0.0	2	3.3	58	96.7	49.58 ± 5.36
III - Nursing care for Port-A-Catheter disconnection/ de-accessing	0	0.0	18	30.0	42	70.0	56.44 ± 7.86
IV- Nursing care for Port-A-Catheter exit site	0	0.0	0	0.0	60	100.0	42.15 ± 7.36
Overall nurses' practice	**0**	**0.0**	**2**	**3.3**	**58**	**96.7**	**49.11 ± 5.06**

Table (4): Correlation between nurses' overall knowledge and overall practices mean percent score (n = 60)

Nurses'	Overall practices	
	R	p
Overall knowledge	0.535*	<0.001*

r: Pearson coefficient

*: Statistically significant at $p \leq 0.05$

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