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Nurses' Performance Regarding Safe Handling with Colostomy among Colorectal Cancer Patients in Intensive Care Units

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Abstract:

Background: Colostomy is a surgical procedure that involves creating an opening in the abdominal wall to divert the flow of stool from the colon to a stoma. Oncology nurse can play a clinically relevant role in the care of colorectal cancer patients with colostomy especially post-operatively. **Aim:** This study aimed to assess the nurses' performance regarding safe handling with colostomy among colorectal cancer patients in intensive care units. **Design**: A descriptive exploratory research design was used to achieve the aim of the study. **Setting:** The study was carried out in the surgical intensive care unit at Qena Oncology Center. **Subjects:** A convenient sample was used including 50 nurses who are caring for colorectal cancer patients. **Tools:** Three tools for data collection were used (1) nurses' self-administered questionnaire, including (a) nurses' personal characteristics, (b) knowledge assessment regarding colorectal cancer disease and (c) colostomy care knowledge, (2) observational checklist of colostomy care and (3) nurses' attitudes regarding safe handling with colostomy (Likert Scale). **Results:** More than half of the studied nurses (52 %) had a satisfactory level of knowledge, while, majority of them (86 %) had incompetent level of practice and more than half of them (56 %) had a positive attitude regarding colorectal cancer and colostomy care. **Conclusion:** There was a positive correlation between knowledge and practice. While there was a negative correlation between knowledge and attitude and also a negative correlation between practice and attitude. **Recommendations:** Performing an educational program on evidence base practices for colostomy care standards for nurses in all departments regardless age or gender.

Keywords: *Colorectal Cancer, Colostomy, Intensive Care Unit, Nurses' Performance*

Introduction:

Cancer is a disease characterized by the uncontrolled division of abnormal cells. When this type of growth occurs in the colon or rectum, it is called colorectal cancer (CRC). The colon and rectum (colorectum), along with the anus, make up the large intestine, the final segment of the gastrointestinal (GI) system. The large intestine is sometimes called the large bowel, which is why CRC is sometimes referred to as bowel cancer **(Nagaraju et al., 2021).**

Tumors of the colon and rectum are relatively common; the colorectal area is the third most common site of new cancer cases in the United States, approximately 104,600 new cases and 53,200 deaths from colorectal cancer occur annually. Colorectal cancer is the third leading cause of cancer death in men or women and the second leading cause of cancer death among all adults in the United States **(Hinkle et al., 2022).**

Critically ill patients are those patients who are at high risk for actual or potential life-threatening health problem, and nurses must often focus on specific life sustaining treatment **(Perrin & MacLeod, 2018).** The colostomy is a stoma that is formed after removing a section from the large bowel or colon and is an opening in the abdominal wall that's made during surgery **(Loughlin et al., 2018).** The most secure type of treatment can include acute diverticulitis, rectal cancer, trauma, or bowel-inflammatory conditions **(Huang et al., 2020).**

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Physical and psychological issues including anxiety, shame, depression and a negative physical image affect patients with a stoma **(Lebona et al., 2016).** Nurses can play a major part in the understanding and have an important role in adjustment to the colostomy patients and their families. This position is only effective if the nurses have expertise and skills **(Chindaprasirt et al., 2017).**

Initial evaluation and education help for patients in the colostomy surgery, before and after surgery, however, patient care and education quality are influenced by the expertise and capacity of nurses. Since patient care is one of the tasks of nurses, they need enough expertise to care for patients **(Duruk & Uçar, 2018).** Therefore, the understanding of nursing skills and expertise influences patient education and healthcare satisfaction. Nurses should be qualified to handle colostomy safely before hospital discharge to determine the physical, psychological and cultural needs of the patient **(Ali et al., 2021).**

Significance of the study

Colorectal cancer (CRC) is the third most common cancer and the second leading cause of cancer related deaths in the world with an estimated number of 1.93 million new cases and about 935,173 deaths worldwide in 2020 **(Haggar & Boushey, 2020).** The epidemiology of CRC varies significantly between different regions in the world as well as between different age, gender and racial groups **(Baidoun et al., 2021).**

In Egypt, accounting for nearly 7,185 deaths, where colon and rectum cancer cases are estimated with 12,696 cases in 2018 **(Rawla et al., 2019).** In Egypt it is found that ages at diagnosis of colorectal cancer were 31.9% of < 40 years, 33.1% of 40-59 years, and 35.0% of > 60 years. There is an elevation of the incidence of colorectal cancer where it shares the characteristics feature of epidemiology of the developing countries, in which the incidence was high in young peoples and cancer of rectum predominates **(Hassan et al., 2021).**

According to the statistical records at Qena University hospital, the total admission number of patients with cancer admitted to radiological department during 2020-2021 were 300, 50 of them diagnosed with rectal cancer which representing16.66% **(Gamal et al., 2022).**

Aim of the study:

The current study aimed to assess the nurses' performance regarding safe handling with colostomy among colorectal cancer patients in intensive care units through the following objectives:

1. Assess the nurses' level of knowledge regarding safe handling with colostomy among colorectal cancer patients in intensive care units.
2. Assess the nurses' level of practice regarding safe handling with colostomy among colorectal cancer patients in intensive care units.
3. Assess the nurses' attitude regarding safe handling with colostomy among colorectal cancer patients in intensive care units.

Research Question:

1- What is the nurses' level of knowledge regarding safe handling with colostomy among colorectal cancer patients in intensive care units?
2- What is the nurses' level of practice regarding safe handling with colostomy among colorectal cancer patients in intensive care units?
3- What is the nurses' attitude regarding safe handling with colostomy among colorectal cancer patients in intensive care units?

I. Technical item:

The technical design included the research design, setting, subjects and tools of data collection.

Subjects and Methods:

Research design:

Descriptive exploratory research design was utilized to achieve the aim of the study

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Study Setting

The study was carried out in the Surgical intensive care unit (SICU) at Qena Oncology Center, affiliated to the secretariat of Specialized Medical Centers, Ministry of Health. It is a specialized therapeutic center for treating oncology patients.

Subjects:

Convenience sample, (50) nurses from both genders who are working in Intensive Care Unit of Qena Oncology Center, affiliated to the secretariat of Specialized Medical Centers, Ministry of Health.

Tools of data collection:

There are three tools were utilized to collect the data during the study period:

Tool (I): Nurses' Self-Administered Questionnaire:

This questionnaire was adapted from **(Hinkle et al., 2022)** & (**Ali et al., 2021)** and modified by the investigator after reviewing related literature to collect the required data. It was written in simple Arabic language. It is divided into three parts as the following:

First Part: Nurses' Personal Characteristics.: which included (age, gender, marital status, qualifications, position status, years of experience in intensive care unit (ICU) and attending courses about colorectal cancer and colostomy care). It was composed of (7) closed ended questions.

Second Part: Nurses' Knowledge Regarding Colorectal Cancer Disease (CRC): it consisted of (11) multiple choice questions with one correct answer such as (definition of CRC, causes, common cells of CRC, types, symptoms, risk factors, diagnoses, stages, complications, treatment and ways of prevention) **(Hinkle et al., 2022).**

Scoring system for tool I, part 2: Each question was scored as one grade for the correct answer and zero grade for the incorrect answer with total 11 grades. The total knowledge score classified into 2 categories as follows:

- **Satisfactory knowledge:** If the total score was equal or more than 75%, it means equal or more than 8 grades **(Zoheir et al., 2022).**
- **Unsatisfactory knowledge:** If the total score was less than 75%, it means less than 8 grades **(Zoheir et al., 2022).**

Third part: Nurses' Knowledge Regarding Colostomy Care among Colorectal Cancer Patients: It was adapted from **(Ali et al.,2021).** It consists of (20) multiple choice questions with one correct answer such as (Meaning of stoma, meaning of colostomy, indication of undergoing colostomy, purpose of colostomy, types of colostomies, normal appearance of the stoma, the time required for the colostomy to return to its normal size, Cleaning of the stoma, definition of colostomy pouch, types of pouches, precautions to be followed when applying pouches, the case in which pouch is changed, warning signs of unhealthy stoma, kinds of foods that could be eaten for a patient with colostomy, kinds of food to be avoided for patient with colostomy, the cause of avoidance of certain foods after colostomy, types of patient' clothes with colostomy, the nurse's advice about patient with colostomy, the required duration for a patient with a colostomy to return for follow-up care after discharge from the hospital and the possibility of a colostomy patient to return to work.

Scoring system for tool I, part 3: Each question was scored as one grade for the correct answer and zero grade for the incorrect answer with total score (20). The total knowledge score classified into 2 categories as follows:

- **Satisfactory knowledge:** If the total score was equal or more than 75%, it means equal or more than 15 grades **(Zoheir et al., 2022)**.

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- **Unsatisfactory knowledge**: If the total score was less than 75%, it means less than 15 grades **(Zoheir et al., 2022)**.

Tool (II): Observational Checklist of Colostomy Care: This tool was adapted and was modified by the investigator after reviewing the related procedures from **(Potter et al., 2016),** and **(Ali et al., 2021)**. It consists of four parts for assessing nursing practice about colostomy care with done or not done:

- **1st part:** Emptying the pouch including (10) items.
- **2nd part**: Irrigation of the stoma including (27) items.
- **3rd part**: Assessment of the stoma and peristomal skin including (7) items.
- **4th part**: Applying new colostomy appliance including (26) items.

Scoring system for tool II: Each step was scored as one grade for done step and zero grade for not done step with total scores (70). Subject responses were calculated in the scoring system classified into:

- Competent level if the percent score was 80% or more and incompetent if less than 80% based on statistical analysis (**Amin et al., 2023).**

Tool (III): Nurses' Attitudes Regarding Safe Handling with Colostomy among Colorectal Cancer Patients in Intensive Care Units (Likert Scale): This tool was adapted from **(Andrew and Sharma., 2013)** and modified by the investigator and translated into a simple Arabic language. A 3-point Scale (1 = Disagree; 2 = Neutral and 3 = Agree) was used to evaluate nursing confidence and attitudes towards colostomy care. It consists of 15 items divided into three parts as follows:

- **Part (1):** Nurses' confidence in assessment and colostomy care skills (7 items).
- **Part (2):** Perception of resources by nurses (5 items).
- **Part (3):** Nurses' perception of the patients' level of preparedness to live with colostomy before discharge from the hospital (3 items).

Scoring system for tool III: For attitude given score as (1) grade for "Disagree", (2) grades for "Neutral" and (3) grades for "Agree", it was adopted from **(Shanmugam & Anandhi, 2016)**. The nurse had positive level of attitude when the total score equal or above 80%, and negative level of attitude when it below 80% based on statistical analysis (**Amin et al., 2023)**.

II. Operational Item:

Preparatory phase: It included reviewing of related literature and theoretical knowledge of various aspects of the study using books, articles, internet periodicals and magazines to develop tools for data collection.

Content Validity:

The tools were revised by a panel of five expertise from nursing staff which included **4** associate professors and **1** lecturer of medical surgical nursing department, faculty of nursing, Helwan University who revised the tools' content for clarity, relevance, comprehensiveness, understanding and ease of implementation. All necessary recommended modifications were done accordingly.

Reliability:

Cronbach's Alpha was used to determine the internal reliability of the adapted tools. Reliability of the tools was tested to determine the extent to which the questionnaire items are related to each other. Cronbach's alpha reliability coefficient normally ranges between 0 and 1 with higher values (more than 0.7) denote acceptable reliability. Reliability of Nurses' knowledge assessment questionnaire was (0.591), Observational checklist of colostomy care was (0.856) and Nurses' attitudes was (0.847) regarding colostomy care.

Ethical Considerations

The research approval was obtained from the scientific research ethical committee of the faculty of nursing at Helwan University in 29/3/2023 registered with No. (33). Oral approval was obtained from each participant prior to data collection. Each participant was informed about the purpose; benefits of the study and participation is voluntary not mandatory. Each participant has the right to withdraw from the study at any time without giving any reason. The investigator assured maintaining anonymity and confidentiality of the study data. Nurses were informed that data collected would be used only

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to improve their knowledge, practice and attitude regarding safe handling with colostomy among colorectal cancer patients in intensive care units.

Pilot study:

A Pilot study was carried out on 5 nurses (10 % of the total number of nurses) after developing the tools and before starting the data collection to evaluate the clarity, applicability, relevance and feasibility of the tools and to estimate the needed time to fill the study tools. No necessary modifications were done. Therefore, the pilot study was included in the total sample.

Fieldwork

Data were collected through 6 months from the beginning of June (2023) until the end of November (2023).

1. The investigator firstly met with the nurses in ICU, explained the purpose of the study after introducing himself. then, individual interviewing was done after obtaining oral approval to participate in the study.
2. Data collection was done 2 days/week by the investigator in the morning and afternoon shifts
3. Each nurse filled the questionnaire of demographic data, colorectal cancer disease and colostomy care knowledge, it took about 20 - 25 minutes.
4. Observational checklist was filled by the investigator based on observing nurses' performance while dealing with the patients, it took about 30 – 45 minutes .
5. Nurses' attitude questionnaire was filled after colostomy care procedure implementation and took about 5 -10 minutes.

Procedure

The current study was conducted through three phases.

1) **Preparation and Planning Phase:** It was concerned with construction and preparation of different data collection tools. In addition, managerial arrangements were executed and the investigator prepared formal requests to selected ICU manager of Qena Oncology Center affiliated to the secretariat of Specialized Medical Centers, Ministry of Health. The purpose and nature of the study were explained to gain acceptance, and support. This stage lasted for one month duration from beginning of January 2023 to the end of February 2023 and ended by carrying out the pilot study.
2) **Implementation Phase:** Data were collected from the beginning of June (2023) until the end of November (2023). The investigator visited the selected setting on two days basis during the morning and afternoon shifts. The average number of nurses who answered the questionnaire was three to five nurses per day. Nurses' answering on Nurses' Self-Administered Questionnaire (tool I) required about 20-25 minutes. The investigator was available to answer any questions or explanations and to check each questionnaire after its completion, to be sure that there are no missed items. Later, two nurses were observed directly by the investigator in each day. Each nurse was observed in two different occasions for one hour, while performing each step of the procedure in the observational checklist (tool II), it took about 30 – 45 minutes Obtained data were converted into numeric data, and the average of the two observations was calculated.
3) **Evaluation Phase:**

   The nurses were assessed their attitude about colostomy care through Nurses' Attitude Questionnaire (tool III) which was filled after colostomy care procedure implementation. It took about 5 – 10 minutes to be filled by each nurse.

III. Administrative Design

An official permission for data collection in intensive care unit- Qena Oncology Center affiliated to the secretariat of Specialized Medical Centers was obtained from the hospital administrative personnel by submission of a formal letter was issued to them from the Dean of Faculty of Nursing; Helwan University explains the aim of the study for obtaining the permission for data collection.

IV. Statistical Item:

All data were collected, tabulated and statistically using IBM SPSS Statistics Version 26 for Windows. Numerical data were presented as mean and standard deviation ± (SD) values. Qualitative data were presented as frequencies (n) and percentages (%). Percent of categorial variables were compared using Chi Square test ($\chi 2$) when appropriate.

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Spearman's rank correlation coefficient was used to determine correlations between different variables, (+) sign indicates positive correlation & (-) sign indicates negative correlation, also values near to 1 indicate strong correlation & values near 0 indicate weak correlation

Significance of the results:

- P-value > 0.05 was considered statistically not significant (NS).
- P-value < 0.05 was considered statistically significant (S)
- P-value <0.01 was considered statistically highly significant (HS).

Results:

Table (1): Frequency and Percentage Distribution of Demographic Characteristics of the Studied Nurses (n=50).

Items	Studied Nurses (n = 50)	
	No	%
Age in years:		
• 20 < 30 years.	47	94
• 30 < 40 years.	3	6
Mean ±SD	**27.65±5.302**	
Marital status:		
• Single.	38	76
• Married.	12	24
Qualifications:		
• School of nursing.	3	6
• Technical institute of nursing.	33	66
• Bachelor degree of nursing.	12	24
• Postgraduate studies in nursing.	2	4
Position status:		
• Staff nurse.	32	64
• Charge nurse.	18	36
Years of experience in Intensive Care Unit (ICU):		
• < 5 years.	46	92
• 5 < 10 years.	4	8
Attending courses about colorectal cancer and colostomy care:		
• No.	38	76
• Yes.	12	24

Table 1: indicates that, 94% of the studied nurses were in age group 20 < 30 years with Mean ± SD was 27.65±5.302 and about 76% of them were single. Concerning to qualifications and position; 66% of them graduated from technical institute of nursing and 64 % working as a staff nurse.92% of the studied nurses had experience in ICU less than five years, 76 % of them hadn't attended courses about colorectal cancer and colostomy care and only 24% who attended.

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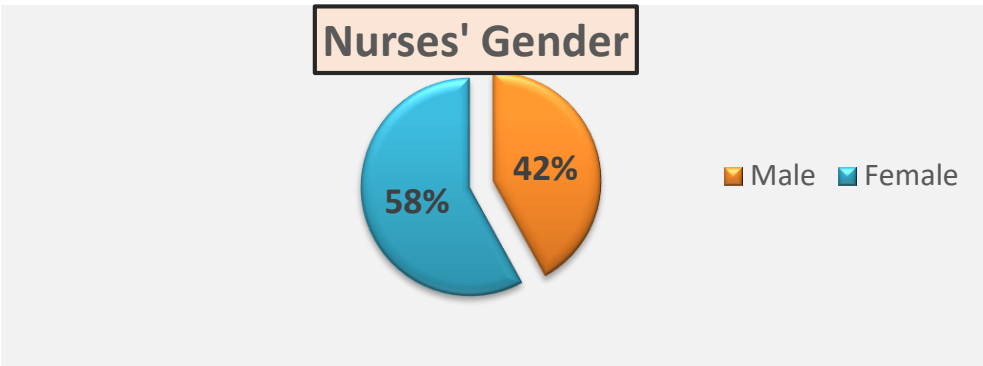

Fig. 1: Pie Graph Representing Nurses' Gender.

Fig 1: indicates that, 58% of the studied nurses were female, while 42% were from male.

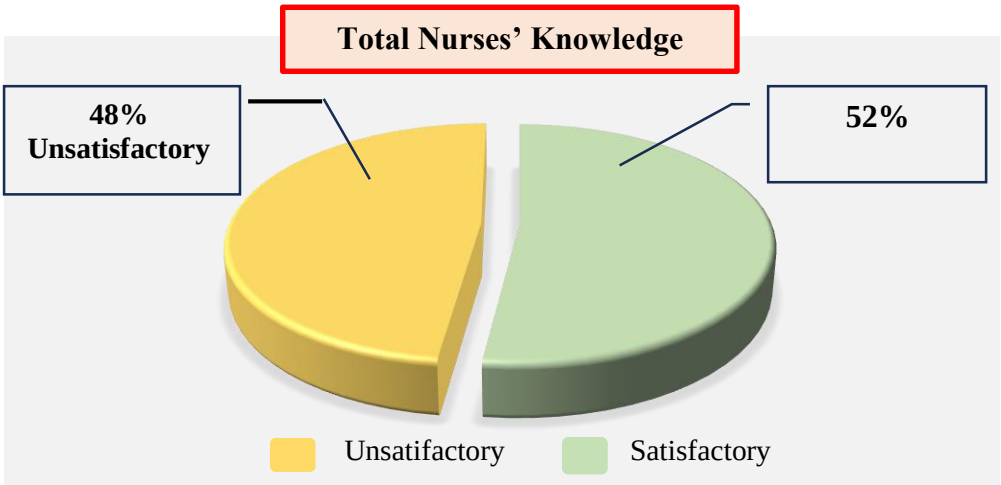

Fig. 2: Pie Graph Representing Total Nurses' Knowledge

Fig 2: illustrates that, 52% of the studied nurses had total satisfactory level of knowledge, while 48% of them had total unsatisfactory level of knowledge regarding colorectal cancer disease and colostomy care among colorectal cancer patients.

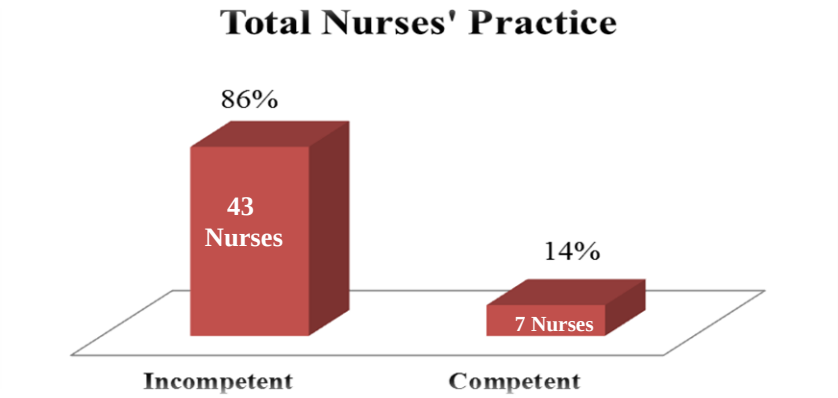

Fig. 3: Bar Graph Representing Total Nurses' Practice.

Fig 3 reveals that, 14% of the studied nurses had a competent level of total practice, while 86% had incompetent level of total practice

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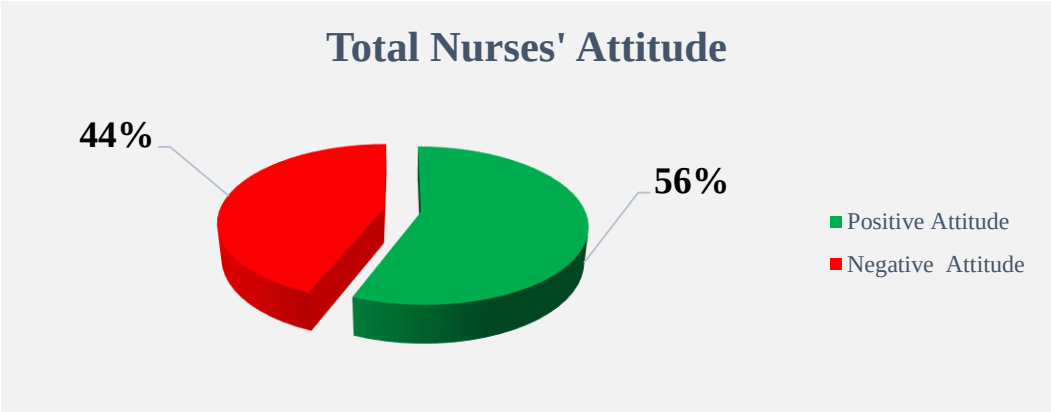

Fig. 4: Pie Graph Representing Total Nurses' Attitude.

Fig 4: shows that, 56% of the studied nurses had a positive attitude, while 44% had a negative attitude regarding colostomy care among colorectal cancer patients.

Table (2): Relation between Demographic Characteristics of the Nurses under Study and their Total Level of Knowledge regarding Colorectal Cancer and Colostomy Care (n=50).

Demographic data	Total knowledge				Chi-square Test	
	Unsatisfactory (n=24)		Satisfactory (n=26)			
	n.	%	n.	%	X^2	P-Value
Age:						
20 < 30 years	23	95.8	24	92.3	0.275	0.600
30 < 40 years	1	4.2	2	7.7		
Gender:						
Male	9	37.5	12	46.2	0.384	0.536
Female	15	62.5	14	53.8		
Marital status:						
Single	21	87.5	17	65.4	3.346	0.067
Married	3	12.5	9	34.6		
Qualifications:						
School of nursing	3	12.5	0	0	6.415	0.093
Technical institute of nursing	13	54.2	20	76.9		
Bachelor degree of nursing	6	25	6	23.1		
Postgraduate studies in nursing	2	8.3	0	0		
Position status:						
Staff nurse	16	66.7	16	61.5	0.142	0.706
Charge nurse	8	33.3	10	38.5		
Years of experience in Intensive Care Unit (ICU):						
< 5years	23	95.8	23	88.5	0.921	0.337
5 < 10 years	1	4.2	3	11.5		
Attending courses about colorectal cancer and colostomy care:						
No	16	66.7	22	84.6	2.204	0.138
Yes	8	33.3	4	15.4		

: Significant at P ≤ 0.05

Table 2: Clarifies that, there was not statistically significant relationship between demographic characteristics of the studied nurses with their total level of knowledge.

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Table (3): Relation between Demographic Characteristics of the Nurses under Study and their Total Level of Practice (n=50).

Items	Total Level of Practice				*x2*	*P*-value
	Incompetent		Competent			
	No	%	No	%		
Age in years:					0.991	0.320
• 20 < 30 years.	41	82.3	6	11.7		
• 30 < 40 years.	2	3.7	1	2.3		
Gender:					5.894	0.01*
• Male.	21	42.1	0	0		
• Female.	22	44.3	7	13.6		
Marital status:					0.421	0.516
• Single.	32	64.3	6	11.7		
• Married.	11	21.7	1	2.3		
Qualifications:					4.508	0.04*
• School of nursing.	3	6	0	0		
• Technical institute of nursing.	30	59.8	3	5.9		
• Bachelor degree of nursing.	9	17.8	3	5.9		
• Postgraduate studies in nursing.	1	2.3	1	2.3		
Position status:					4.434	0.03*
• Staff nurse.	30	59.8	2	4.2		
• Charge nurse.	13	25.8	5	10.2		
Years of experience in Intensive Care Unit (ICU):					0.437	0.05*
• < 5 years.	40	80.3	6	11.7		
• 5 < 10 years.	3	5.7	1	2.3		
Attending courses about colorectal cancer and colostomy care:					0.093	0.760
• No.	33	65.6	5	10.1		
• Yes.	10	20.1	2	4.2		

*: Significant at P ≤ 0.05

Table 3: shows that, there was statistically significant relation between total nurses' level of practice and gender, qualifications, position status, and years of experience in ICU P-*value* = 0.01, 0.04, 0.03, and 0.05 respectively.

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Table (4): Relation between Demographic Characteristics of the Nurses under Study and their Total Level of Attitude (n=50).

Items	Nurses' Attitude (n = 50)						*x2*	*P*-value
	Disagree		Neutral		Agree			
	No	%	No	%	No	%		
Age in years:								
• 20 < 30 years.	2	4.1	18	35.8	26	51.9	0.988	0.610
• 30 < 40 years.	0	0	2	4.1	2	4.1		
Gender:								
• Male.	1	2	9	18	12	23.9	0.211	0.900
• Female.	1	2	11	12	16	32.1		
Marital status:								
• Single.	1	2	16	32	21	42	0.932	0.628
• Married.	1	2	4	8	7	14		
Qualifications:								
• School of nursing.	0	0	0	0	1	2	3.287	0.001*
• Technical institute of nursing.	1	2	14	28	19	37.8		
• Bachelor degree of nursing.	1	2	5	10	6	12.1		
• Postgraduate studies in nursing.	0	0	1	2	2	4.1		
Position status:								
• Staff nurse.	1	2	12	24	20	40.4	0.490	0.783
• Charge nurse.	1	2	8	16	8	15.6		
Years of experience in Intensive Care Unit (ICU):							0.311	0.000*
• < 5 years.	2	4	18	36	24	48.5		
• 5 < 10 years.	0	0	2	4	4	7.5		
Attending courses about colorectal cancer and colostomy care:							0.658	0.720
• No	2	4	15	30	21	42		
• Yes	0	0	5	10	7	14		

*: Significant at P ≤ 0.05

Table 4: shows that, there was statistically significant relation between total nurses' attitude and qualifications & years of experience *P-value* = 0.001, and 0.000 respectively.

Table (5): Correlation between Nurses' Total Knowledge, Practice and Attitude.

Items	Total Nurses' knowledge (n = 50)			Total Nurses' Practice (n = 50)		
	Mean±SD	Correlation Coefficient	*P*-value	Mean±SD	Correlation Coefficient	*P*-value
Total Nurses' Practice	40.66±8.75	0.241	0.02*			
Total Nurses' Attitude	22.16±4.067	- 0.168	0.242	22.16±4.067	-0.036	0.803

*: Significant at P ≤ 0.05

Table 5: shows that, there was positive correlation between the studied nurses' total knowledge and total nurses' practice with (p- value 0.02*). While, there was negative correlation between total nurses' knowledge and total attitude (R = - 0.168). Also, this table shows that, there was negative correlation between the studied nurses' total practice and total attitude with R = - 0.036 & P- value (0.803).

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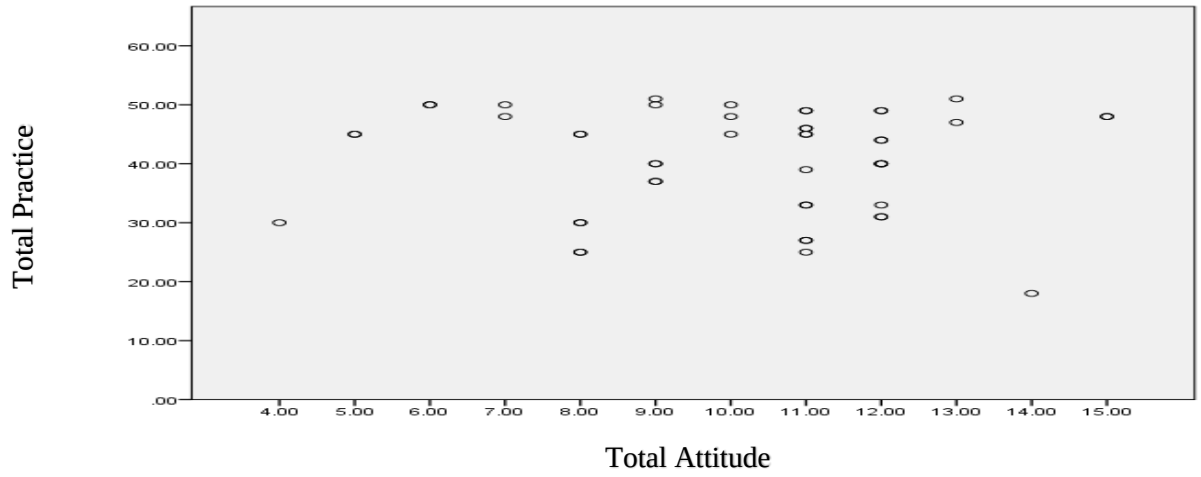

Fig. 5: Scattered Diagram Representing Correlation between Total Practice and Total Attitude.

Fig 5: shows that, there was a negative correlation between the studied nurses' practice and total attitude (R= - 0.036) & (*P*-value=0.803).

Discussion:

Colorectal Cancer (CRC) has become the most common cancer in the world after lung cancer, affecting about 1.36 million individuals each year. CRC incidence varies regionally worldwide and tends to be higher in economically developed countries compared to economically developing ones. According to the International Agency for Research on Cancer of the World Health Organization, 1.9 million new cases and 935 000 deaths of CRC are expected in 2020, with 148 000 new cases and approximately 53 000 deaths expected in the United States **(Luo et al., 2022).**

Colostomy is a surgical procedure where the normal bowel bath is interrupted with an artificial opening called stoma or ostomy appliance, this type of stoma drains waste from the large intestine (colon), and should drain a less liquid more stool-like type of waste **(Keng et al., 2021).** In order to care for people who experience colostomy, it is essential that they be guided by a holistic view that contemplates humanism in care actions and consider the specificities necessary for their adaptation and rehabilitation. Therefore, it is intended to emphasize the essence of care as an interactive process, which adds to the technical and scientific aspects and constitutes the knowledge and practices that guide the profession **(Wang et al., 2021).** Therefore, the aim of the current study to assess the nurses' performance regarding safe handling with colostomy among colorectal cancer patients in intensive care units.

Concerning with demographic data of the studied nurses, the results of the present study showed that most of the studied nurses were in age group 20 < 30 years, the mean ± SD of age is 27.65 ± 5.302, this result was agreed with **(Adley & Mohamed., 2022)** who conducted study entitled "Nurses' knowledge and performance regarding colostomy care among old age in Beni-Suef" and revealed that more than half of the studied nurses their ages were less than 30 years.

Regarding gender of the studied nurses, the current study revealed that more than half of the studied nurses were females. This result was agreed with **(Belay et al., 2023)**, who conducted a study entitled "Knowledge and Associated Factors of Nursing Professionals Toward Colostomy Care at Borumeda and Dessie Comprehensive Specialized Hospital" and revealed that more than two thirds were female. On the other hand, this result was in contrary with **(Amin et al., 2023)**, who conducted a study entitled with "Effect of Educational Intervention on Nurses' Performance and Attitude Regarding Intestinal Ostomy Care", and revealed that the majority of the nurses was male.

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Concerning with studied nurses' level of knowledge regarding colorectal cancer disease and colostomy care among colorectal cancer patients in intensive care units, the results of current study revealed that more than half of studied nurses had a satisfactory level of knowledge regarding colorectal cancer disease and colostomy care among colorectal cancer patients. Result of this study was supported by (**Belay et al., 2023),** who discovered that more than half of the staff nurses had good knowledge of colostomy care, while less than half of the staff nurses had poor knowledge. Another study supported the result by (**Endeshaw et al., 2024),** who conducted a study entitled "Knowledge and Practice of Intestinal Ostomy Care Among Nurses in Bahir Dar City, Ethiopia", and revealed that more than half of nurses (55.2%) were knowledgeable about ostomy care.

Concerning with studied nurses' level of practice regarding colostomy care among colorectal cancer patients in intensive care units, the current study revealed that the majority of studied nurses had incompetent level of practice regarding colostomy care of colorectal cancer patients, this result was agreed with **(Elbilgahy et al., 2024),** who conducted a study entitled "The Effect of Simulation-Based Intervention on Nurses' Performance and Satisfaction regarding Colostomy Care at Pediatric Surgical Unit", who revealed that less than two thirds, more than two thirds, less than half and more than half of the studied nurses had incompetent level practice related emptying the pouch of colostomy, irrigation, assessment of stoma & peristomal skin and application new colostomy appliance respectively.

On the other hand, this result was disagreed with **(Duruk & Ucar, 2018)**, who conducted a study entitled "Staff nurses' knowledge and perceived responsibilities for delivering care to patients with intestinal ostomies" and revealed that 74 % of the respondents were knowledgeable towards colostomy care.

Concerning with studied nurses' level of attitude regarding safe handling with colostomy among colorectal cancer patients, the result of current study revealed that more than half of the studied nurses who working in the intensive care unit had a positive attitude regarding colostomy care. This study was agreed with **(Alhawri et al., 2020),** who conducted a study entitled "Knowledge, Attitude, Performance and Associated Factors towards Colostomy Care among Nurses in Public Hospitals" and found that more than two thirds had a positive attitude towards nursing documentation and performance of colostomy care. Conversely, this study was disagreed with (**Amin et al., 2023),** who revealed that a staggering majority of the nurses had a negative attitude towards colostomy care.

Regarding to relation between total mean knowledge scores and demographic characteristics. The current study found that there wasn't statistically significant relationship between demographic characteristics of the studied nurses with their total level of knowledge.

Regarding to relation between total level of practice and demographic characteristics. The current study presents that there was a statistically relation between total nurses' level of practice and gender, qualifications, position status, and years of experience. This study agreed with **(Alhawri et al., 2020),** who found that there is a statistically significant relation between total performance and their demographic characteristics. Conversely, this result disagreed with **(Wang, et al., 2021)**, who conducted a study entitled "Effectiveness of a Multimedia Patient Education Intervention on Improving Self-care Knowledge and Skills in Patients with Colorectal Cancer after Enterostomy Surgery" and found that there was negative correlation between total performance and their demographic characteristics.

Regarding to relation between total level of attitude and demographic characteristics, there was a statistically significant relation between total nurses' attitude and qualifications & years of experience which agreed with **(Alenezi et al., 2022),** who conducted a study entitled with "Confidence, skills and barriers to ostomy patient care by nursing staff in Saudi Arabia", and revealed there was a significant positive correlation (p = 00.00) was also identified between the nurses' years of experience and their confidence in providing ostomy care.

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Regarding correlation between nurses' total knowledge and practice, this study showed that, there was a positive correlation between the studied nurses' total knowledge and total nurses' practice. This study was supported by **(Adley & Mohamed., 2022),** who showed that there is a positive correlation between nurses' total knowledge and their total performance. Conversely, this result is in disagreement with **(Dalmolin, et al., 2020)** who found that there is a negative correlation between nurses' total knowledge and their total performance.

Regarding correlation between total nurses' knowledge and attitude, this study represented that there was a negative correlation between the studied nurses' total knowledge and total attitude. This study disagreed with **(Tiruneh et al., 2022),** who revealed that nurses who have adequate knowledge towards colostomy care were significantly associated with nurses' attitude towards colostomy care.

Regarding correlation between total nurses' practice and total nurses' attitude, this study result revealed that there was negative correlation between the studied nurses' total practice and total attitude. This result was disagreed with **(Amin et al., 2023)**, who revealed that, the study highlighted a positive correlation between nurses' practice and attitudes towards colostomy care practice.

Conclusion:

More than half of studied nurses had a satisfactory level of knowledge, but majority of them had incompetent level of practice, while more than half of them had a positive attitude regarding colorectal cancer disease and colostomy care among colorectal cancer patients in intensive care units.

There was a positive correlation between the studied nurses' total knowledge and total nurses' practice. while, there was negative correlation between total nurses' knowledge and their total attitude and also a negative correlation between the studied nurses' total practice and total attitude.

Recommendations:

- Conducting comprehensive studies on nurses' performance in handling colostomies, including qualitative studies involving nurses and patients to understand their experiences and challenges.
- Performing an educational program updated on evidence base practices for colorectal cancer and colostomy care standards for nurses in inpatient surgical, post operative and outpatient departments regardless age or gender.
- Qena Oncology Center and other oncology hospitals & centers should focus on enhancing nurses' performance during colostomy care and assessing their educational needs for both staff and newly employed nurses, so that the quality of patients living with colostomy could be enhanced with no complications.
- Integrating the colostomy care module in the core nursing curriculum covering theory and practice to prepare nurses to deliver safe and compassionate care to colorectal cancer patients, especially in intensive care units.

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