Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (98-114), Month: May - August 2020, Available at: www.noveltyjournals.com

Effect of Designing and Implementing Nursing Teaching Guidelines on Patients Undergoing Radical Nephrectomy

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Abstract: **Background: Radical nephrectomy (RN) is the standard treatment of choice for localized renal cell carcinoma (RCC). Ensuring that patients' informational needs have been met before and after RN set the stage for successful management and improves recovery. Aims: To design and implement nursing teaching guidelines for patients undergoing RN and to evaluate the effect of implementing these guidelines regarding postoperative anxiety level, postoperative pain, early postoperative complications and length of hospital stay. Patients and methods: Prospective randomly categorized controlled trial research design. Sample; sixty adult patients undergoing RN at Assiut Urology and Nephrology University Hospital. Patients were randomized into two groups (study and control). Study group patients received the nursing teaching guidelines while the control group patients received the routine hospital care. Tools: I) Patient assessment sheet. II) State-Trait Anxiety Inventory for Adult. III) Numeric rating scale for pain. IV) Clavien-Dindo grading system and V) The designed nursing teaching guidelines. Results: Statistically significant differences were found between study and control groups regarding postoperative anxiety levels (< 0.01), postoperative pain (P < 0.01), early postoperative complications in the form of urinary tract infection (UTI) (P < 0.01) and length of hospital stay (P < 0.01). Conclusion: Study group showed a significant decrease in preoperative and postoperative anxiety, postoperative pain, UTI, and length of hospital stay than control group patients. Recommendation: Patients should be provided with sufficient information to remind them with specific instructions regarding treatment to avoid certain postoperative complications.**

Keywords: **Radical nephrectomy and Nursing teaching guideline.**

1. INTRODUCTION

Renal cell carcinoma accounts for about 3% of adult malignancies. It is the seventh most common cancer. Surgery is considered the primary treatment. A variety of surgical procedures are available, depending on type and size of the tumor, extent of disease, and the patient's overall physical condition **(Gaudino et al., 2016 and Msaouel et al., 2019)**.

Radical nephrectomy is the standard treatment of choice for localized RCC. In certain circumstances, RN is also indicated to treat locally advanced RCC. Potential risks and complications after RN include: severe hemorrhage, infection, organ injury, postoperative pneumonia, and allergic reactions to anesthesia. Uncommon complications may include: adrenal insufficiency, and vascular thrombosis. Because patients are left with one functioning kidney, there is an increased risk of chronic kidney disease **(Hadjipavlou et al., 2016 and Hevia et al., 2016)**.

Patients undergoing RN presented higher levels of anxiety. The patient and his or her family may have questions after admission that can often be addressed by a knowledgeable nurse. Nursing staff play important role in ensuring that the patient understands the preoperative information and the risks and benefits of the surgery. This often decreases the patient's anxiety and allows the patient to further understand recommendations made by the nurse and urologist **(Pastore et al., 2017 and Patel et al., 2012)**.

All patients undergoing RN need preoperative and postoperative care. Preoperative assessment include: physiological status and cardiorespiratory reserve, renal and hepatic functions, urine examination, complete blood count and coagulation profile**,** optimization of nutritional status, and cessation of smoking **(Azhar et al., 2016)**.

Many patients still experience severe postoperative pain. The higher pain was found especially in the early postoperative period and adequate pain relief was achieved after 4 hours postoperatively. Pain control should be carefully planned in order to reduce early postoperative pain and also potentially prevent chronic postsurgical pain **(Owen et al., 2017 and Alper and Yüksel, 2016)**.

Nurse has a very important role in detecting early post-operative complications and preventing further complications. Nurses should emphasize to the patient the importance of reporting symptoms immediately. So close follow-up after RN is important and including administration of prescribed medications, close observation, monitoring for vital signs, laboratory tests especially renal function, careful observation for wound site, drains, catheter, avoid infection, early and gradual ambulation as possible, careful observation, monitoring and management for any developed postoperative complications. Patients should be provided with necessary instructions during preoperative and postoperative periods to prevent or reduce the occurrence of complications **(Flavin et al., 2016)**.

Significance of the study

According to Assiut Urology and Nephrology University Hospital records in (2017), 55 RN operations were done. Also, from the researcher's clinical experience it was observed that; patients undergoing RN suffer from high level of anxiety and they don`t receive enough information regarding their conditions. So, this study conducted to provide nursing teaching guidelines for those patients about RN to reduce postoperative anxiety, improve their knowledge, reduce postoperative pain, reduce early postoperative complications and decrease length of hospital stay.

2. AIMS OF THE STUDY

1. Design and implement nursing teaching guidelines for patients undergoing.
2. Evaluate the effect of implementing the nursing teaching guidelines on patients undergoing RN regarding postoperative anxiety level, postoperative pain, early postoperative complications and length of hospital stay.

3. RESEARCH HYPOTHESIS

- Postoperative anxiety level, postoperative pain, early postoperative complications and length of hospital stay among the study group will be less than the control group.

4. PATIENTS AND METHODS

Research design

Prospective randomized controlled trial research design was utilized in this study. Patients were randomly allocated into two equal groups using a computer based selection program as group I (Study group) and group II (Control group) with ratio of 1:1 assignment.

Study variables

The independent variable was the nursing teaching guidelines while the dependent variables were postoperative anxiety level, postoperative pain, early postoperative complications and length of hospital stay.

Setting

The study was conducted at Assiut Urology and Nephrology University Hospital.

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
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Sample

Sixty adult patients undergoing radical nephrectomy were included in the study with the following criteria; age ranged from 18 - 65 years from both sexes. Patients were divided into two groups (study and control groups), 30 patients for each. Sixty adult patients undergoing RN were included in the study with the following criteria; age ranged from 18 - 65 years from both sexes. Patients were divided into two groups (study and control groups), 30 patients for each. Study group patients received the nursing teaching guidelines, while the control group patients received the routine hospital care. Patients undergoing laparoscopic radical nephrectomy were excluded from the study.

Study tools

The following tools were utilized for data collection:

Tool I: Patient assessment sheet:

It was developed by the researcher after current national and international literature review. It consisted of two parts:

Part I: Demographic data about the patients: Name, age, sex, occupation, level of education, marital status and residence.

Part II: Medical data: Past and present health history, duration of illness, criteria of tumor, stage of renal cell carcinoma, medical treatment, patient's habits, laboratory investigations, vital signs, length of hospital stay and comorbidity.

Tool II: State-Trait Anxiety Inventory for Adults {State form}:

It was developed by Spielberger et al, (1983). It is the definitive instrument for measuring anxiety in adults. It was adapted by the research to assess postoperative anxiety. It includes 20 items to assess level of anxiety. All items are rated on a 4-point scale (1 = not at all, 2 = somewhat, 3 = moderately so, 4 = very much so).Scores range from 20 to 80.The scores of (0 < 20 no anxiety, 20 < 40 normal anxiety, 40 < 60 above the moderate level of anxiety, and 60 - 80 severe anxiety). One of the factors is related to the presence of anxiety (State-anxiety present) and includes all 10 negatively worded items. The other factor of this scale is associated with the absence of anxiety (State-anxiety absent) and includes all 10 positively worded items.

Tool III: Numeric rating scale for pain:

Worded items	**Numbers**	**Total**	**Interpretation and arranged them**			
			Not at all	Somewhat	Moderately	Very much
Negatively worded items	3, 4, 6, 7, 9, 12, 13, 14, 17, 18	10	1	2	3	4
Positively worded items	1, 2, 5, 8, 10, 11, 15, 16, 19, 20	10	4	3	2	1
Total question	20					

It was developed by Beebe and Latham, (1994). It ranges from 0-10. It was used to measure pain intensity in adults. Patient was asked to rate his or her pain level from 0 to10 with the understanding that 0 is equal to no pain, 1-3 is equal to mild pain, 4-6 is equal to moderate pain and 7-10 is equal to sever pain. It was adopted in this study by the researcher for monitoring of postoperative pain.

Tool IV: Clavien-Dindo grading system for the classification of surgical complications:

It was developed by Clavien et al (1992). It was reevaluated and modified in 2004 by Dindo et al. It was developed to classify complications based on life-threatening conditions, interventions required, and disability. It was adopted by the researcher to evaluate early postoperative complications. The classification includes:

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Degree	Definitions
I	Any deviation from the normal postoperative course without the need of intervention beyond the administration of antiemetics, antipyretics, analgesics, diuretics, electrolytes, and physical therapy*
II	Complications requiring pharmacological treatment with other medicines beyond the ones used for the complications of degree I
III	Complications requiring surgical, endoscopic, or radiological intervention
III-a	Intervention without general anesthesia
III-b	Intervention under general anesthesia
IV	Life-threatening complication requiring admission to intensive care unit
IV-a	Uni-organ dysfunction
IV-b	Multi-organ dysfunction
V	Death

❖ **The designed nursing teaching guidelines for patients undergoing radical nephrectomy:**

The designed nursing teaching guidelines were developed by the researcher after reviewing current national and international literatures. The guidelines included:

- Brief anatomy of urinary system.
- Brief description of RCC.
- Radical nephrectomy
- Definition of RN.
- Brief description for surgery.
- Complications of RN.
- Nursing guidelines for patients undergoing RN:
  - Nursing care and teaching before, during and after surgery.
  - Medications.
  - Wound care and catheter.
  - Diet.
  - Physical activity and exercise include:
    - Turning or moving a patient in bed.
    - Breathing and coughing exercises.
    - Legs and feet exercises.
  - Smoking cessation.
  - Routine follow up; the importance of regular follow up visits every 3 months in the first year. In the following 2 years the visits are scheduled every 6 months, and then once a year, the patient will be required to attend the out patients clinic to ensure that wound healing is progressing and no problems with their voice or swallowing and to early diagnosis of local recurrence of RCC.

Ethical approval

Permission to carry out the study was obtained from the ethical committee of the faculty of nursing. An official letter was issued from the Dean of the Faculty of Nursing to the Head of the Urology Department to collect the necessary data, and explain the aim and contents of the study to nursing supervisors and surgeons to gain their cooperation. Informed consent was obtained from patients to participate in the study after explanation of the nature and purposes of the study. Confidentiality and anonymity were assured. Patients have the right to refuse to participate and or withdraw from the study without any rational at any time.

5. PROCEDURE

The study was carried out on 3 phases:

The first phase (preparatory phase):

Preparation of the data collection tools and the designed nursing teaching guidelines were carried out by the researcher after extensive literature review (nursing and medical textbooks, journals and internet resources) this phase ended by content validity and pilot study.

Content validity and reliability:

It was checked and reversed by special five expertise's (2 from Medical staff of Urology and 3 from Medical–Surgical Nursing staff) who reviewed the tools for clarity, relevance, and applicability. Modification was carried out accordingly. Test reliability of the tools was ascertained with Cronbachs alpha (0.73).

Pilot study:

It was conducted on 10% of sample (6 patients) in the selected setting for testing clarity and applicability of the study tools. The purpose of the pilot study was to detect any particular problem in the statements, clarity, feasibility, and applicability of the tool. The data obtained from the pilot study were analyzed; no change was done, so the 10% of sample selected for the pilot study were included in the main study.

The second phase (Implementation phase):

- During preoperative period the researcher interviewed with both study and control groups, the researcher introduced herself to initiate communication, and explain the nature and purpose of the study. Base line data were established using tools (I).

- Patients who constituted the control group were exposed to the routine hospital care. Take a complete history and make physical examination including chest radiography or chest computed tomography (CT), abdominal CT, electrocardiogram and laboratory studies. Informed consent obtained, recommend that patients have their blood typed and screened before the procedure, patients receiving prescribed medication and inform the patient to take nothing by mouth after midnight before surgery.

- The study group was given the routine hospital care in addition to the designed nursing teaching guidelines by the researcher (tool V).

- The program contain one session which took about 40 - 50 minutes. After the session the researcher discussed with the patient each point of guidelines to ensure appropriate understanding. The teaching guidelines were given on an individual basis and one of the family members was present to ensure patient support.

- During the session each patient was given a written copy of the guidelines (booklet) in clear Arabic language. A brief review from the patient to assess his or her understanding, then the researcher clarified any points that the patient didn't understand.

- The researcher ensured commitment of the study group patients to implement the nursing guidelines through daily visiting them during hospitalization.

- Data were collected through the period from the beginning of February 2018 to the end of May 2019.

The third phase (Evaluation phase):

Both study and control groups were visited daily during the postoperative period till discharge to assess patients' conditions and evaluate the effect of the designed nursing teaching guidelines on patients' outcomes by using tools (II, III, and IV).

Statistical analysis

Data were collected and statistical analysis was done using IBM SPSS 19 ®. Data expressed as mean, standard deviation, number and percentage. Quantitative data was analyzed using Independent sample t-test, while qualitative data was analyzed using Pearson chi square test and ANOVA test. A probability level of <0.05 was adopted as a level of significance for testing the research hypothesis.

Limitation of the study

The main limitation of this study which prevented us from doing a multivariate analysis to assess the effect of our teaching protocol regardless any other confounding variable, is the tumor stage as the patients varied from stage I to stage III.

6. RESULTS

Table (1) shows that the mean age of both study and control groups was 51.52 ± 11.95, the highest percentage of them was male, not-educated, manual workers, married, and from rural area. No statistically significant difference was found between both groups regarding demographic data.

Table (2) presents that the highest percentage of both study and control groups have stage II renal cell carcinoma (46.7%). Also, hypertension was the most common medical comorbidities (23.3%). No statistically significant difference was found between both groups regarding medical data.

Table (3) reveals that more than third of patients 28 (46.7 %) with RCC are clinically asymptomatic. Flank pain was the most frequent clinical presentations 14 (23.3 %), followed by hematuria 9 (15.0 %) and palpable mass 9 (15.0 %) then anemia 8 (13.3%).

Fig (1) shows that there was a significant increase in the level of postoperative anxiety among control group patients in comparison with the study group patients ($P < 0.01$).

Fig (2) shows that a significant improvement in the pain level was obvious among study group patients in comparison with the control group ones ($P < 0.01$).

Table (4) demonstrates no statistically significant difference between the two study groups regarding total early postoperative complications. Statistically significant difference between the two study groups regarding UTI ($P < 0.01$).

Table (5) reflects that there was a highly statistical significant increase in the length of hospital stay among the control group than the study group ($P < 0.01$).

Table (6) exhibits that there was a statistical significant relation between educational level and early postoperative complications of the studied sample ($P< 0.05$).

Table (7) shows that statistical significant relation was found between comorbidity, smoking and early postoperative complications ($P < 0.01$). No statistically significant relation was found between stage of RCC and early postoperative complications.

Table (8) illustrates that there were statistical significant relations between postoperative pain, postoperative anxiety and early postoperative complications among the studied sample ($P < 0.05$ and $P < 0.01$ respectively).

Table (9) shows that there was a statistical significant relation between length of hospital stay and early postoperative complications among the studied sample ($P < 0.01$).

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
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Table (1): Comparison between study and control groups regarding demographic data

Variables	All patients (N. = 60)		Study group (N. = 30)		Control group (N. = 30)		P-value
Age (years)	**Mean ± SD**						
	51.52±11.95		54.80±8.93		48.23±13.72		0.062 Ns
Gender	**N**	**%**	**N**	**%**	**N**	**%**	
- Male	33	55.0	17	56.7	16	53.3	0.500 Ns
- Female	27	45.0	13	43.3	14	46.7	
Educational level							
- High education	4	6.7	3	10.0	1	3.3	
- Secondary	11	18.3	6	20.0	5	16.7	0.463Ns
- Read and write	16	26.7	6	20.0	10	33.3	
- Not educated	29	48.3	15	50.0	14	46.7	
Occupation							
- Office work	6	10.0	5	16.7	1	3.3	0.213 Ns
- Manual worker	31	51.7	15	50.0	16	53.3	
- Not working	23	38.3	10	33.3	13	43.4	
Marital status							
- Single	3	5.0	-	-	3	10.0	0.203 Ns
- Married	47	78.3	25	83.3	22	73.3	
- Widow/ widower	10	16.7	5	16.7	5	16.7	
Residence							
- Urban	26	43.3	16	53.3	10	33.3	0.118 Ns
- Rural	34	56.7	14	46.7	20	66.7	

Person Chi-Square tests and Independent samples test **Ns: Not significant**

Table (2): Comparison between study and control groups regarding medical data

Medical data	Total (N. = 60)		Study group (N. = 30)		Control group (N. = 30)		P-value
	N	**%**	**N**	**%**	**N**	**%**	
Location of tumor							
- Right	28	46.7	15	50.0	13	43.4	0.61 Ns
- Left	32	53.3	15	50.0	17	56.7	
Stage of renal cell carcinoma							
- Stage I: T1N0 M0	15	25.0	8	26.7	7	23.3	0.34Ns
- Stage II: T2 N0 M0	28	46.7	16	53.3	12	40.0	
- Stage III: T3 N1M0	17	28.3	6	20.0	11	36.7	
Medical co-morbidities							
- Diabetes mellitus	5	8.3	2	16.7	3	10.0	
- Hypertension	14	23.3	5	16.7	9	30.0	
- Ischemic heart disease	2	3.3	-	-	2	6.7	
- Hepatitis C	3	5.0	1	1.3	2	6.7	0.41Ns
Total patients associated with medical comorbidities	19	31.6	8	26.7	11	36.7	
Patients habits							
- Smoking							0.297 Ns
- Yes	26	43.3	11	36.7	15	50.0	
- No	34	56.7	19	63.3	15	50.0	
	Mean ± SD						
Hemoglobin	12.34±1.03		12.09±0.90		12.60±1.11		0.06 Ns

Person Chi-Square tests and Independent samples test **Ns: Not significant**

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ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
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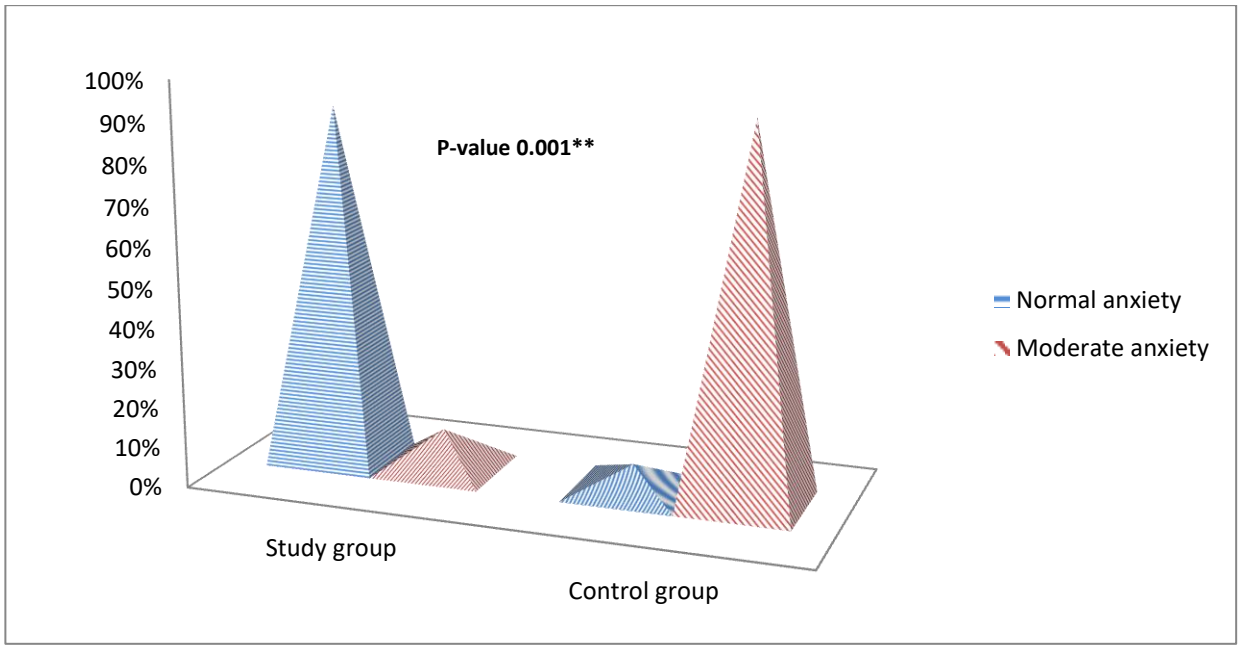
Table (3): Frequency distribution of clinical presentations among study and control groups before RN

Clinical presentations		Total (N. = 60)		Study group (N. = 30)		Control group (N. = 30)	
		N	%	N	%	N	%
Asymptomatic		28	46.7	13	43.4	15	50.0
Classic trial manifestation							
-	Flank pain	14	23.3	6	20.0	8	26.7
-	Hematuria	9	15.0	6	20.0	3	10.0
-	Palpable mass	9	15.0	4	13.3	5	16.7
Para-neoplastic syndromes							
-	**Clinical**						
-	Fever	1	1.7	1	3.3	-	-
-	Anemia	8	13.3	5	16..7	3	10.0
-	Lethargy	5	8.3	3	10.0	2	6.7
-	Fatigue	5	8.3	3	10.0	2	6.7
-	Cachexia	-	-	-	-	-	-
-	Hypertension						
-	**Laboratory**	-	-	-	-	-	-
-	Hypercalcemia	-	-	-	-	-	-
-	Polycythemia	-	-	-	-	-	-
-	Stauffer's Syndrome	-	-	-	-	-	-

Person Chi-Square tests **Ns: Not significant**

Figure (1): Comparison between study and control groups regarding postoperative anxiety



Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (98-114), Month: May - August 2020, Available at: www.noveltyjournals.com

Figure (2): Comparison between study and control group patients regarding postoperative pain

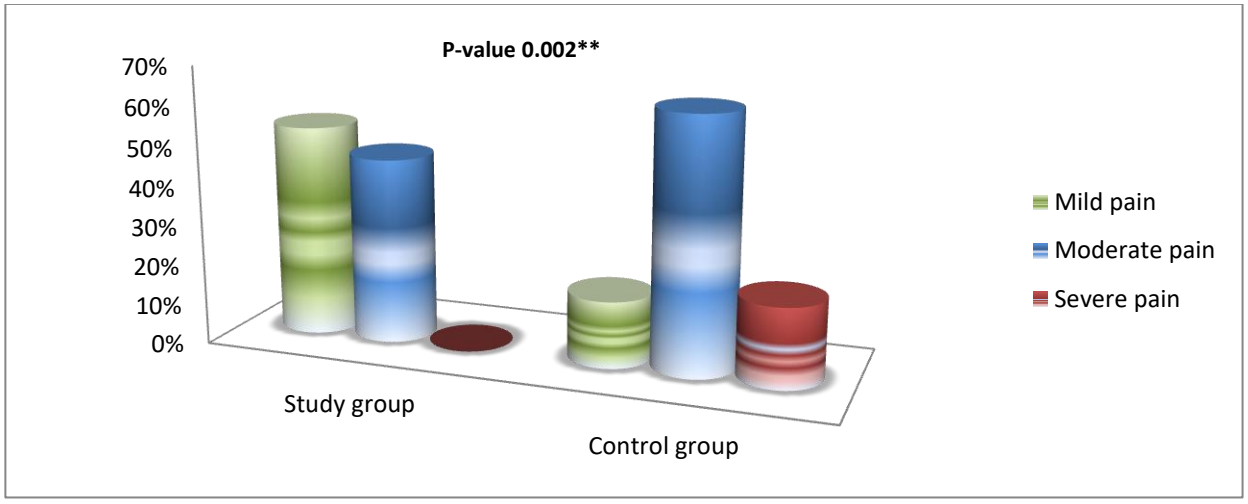


Table (4): Frequency distribution of early postoperative complications according to modified Clavien-Dindo grading system among study and control groups

Early postoperative complications	Management	Study group (N. = 30)		Control group (N. = 30)		P-value
		N	%	N	%	
Grade I complications						
- Bronchitis	Chest physiotherapy	2	6.7	4	13.3	0.36 Ns
- Nausea	Conservative	8	26.7	10	33.3	0.383 Ns
- Vomiting	Conservative	2	6.7	8	26.7	0.080 Ns
- Abdominal distension	Conservative	2	6.7	8	26.7	0.080 Ns
- Hypertension	Conservative	-	-	1	3.3	0.123 Ns
- Fever	Conservative	-	-	2	6.7	0.492 Ns
Grade II complications:						
- Pneumonia	Continuous antibiotics	-	-	4	13.3	0.112 Ns
- Late fever	Continuous antibiotics	-	-	4	13.3	0.112 Ns
- Urinary tract infection	Continuous antibiotics	-	-	9	30.0	0.002 **
- Wound infection	Continuous antibiotics	-	-	2	6.7	0.492 Ns
Grade V complications:						
- Bleeding leading to death		-	-	1	3.3	0.123 Ns
- Death		-	-	1	3.3	0.123 Ns
Total patients saver from early postoperative complications						
- Present		13	66.7	21	93.3	
- Not present		17	33.3	9	20.0	0.067 Ns

Person Chi-Square tests **Ns: Not significant** ** **: Highly significant(P < 0.01)**

Novelty Journals

ISSN 2394-7330

International Journal of Novel Research in Healthcare and Nursing
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Table (5): Comparison between length of hospital stay in both groups (study and control)

Variable	Study group (N. = 30)	Control group (N. = 30)	P-value
Length of hospital stay	Mean ± SD		0.005**
	6.10±1.322	7.83±2.949	

ANOVA and Independent samples test ****: Highly significant (P < 0.01)**

Table (6): Relation between demographic data and early postoperative complications among the studied sample (n = 60)

Variable	Early postoperative complications								P-value
Age	Study group (N. = 30)				Control group (N. = 30)				0.501Ns
	Yes		No		Yes		No		
	Mean ± SD				Mean ± SD				
	58.95±12.41		46.50±8.18		47.11±13.51		58.00±0.00		
Gender	N	%	N	%	N	%	N	%	0.603Ns
- Male	6	20.0	11	36.7	12	40.0	4	13.3	
- Female	7	23.3	6	20.0	9	30.0	5	16.7	
Educational level									0.05*
- High education	-	-	3	10.0	1	3.3	-	-	
- Secondary	1	3.3	8	26.7	3	10.0	4	13.3	
- Read and write	2	6.7	1	3.3	5	16.7	3	10.0	
- Non educated	10	33.3	5	16.7	12	40.0	2	6.7	
Occupation									0.162Ns
- Office work	1	3.3	4	13.3	1	3.3	-	-	
- Manual worker	7	23.3	8	26.7	12	40.0	4	13.3	
- Not working	5	16.7	5	16.7	8	26.7	5	16.7	
Marital status									0.073Ns
- Single	-	-	-	-	1	3.3	2	6.7	
- Married	10	33.3	15	50	17	56.7	5	16.7	
- Widow	3	10.0	2	6.7	3	10.0	2	6.7	
Residence									0.602Ns
- Urban	9	30.0	7	23.3	8	26.7	2	6.7	
- Rural	4	13.3	10	33.3	13	43.3	7	23.3	

Person Chi-Square tests **Ns: Not significant** ***: Significant (P < 0.05)**

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Table (7): Relation between medical data and early postoperative complications among the studied sample (n = 60)

Variable	Early postoperative complications								P-value
	Study group (N. = 30)				Control group (N. = 30)				
	Yes		No		Yes		No		
	N	%	N	%	N	%	N	%	
Stage of RCC									0.085^{Ns}
- Stage I: T1N0 M0	3	10.0	3	10.0	6	20.0	1	3.3	
- Stage II: T2 N0 M0	6	20.0	8	26.7	8	26.7	4	13.3	
- Stage III: T3 N1M0	4	13.3	2	6.7	7	23.3	4	13.3	
Medical comorbidity									
- Yes	7	23.3	1	3.3	11	36.7	-	-	0.001**
- No	6	20.0	16	53.3	10	33.3	9	30.0	
Patients habits									
- Smoking									
- Yes	9	30.0	2	6.7	15	50.0	-	-	0.001**
- No	4	13.3	15	50.0	7	23.3	8	26.7	

Person Chi-Square tests **Ns: Not significant** ****: Highly significant (P <0.05)**

Table (8): Relation between postoperative pain, postoperative anxiety and early postoperative complications among the studies sample (n = 60)

Variable	Early postoperative complications								P-value
	Study group (N. = 30)				Control group (N. = 30)				
	Yes		No		Yes		No		
	N	%	N	%	N	%	N	%	
Postoperative pain									0.011*
- Mild pain	5	16.7	11	36.7	2	6.7	3	10.0	
- Moderate pain	8	26.7	6	20.0	15	50.0	4	13.3	
- Sever pain	-	-	-	-	4	13.3	2	6.7	
Postoperative anxiety									
- Normal anxiety	12	40.0	15	50.0	2	6.7	-	-	0.007**
- Moderate anxiety	1	3.3	2	6.7	19	63.3	9	30.0	

Person Chi-Square tests ***Significant (P <0.05)** **** : Highly significant (P < 0.01)**

Table (9): Relation between length of hospital stay and early postoperative complications among the studied sample (n = 60)

Variable	Postoperative complications				P-value
	Study group (N. = 30)		Control group (N. = 30)		
	Yes	No	Yes	No	
	Mean ± SD		Mean ± SD		
Length of hospital stay	6.70±1.08	4.90±.876	7.89±3.047	7.00±0.0	0.005**

ANOVA and Independent samples test ****: Highly significant (P < 0.01)**

International Journal of Novel Research in Healthcare and Nursing
Vol. 7, Issue 2, pp: (98-114), Month: May - August 2020, Available at: www.noveltyjournals.com

7. DISCUSSION

Radical nephrectomy remains the most commonly performed procedure for the excision of RCC. Patients undergoing RN require preoperative assessments and planning prior to intervention. Failure to properly assess the pre-operative needs of those patients can potentially result in increased intraoperative and postoperative morbidity. It is important to understand the physiologic considerations in patients undergoing RN. So, when patient is considered for surgery, it is imperative to have a detailed discussion among the surgeon, anesthetist, patient, and nursing to optimize a satisfactory postoperative outcome **(Vasdev et al., 2014 and Tran et al., 2017)**.

Regarding demographic characteristics; the present study showed that, the mean age of the study and control groups was fifty one years. These findings are supported by **(Chung et al., 2016)** who mentioned that the mean age of patients undergoing RN was fifty-seven years. This also was in concordance to the study by **(Krebs et al., 2014)** who reported that the mean age for patient undergoing RN was fifty- sex years. Also, **(Gao et al., 2018)** reported that, RCC are very common in a young-old group (ranged from forty to seventy-five years).

The present showed that thirty-three of patients were male. This result agreed with **(Qureshi et al., 2015)** who reported that more than half of patients undergoing RN were male. According to **(Zhang et al., 2018)** more than two thirds of patients undergoing RN were male.

Regarding level of education, fifteen patients in the study group and approximately the same in the control group, fourteenth patients were not educated. This study finding was in agreement with **(Tan et al., 2012)** who conducted study in Michigan State from 1992 through 2007 which revealed that the majority of patients undergoing RN were having low education. On the contrary **(Arnold et al., 2013)** reported that the majority of patients undergoing RN were having high education.

As regard to the residence, results from data collected in this study revealed that the majority of study and control groups were from rural areas. these finding was supported by **(Chang et al., 2018)** who reported that the highest percentage of patients undergoing RN lived in rural area. On the contrary **(Tan et al., 2019)** reported that the majority of patients undergoing RN were from urban area. This difference is mostly due to the nature of area and population served by our hospital.

Regarding medical data; the current study presented that the highest percentage of both study and control groups had stage II RCC. Also, hypertension was the most common medical comorbidities. No statistically significant difference was found between both groups regarding medical data. **Kopp et al., (2014)** agreed with these findings as they reported that hypertension was found in majority of patients undergoing RN. Also, **(Khan et al., 2019)** stated that most of the patients undergoing RN had stage II RCC.

Regarding cigarette smoking, it remains a highly prevalent habit in Egypt **(Fouda et al., 2018)**. Smoking is the most consistent risk factor for RCC; however, the impact of smoking on survival in patients with RCC remains understudied. In the present study, twenty-six patients were smokers. These findings are consistent with **(Zabor et al., 2016)** who reported that the majority of the studied patients undergoing RN were smokers. On the contrary **(Ehdaie et al., 2014)** stated that most of patients with RCC were nonsmokers.

Clinically, patients with RCC are reported asymptomatic or nonspecific symptoms such as fatigue, malaise and vague symptoms, and specific symptoms as flank pain and hematuria. This result agreed with **(Gray and Harris, 2019)** who stated that RCC are often detected incidentally during CT scan of the abdomen or chest that was ordered for unrelated symptoms. Hematuria serves as a warning sign that requires evaluation and imaging leading to a diagnosis and treatment plan.

Regarding postoperative anxiety the present study proved that a significant decrease in the level of postoperative anxiety was found among the study group in comparison to the control group patients. From the researcher point of view this may be due to the effect of the nursing teaching guidelines and the importance of preoperative education for the study group patients. Also, informing the patients about the incidence of complications and their management shared in decreasing the level of anxiety.

This result agreed with **(Song et al., 2018)** who reported that unstable psychological status has been reported in RCC patients after RN, with depression and anxiety being the most common mood disorders observed in clinical practice. Also,

(Draeger et al., 2018) who stated that Psych-oncological interventions can be effective in coping with the RCC and alleviate psychological or psychosomatic symptoms.

Preoperative education is provided to patients to improve their coping skills, increase knowledge on self-care activities, and to provide psychological support for patient undergoing surgery. Our findings regarding the effect of preoperative education on postoperative outcomes were in agreement with **(Vukovic and Dinic, 2018)** who revealed that preoperative assessment and education leads to improved outcomes in patients undergoing major urology surgery.

Regarding postoperative pain the present study showed that the study group experienced low pain levels after RN than the control group. Previous studies showed similar findings, after education programs there was statistically significant lower pain among study group patients than control group who received the routine hospital care only **(Ingadóttir and Zoëga, 2017)**.

Regarding early postoperative complications, the modified Clavien grading system was used efficiently to evaluate the complications of RN **(Sundara and Tyagi, 2016)**. So the researcher used it in this study to compare complications of RN between study and control groups.

The results of our study showed that no statistically significant difference between the two groups regarding to early postoperative complications but study group experienced less frequency of early postoperative complications than control group. In the current study, grade I complications occurred in both groups including nausea; it is the most common complications after RN followed by abdominal distension then bronchitis. However, the most common grade II complications (UTI, pneumonia, fever and wound infection) appeared only in the control group. With statistically significant difference between two groups regarding UTI

This may be due to limited information the control group received about their condition and about surgery during perioperative period and this illustrate the effect of the nursing teaching guidelines on study group patients who received the guidelines by the researcher (information about surgery, performing status, catheter care, wound care, deep breathing exercise and nutrition especially postoperative nutrition).

The study of **(Lin et al., 2018)** said that the application of enhanced recovery after surgery (ERAS) protocol in perioperative management could enhance the patient's recovery after laparoscopic NSS surgery. No significant difference in total postoperative complications between the ERAS group and the control group, but the frequency of various complications was decreased in the ERAS group than control group.

Zhang et al., (2013) found that the gastrointestinal complications were the most common among all the postoperative complications in patients undergoing RN.

Also, study group patients who received the nursing teaching guidelines included; deep breathing exercise had better pulmonary function compared to patient of control group who didn't perform deep breathing exercise. This result supported by **(Ünver et al., 2018)** who reported that a strong positive correlation was found between receiving education about deep breathing exercise and decrease the incidence and severity of pulmonary complications, such as pneumonia, atelectasis, and hypoxemia

In our two patients from control group were die. The first patient was a sixty-four years old woman with history of hypertension who presented with stage III "T3 N1M0" of RCC; death due to uncontrolled vascular bleeding. The second patient was a forty-four years old man presented with stage II "T2 N1 M0" of RCC. Suggestion, pulmonary embolism may be lead to suddenly death.

Related to length of hospital stay the present study showed increase length of hospital stay among the control group (7.83 ± 2.94) than the study group (6.10 ± 13) which may be due to the effect of the nursing teaching guidelines in decreasing postoperative anxiety, and early postoperative complications and thus decrease length of hospital stay. This result was in agreement with **(Lin et al., 2018)** who reported that the application of enhanced recovery after surgery protocol in perioperative management could enhance the patient's recovery after laparoscopic NSS, relieve postoperative pain and reduce hospitalization time and costs.

In the same line **(Abdelmowla et al., 2019 & Itisha and Manu, 2016)** studied the effect of preoperative counseling on postoperative outcomes, they found that preoperative teaching significantly decreased pre/postoperative anxiety, postoperative pain and hospital stay.

In our study, smoking, comorbidity, anxiety and pain as an independent risk factors for early postoperative complications. So, awareness of the patient about risk factors and how to deal with is important part in improving outcome and lowering the length of hospital stay.

Significant relation was found between the education levels and early postoperative complications of the studied patients; patients with high and moderate education experienced less complications than low educated patients. This may be due to the fact that an educated patient can gain more understanding of the preoperative nursing teaching guidelines (teaching booklet) and have enough information about surgery. Also, highly and moderate educated patients can read and search for information about their conditions through different sources as internet. This emphasizes the importance of patients' understanding to the available information about the operation. this study result supported by study of **(Abdelmowla et al., 2017 and Abdelmowla et al., 2018)** who reported that health education can significantly improve patient outcome.

We also found a statistically significant difference between comorbidity, smoking and early postoperative complications. Increased SSI was noted among patients with hypertension, diabetes and smoking; this suggests that hypertension and diabetes contribute to more early postoperative complications. According to **(Tomaszewski et al., 2014)** who reported that patients deemed high risk by age and comorbidity criteria were more likely to incur a postoperative complications following RN.

Significant relations were found between postoperative pain, anxiety, length of hospital stay one side and early postoperative complications on another side; patients who experienced postoperative complications had increased level of anxiety, pain and increased length of hospital stay. **Muluka, (2012) and Deniz et al., (2014)** supported the study result as they reported that severity of postoperative pain after RN is related to many factors include postoperative complications and anxiety. Also, **(Wang et al., 2019)** stated that occurrence of complications led to increase the length of hospital stay.

8 . CONCLUSION

Based on the results of the present study, it can be concluded that patients undergoing RN are at high risk for many postoperative complications which had a bad effect on patients` health. So, Patients before and after RN are in essential need for nursing teaching guidelines to help them to decrease these complications, where study group patients who received the designed nursing teaching guidelines showed a significant decrease in postoperative anxiety, postoperative pain, early postoperative complications in the form of UTI, and length of hospital stay than control group patients who received the routine hospital care.

9. RECOMMENDATIONS

1. Preoperative teaching as a mean of prevention of postoperative complications should be an integral part of nurses' duty in all hospitals.

2. Establishment of health care educational center in the urology department to educate patients about necessary instructions regarding their conditions using booklet, illustrated pamphlets, models, and video tapes for each patient especially those who cannot read and write.

3. Establishment of a hot line (phone and net) contact for urgent consultations.

4. Replication of the study on a larger probability sample acquired from different geographical areas in Egypt to figure out the main aspects of these conditions and improve health service.

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