Nurses' Performance Regarding Care of Patients Undergoing Renal Transplantation

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ABSTRACT

Background: Kidney transplantation is a safe and successful surgical strategy consisting of the removal of a healthy kidney from donor to recipient, to maintain lost, ineffective kidney functions. **The aim** of this study was to assess nurses' performance regarding care of patients undergoing renal transplantation. **Research design:** A descriptive exploratory design was utilized to achieve the aim of the study. **Setting**: the study was conducted at kidney transplantation unit, operation unit and intensive care unit at Special Ain-Shams Hospital. **Sample:** A convenient sample of 80 nurses were included in the study**. Tools:** Tool I: Self-administered interview questionnaire: included two parts. Part 1: demographic characteristics of studied nurses, Part 2: Studied nurses' knowledge regarding care of patients undergoing renal transplantations. Tool II: Observational checklist of studied nurses' practices regarding care of patients undergoing renal transplantations**. Results**: The study findings showed that less than half of the studied nurses had satisfactory total knowledge regarding care of patients undergoing renal transplantation, while, slightly more half had unsatisfactory total knowledge. Less than half of the studied nurses had competent scores of total practices regarding care of patients undergoing renal transplantation and more than half had incompetent scores of practices**. Conclusion:** The present study showed that slightly more than half of the studied nurses had unsatisfactory total level of knowledge regarding care of patients undergoing renal transplantation and more than half had incompetent total level of practices regarding care of patients undergoing renal transplantation. **Recommendations:** Continuous educational programs for nurses for updates their knowledge and practices regarding care of patients undergoing renal transplantation.

Key words: Nurses' performance, Renal transplantation, Chronic kidney disease.

Introduction

The kidneys serve essential functions, such as filtration and excretion of metabolic waste products from the bloodstream, regulation of electrolytes and stimulation of red blood cell production. They also regulate blood pressure by the use of a renin-angiotensin- aldosterone system, controlling reabsorption of water, maintaining the correct potential of hydrogen, chemical balance and intravascular fluid status of the body. The kidneys also reabsorb glucose and amino acids which involved in regulation of hormonal functions via erythropoietin and vitamin D activation *(Osborn et al., 2021)*.

The kidney is a very important filtering organ of the body. When the kidneys fail, it means they have stopped working well that called renal failure and include acute kidney injury (AKI) and chronic kidney disease (CKD) that can be treated with different renal replacement therapy (RRT) such as dialysis (hemodialysis or peritoneal dialysis), hemofiltration or a kidney transplant. Renal transplantation is the best option of treatment *(Abd-Elbaset et al., 2020)*.

Chronic kidney disease (CKD) is a worldwide public health problem. In the Egypt and United States, the prevalence of end stage renal disease (ESRD) is increasing. CKD is defined as the failure of functional nephrons in a progressive and irreversible way. It is revealed that, due to the increase in incidence and prevalence, this disease is related to a decrease in the individual's quality of life, increased spending on health care, in addition to a high mortality rate *(Ahmed et al., 2020)*.

Kidney transplantation is considered the treatment of choice for patients with chronic kidney disease (CKD) as long as they are able to perform the surgery and have no contraindications to the use of immunosuppressant's. In relation to dialysis therapies, this type of treatment offers a better quality of life for the individual, as it offers better socioeconomic rehabilitation with less social cost, in addition to freeing him / her from dependence on dialysis *(Andersen et al., 2022)*.

Individuals undergoing renal transplantation are required to take specific precautions to be successful in this treatment and to avoid complications after surgery, including graft rejection. It is necessary for the individual to be guided about this new way of life, without dialysis sessions, however, with the dependence on immunosuppressive medications, in addition to receiving adequate information about the possibility of rejection (*De Lima Silva et al., 2020*).

The renal transplant rejections can be classified broadly to hyper acute rejection which happens minutes after transplant to the preformed antibody or ABO incompatibility. acute rejection that can happen any time after transplant, usually within days to weeks after transplant. Chronic rejection, it usually develops more than three months' post-transplant (*Naik & Shawar, 2020*).

Nurses practice for renal transplant recipients require specialized knowledge and skill to reduce problems in early post-transplant period by fluid balance, urine output, infection prevention, anticipation, and early intervention to maximize short and long-term graft outcome. As well assess and manage long- term complications associated with renal transplantation (*Masaad et al., 2020*).

Nurses can provide adequate support and comprehensive nursing care based on the individual needs of patients. Caring behaviors increase the feeling of safety in patients and reduce anxiety and establish a good relationship with patient. Patient satisfaction affects the process and outcome of treatment, improves the condition control of the disease, recovery and reduce the length of hospitalization, leading to the reduced economic burden for both the patient and the community (*Rahimi & Borhani, 2020*).

Nurses play a role in screening, support and education at all stages of the transplantation process. to return patient to normal daily life in a short time without problems and to help the patient cope with both physiological and psychosocial problems. Nurses must systematize their actions, care provided and interventions with periodic evaluation of patients. Thus, the health care provided to the transplanted becomes quality and safe care (*Yasin et al., 2023*).

Significance of the study

Kidney transplantations performed worldwide, and more than 174, 000 performed in the United States (USA). Transplantation of the human kidney is the treatment of choice for advanced chronic renal failure worldwide. Tens of thousands of procedures have been performed with more than 180.000 patients bearing functioning kidney transplants in the USA (*Poggio et al.,2021*).

Kidney transplants by World Health Organization (WHO) region. In particular, Africa has a very low transplant rate, with only 535 kidney transplants performed (0.5 per million populations, as many countries have no transplantation programs. The majority of kidney transplants were performed in South Africa, Tunisia and to a lesser extent in the Sudan. The majority of transplants occur in high-income countries (HIC) and these regions generally have higher rates of deceased donation, with deceased donors being more common than live donors in the Americas, (*Brown, et al., 2020*).

The first kidney transplantation in Mansoura was performed in 1983. Urology and Nephrology Center offers 2 pretransplant clinics per week in which 40–50 recipients and live donors are seen. Approximately, half of our potential living donors are not approved based on medical reasons (34.4%), nephrological disorders (25.6%), urological diseases (11.7%), immunological concerns (16.2%), or other causes (12. 1%).The vast majority (90%) of living donors are relatives of recipients; approximately 10% are unrelated donors. The Mansoura team provides transplantation services to patients throughout all of Egypt (*Bakr, et al., 2020*).

Aim of the Study

The aim of this study was to assess nurses' performance regarding care of patients undergoing renal transplantation through the following objectives.

1. Assess the level of nurses' knowledge regarding care of patients undergoing renal transplantation.
2. Assess the level of nurses' practice regarding care of patients undergoing renal transplantation.

Research questions:

1. What is the level of nurses' knowledge regarding care of patients undergoing renal transplantation?

2. What is the level of nurses' practice regarding care of patients undergoing renal transplantation?

Operational definition:

Nurses Performance refers to nurses' knowledge and practice, it's process of performing a task measured against preset known standard accuracy completeness cost and speed.

Subject and methods:

Technical item:

It included the research design, setting, subjects and tools for data collection.

Research design:

A descriptive exploratory research design was utilized to achieve the aim of this study.

Research setting:

This study was conducted at special Ain-Shams Hospital, in Egypt. Which include kidney transplantation unit, operation room and intensive care unit. It consists of five floors, where kidney transplantation unit containing 15 beds that are usually occupied, intensive care unit containing 20 beds and operative room for transplant containing 2 rooms.

Research subjects:

A convenient sample of eighty nurses (80) from both gender at the previously mentioned settings at time of data collection and agreed to participate in this study.

Tools for data collection:

Data were collected using the following tools:

Tool I: Self-administered interview questionnaire

This questionnaire was adapted from **(Hussein, et al., 2019)** and it consisted of two parts:

Part 1: Demographic characteristics of studied nurses:

It included seven items as nurses'(age, gender, marital status, educational level, years of experience, job title, department).

Part 2: Studied nurses' knowledge regarding care of patients undergoing renal transplantation:

This questionnaire consisted of (41) multiple choice questions covering 5 domains: anatomy of the kidney (7 items), function of the kidney (5 items), knowledge preoperative (13 items), knowledge during operative (2 items) and knowledge post operatives (14 items).

The investigator adapted the questionnaire by rewording statements of some questions and adding some questions to assess nurses' knowledge regarding care of patients undergoing renal transplantation.

Scoring system of studied nurses' knowledge questionnaire:

Each knowledge item was scored as score one for the correct answer and score zero for the incorrect answer. The total score was calculated for each nurse by adding the score items of questionnaire. Total scores ranged from 0-41 and were categorized as: Satisfactory level of knowledge when the total score equal or above 80% Unsatisfactory knowledge if the total score below 80%

Tool (II): An observational checklist of studied nurses regarding care of patient undergoing renal transplantation:

It was adapted from *(Hussein and Zatoon, 2019)* to assess nurses' practices regarding care of patients undergoing renal transplantations.

The investigator adapted the checklist by rewording statements and adding some practical skills for nurses according standard guidelines.

It composed of 52 items which were divided as the following:

Lab investigation and diagnostic tests related to renal transplantations: it included (10 items), Studied nurses' practices before renal transplantation: It included (14 items). Studied nurses' practices intra operative: It included (9 items), Studied nurses' practices immediate post- operative: It included (12 items). And Studied nurses' practices late postoperative of renal transplantation: It included (7 items).

Scoring system of studied nurses' practices:

Each step was given one point for done step and zero for not done step. The total scores of the practices was ranged from 0 to 52. A total score equal or above 80% was considered competent, while, a score below 80% was considered incompetent.

Operational item:

The operational item for this study included preparatory phase, content validity of the developed tool, pilot study and field work.

Preparatory phase:

This phase was conducted through 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.

Pilot study:

The pilot study was done on 10% (8 nurses) of the sample to examine the clarity of questions and time needed to complete the study tools. Based on the results, the pilot of study nurses was also included in the main study subjects, because there was minor modification in the tools.

Content validity and reliability:

Validity:

Is the extent to which the instrument actually measures what it's designed to measure (**Mueller and Knapp., 2018**). Content validity was conducted to determine whether the tools covered the aim, test its appropriateness, comprehensiveness, accuracy, correction, clearance, and relevance through a jury of 5 experts (assistant professors and lecturers of medical surgical and critical nursing) from the Faculty of Nursing- Helwan University. Their opinion was elicited regarding tools consistency, rephrasing for some statements, and scoring system. Ethics, values, culture, and beliefs were respected.

Reliability:

Reliability refers to the stability of the measuring instrument used and its consistency over time. In other words, Reliability is the ability to measure instruments to give similar results when applied at different times *(Suruku & Maslakci, 2020).* It was determined using alpha Cronbach's coefficient to assess the internal consistency of the tool and its value was (0.032) for studied nurses' knowledge questionnaire and (0.046) for studied nurses' practices observational checklist.

Field work:

- Field work included the following:
- An approval was obtained from the scientific ethical committee of Faculty of Nursing-Helwan University (19/10/2022) and the studied nurses to take an agreement to participate in the study.
- An official permission included the title and purpose of study submitted to the director of Special Ain Shams Hospital to get approval for data collection to conduct the study.
- Data collection of the study was started and completed within 6 months from the beginning of august 2023 to the end of to juanury2024.
- First, the investigator introduced herself to the studied nurses and gave a brief explanation about the study and its purpose before any data collection.
- Each nurse was interviewed individually to gather the necessary data of the study.
- The investigator was going to the hospital two days/week (Sunday & Wednesday) in the morning shift from 9.00 am to 12.00 pm and afternoon shifts.4 pm- 6 pm).
- The time needed for self- administered interview questionnaire, then assessing nurses' knowledge took 25-30 minutes.
- Each nurse was observed during caring of patients undergoing renal transplantation by assessing nurses' practices at the kidney transplantation unit, operation rooms and intensive care unit. The time for filling observational checklist and total time needed for all questionnaires nurses' practical skills took 25-30 minutes about studied procedures.
- The studied nurses were assured that the information collected would be treated confidentially and that it would be used only for the study purpose.

Administrative Item:

After explanation of the study aim and objectives, an official permission was obtained from the Dean of Faculty of Nursing and the director of Special Ain Shams Hospital asking for cooperation and permission to conduct the study.

Ethical considerations:

An approval was obtained from scientific ethical committee of the Faculty of Nursing -Helwan University (19/10/2022). The investigator clarified the objective and aim of the study to the nurses prior to any data collection. The investigator assured maintenance of anonymity and confidentiality of the studied nurses' data and the nurses have the right to withdraw from the study at any time. Ethics, values, culture, beliefs were respected.

Results

Table (1): Frequency and percentage distribution of studied nurses regarding to demographic characteristics (n=80)

Items		N	%
Age:	**20< 30**	42	52.5%
	30< 40	26	32.5%
	40< 50	10	12.5%
	50 ≤ 60	2	2.5%
	Mean ± SD	**31.5 ± 2.297**	
Gender:	**Male**	33	41.25%
	Female	**47**	**58.75%**
Marital status:	**Single**	32	40.0%
	Married	**36**	**45.0%**
	Divorced	7	8.75%
	Widow	5	6.25%
Experience years in kidney transplantation unit:	**less than 5**	**44**	**55.0%**
	5 < 10	23	28.75%
	10 < 15	6	7.5%
	15 ≤ 20	7	8.75%
	Mean ± SD	6.0 ± 2.24	
job title:	**Staff Nurse**	**61**	**76.25%**
	Charge Nurse	15	18.75%
	Head Nurse	2	2.5%
	Nursing Supervisor	2	2.5%
Department:	**Operating room**	25	31.25%
	Kidney Transplantation Unit	26	32.5%
	Intensive care unit	**29**	**36.25%**

Table (1) shows that 52.5 % of the studied nurses were in the age group from 20 to less than 30 years with a mean age 31.5 ± 2.297, 58.75% of the studied nurses were females and 45.0% married. Also 55% of studied nurses had experience of less than 5 years with mean years of experience 6.0 ± 2.24, as well 76.25% of the studied nurses were staff nurses, and 36.25% of the studied nurses were working at ICU department.
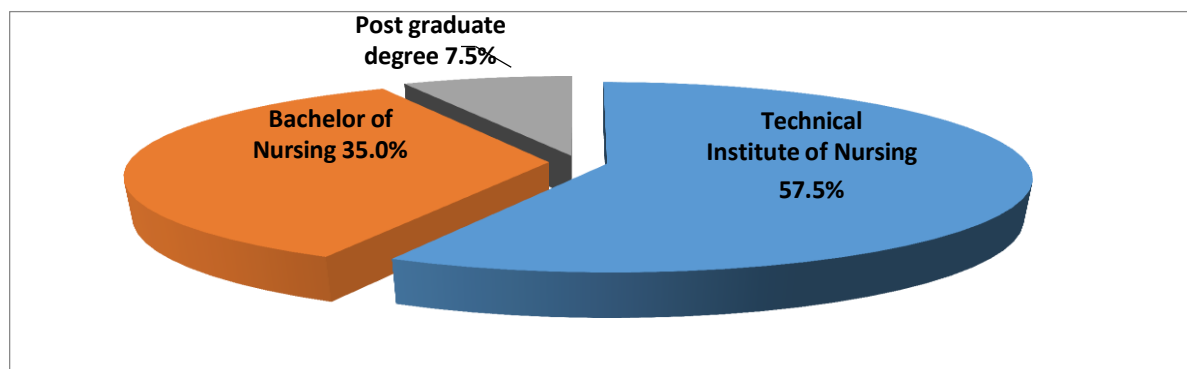

Figure (1): Percentage distribution of studied nurses regarding to education level

Figure (1): illustrates that 57.5% of the studied nurses were technical institute of nursing, 35% were bachelor of nursing while, 7.5% were post graduate degree.
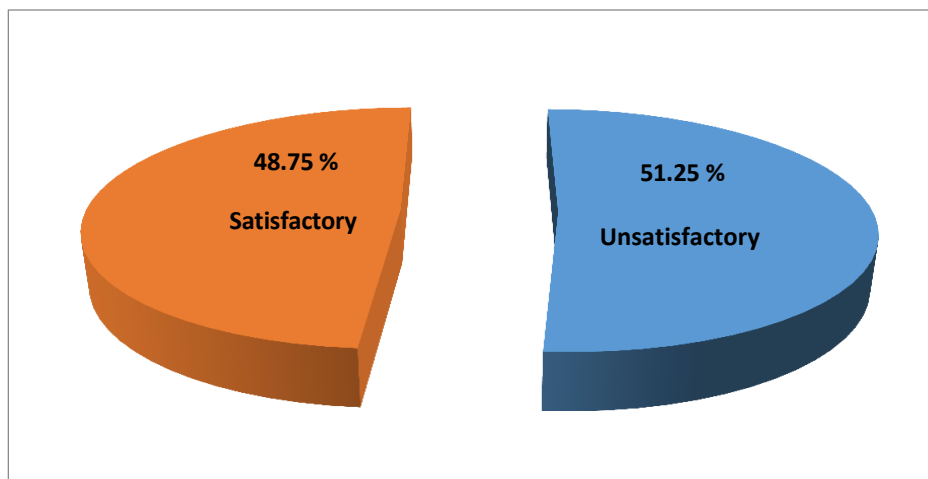
Table (2): Frequency and percentage distribution of the studied nurses regarding to total level of knowledge (n=80)

Items of knowledge	Satisfactory		Unsatisfactory		Chi-Square	
	N	%	N	%	X^2	P-value
Anatomy of the kidney	31	38.8%	49	61.3%	4.05	0.044*
Function of the kidney	22	27.5%	58	**72.5%**	16.20	>0.001**
Preoperative knowledge	57	**71.3%**	23	28.8%	14.45	>0.001**
Knowledge during operative	9	11.3%	71	**88.8%**	48.05	>0.001**
Knowledge post- operative	20	25.0%	60	75.0%	20.00	>0.001**
Total knowledge	39	**48.75%**	41	51.25%	0.050	0.823

** Highly significant if P Value <0.001

* Significant if P Value <0.05

Table (2) reveals that 71.3% of studied nurses had satisfactory total knowledge scores regarding knowledge pre-operative compared to 88.8% had unsatisfactory total knowledge scores regarding knowledge during operative period

Figure (2): Percentage distribution of the studied nurses regarding to total scores of knowledge
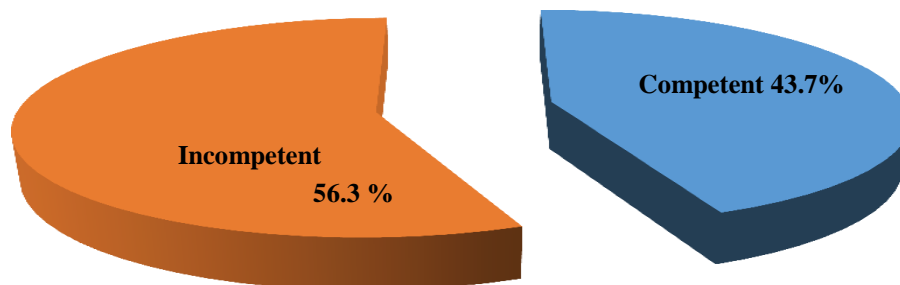(n=80)

Figure (2): illustrates that 48.75% of the studied nurses had satisfactory total knowledge regarding care of patients undergoing renal transplantation, while, 51.25% of them had unsatisfactory total knowledge.

Table (3): Frequency and percentage distribution of the studied nurses regarding to total level of practices (n=80)

Items of Practices	Competent		Incompetent		Chi-Square	
	N	%	N	%	X^2	P-value
Laboratory investigation and diagnostic test related to renal transplantation.	24	92.3%	2	7.7%	18.62	>0.001**
Nursing care before renal transplantation.	48	**94.1%**	3	5.9%	39.71	>0.001**
Nursing care intra operative of renal transplantation.	23	92.0%	2	8.0%	17.64	>0.001**
Immediate post-operative nursing care.	50	92.6%	4	7.4%	39.19	>0.001**
Late postoperative nursing care.	20	76.9%	6	**23.1%**	7.54	0.006**

** Highly significant if P Value <0.001

Table (3) demonstrates that 94.1% of studied nurses had competent scores of practices before renal transplantation, 92.6% had competent scores of Laboratory investigation and diagnostic test practices immediate post-operative nursing care, 92.3% had competent scores of related to renal transplantations, and 92% had competent scores of practices intra operative of renal transplantation. While 23.1% of studied nurses had incompetent scores of practices regarding late postoperative nursing care.

Figure (3): Percentage distribution of the studied nurses regarding to total practices for care of patients undergoing renal transplantation (n=80)

Figure (3): illustrates that 43.7% of the studied nurses had competent scores of total practices regarding care of patients undergoing renal transplantation while 56.3% had incompetent scores of practices.

Table (4): Relation between demographic characteristics of the studied nurses and total knowledge level (n=80).

Demographic characteristics		Total Knowledge				Chi-Square	
		Satisfactory		Unsatisfactory		X^2	P-value
		N	%	N	%		
Age	20 < 30	17	40.5%	25	59.5%	7.232	0.065
	30 < 40	14	53.8%	12	46.2%		
	40 < 50	8	80.0%	2	20.0%		
	50 ≤ 60	0	0.0%	2	100.0%		
Gender	Male	13	39.4%	20	60.6%	1.968	0.161
	Female	26	55.3%	21	44.7%		
Marital status	Single	15	46.9%	17	53.1%	1.673	0.643
	Married	19	52.8%	17	47.2%		
	Divorced	2	28.6%	5	71.4%		
	Widow	3	60.0%	2	40.0%		
Educational level	Technical Institute of Nursing	26	56.5%	20	43.5%	6.880*	0.032
	Bachelor of nursing	13	46.4%	15	53.6%		
	Post graduate degree	0	0.0%	6	100.0%		
Experience years in kidney transplantation Unit	less than 5	20	45.5%	24	54.5%	1.167	0.761
	5 < 10	11	47.8%	12	52.2%		
	10 < 15	4	66.7%	2	33.3%		
	15 ≤ 20	4	57.1%	3	42.9%		
job title	Staff Nurse	29	47.5%	32	52.5%	2.699	0.440
	Charge Nurse	9	60.0%	6	40.0%		
	Head Nurse	1	50.0%	1	50.0%		
	Nursing Supervisor	0	0.0%	2	100.0%		
Department	Operating room	4	16.0%	21	84.0%	15.698**	<0.001
	KTU	16	61.5%	10	38.5%		
	ICU	19	65.5%	10	34.5%		

* Significant if P Value <0.05 ** Highly significant if P Value <0.001

Table (4): reveals that highly statistically significant relations between total knowledge of the studied nurses and work department with p-value <0.001. Also, there was statistically significant relation between total knowledge and studied nurses' educational level with p-value =0.032.

Table (5): Relations between demographic characteristics of the studied nurses and total   practices level (n=80).

Demographic characteristics		Total Practices				Chi-Square	
		Competent		Incompetent		x^2	P-value
		N	%	N	%		
Age	20 < 30	35	83.3%	7	16.7%	0.846	0.838
	30 < 40	23	88.5%	3	11.5%		
	40 < 50	9	90.0%	1	10.0%		
	50 ≤ 60	2	100.0%	0	0.0%		
Gender	Male	28	84.8%	5	15.2%	0.093	0.760
	Female	41	87.2%	6	12.8%		
Marital status	Single	26	81.3%	6	18.8%	2.588	0.460
	Married	31	86.1%	5	13.9%		
	Divorced	7	100.0%	0	0.0%		
	Widow	5	100.0%	0	0.0%		
Educational level	Technical Institute of Nursing	39	84.8%	7	15.2%	3.054	0.217
	Bachelor of nursing	26	92.9%	2	7.1%		
	Post graduate degree	4	66.7%	2	33.3%		
Experience years in kidney transplantation	less than 5	39	88.6%	5	11.4%	**7.985**	**0.046***
	5 < 10	20	87.0%	3	13.0%		
	10 < 15	3	50.0%	3	50.0%		
	15 ≤ 20	7	100.0%	0	0.0%		
job title	Staff Nurse	53	86.9%	8	13.1%	2.558	0.465
	Charge Nurse	13	86.7%	2	13.3%		
	Head Nurse	2	100.0%	0	0.0%		
	Nursing Supervisor	1	50.0%	1	50.0%		
Department	Operating room	17	68.0%	8	32.0%	**10.320**	**0.006****
	KTU	25	96.2%	1	3.8%		
	ICU	27	93.1%	2	6.9%		

* Significant if P Value <0.05 ** Highly significant if P Value <0.001

Table (5): illustrates that high statistically significant relation between total practices of the studied nurses and work department with p-value = 0.006. Also, there was statistically significant relation between total practices and studied nurses experience years in kidney transplantation with p-value =0.046.

Table (6): Correlation between total knowledge and total practice scores of the studied nurses (n=80).

Items	Total knowledge	
	r	P-value
Total practices	0.207	0.065

Table (6): shows that there was insignificant statistically correlation between total knowledge and total practices scores of the studied nurses with p-value < 0.065.

Discussion

Kidney transplantation is an effective treatment for end-stage renal disease. In recent years, with the development of medical technology, the survival rate of grafts after kidney transplantation has obviously improved, which is conducive to prolonging the life span of patients and improving the quality of life. Good perioperative preparation, safe anesthesia techniques and implementation of intraoperative and postoperative nursing care measures are the key to ensure the success of surgery, reduce postoperative complications and promote the recovery of patients **(Song et al., 2022).**

This study aimed to assess nurses' performance regarding care of patients undergoing renal transplantation. Discussion of the findings of this study includes the following parts: Part (I); This part represents the demographic characteristics of the studied nurses. Part (II): This part represents studied nurse's level of knowledge. Part (III): This part illustrates studied nurses' practices regarding care of patients undergoing renal transplantation. Part (IV): This part represents the relations and correlation between the studied variables.

As regard to demographic characteristics of studies nurses, the findings of the current study revealed that more than half of the studied nurses were in the age group from 20 to less than 30 years with a mean age 31.5 ± 2.297, more than half of the studied nurses were females and less than half of them were married.

Concerning educational level of the studied nurses, the present study illustrated that more than half of the studied nurses were technical institute of nursing, more than third of them were bachelor of nursing, while, minority of them were post graduate degree. This finding is supported by **Allahverdi, et al., (2020),** in their study titled "The knowledge of nursing students about organ donation and the effect of the relevant training on their knowledge. In kidney Transplantation Proceedings ", which found that about half of the studied nurses were nursing institute graduates.

Considering studied nurse's knowledge regarding anatomy and function of the kidney and function of the kidney, the study finding reveals that more than half of the studied nurses had correct knowledge about kidneys position and the approximate length and thickness of kidneys. However, about two thirds of them had incorrect knowledge about the structure that encloses the kidneys and the approximate weight of the kidneys. As well, more than half them had correct knowledge about conditions requiring kidney transplantation and the rate of kidney filtration. However, about two thirds of them had incorrect knowledge about the endocrine function of the kidney and the amount of the kidneys filtration and reabsorption.

These findings are in accordance with the Egyptian study done by **Hussein, & Zatoon, (2019),** entitled "Nursing intervention program on nurses' knowledge and practices post kidney transplantation", their study results indicated that the mean score of nurses' knowledge about indications for kidney transplantation.

Regarding total satisfactory level of the studied nurses' knowledge, it was found that less than half of studied nurses had satisfactory regarding care of patients undergoing renal transplantation, while, slightly more than half of them had unsatisfactory total knowledge. This result can be related to the educational level of the studied nurses as more than of them were graduated from technical nursing institute. This finding is emphasized by **Ponnu et al., (2021),** who conducted a study in India by entitled "Knowledge on nursing management regarding renal transplant among the nurses", and stated that more than half of the studied nurses had poor knowledge.

Regarding to total practices level of studied nurses the current study findings demonstrated that the most of studied nurses had competent scores of practices before renal transplantation, immediate post-operative nursing practices, lab investigation related to renal transplantations and intra operative practices of renal transplantation. While less than one quarter of them had incompetent scores of practices regarding to late postoperative nursing care.

Regarding total score level of the studied nurses' practices, the findings of the present study showed that less than half of the studied nurses had competent scores of total practices regarding care of patients undergoing renal transplantation and more than half of them had incompetent scores of practices. From investigator point of view, this may be explained by more than half of the studied nurses had experience of less than 5 years at kidney transplantation unit. This finding is consistent with **Aliam et al., (2023),** whose results declared that less than half of the studied nurses had competent practices post renal transplantation.

The findings of the current study clarified that there was highly statistically significant relation between total knowledge of the studied nurses and their work department and studied nurses' education of level. This finding comes in agreement with **Muhammed et al., (2022),** whose findings illustrated that there was a statistically significant relation between nurses' knowledge about care of patients with kidney transplantation unit and their qualification. On the other hand, this study disagrees with **Mohammed et al., (2023),** who reported that were no statistically significant relations between knowledge of the studied nurses and their demographic characteristics.

The findings of the present study showed that there was high statistically significant relation between total practices of the studied nurses and their work department. Also, there was statistically significant relation between total practices and studied nurses experience years in kidney transplantation. From investigator point of view, this may be due to the highest percentage of nurses having competent practices were working at kidney transplant department.

This finding agrees with **Morad et al., (2023),** who mentioned that there was a statistically significant relation between nurses' practices and their experience. Conversely, this study differs from the results of **Khalaf et al., (2024),** whose findings illustrated that were no statistically significant relations between nurses' practices and their demographic characteristics.

Regarding correlation between the studied variables, there was insignificant statistically correlation between total knowledge and total practices scores of the studied nurses. This study finding is congruent with **Aliam et al., (2023),** whose findings showed, that were no statistically significant correlation between nurses' knowledge and practices post renal transplantation. On the contrary, this study contrasts to the findings of **Azer et al., (2024),** who reported that there was a high statistically significant correlation between studied nurses' knowledge and practices.

Conclusion

Based on the findings of the present study, it was concluded that:

The present study showed that slightly more than half of the studied nurses had unsatisfactory total level of knowledge regarding care of patients undergoing renal transplantation and more than half had incompetent total level of practices regarding care of patients undergoing renal transplantation. Meanwhile there was a statistically significant relation between studied nurses' total knowledge and educational level and work department. Also there was a statistically significant relation between studied nurses' total level of practices and experience years in kidney transplantation unit. As well there was insignificant statistically correlation between studied nurses' total level of knowledge scores and total level of practices scores.

Recommendations

In the light of the study findings, the following recommendations are   suggested

- Continuous educational programs for nurses for updates their knowledge and practices regarding care of patients undergoing renal transplantation.
- A simplified, comprehensive and clarified Arabic guided booklet about renal transplantation must be available in kidney transplantation unit.
- Replication of the study on larger sample is needed to elaborate the effects of different variables on the knowledge of nursing.

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