

## Factors Affecting Patient's Compliance toward Therapeutic Regimen Post Kidney Transplantation

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### Abstract

**Background:** Kidney transplantation is the treatment of choice for most patients with end-stage renal disease (ESRD), however, compliance to the recommended therapeutic regimen is critical for a positive prognosis. Several factors affect patient's compliance these factors include, social and economic factors, health care system-related Factors, condition-related factors, therapy-related factors and patient-related factors. **Aim:** This study aimed to assess factors affecting patient's compliance toward therapeutic regimen post kidney transplantation. **Design:** A descriptive explorative design was used. **Setting:** it was conducted at the outpatients' clinics at Urology and Nephrology center-that affiliated to Mansura University, Egypt. **Subjects:** A purposive sample of 101 adult patients from both sexes were recruited for this study. **Tools:** three tools were used in the study; **I)** Patient's interview questionnaire including two parts, 1) socio-demographic data of the patient. 2) patient's health history. **II)** Patient's compliance assessment tool. **III)** Factors affecting patient's compliance assessment tool. **Results:** the study revealed that, the majority of renal transplant recipients had a partial compliance toward therapeutic regimen post kidney transplantation. Furthermore, the most common factors affecting patients' compliance were, therapy-related factors rated the highest dimension followed by condition- related factors and patient- related factors respectively. **Conclusion:** the majority of the studied patients had a partial compliance with therapeutic regimen. Furthermore, many factors were affecting patients' compliance such as; therapy-related factor, condition-related factors, patient-related factors, social and economic factors and health care system-related factors. There was a highly significant relation between total compliance score and total factors. **Recommendations:** educational nursing guidelines should be conducted for patients to improve their compliance and intensive assessment of factors affecting patient's compliance should be done periodically to identify their needs which help in the plan to improve their compliance.

**Key words:** Kidney transplantation, compliance, therapeutic regimen, Factors affecting.

### Introduction

Kidney transplantation is a well-established and treatment of choice for selected end stage renal disease (ESRD) patients, extending their survival and improving their quality of life, while benefiting from the reduction in the mortality associated with long term dialysis (Mahendran and Barlow, 2014).

Following discharge after kidney transplantation, patients and their caregivers must know and comply with not only the medication for immunosuppression and comorbidities but also with the various lifestyle measures recommended following renal transplantation (Adhikari et al., 2018).

Compliance to therapeutic regimen (taking medication on time, proper nutritional supplementation, follow up of visit, prevent infection, physical activity and ideal body weight, prevent smoking and

social relations) is a major part in renal transplant recipient life which affects their health positively or negatively (Omer, 2009).

Non-compliance is a serious health concern among renal transplant recipients. Non-adherent renal transplant recipients face a seven- to eight-fold risk of graft loss compared to their adherent peers (Takemoto et al., 2007)

The factors affecting patients' compliance toward therapeutic regimen include; social and economic factors (e.g., family functioning, social supports, and medication costs), health care system-related factors, condition-related factors (e.g. symptoms, comorbidities, psychiatric conditions), therapy-related factors (e.g., treatment side effects, duration of treatment, and regimen complexity) and patient-related factors (e.g. health beliefs, self-efficacy, knowledge, and perceived barriers to compliance), (Sabate, 2003).

The nurse must consider many issues facing the transplant recipient such as medication management, infection prevention, chronic disease management, fluid balance, urine output and many psychological issues that surround receiving a transplant. In addition, the nurse is in a unique role to identify non-compliance as well as risk factors for developing these behaviours and to construct methods for intervening and supporting those patients (Gheith et al., 2008).

### **Significance of the Study:**

Compliance is very important issue in medical and nursing care. Non-compliance with health care recommendations and health promotion behavior is one of the top three reasons of graft loss leading to, turn to dialysis, retransplantation and death. Good compliance has apposite effect on clinical outcomes (Lin et al., 2011). So; this study was conducted to assess factors affecting

patient's compliance toward therapeutic regimen post kidney transplantation.

### **Aim of the Study**

The present study aimed to:

Assess factors affecting patient's compliance toward therapeutic regimen post kidney transplantation.

#### **Research Questions:**

What are factors affecting patient's compliance toward therapeutic regimen post kidney transplantation?

#### **Subjects and Methods**

##### **Technical Design:**

The technical design entails the study design, setting, subjects, and tools for data collection.

##### **Research Design:**

A descriptive explorative design was utilized to conduct this study.

##### **Research Setting:**

This study was conducted at outpatients' clinic at Urology and Nephrology center-that affiliated to Mansura University.

##### **Subjects:**

The study included a purposive sample of 101 patients carried out renal transplantation one year and more on outpatients' clinics, aged from 18-60 years.

##### **Tools of data collection:**

Three tools were used in the current study as follows:

##### **Tool I - Patient's interview questionnaire.**

This tool was adopted from El said, (2017) and included two parts

##### **Part I: Socio-demographic data of the patient.**

This part was consisted of seven items to assess socio demographic characteristics of the renal transplant recipients including; age, gender, marital status, education, type of work, residence and monthly income.

##### **Part II: Patient's health history.**

This part was consisted of ten items to assess patient's past history (e.g. onset of renal failure, causes of renal failure, type of dialysis, period of dialysis, duration since renal transplantation) and family history of

renal failure, and present history (e.g. donor type and relationship between donor and recipient, diseases after transplantation, prescribed medications post renal transplantation and presence of medication side effects).

#### **Tool II- Patient's compliance assessment tool:**

This tool was adopted from **Gheith et al., (2008)**. It was concerned with assessment level of compliance of the renal transplant recipients to the recommended therapeutic regimen. It was represented as a four points Likert scale ranging from zero to three. Zero (never), one (sometimes), two (often), three (always).

#### **Scoring system**

This tool consisted of 90 items that categorized as follows:

- Medication included 10 items = 30 marks.
- Nutrition included 10 items = 30 marks.
- Control of fluid intake included 9 items = 27 marks.
- Avoiding infection included 13 items = 39 marks.
- Follow up visits included 9 items = 27 marks.
- Social relationships included 8 items = 24 marks.
- Work post renal transplantation included 3 items = 9 marks.
- Daily physical exercise included 4 items = 12 marks.
- Marital relation included one item for males and female = 3 marks.
- Sexual relation included 3 items for married males and females = 9 marks.
- Pregnancy and lactation for married females included 9 items = 27 marks.
- Precautions of skin cancer included 4 items = 12 marks.
- Precautions of female breast cancer included 3 items = 9 marks
- Avoiding smoking included 4 items = 12 marks

The patient's compliance was represented as a four points Likert scale ranging from zero (non-compliant), one (poor compliant), two (partial compliant),

three (good compliant), to determine the level of compliance of the renal transplant recipients to the recommended therapeutic regimen.

The total scores of patient's level of compliance will be recorded between 0 to 270, Score less than 51% will be defined as never or noncompliant; 51% to less than 71% poor compliant; 71% to less than 96% partial compliant; and 96% to 100% good compliant.

#### **Score for single male (75 items) = 225**

This part includes all items except items related to sexual relations, pregnancy and lactation, and precautions of female's breast cancer.

- Never or non-compliant; less than 51% - of total scores (<114.75)
- Poor compliant =  $\geq 51\%$  to less than 71% of total scores ( $\geq 114.75 - <159.75$ )
- Partial compliant =  $\geq 71\%$  to less than 96 % of total scores ( $\geq 159.75 - <216$ )
- Good compliant  $\geq 96\%$  -100% of total score ( $\geq 216 - 225$ )

#### **Score for single female (78 items) =234**

This part includes all items except items related to sexual relations and pregnancy and lactation.

- Never or non-compliant; less than 51% - of total scores (<119.34)
- Poor compliant=  $\geq 51\%$  to less than 71% of total scores ( $\geq 119.34 - <166.14$ )
- partial compliant;  $\geq 71\%$  to less than 96 % of total scores ( $\geq 166.14 - <224.64$ )
- Good compliant  $\geq 96\%$  -100% of total score ( $\geq 224.64 - 234$ )

#### **Score for married male (78 items) =234**

This part includes all items except items related to pregnancy and lactation and precautions of female's breast cancer.

- Never or non-compliant; less than 51% - of total scores (<119.34)
- Poor compliant=  $\geq 51\%$  to less than 71% of total scores ( $\geq 119.34 - <166.14$ )
- partial compliant;  $\geq 71\%$  to less than 96 % of total scores ( $\geq 166.14 - <224.64$ )
- Good compliant  $\geq 96\%$  -100% of total score ( $\geq 224.64 - 234$ )

**Score for married female (90 items)**  
= 270

This part includes all items included in the questionnaire.

- Never or non-compliant; less than 51% - of total scores (< 137.7).

- Poor compliant =  $\geq 51\%$  to less than 71% of total scores ( $\geq 137.7$  - <191.7).

- Partial compliant;  $\geq 71\%$  to less than < 96 % of total scores ( $\geq 191.7$  - <259.2).

- Good compliant  $\geq 96$  %-100% of total score ( $\geq 259.2$  – 270).

**Tool III: Factors affecting patient's compliance assessment tool:**

This tool was related to assessment factors affecting patient's compliance. This part was adopted from a study conducted by **WHO (2003)**. It covered 54 statements with Yes/no. Which include five main dimensions: Social and economic factors (10 items), Health Care System-Related factors (12 items), Condition-Related factors (6 items), Therapy Related factors (8 items) and Patient Related factors (18 items) which included physical factors (5 items) and psychological or behavioral factors (13 items). Each item in each group scored as Yes (1), and No (0).

**Operational Design:**

• **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 data collection tools.

• **Validity & Reliability:**

Validity: Was done to the tools by submitting the tools to five expertises in the field of-Medical surgical nursing, in addition to statistics. Their recommended modifications had been done.

Reliability: Reliability of tools was tested by using Cronbach's alpha test in SPSS v.16 as the following:

- The Cronbach's alpha was 0.858 for renal transplant recipients' socio demographic characteristics.

- The Cronbach's alpha was 0.870 for renal transplant recipients' health history.

- The Cronbach's alpha was 0.871 for renal transplant recipients' level of compliance.

- The Cronbach's alpha coefficient score was 0.7 for factors affecting patient compliance

• **Pilot Study:**

A pilot study was conducted on 10 % of studied sample (10 patients) selected from the same setting to evaluate the clarity, applicability, and reliability of the research tools and estimate the approximate time required for data collection. There was no modification done on the study tool after pilot study, so that, the patients who included in the pilot study were included in the main study group.

• **Field Work:**

The researcher explained the purpose of the study to renal transplant recipients included in the study. This study started and completed within six months from beginning of July to the end of December (2018). Patients oral consent to participate in the study obtained and every patient was informed that confidentiality was assured. Data were collected by the researcher two days per week, in outpatients' clinic in the previous mentioned setting. The researcher was interviewed with the renal transplant recipients to collect the data by using the prepared study tools.

**Administrative Design:**

An official approval with written letter, clarifying, the purpose and setting of the study was obtained from the Dean of faculty of nursing at Ain Shams University and the directors of setting.

**Ethical considerations:**

Purpose and expected outcomes of the study were explained to each study subject. They were secured that all the gathered data was used for the research purpose only, the study is harmless and their approval to participate is a prerequisite to be included in the study. Each subject was assured that they can quit/withdraw whenever they want.

**Statistical Design**

The collected data were organized, categorized, tabulated and statistically analysed using the Statistical Package for Social Science (SPSS), version 16. Data were presented in tables and charts using numbers

and percentages. The statistical analysis included number (No), percentage (%), Range, the arithmetic mean ( $\bar{x}$ ), standard deviation (SD), (t) test and (F) test.

#### Significance of results was described as follows:

- Non-significant (NS) difference at  $p > 0.05$ .
- Significant (S) difference at  $P \leq 0.05$ .
- Highly significant (HS) difference at  $P \leq 0.001$ .

### Results

**Table 1:** Showed that, 44.6 % and 32.7% of the studied patients their age were ranged between 18.0 – < 30.0 and 30.0 – < 40.0 years old respectively, with a mean of age  $32.50 \pm 9.91$ . This table also shows that 67.3 % of studied patients were males, 67.3 % were married, 50.5% had secondary education, and 52.5 % did not work. Additionally, the table illustrates that 57.4% of patients were resident at rural area and 61.4% did not have enough monthly income.

**Table 2:** Presents medical health history of renal transplant recipients. 82.2% of patients had unknown cause of renal failure, 96.0% were on hemodialysis and 54.6% stayed on dialysis for 1.0 – < 5.0 years. This table also revealed that 54.5% of patients had renal transplantation from 1.0 – < 5.0 years ago. Regarding family history of renal failure, 98.0% of studied patients had no family history.

In addition to that, 87.1% of renal transplant recipients received the kidney from related living donor. Regarding diseases after transplantation, the result showed that 59.4% of patients had no disease. Regarding prescribed medications post renal-transplantation, the table illustrated that all studied patients taken immunosuppressive

medications, 88.1% of them taken vitamins, and 55.4% of them taken antacid.

**Table 3:** Showed that 96.0% of the studied patients had good compliance regarding medication. In addition, the result revealed that the majority of the patients had partial compliance regarding nutrition, control of fluid intake, avoid infection, social relation, physical exercise, Pregnancy and lactation, precaution of skin cancer and smoking (80.2%, 89.1, 80.2%, 91.1%, 80.2%, 85.0%, 83.2%, and 83.2% respectively).

**Figure 1:** presents total level of compliance percentage as shown, the majority 81.2% of study group had a partial compliance toward therapeutic regimen post kidney transplantation, followed by good compliance and poor compliance (9.9%, 8.9%) respectively.

**Table 4:** Revealed factors affecting patients' compliance as mentioned by the studied patients. Therapy-related factors rated the highest dimension followed by condition- related factors, patient- related factors (psychological / behavioral factors), social and economic factors and health care system-related factors (69.39%, 43.00%, 33.52%, 14.47, 11.40%) respectively.

**Table 5:** Revealed that there was a highly significant relation between total compliance score and social and economic factors and Health care system- related factors at  $p$  value = 0.00069\*\*, 0.00009\*\* respectively, Also there was a significant relation between total compliance score and patient-related factors at  $p$  value = 0.01047\*. In addition to that, there was a highly significant relation between total compliance score and total factors at  $p$  value = 0.00141\*\*.

Table (1): Socio-demographic characteristics of the studied patients (n=101)

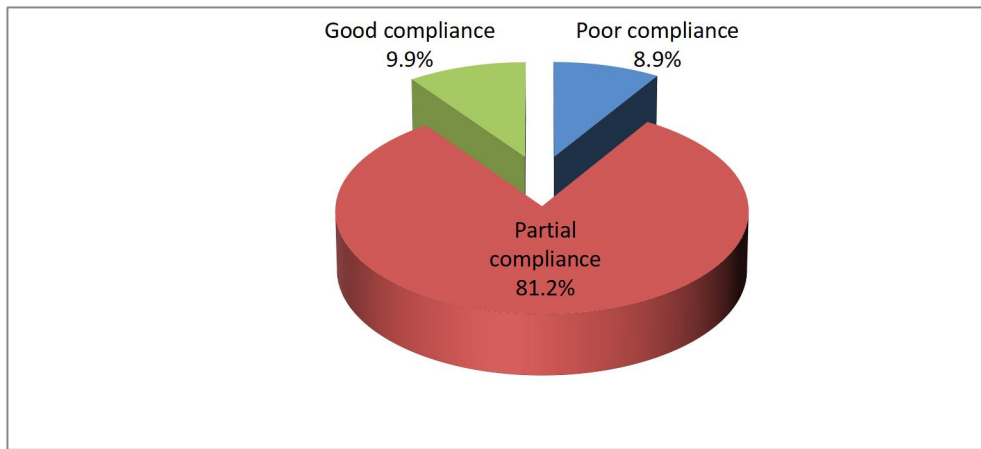
Socio-demographic items	No.	%
<b>Age (years)</b>		
18.0 – < 30.0	45	44.6
30.0 – < 40.0	33	32.7
40.0 – < 50.0	17	16.8
50.0 – ≤ 60.0	6	5.9
Range: 18.0 – 57.0, Mean ± SD = 32.50 ± 9.91		
<b>Gender</b>		
Males	68	67.3
Females	33	32.7
<b>Marital status</b>		
Married	68	67.3
Single	33	32.7
<b>Education</b>		
Illiterate	6	5.9
Read/write	8	7.9
Secondary	51	50.5
University	36	35.6
<b>Type of work</b>		
Not working/retired	53	52.5
Trade works	7	6.9
Employee	8	7.9
Professional	10	9.9
Manual work	23	22.8
<b>Residence</b>		
Urban	43	42.6
Rural	58	57.4
<b>Income</b>		
Enough	39	38.6
Not enough	62	61.4

Table (2): Medical history of the studied patients (n=101)

	No.	%
<b>Past history</b>		
<b>Causes of renal failure</b>		
Hypertension	10	9.9
DM	1	1.0
Polycystic kidney	7	6.9
Unknown	83	82.2
<b>Types of dialysis</b>		
Hemodialysis	97	96.0
Peritoneal dialysis	0	00.0
No dialysis	4	4.0
<b>Dialysis period (97)</b>		
Up to one year	37	36.6
1.0 – < 5.0 years	53	54.6
≥ 5 years	7	7.2
Range: 2.0 – 120.0 months, Mean ± SD = 26.29 ± 22.91		
<b>Duration since renal transplantation</b>		
one year	12	11.9
1.0 – < 5.0	55	54.5
5.0 – < 10.0	15	14.9
≥10 years	19	18.8
Range: 2.0 – 27.0, Mean ± SD = 8.42 ± 5.17		
<b>Family history of renal failure</b>		
None		
Sister	99	98.0
Cousin	1	1.0
	1	1.0
<b>Present history</b>		
<b>Donor</b>		
Not relative	13	12.9
Relative	88	87.1
<b>Relationship (88)</b>		
Father	13	14.8
Mother	37	42.0
Brother	20	22.7
Sister	18	20.5
<b>Diseases after transplantation</b>		
None		
DM	60	59.4
Hypertension	10	9.9
	31	30.7
<b>Drugs used after transplantation</b>		
Immunosuppressive		
Antidiabetic drugs	101	100.0
Antihypertensive drugs	10	9.9
Vitamins	31	30.7
Antacid	89	88.1
	56	55.4

**Table (3): Patients' level of compliance toward therapeutic regimen post kidney transplantation = (n=101)**

Categories	Non compliance		Poor compliance		Partial compliance		Good compliance		Min	Max	Median
	No.	%	No.	%	No.	%	No.	%			
Medications	0	0.0	0	0.0	4	4.0	97	96.0	28	30	29
Nutrition	1	1.0	8	7.9	81	80.2	11	10.9	15	29	25
Control of fluid intake	0	0.0	9	8.9	90	89.1	2	2.0	16	26	23
Avoid infection	0	0.0	11	10.9	81	80.2	9	8.9	23	38	30
Follow up visits	0	0.0	9	8.9	79	78.2	13	12.9	15	27	23
Social reactions	0	0.0	9	8.9	92	91.1	0	0.0	13	23	19
Work post transplantation	0	0.0	11	10.9	75	74.3	15	14.9	5	9	8
Physical exercise	0	0.0	8	7.9	81	80.2	12	11.9	8	12	10
Marital relations	0	0.0	18	17.8	0	0.0	83	82.2	2	3	3
Sexual relations (68)	1	1.5	8	11.8	51	75.0	8	11.8	3	9	8
Pregnancy and Lactation (20)	0	0.0	1	5.0	17	85.0	2	10.0	17	27	22
Precaution of skin cancer	0	0.0	10	9.9	84	83.2	7	6.9	7	12	10
Precautions of female breast cancer (33)	0	0.0	2	6.1	22	66.7	9	27.3	6	9	8
Smoking	0	0.0	9	8.9	84	83.2	8	7.9	8	12	10
Total Compliance	0	0.0	9	8.9	82	81.2	10	9.9	64.4	97.4	84.3

**Figure (1): Total level of compliance among post kidney transplant recipients (n=101).**



**Table (4): Factors Affecting patients' compliance (n=101)**

Factors	%
1. Social and economic factors	14.47
2. Health care system- related factors	11.40
3. Condition-related factors	43.00
4. Therapy-related factors	69.39
5. Patient- related factors:	25.32
• Physical factors	3.98
• Psychological / behavioral factors	33.52

**Table (5): Relationship between patients' total level of compliance and factors affecting patients' compliance (n=101)**

Factors affecting patients' compliance	Total compliance score	
	F	P value
1. Social and economic factors	7.85	P 0.00069 **
2. Health care system- related factors	10.23	P 0.00009 **
3. Condition-related factors	0.31	P 0.73336
4. Therapy-related factors	1.42	P 0.24657
5. Patient- related factors	4.78	P 0.01047 *
• Physical factors	1.61	P 0.20538
• Psychological / behavioral factors	4.00	P 0.02131 *
6. Total factors	7.02	P 0.00141 **

f: ANOVA test \* Significant P value  $\leq 0.05$  - \*\* High Significance P value  $\leq 0.001$

## Discussion

**In relation to socio-demographic characteristic** of the studied patients, the result of the current study revealed that, their age were 18- < 60 years, nearly half of them aged from 18-< 30 years. This result agreed with the finding carried out by **El said, (2017)** who stated in research titled "Assessment of Lifestyle Modification among Renal Transplant Recipients". In Egypt that the subjects were aged from 18- 58 years, more than half of them aged from 18-28 years.

As regards to gender, the present study showed that more than two thirds of the study sample were male. This finding was supported by **Ghieth et al., (2008)** who stated in research titled "Compliance with recommended life style behaviors in kidney transplant recipients." in Egypt that male had a significantly higher rate than female. While it was contrary with the finding carried out by **Kosaka et al., (2013)** who stated in research titled "Development of self-management scale for kidney transplant recipient, including management of post

transplantation chronic kidney disease." in Tokyo that two thirds of the subjects were female.

In relation to marital status, the current study showed that more than two third of the subjects were married. This was supported by **Hedayati, (2017)** who reported in research titled "Non adherence Behaviors and Some Related Factors in Kidney Transplant Recipients." in Iran that the majority of studied subjects were married.

Concerning educational level, the results of this study illustrated that half of the studied patients were secondary school degree. This finding was supported by **Adhikari et al., (2018)** who stated in research titled "Compliance of kidney transplant recipients to the recommended lifestyle measures following transplantation" in India that the majority of the subjects were educated up to higher secondary level. While the finding of the present study was contrary with **Ghieth et al., (2008)** who stated that most of studied patients were highly educated.

In relation to type of work, the current study demonstrated that more than half of the studied patients were not working. This finding was consistent with **Kosaka et al., (2013)** who stated that less than two thirds of the subjects were not working. From the researcher point of view, this might be due to the nature of work wasn't suitable with their health condition and didn't require effort such as driver, barber, plumber and shopkeeper.

Concerning residence, more than half of the studied subjects were living at rural area. This finding supported by **El said, (2017)** who stated that the majority of his subjects were from rural area. From the researcher point of view, this might be due to unhealthy practices like unhealthy diet, lack of medical care and follow up in rural area.

In relation to monthly income, the current study showed that, more than half of the studied subjects reported that they had no enough monthly income. This finding was consistent with **Ghieth et al., (2008)** who stated that, half of the subject had no enough income. From the researcher point of view, this might be due to patients' employment status, high cost of living and transportation expenses.

**As regard to renal transplant recipients medical health history;** the current study illustrated that the majority of the study sample had unknown cause of renal failure, this finding supported by **Mandor, (2013)** who stated in research titled "Adherence of patient after kidney transplantation toward therapeutic regimen". In Egypt that more than half of the subjects had unknown cause of renal failure and the rest of the sample had hypertension.

The current study illustrated that most of the studied subjects were on hemodialysis before transplantation and more than half of them had renal transplantation < 5 years ago. This result was consistent with **Ghieth et al., (2008)** who stated that the majority of the

subjects were on hemodialysis before renal transplantation and two third of renal transplant recipients had renal transplantation < 5 years ago.

Regarding family history of renal failure, the majority of studied subjects had no family history of renal failure. This was consistent with **El said, (2017)** who stated that the majority of renal transplant recipients had no family history of renal failure.

The current study showed that the majority of the studied subjects received the kidney from related living donor this finding agreed with **Ramadan et al., (2013)** who reported in research titled "Assessment of renal transplant recipient needs". In Egypt that more than three quarters of the subjects were first degree related donor.

Regarding diseases after transplantation, more than half of the studied patients had no disease, less than one third of the studied patients had hypertension and the minority had diabetes mellitus. This finding was consistent with **Jimenez et al., (2009)** who reported in research titled "Management of chronic kidney disease after renal transplantation" that the minority of their finding had hypertension and diabetes post transplantation. From the researcher point of view, this may be due to side effects of immunosuppressant drugs post renal transplantation.

Regarding post renal transplantation drugs used, all of the studied patients taken immunosuppressive medications. The majority of patients had taken vitamins, and more than half had taken antacid. These findings were consistent with **National kidney Foundation, (2012)** who stated that, renal transplant recipients must receive immunosuppressive medication, minerals vitamins and anti-acids to prevent complication related immunosuppressant, and increase graft survival.

### **As regard to compliance of renal transplant recipients to recommended therapeutic regimen post kidney transplantation.**

After kidney transplantation, compliance to recommended therapeutic regimen (taking medication, healthy eating preventing of infection, referring to outpatient clinics, physical exercise, and sun protection) is critical for a positive prognosis. Complications caused by non-compliance among these patients leads to increased rates of mortality (**Blanca et al., 2013**).

The current study found that, most of study group had a partial compliance toward therapeutic regimen post kidney transplantation, followed by good compliance and poor compliance respectively. This finding was consistent with **El said, (2017)** who stated that, the majority of the study sample had partial level of compliance, also this finding was supported by **Omer, (2009)** who founded in research titled "Evaluation of follow up care among post kidney transplantation client, community health nursing". in Egypt that more than three quarters of his subjects were had good practices in relation to post renal transplantation care.

In my point of view, this might be due to renal transplant recipients feared from graft loss or return to dialysis or due to increased awareness of the patients regarding the importance of compliance toward therapeutic regimen post kidney transplantation. In addition to that, Urology and Nephrology Center affiliated to Mansoura University offer health care service and medication for free for renal transplant recipients.

### **Regarding factors affecting patients' compliance.**

The current study showed that, therapy-related factors rated the highest dimension followed by condition- related

factors, patient- related factors, social and economic factors and health care system-related factors. this agreed with **Iuga and McGuire, (2017)** who mentioned in research titled "Adherence and health care costs. Risk Management Healthcare Policy" in USA that, there are many factors affecting patients' compliance toward therapeutic regimen which include, therapy-related factors, condition- related factors, patient-related factors, socioeconomic-related factors and health care system-related factors.

From the researcher point of view, therapy-related factors rated the highest dimension that affect patients' compliance because chronic condition as kidney transplantation can often be complex and require that the patient take multiple medications at various times throughout the day for rest of life, this effect on psychological status which considered as sources of non-compliance among patients post kidney transplantation.

**As regard to relation between total compliance and factors affecting patients' compliance.** The current study revealed that, there was statistically significant relation between total compliance and social and economic factors. This finding was on the same line with **Ibrahim and Mahmoud, (2012)** who stated in a study about "Compliance with treatment of patients in Almadinah Almunawwarah: A community-based study" in Taibah University that there is high significant relation between socioeconomic factor and level of compliance.

The current study showed that there was significant relation between total compliance score and health care system-related factors. This finding was agreed with **Kalogianni, (2011)** who reported in research titled "Factors affect in patient adherence to medication regime" in Greece that there was positive association between health-care system and compliance to therapeutic regimen.

The current study showed that there was significant relation between total compliance score and patient related- factors. This finding was agreed with **Tielen et al., (2014)** who reported in research titled "Attitudes to medication after kidney transplantation and their association with medication adherence and graft survival: a 2-year follow-up study". In Netherlands that there was association between patient related- factors and compliance to therapeutic regimen.

### Conclusion

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

The majority of the studied patients had a partial compliance with therapeutic regimen post kidney transplantation and many factors were affecting patients` compliance such as; Therapy-related factors rated the highest dimension followed by condition- related factors, patient- related factors, social and economic factors and health care system- related factors respectively. Furthermore, there was a significant relation between total compliance with social and economic factors, health care system- related factors and patient- related factors .In general, there was a highly significant relation between total compliance score and total factors.

### Recommendations

- Educational nursing guidelines should be conducted for kidney transplant recipients pre and post transplantation to improve their compliance toward therapeutic regimen.

- Intensive assessment of factors affecting patient's compliance should be done periodically to identify their needs which help in the plan to improve their compliance.

- Further researches in different centers should be done to detect potential risk

factors of non-compliance to therapeutic regimen post kidney transplantation.

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