ORIGINAL RESEARCH

Gender disparity among renal transplant recipients receiving immunosuppressive therapy

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ABSTRACT

Immunosuppressant therapies are considered vital for the long-term survival of kidney grafts, however it can significantly modify patients' HRQOL because of their adverse effects and the complex medication schedule they represent. *Aims:* (1) To explore symptom experiences and symptom distress with adverse effects of immunosuppressive therapies, (2) To assess the impact of symptoms experience and symptoms distress on health-related quality of life among renal transplant recipient, and (3) To correlate them with gender. One hundred Renal transplant recipients were interviewed using the End-Stage Renal Disease Symptom Checklist Transplantation Module (ESRDSCL-TM). *Results:* Most of the renal transplant participants reported best and good quality of life, however, there were a statistically significant differences by gender. Women reported low satisfaction in quality of life comparing with men. In relation to the most frequent distressing symptoms in men and women, the study revealed that women reported higher levels in majority of the given symptoms distress such as back pain, increased hair growth and mood swings. Moreover, women perceived higher means levels with respect to increased appetite while men reported more distress for the items as increased appetite, mood swings, decreased interest in sex, depression, and sleeplessness. *Conclusion:* Renal transplant recipients had good quality of life with immunosuppressive therapies, but intensive assessment of patients after transplantation should be done to identify their needs. Moreover, consideration should be taken with regards gender variations thus help planning to get better quality of life, as a relatively normal lifestyle is re-established.

Key Words: Renal transplantation, Immunosuppressive therapy, Symptoms experiences, Symptoms distress, Gender, End stage renal disease symptoms, Transplantation module

1. INTRODUCTION

Organ transplantation is considered one of the important fields in medicine and constantly shows better outcomes. Since the last half-century, renal transplantation has to pay attention worldwide and it is the most commonly transplanted solid organ.[1] A renal transplant is a surgical procedure used to place a healthy kidney taken from a living or deceased donor into an individual whose kidneys no longer function effectively. Over the past decade, major advancement has been made to improve graft and patient life within renal transplantation.[2] Renal transplantation is considered the safest and the best current management option for patients with end-stage renal disease (ESRD) because it prolongs a patient's life, decreases morbidity, and consequently improves the quality of life (QOL).[3,4]

On the other hand, researchers[5–8] agreed that renal transplantation is becoming the first line of management for patients with ESRD, regardless of age, when compared to renal

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dialysis. Kidney transplantation increases life expectancy, as well as improves both patient's physical and social functioning (quality of life), as well as intellectual stability, energy, and the overall well-being and the upcoming outlook. End-stage renal illness is progressive disease and timely renal substitution therapy is needed to avoid death. The disease is associated with recurrent hospitalizations, increased health-care cost, and many metabolic changes.[9–11] The death rates for patients with end-stage renal illness are extensively high even with the appropriate dialysis, the death rates ranged from 20% to 50% every year.[10, 12] The advance of chronic kidney disease (CKD) and its development to this terminal disease remains a major source of decreased health-related quality of life and high early mortality. ESRD burden, based on the World Health Organization (WHO) definition, is predicted to cause an annual loss of 22,500 life per year across Egypt and North Africa due to death or disability.[9]

The first renal transplantation in humans was done in Ukraine, in 1933, however, the graft was not successful. At the start of the 1950s, many kidney transplantations surgeries were carried out in Paris and Boston, but no drug was given to avoid rejection and only one patient lived. The introduction of immunosuppressant treatments led to a decrease in rejection and an increase in the expected life of transplanted grafts with longer survival of the kidney transplant recipient.[13] On the other hand, March 1976 was an important sign for transplantation in Egypt: the first renal transplantation was done in Mansoura. Following a very slow start, the number of transplant patients gradually started to increase, reaching an annual rate of 90-100 transplants. Presently, 80 centers do renal transplantation in Egypt, with the overall experience of more than 7,000 living donors.[14] Fortunately, the conditions of patients after a kidney transplant have been enhanced with essential daily self-care abilities and expanded life periods however, the QOL of those patients is still mostly different from that of ordinary people.[15]

A wide range of immunosuppressive treatments is available, the overall goals of immunosuppressive agents in renal transplantation are to prevent graft refusal after transplantation, decrease morbidity and prevent complications.[15] Immunosuppressant therapy includes drugs as calcineurin inhibitors (CNIs), corticosteroids, antimetabolites, mammalian target of rapamycin (mTOR) inhibitors, and other immunosuppressant agents like depleting antibodies. Transplant recipient patients are maintained on an immunosuppression routine based on 1 to 3 drugs. The most often prescribed safeguarding immunosuppressive protocol for renal transplant recipients is triple therapy with a calcineurin inhibitor (cyclosporine or tacrolimus), an antimetabolite mycophenolate or azathioprine) and a corticosteroid (prednisolone or prednisone). This combination of medication is given concurrently, with each drug mainly targeting a different part of the immune system's response.[16]

Although renal transplantation could improve the health-related quality of life (HRQOL) of patients on dialysis from a physical, psychological, social, or general well-being perspective, and free the patient from the daily restraints accompanied with dialysis, however, immunosuppressant treatments can extensively change patients' HRQOL because of their possible side effects and the difficult chronic medication schedule they signify.[17–19] Clinical evaluation of these side effects focuses mostly on those which may increase death and co-morbidity due to diabetes, hypertension, or cancer. Nevertheless, there are other main symptoms and side effects with little significance to public health but which may extensively affect patients' well-being, health-related quality of life, and adherence.[20] There are short- and long-term toxicities linked to these immunosuppressive treatments that can be ranged from mild to severe. Mild side effects include nausea, discomfort, appetite loss while, severe side effects may include: severe diarrhea, nephrotoxicity, hyperlipidemia, and diabetes.[2]

Quality of life has been known as the gap between the prospect and the current condition of an individual. Health-related quality of life represents the functional effect of an illness and its management upon the patient as perceived by the patient himself. Health-related quality of life is a multidimensional concept that includes factors related to physical, mental, emotional, and social functioning. It goes further than direct measures of personal health, life anticipation, and causes of death, and focuses on the effect that health condition has on QOL. In addition to its multidimensional character, one important motive to measure the HRQOL is establishing and increasing information about the range of harms that affect the patients.[21–23]

HRQOL dimensions have become an essential outcome measures in addition to morbidity and mortality rates, in both people health assessment and in experimental trials. Nurses have an exclusive function and must take proficient accountability in assessing and helping renal transplant patients and their families discover how to deal with events efficiently and to accomplish the maximum level of HRQOL. Moreover, the nurse has the competencies to evaluate, detect, and intervene early in the possible complications of the renal transplant.[24] Thus, understanding transplant patients' symptom experience is considered critical to the development of effective nursing interventions that could improve patients' quality of life and medication compliance. Furthermore, those interventions based on assessment could be used to teach renal

transplant patients to employ better strategies to effectively handle the adverse effects of immunosuppressive drugs and increase their capacity to socialize and their ability to sustain employment. Consequently, patients' universal condition and well-being will be improved. The holistic viewpoint of nursing stresses both the physiological and psychological aspects of patients. From this standpoint, exploring the experience of renal transplant patients, recognizing their reaction to transplantation, and assisting them successfully manage with its effects are within the realm of nursing.

Currently, investigations on the symptom occurrence and symptom distress of immunosuppressants agents after renal transplantation were inadequate. Moreover, most of the related studies discussed renal transplantation and age variable and very scant studies talked about gender variables in such a population. Therefore, the current study aims were to: (1) Explore symptom experiences and symptom distress with adverse effects of immunosuppressive therapies, (2) Assess the impact of symptoms experience and symptoms distress on health-related quality of life in renal transplant recipient using End-Stage Renal Disease Symptom Checklist Transplantation Module (ESRDSCL-TM), and (3) Correlate them with gender.

2. METHODS

2.1 Design

A descriptive correlational research design was used to accomplish the aims of the present study. This design is employed to describe the relationship among variables.[25]

2.2 Setting

The current study was conducted at the Internal medicine outpatient clinic of one major University hospital, in Cairo, Egypt.

2.3 Participants

A convenience sampling of one hundred patients who had undergone renal transplantation in the Kidney Transplant Unit was recruited. All recipients had started double immunosuppressive drugs (cyclosporine and prednisolone). However, in some of them, a third immunosuppressor (azathioprine) was added when the clinical condition was needed. The recipients were selected with the following inclusion criteria: age of 18 years and above, first renal transplant (had get a renal transplant only one time), with a functioning kidney graft (means that was not in need of dialysis support) at the time of enrollment, and has written prescription. Recipients who had psychiatric or emotional problems, cognitive difficulties, and hearing or speech problems were excluded as that could interfere with the reliable completion of the questionnaire.

2.4 Tools

Data pertinent to the current study were gathered through a structured face to face interview utilizing a questionnaire sheet. The questionnaire sheets consist of the following sections:

1) The first section is related to a background data sheet; that was developed by the researchers based on the objectives and it covers areas related to (1) Socio-demographic characteristics such as age, gender, residence, marital status, educational level, employment status, and smoking history; and (2) Medical background datasheet related variables such as past medical history, family history, duration of being affected with ESRD disease, type of donor, the period of transplantation, and immunosuppressive therapy numbers regimen and types.
2) The second section presents variables related to side effects of immunosuppressive treatments using the End-Stage Renal Disease Symptom Checklist–Transplantation Module (ESRD SCL-TM).[26] It was specifically developed to assess the specific physical and psychological quality of life of renal transplant recipients, with a special focus on the side effects of immunosuppressive treatment. This tool is more effective to measure symptoms frequency/experience because it contains many symptoms and categorized into six subscales as follows: (a) Limited physical capacity (10 items): including questions about pain, exhaustion, and dizziness, etc. (b) Limited cognitive capacity (8 items): including questions about forgetfulness, trouble concentrating, and decreasing hearing and visual capacities, etc. (c) Cardiac and renal dysfunction (7 items): containing items concerning edema in lower extremities, increased blood pressure, etc.; (d) Side effects of corticosteroids (5 items): including questions about alterations of the face, decreased satisfaction with appearance and proneness to infections, etc. (e) Increased growth of gum and hair (5 items): containing items concerning gingival hyperplasia and increasing growth of body hair, etc (f) Transplantation-associated psychological distress (8 items): including items dealing with the uncertainty of how long the transplant will function, anxiety and sleeplessness, etc. Scoring system: For each item, the patient can rate the severity of the symptom on a subscale from 0 (not at all) to 4 (extremely). Higher scores indicate a higher level of side effects from immunosuppressive treatment. A Global Score combined information about all 43 items. The participants' scores were divided into 4 groups as follows: a) Best health/quality ($0 \geq 43$), b) Good health/quality ($44 \geq 86$), c) Moderate health/quality ($87 \geq 129$), and d) Poor health/quality ($130 \geq 172$) indicated in their responses. This level was determined by the total scores, which were recorded on a scale between zero and 172. In the other words, scores less than 86 were

defined as good quality; 87 to 129, partial good quality; 130 to 172, poor quality.

2.5 Reliability and validity

The tools were converted into Arabic by two nephrologists who were confident in both English and Arabic language. The Arabic draft was then back-translated into English by another two people flowing in both Arabic and English. The back-translated version was compared with the original English version to prove that the questions were correctly translated. All of the back-translated items were worded similarly to the original ones and were similar in their meaning. The Arabic draft was then discussed by three nephrologists who found that it would aid understanding to rephrase the questions in the form of simple statements instead of question format without changing their meaning. Then, the content validity was established by a panel of experts (transplant surgeons, nephrologists, and pharmacists). Internal consistency, as measured by Cronbach's α, was 0.79 for the symptom distress and End-Stage Renal Disease Symptoms Checklist–Transplantation Module (ESRDSC-TM).

2.6 Procedure

upon permission was taken to carry on with the projected study, the study was carried out in two phases. In the first phase; the recipients who assemble the criteria for feasible inclusion were acknowledged from admission records with the assistance of the doctors and nurses of the related setting. While in the second phase, recipients who were matching the criterion for the study inclusion were approached by the research investigators. A pilot study was conducted on 10% of the sample (10 recipients) to approximate the needed time for data collection and measure the feasibility, objectivity, validity, and applicability of the study tools. The necessary modifications were done, and the pilot study samples were removed from the final study sample. Data were collected through a face-to-face independent interview for each participant. Data collection time ranged between 30 minutes to 45 minutes for questionnaire completion.

2.7 Ethical considerations

For ethical purposes, official permission was taken from hospital managers and the other concerned authorities' personnel in the study setting. Also, each appropriate recipient who met the criteria for inclusion was well-informed about the purpose of the study and its value. The researcher emphasized that participation in the study was voluntary, and anonymity and confidentiality were guaranteed through coding the data. Informed consent was taken from recipients who allow being included in the study. Moreover, the recipients were assured that the collected data will not be reused in further researches without getting their agreement.

2.8 Statistical analysis

Upon completion of the data collection phase, data were computed and analyzed. Data analysis was utilized using a statistical package for social sciences (SPSS). The following statistical tests were used based on the number of participants: (a) Frequency distribution and percentage, (b) Arithmetic mean as an average that describes the central tendency of observations, and (c) Standard deviation as a measure of the dispersion of results around the mean. The results were considered significant when the p-value was $< .05$.

3. RESULTS

The analyzed data are offered in the following sections: (1) Recipients socio-demographic characteristics and medical background related variables (see Tables 1, 2) ; (2) Symptom experiences and symptom distress with adverse effects of immunosuppressive therapies (see Tables 3, 4, 5); (3) The overall Symptoms experiences by gender (see Table 6); (4) Variables related to quality of life domains (see Tables 7, 8).

Table 1. Frequency and percentage distribution of socio-demographic characteristics among studied recipients (n = 100)

Demographic Characteristics	No	%
Gender (n = 100)		
Male	67	67.0
Female	33	33.0
Age (Years)		
20-	61	61.0
30-	25	25.0
40-	10	10.0
50-	4	4.0
$\bar{x} \pm SD$	27.31 ± 11.72	
Residence		
Rural	45	45.0
Urban	55	55.0
Marital Status		
Married	50	50.0
Single	48	48.0
Not Married (S/D/W)	2	2.0
Education		
Illiterate	13	13.0
Read and write	10	10.0
Primary	23	23.0
Secondary	34	34.0
University	20	20.0
Employment		
In employment	33	33.0
Not in employment	67	67.0
Smoking History		
Smoker	4	4.0
Non-Smoker	96	96.0

Table 2. Frequency distribution and percentage of the medical background data variables among studied recipients (n = 100)

Medical Background variables	No	%
Past medical history		
No	86	86
Yes	14	14
Hepatitis C	2	
Breast cancer	1	
Hepatitis C and Diabetes mellitus	2	
Diabetes mellitus and Hypertension	1	
Hypertension	1	
Systemic Lupus	1	
Others	6	
Family history about renal disease		
Yes	78	78
No	22	22
Duration of illness		
Less than 5 years	61	61
More than 5 years	39	39
Mean duration of dialysis before transplantation / month (Mean ± SD)	10.26 ± 6.09	
Type of transplant		
Non-biological related	36	36
Biological related	64	64
Immunosuppressant drug regimen, number (%)		
Cyclosporin A + Prednisolone	91	91
Cyclosporin A + Prednisolone + Azathioprine (Imuran)	9	9
Mean duration of functioning renal graft/years	3.79 ± 2.28	

Table 3. Percentage distribution of symptoms experience among studied recipients (n = 100)

Variables	Extremely	Quite a bit	Moderately	A little bit	Not at all
Increased appetite	26	24	13	15	22
Sleeplessness	21	5	12	23	39
Mood swings	20	11	18	21	30
Back pain	19	16	15	20	30
Increased hair growth	19	12	11	14	44
Decreased interest in sex	17	13	14	27	29
Acne	16	11	10	21	42
Depression	15	13	15	28	29
Fatigue	14	12	10	26	38
Gingival hyperplasia	12	9	9	19	51
Stomach complaints	12	13	8	25	42
Changed appearance	10	10	9	25	46
Change taste	10	12	12	23	43
Muscle weakness	10	6	8	37	39
Diarrhea	9	4	8	39	40
Poor vision	8	7	10	14	61
Fragile skin	7	8	6	16	63
Moon face	7	12	11	26	44
Poor appetite	7	2	19	18	54
Bruises	6	3	3	24	64
Impotence/Painful menstruation	6	3	4	4	33 (50 S/D/W)
Headache	6	13	4	40	37
Swollen ankles	6	6	5	27	56
Inflammation	6	5	18	14	57
Tremors	6	8	5	23	58
Palpitation	5	8	9	29	49
Poor concentration	3	4	12	26	55

Table 4. Symptoms experience mean scores by gender among studied recipients (n = 100)

Variables	Male	Female	Paired sample t test
Fragile skin	0.67 ± 1.08	1.06 ± 1.58	4.10 (.000)*
Bruises	0.54 ± 0.93	0.82 ± 1.38	6.13 (.000)*
Back pain	1.73 ± 1.48	1.76 ± 1.58	-2.60 (.011)
Impotence/Painful menstruation	0.40 ± 1.03	0.42 ±1.12	7.98 (.000)*
Increased hair growth	1.31 ± 1.57	1.76 ± 1.60	-.816 (.416)
Palpitation	0.96 ± 1.13	0.79 ± 1.24	3.33 (.001)
Changed appearance	1.09 ±1.32	1.21 ± 1.45	1.40 (.163)
Mood swings	1.69 ± 1.51	1.76 ± 1.48	-2.44 (.016)
Depression	1.55±1.37	1.64 ± 1.50	-1.70 (.93)
Moon face	1.16 ±1.20	1.03 ± 1.47	1.51 (.135)
Poor concentration	0.75 ± 0.99	0.73 ±1.10	5.23 (.000)*
Sleeplessness	1.48± 1.60	1.42 ±1.48	-.80 (.427)
Decreased interest in sex	1.66 ± 1.48	1.54 ± 1.42	-1.88 (0.64)
Increased appetite	2.33 ± 1.54	1.85 ± 1.44	-5.07 (.000)*
Stomach complaints	1.18 ±1.29	1.48 ± 1.68	.343 (.733)
Headache	1.01 ± 1.20	1.30 ± 1.24	1.76 (0.82)
Fatigue	1.40 ± 1.41	1.33 ±1.53	-.326 (.745)
Swollen ankles	0.79 ± 1.09	0.82 ± 1.31	4.23 (.000)*
Inflammation	0.79 ± 1.15	1.09 ± 1.35	3.50 (.001)
Poor appetite	0.96 ± 1.17	0.79 ± 1.27	3.26 (.002)
Acne	1.46 ± 1.48	1.24 ± 1.56	-.373 (.710)
Tremors	0.90 ±1.21	0.64 ± 1.22	-.387 (.000)*
Muscle weakness	1.00 ± 1.07	1.33 ± 1.59	1.69 (.094)
Gingival hyperplasia	1.10 ± 1.43	1.15 ± 1.46	1.40 (.164)
Diarrhea	0.99 ± 1.25	1.12 ± 1.14	2.35 (0.21)
Poor vision	0.87 ± 1.27	0.88 ± 1.41	3.31 (.001)
Change taste	1.22 ± 1.38	1.24 ± 1.39	0.69 (.493)
Total	30.99 ± 13.97	32.21 ± 22.10	-17.75 (.000)*

*$p < .05$

Table 5. List of the ten most frequent distressing symptoms in men and women among studied recipients (n = 100)

Men	Women
Increased Appetite (2.33)	Increased Appetite (1.85)
Back Pain (1.73)	Back Pain/Increased hair growth/Mood Swings (1.76)
Mood Swings (1.69)	Depression (1.64)
Decreased interest in sex (1.66)	Decreased interest in sex (1.54)
Depression (1.55)	Stomach complain (1.48)
Sleeplessness (1.48)	Sleeplessness (1.42)
Acne (1.46)	Muscle weakness/Fatigue (1.33)
Fatigue (1.40)	Headache (1.30)
Increased hair growth (1.31)	Change taste/Acne (1.24)
Stomach complain (1.18)	Changed appearance (1.21)

*Correlation is significant at the .05 level (2-tailed)

3.1 The overall Symptoms experiences by gender

Table 6 shows the overall symptoms experiences by gender among recipients. Comparison of the overall symptoms' frequency associated with immunosuppressant treatment in men and women on the basis of the End stage Renal Disease Symptom Checklist-Transplantation Module revealed that in general there were statistically significant differences by gender.

Table 6. Comparison of the overall symptoms experience by gender among studied recipients (n = 100)

Quality of Life Dimensions	Male	Female	$\bar{X}$ ± SD
Limited physical capacity (Score = 40)	11.88 ± 8.33	13.15 ± 9.29	12.30 ± 8.63
Range/*t*-test	0.00-40 (*t* = -12.741 – *p* = .000)*		
Limited cognitive capacity (Score = 32)	8.52 ± 4.91	9.88 ± 6.98	8.97 ± 5.68
Range/*t*-test	0.00 – 28.00 (*t* = -13.533 – *p* = .000)*		
Cardiac and renal dysfunctions (Score = 28)	5.64 ± 4.24	6.61 ± 6.77	5.96 ± 5.20
Range/*t*-test	0.00 – 22.00 (*t* = -8.943 – *p* = .000)*		
Increased growth of gum and hair (Score = 20)	4.79 ± 3.82	6.97 ± 5.46	5.51 ±4.52
Range/*t*-test	0.00-20.00 (*t* = -9.417 – *p* = .000)*		
Side effects of corticosteroids (Score = 20)	6.39 ± 4.91	7.00 ± 5.45	6.59 ± 7.07
Range/*t*-test	0.00 – 20.00 (*t* = -10.378 – *p* = .000)*		
Transplantation-associated psychological distress (Score = 32)	11.19 ± 7.04	14.18 ±8.32	12.18 ±7.58
Range/*t*-test	0.00 – 32.00 (*t* = -14.454 – *p* = .000)*		
Mean total score of symptoms experiences (Score = 172)	48.42 ± 22.55	57.79 ± 35.09	51.51 ± 27.51
Range/*t*-test	19.00 – 165.00 (*t* = -4.262 – *p* = .000)*		

*$p < .05$

Table 7. Total mean score for quality of life among studied recipients (n = 100)

Quality of life Variables	Male	Female	Total
Poor quality of life(130 ≥ 172)	0	1	1 (1%)
Moderate quality of life (87 ≥ 129)	5	7	12 (12%)
Good quality of life(44≥ 86)	32	9	41 (41%)
Best quality of life(0-43)	30	16	46 (46%)
Total	67	33	100
Mean total quality of life ($\bar{X}$ ± SD)	1.63 ± 0.62	1.79 ± 0.89	1.68 ± 0.72
Paired *t*-test	-4.262 (.000*)		

*Correlation is significant at the .05 level (2-tailed)

Table 8. Correlation of independent variables and quality of life domains among studied recipients (n = 100)

Variables	Limited physical capacity	Limited cognitive capacity	Cardiac and renal dysfunction	Side effects of corticosteroids	Increased growth of gum and hair	Transplantation-associated psychological distress
Gender						
r	.070	.113	.088	.057	.228*	.186
p	.491	.264	.386	.573	.023	.064
Age						
r	.010	.081	.090	.048	.013	-.019
p	.924	.422	.372	.632	.898	.854
Marital status						
r	.215*	.163	.173	.037	-.066	.030
p	.032	.106	.085	.718	.513	.764
Employment status						
r	-.112	-.120	.003	.048	.193	-.076
p	.269	.233	.978	.633	.054	.451
Education level						
r	-.090	.216*	-.037	.032	.005	-.011
p	.372	.031	.717	.750	.958	.914
Length of time since transplant in years						
r	.129	.224*	.223*	-.083	.085	-.073
p	.200	.025	.026	.410	.399	.468

*Correlation is significant at the .05 level (2-tailed)

3.2 Variables related to quality of life domains

Table 7 shows comparison of the overall quality of life associated with immunosuppressant treatment in men and women.

4. DISCUSSION

100 adults renal transplant recipients have constituted the sample of the current study. The socio-demographic characteristics of the studied recipients were as follows: the majority were male, half of the sample were living together with partners, their ages ranged from 20 to 55 years. Additionally, more than half of them were coming from the urban region. The majority were literate, professionally inactive, and most of them were a non-smoker. Concerning medical background data, most of the patients had no past medical history but had a family history of renal disease. The mean duration of dialysis before transplantation was 10.16 ± 6.09 months among them. More than half of them were biologically related to mothers, fathers, or brothers/sisters. The majority of the recipients were getting a double immunosuppressive regimen of cyclosporine and prednisolone. However, a minority had received a triple immunosuppressive treatment (cyclosporine, prednisolone, and azathioprine).

Unpleasant side effects of immunosuppressant drugs were frequent in renal transplant patients. The main adverse effects were strange hair growth, gingival hyperplasia, easy bruising, slow curing, weight gain, hypertension, sexual dysfunction, bone pain, weakness of the muscles, and headaches, and these adverse effects had negative effects on health-related quality of life.[2] These findings are consistent with the current study results.

Concerning symptoms experience among studied recipients based on the "Transplant Symptom Frequency and Symptom Distress Scale', the current study results showed that the most frequent and more prominent symptoms among both male and female recipients were as follows: increased appetite, sleeplessness, mood swings, increase hair growth, back pain, decreased interest in sex, acne, depression, fatigue, and stomach complains respectively. These findings are matching another study, which concluded that many renal transplant recipients reported symptoms such as problems related to sleep, fatigue, reduced interest in sex, mood swings, headache, and reduced concentration.[26] Moreover, other studies concluded that the most prevalent symptoms were weakness, difficulty in sleeping, dyspnea, anxious feeling, and drowsiness.[27,28] While, certain symptoms such as weakness, difficulty in sleeping, dyspnea, and drowsiness were commonly reported as severe. Furthermore, anxiety and depression were reported as the most apparent symptoms in other study findings.[29]

On the other hand, when comparing with gender the present study results revealed that women reported higher levels in the majority of the given symptoms experience and symptoms distress such as increased appetite, back pain, increased hair growth, mood swings, and depression. In addition to that, men reported significantly more symptoms experience in other items such as decreased interest in sex, sleeplessness, acne, and fatigue. Also, there was statistical significance difference by gender, especially with items such as fragile skin, bruises, impotence/painful menstruation, poor concentration, increased appetite, swollen ankles, and tremors. These findings are not convenient with the other findings mentioned that there was no important difference between gender with regards to the side effect of the immunosuppressive treatments.[2]

Moreover, when comparison of the overall symptoms experiences associated with immunosuppressant treatments in men and women based on the End-stage Renal Disease Symptom Checklist-Transplantation Module, the study results showed that generally there was a statistically significant difference by gender. Women reported a higher level of symptoms experienced when compared with men. Nevertheless, a comparison of symptom experiences by gender at the item level, it is showed that women reported also a statistically significant high level of symptom experiences with all items. These findings are in agreement with a study result which reported that female gender was constantly related to a health status perceived as being worse and a higher rate of symptom experience.[29]

Regarding the health-related quality of life, the current study results revealed that the majority of patient recipients had reported a best and good quality of life when compared with only one female recipient who reported poor quality of life. These results are convenient with most of the studies that concluded QOL in patients after renal transplantation showed a good level for everyday life functioning comparing with other treatment options for ESRD.[2–4] These findings interpreted in light of renal transplant recipients are freer in terms of diet and travel than any patient on dialysis.[30] In addition, other studies concluded that renal transplantation stays the best option in the management of patients with end-stage renal disease (ESRD) as it gives the best potential quality of life, less morbidity and mortality, and great cost savings in the long term for patients with ESRD.[31] Furthermore, Renal transplant is the best therapeutic anticipation for uraemic patients and has been associated with a major improvement in QoL, lessening in pain, and a general increase in functional capacities.[22] The current study findings concluded that the health-related quality of life is generally enhanced after renal transplantation which is incongruence with most of the other

related studies.[4, 32]

On the other hand, when comparing with gender the current results showed the majority of the recipients that reported a best and good quality of life were men while the minority were female. The reason for this result could be because the majority of the study participants were men. However, this finding is in congruence with a study that reported that female renal transplant patients had an inferior quality QOL and demonstrated a reduced amount of improvement after transplantation.[33] The finding is consistent with results that concluded that the average QOL was significantly higher in men.[29] This could be interpreted in light of women are taught to be more psychologically expressive, dependent, and concerned with their bodily appearance to be accepted by society these matters could be the reason. Moreover, since females reported higher levels compared with males on symptoms experience and distress as mentioned before so, dissatisfaction with the symptom experience of immunosuppressive treatment may correlate with poor QOL in the female.

Concerning the overall quality of life domains connected to immunosuppressant treatment in men and women, the current study result showed that there were statistically significant differences by gender, marital condition, and learning level. There was a strong correlation between marital status with limited physical capacity; gender and enlarged growth of gum and hair; and educational level with incomplete cognitive capacity. This means that gender, marital status, and educational level were important predictors for ESRD-SCL-TM quality of life. This is consistent with other studies that concluded that the level of health-related quality of life significantly decreases with age, female gender, living status, and educational level.[23, 34] however, the findings are not matching another finding which concluded that socio-demographic factors did not influence the recipients' quality of life after renal transplants.[35] While in another study, findings concluded that marital status was the most obvious socio-demographic variable that has a negative statistically significant effect on QOL for married recipients.[30]

4.1 Limitations/recommendations

Data is limited to one single major university hospital; therefore, findings must be confirmed in a larger sample considering female sample size to allow for generalization. Moreover, the features of health-related quality of life that change following the commencement of renal replacement therapy likely to be extremely individual and may include a vary in the level of physical activity, loss of employment, and alteration in the person's community function. This health variations require further researches to determine its consequence on the quality of life level. Also, the relationship between the adverse effects and the medication taking points to recommend the importance of investigating the direct relationship between noncompliance, and the related consequences such as rejection, and health-related quality of life. Furthermore, little is known about the health-related quality of life of adults with ESRD since childhood. A long-term follow-up study must assess health-related quality of life in these patients and compared the consequences with those in the general population and in dialysis patients with adult-onset of ESRD.

5. Conclusion

Health-related quality of life is becoming more of a matter in terms of outcome measurements after renal transplantation. Advances in immunosuppressive treatments improved graft and patient survival, but it still unknown whether this objective success is projected also in subjective patients' appreciation and well feeling. Unfortunately, patients will face physiological, psychological, social, and many other troubles and stresses. Notably, the patients need to take lifelong immunosuppressant treatments to manage the physical rejections, which are connected with a variety of side effects. The current study concluded that health-related quality of life of renal transplant recipients has improved in general after successful renal transplantation when compared to the other treatment choice for all participants, however, there was a significant gender disparity, in which male reported a higher level of health-related quality of life more than female. Moreover, female recipients showed a higher level of symptoms experience than male. Since the nurse plays an important role in health education and therapeutic adherence, in order to avoid kidney failure and consequent re-transplants, therefore, nurses should offer health promotion behaviors through proper nursing interventions to improve the health-correlated quality of life and the general health of kidney transplant recipients taking into account the gender differences and other socio-demographic variables that could affect.

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Conflicts of Interest Disclosure

The authors declare that there is no conflict of interest.

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