Factors Associated with quality of life in Kidney Transplant: A study from Saudi Arabia

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Abstract: **Background and aim: The health outcomes of renal transplant vary largely and not all recipients have a positive experience reporting a poor quality of life. Assessment of quality of life is one of the key indicators for monitoring coping strategies acquired by the kidney transplant patients. The main aim of this study was to explore the factors affecting health- related quality of life in kidney transplant patients, in the Kingdom of Saudi Arabia.**

Methods: A cross-sectional study was conducted in the Prince Sultan Military Medical City in Saudi Arabia on 214 Kidney Transplant Patients which have been selected by convenient sampling method. Arabic version of short form (SF-36) was used to measure health- related quality of life of patients after kidney transplantation. SPSS was used to analyze data collected from patients using descriptive and inferential statistics.

Results: The study results revealed that the quality of life domain which got the highest mean score is the domain of "Physical health interferes with social activities" with a mean percentage (85.0%). Following by the second highest domain of "mental health" with a mean percentage (82.33%). On the other hand, the quality of life domain which got the lowest mean score was the domain of "Perception of health" with a mean percentage 59.90%.

Conclusion: Health- related quality of life among kidney transplant patients are affected by several factors including patients' gender, comorbidity and adequacy of health insurance. Health education should be targeted more toward female kidney transplant patients and the ministry of health should provide adequate health insurance level for those patients to maximize their quality of life level.

Implications for Nursing Management:

Design an educational patient education program aiming to overcome the factors and barriers affecting kidney transplants patient for maintaining quality of life. An updated nursing curricula and patient teaching strategies to promote a kidney transplants patient self care management.

Keywords: **Health, Quality of life, Patients, Factors, Kidney, Transplant.**

1. INTRODUCTION

There are many people around the world that are affected by chronic kidney disease, and nowadays it has become a worldwide health crisis (National Kidney Foundation, 2015). According to an article authored by Frellick, one in 10 people worldwide has Chronic Kidney Disease (Frellick, 2017). The National Kidney Foundation states that 10% of the worldwide population is affected by chronic kidney disease (National Kidney Foundation, 2015). In Saudi Arabia, the prevalence of end-stage renal failure treated by dialysis is estimated to be 604 cases/PMP, total death was 1,726 (9%), while the incidence of treated end-stage renal disease is estimated at 163 cases/PMP (SCOT Data, 2018).

At the end of 2017, there were a total of 19,659 dialysis patients in the Kingdom of Saudi Arabia, 18,270 of them are treated by hemodialysis with prevalence rate of 513 cases per million populations (SCOT Data, 2018). Additionally, during the year 2012, there were a total of 624 transplanted kidneys; the results for these statistics are not available for the year 2016 or 2017. Those patients are in need for health education for their self-management (SCOT Data, 2018).

The health outcomes of renal transplant vary largely and not all recipients have a positive experience reporting a poor quality of life (Kamran and Schaw, 2014). According to Pasquale, (2014), assessment of quality of life is one of the key indicators for monitoring coping strategies acquired by the transplanted patient and/or the donor-recipient pair. In fact, although it constitutes a subjective variable, quality of life constantly changes in relation to the short and long-term therapeutic results, and with recipient and donor expectations (Pasquale, 2014). Following kidney transplantation, a chronic multi-factorial physical and mental condition persists for the recipients. Life with the best functioning transplanted kidney is a life with uncertainty, however the fear and possibility of rejection are constant. Immunosuppressive therapy can lead to psychiatric and psychological morbidity, and necessary shifts in family dynamics and readjustment into society can cause emotional difficulties (Das et al., 2014).

The study of Shetty et al. (2017) explored other factors that negatively impact health-related quality of life (HRQOL) after transplant include older recipient age, deceased donor transplantation, female gender, lack of social support, and comorbid conditions such as diabetes and depression. Improved HRQOL after kidney transplantation, especially in the physical domain, has been associated with better patient and allograft survival (Shetty et al., 2017). There are no previous studies exploring the factors affecting health- related quality of life in kidney transplant patients, in the Kingdom of Saudi Arabia. Therefore, the main aim of the current study was to explore the factors affecting health- related quality of life in kidney transplant patients, in the Kingdom of Saudi Arabia.

2. MATERIALS AND METHODS

Study design and sampling process

A quantitative cross-sectional design was used to conduct this study. The study population consisted of the transplant patients in the Prince Sultan Military Medical City, Riyadh City, Saudi Arabia. After calculation of study sample using Stephen Thompson formula (CI: 95.0%, Power 0.8, and $\alpha=0.05$), a convenience sampling method was applied to recruit 214 kidney transplant patients from both sexes. Saudi; adult (≤18) who has been undergone kidney transplant surgery which was performed in the Prince Sultan Military Medical City have been included in this study. Patients who had another organs transplantation (e.g., liver, pancreas, and stem cell), and the patients who have a failed graft i.e. (the new kidney transplant is failed (requires dialysis support) have been excluded.

Data collection and tools

Data has been collected by structured self-administered questionnaire adopted after permission from Aly and Mersal (2014); consisted of three parts: The first domain consisted of patient's socio-demographic characteristics such as patients' gender, age, marital status, level of education, occupation, habits, etc. Second domain consisted of patient's health history such as patients' past and present medical history, history related to the date of kidney transplant surgery, body mass index, follow-up, and etc.

Third domain consisted of quality of life (QoL), in which an Arabic version of short form (SF-36) was used to measure health related QoL of patients after kidney transplantation. This domain covered all aspects of HRQoL. This domain has eight parts assessing; 1) physical functioning, 2) role limitations due to physical health problems, 3) Role limitations due to emotional problems, 4) Energy or fatigue, 5) Bodily pain, 5) Emotional well-being, 6) Social functioning, 7) Pain, and 8) General health (Research and Development "RAND", 2017). The maximum mean score for each domain calculated by multiplying the maximum score of each item by the number of questions of the domain. Mean percentage was calculated by dividing the mean score of each domain on the maximum score for the domain itself.

Ethical approval was obtained from the Institutional Review Board (IRB). An approval for data collection was obtained from the Research Ethical Committee (Research Center) at Prince Sultan Medical Military City in Riyadh (PSMMC). Consent to participate in this study was obtained as well from all of participants before starting data collection. Information obtained from the participants in the study will remain strictly anonymous and confidential.

Data was analyzed using statistical package for social sciences (SPSS) version 20. Descriptive statistics including frequencies, means, and standard deviations were used to summarize patient's baseline data and describe the distribution of responses. Bivariate analysis to show the factors affecting health-related quality of life of patients such as have been used as well such as One-Way ANOVA and Independent-sample t test.

3. RESULTS OF THE STUDY

Demographic characteristics of the study sample was done and it was shown in the tables. More than half (57.0%) of the study participants were males, while 43.0% of them were females. Also, 55.6% of the study participants were 25 – 50 years and 37.5% were more than 50 years old. Moreover, 72.4.% of the study participants were married, and 16.4% were singles. On the other hand, 96.7% of the study participants were living with their families, while the rest (3.3%) were living alone. Additionally, 34.6% of the study participants; have university degree education, 24.8% of them have secondary school, and only 17.8% have illiterate (Table 1).

Regarding working status, income, and health Insurance of patients, more than half (61.7%) of the study participants were not working, 58.9% of them have sufficient expenses for treatment and family, while 41.1% have insufficient expenses for treatment and family. In addition, the majority (79.9%) of the study participants did not have health insurance, and 14.0% of them have had incomplete health insurance. On the other hand, 91.6% of the study participants were not smokers, and 8.4% were smokers (Table 2).

Regarding domains related to HRQoL among kidney transplant patients, the domain which got the highest mean score is the domain of "Physical health interferes with social activities" with a mean percentage 85.0%. The second highest domain is the "mental health" with a mean percentage 82.33%. While, the domain which got the lowest mean score is the domain of "Perception of health" with a mean percentage 59.90%. The second lowest mean score is the domain of "Feelings in the past 4 weeks" with a mean percentage 71.40%. The total man score of HRQoL for kidney transplant patient is 105.39 out of 144 with mean percentage 73.18% (Table 3).

The results revealed that there was a significant difference in mean score of total HRQoL with regard to patients' gender ($p<0.05$), in which the mean score of male patients in the total HRQoL is significantly higher than the mean score of female patients. The results also revealed that there was a significant difference in mean score of total HRQoL with regard to patients' comorbidity ($p<0.05$), in which the mean score of patients who do not have other diseases have significantly higher score of HRQoL than the mean score of patients who have other diseases (Table 4). Moreover, there is a significant difference in the mean score of HRQoL with regard to patients' age groups ($p<0.05$), in which the patients who were 25 – 50 years old have significantly higher mean score of HRQoL. On the other hand, the results revealed that there was no significant difference in mean score of total HRQoL with regard to patients' working status and their income level, living arrangement, smoking status, marital status, duration of kidney transplantation, and body mass index (Table 5).

Tables of the study:

Table 1: Sample Distribution According to the Participants' Gender, Age groups, and Marital Status and Educational Level (n=214)

Gender	Number	%
Male	122	57.0
Female	92	43.0
Age groups		
<25 years	14	6.5
25-50 years	119	55.6
>50 years	81	37.9
Marital status		
Single	35	16.4
Married	155	72.4
Divorced	10	4.7
Widowed/er	14	6.5
Living arrangements		
Family	207	96.7
Alone	7	3.3
Educational Level		
Illiterate	38	17.8
Below secondary	49	22.9
secondary	53	24.8
University	74	34.6

Table 2: Sample Distribution According to the Participants' Working Status, Income, and Heath Insurance (n=214)

	Number	%
Working status		
Working	82	38.3
No	132	61.7
Income		
Sufficient expenses for treatment and family	126	58.9
Insufficient	88	41.1
Health Insurance		
No	171	79.9
Incomplete health insurance	30	14.0
Complete health insurance	13	6.1
Smoking		
No	196	91.6
Yes	18	8.4

Table 3: Summery of the Mean and mean Percentage of each Quality of Life Domain (n=214)

Quality of Life Domains	Number of items	Max. score	Mean	SD	Mean %
General health	10	10	8.09	1.66	80.9[1]
Activities of daily living	10	30	22.56	5.41	75.2
Physical health	4	8	6.16	1.66	77.0
Mental health	3	6	4.94	1.29	82.33
Physical health interferes with social activities	1	5	4.26	1.09	85.20
Bodily pain	1	6	4.71	1.37	78.50
Interference with normal work	1	5	4.10	1.08	82.0
Feelings in the past 4 weeks	9	54	38.56	8.07	71.40
Perception of health	4	20	11.98	3.33	59.90
Total mean of HRQoL for the patients	43	144	105.39	16.53	73.18

[a] Calculated by dividing the mean score on the maximum score

Table 4: Factors affecting HRQoL among kidney transplant patients

Factor	Mean (SD) HRQoL	*t* statistics (df)	*p* value[*]
Gender			
Male	107.54 (15.39)	2.20 (212)	0.028
Female	102.54 (17.60)		
Working status			
Working	104 .06 (16.76)	-1.49 (212)	0.137
Not working	107.52 (16.01)		
Income			
Enough	105.85 (16.80)	0.491 (212)	0.624
Not enough	104.72 (16.21)		
Comorbidity			
Yes	110.00 (14.22)	4.59 (212)	<0.001
No	100.04 (17.46)		

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[1] Calculated by dividing the mean score on the maximum score

Living Arrangement			
living with family	105.57 (16.72)	0.854 (212)	0.394
Living alone	100.14 (7.90)		
Smoker			
No	105.11 (16.81)	-0.81 (212)	0.414
Yes	108.44 (12.98)		

[*]Independent sample *t* test

Table 5: Factors affecting HRQoL among kidney transplant patients

Factor	Mean (SD) HRQoL	*f* statistics (df)	*p* value[*]
Marital status			
Single	103.85 (15.87)	2.501 (3.210)	0.060
Married	106.80 (16.08)		
Divorced	103.90 (21.08)		
Widow/ed	94.71 (17.04)		
Duration of transplantation			
>1 year	107.43 (16.23)	1.04 (3.210)	0.392
1 – 5 years	103.75 (17.49)		
6 – 10 years	106.80 (12.34)		
> 10 years	98.33 (8.50)		
BMI			
>18.5	106 .12 (17.02)	0.226 (3.210)	0.879
18.5-24.9	105.12 (17.02)		
24.9-29.9	104.24 (16.01)		
≥30	106.57 (16.55)0.58		
Patient's age			
<25 years	99.85 (15.97)	3.510 (2. 211)	0.032
25-50 years	107.97 (16.07)		
>50 years	102.55 (16.78)		
Health insurance			
No	103.94 (16.25)	3.343 (2.211)	0.037
Not sufficient	111.46 (18.65)		
Sufficient	110.38 (10.92)		

[*]One-way ANOVA

4. DISCUSSION

This study discussed an important significant issue in Saudi Arabia, factors affecting HRQoL among patients with kidney transplant has not been extensively studies in Saudi Arabia; thus, the study shed the light on the factors affecting HRQoL among those patients. Regarding the factor of gender, this result is not consistent with the results of a recent study in Saudi Arabia, which revealed that that male gender, older age and duration of treatment have significantly lower QoL than female patients (Bayoumi et al., 2013). Regarding working status, the result is not consistent with the results of Ortiz et al. (2014) which revealed that the patients in employment after transplantation have significantly higher score of QoL than those not employed. Additionally, the results are not consistent with the results of Bayoumi et al. (2013) which revealed that the QoL scores revealed a decreasing trend with unemployment.

Regarding family income, significant difference was noted in some domains of total HRQoL but not in the total mean score. Junchotikul et al., (2015) stated that, the family income was positively related to QoL of patients after kidney transplant. To further explain, patients with a higher family income are more likely to have better QoL than those who have a lower family income. This may be because money is a very important economic factor for individuals' living in the

present-day society. Money also determines an individual's ability to search for resources and facilities that can ensure quality care when facing an illness. As a result, a higher economic status means a better QoL for patients after kidney transplant.

Also, these results are not consistent with the results of Ruzevicius (2012) which revealed that the HRQoL is influenced by the level of patens' income. On the other hand, the current study results are consistent with the study of Fama (2013) which revealed that the patients with medium and high socio-economic conditions showed higher appreciation in HRQoL compared to those with low income; however, this didn't reach statistical significant.

Regarding age, the present study reported that there is significant difference in the mean score of HRQoL with regard to the patients' age groups. The finding of Bayoumi et al (2013) reported that age is an important factor that affects HRQoL. Marital status, along with other socio-demographic characteristics, has the potential to affect HRQoL, and possibly the overall outcome of the transplant (Naiman et al. 2007). Additionally, the present study indicated that there is no significant difference in the mean score of HRQoL with regard to patients' marital status ($p<0.05$). In the study of Junchotikul et al. (2015), marital status shown that there was no relationship between marital status and QoL. This could be attributed to the type of sample and the status of persons which have been included in the study.

The present study reported that there was no significant difference in the mean score of HRQoL with regard to BMI. Lim et al., (2016) found that HR-QOL significantly improved after kidney transplant in all of the kidney-specific HRQoL domains, including both physical and mental areas. Post- transplantation HRQoL was associated with baseline QoL, good allograft function, and low BMI (Lim et al., 2016). Furthermore, Hoogeveen et al. (2011) showed that post-transplantation body mass index is an important risk factor for graft failure and premature death; this could lead to decrease the quality of life among those patients. Also, these results are not consistent with the results of Korhonen et al. (2014) which revealed that all physical components of the SF-36 decreased linearly according to BMI categories. Also, the results of Blaes et al. (2013) revealed that the weight status is associated with QoL.

Regarding smoking status, the results are not consistent with the results of Rezaei et al. (2017) in Iran which revealed that heavy smokers had a significantly lower HRQoL score than moderate and light smokers. Also, the results of Goldenberg et al. (2014) in the United States revealed that low QoL is associated with higher odds of smoking. Regarding patients' co-morbidities, the results are consistent with the results of Carminatti et al. (2016) which revealed that there is a lower prevalence of chronic kidney disease (CKD) related complications in Kidney transplant recipients. The current study results could be attributed to the fact that with the presence of other diseases beside kidney transplantation, the quality of life might be significantly decreased due to the interference of the other disease with physical, social, and mental activity of the patient.

Regarding the years of transplantation, the results are not consistent with the results of Terrie (2017) which revealed that 50% of transplant patients experience at least one episode of substantial anxiety or depression within the first 2 years of the post-transplant period (Terrie, 2017). Moreover, the current study results are not consistent with the results of Pinson et al. (2000) which revealed that the scores of health-related QoL were improved to 67 at 3 months, 77 at 6 months, 82 at 12 months, 86 at 24 months, 84 at 36 months, and 83 at 48 months for penitents with kidney transplantation except for mental health domain. On the other hand, the current study results are consistent with the results of Fiebiger et al. (2004) which revealed that the health-related QoL (SF-36) scores did not change significantly over the years after transplantation.

5. CONCLUSION AND RECOMMENDATIONS

The kidney transplant patients have a certain degree of limitations and deficit in all aspects of quality of life as, physical, psychological and social, a mental domain. The factors affecting HRQoL of Kidney transplantation include gender, comorbidity and health insurance. Designing a system for training a nurses aims to educate the patient about who they assess their quality of life and when the patient can seek medical and nursing advice to over affecting their quality of life.

Implications for Nursing Management

Design an educational patient education program aiming to overcome the factors and barriers affecting kidney transplants patient for maintaining quality of life. An updated nursing curricula and patient teaching strategies to promote a kidney transplants patient self care management.

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Limitations of the study

Conducting a study using a mixed method design and recruiting participants from different hospitals and cities in Saudi Arabia would provide additional insight about quality of life in the kidney transplant patient. Moreover, the findings can only be generalized to the specific sample of adult with kidney transplant receiving care within the transplant clinics at Prince Sultan Military Medical city. Participants were recruited from adult with kidney transplant receiving treatment on transplant center in the PSMMC. The characteristics of the individuals attending these centers may be different from other adult with kidney transplant receiving care at different settings.

Author contribution

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ETHICS

Ethical approval was granted by The Prince sultan medical military city, Research Ethics Committee: Reference number; project no.: 1063.

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