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Application of Quality of Life Adjusted Survival in Nursing Health Policy Decision on Kidney Transplantation (2/2)

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Application of Quality of Life Adjusted Survival in Nursing Health Policy Decision on Kidney Transplantation

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BACKGROUND

Improvement in quality of life (HRQoL) and work capacity (WC) are the main reasons for a prospective organ recipient to consider organ transplantation. Taiwan has the first organ transplantation (OT) surgery around the Asia countries, and nowadays, kidney and heart transplants are respectively the first and second most popular procedures performed since 1968 and 1987. Many studies have shown that kidney transplantation (KT) is a successful model to prolong one's life expectancy and enhance HRQoL when a person suffers from an end-stage renal failure (Demirag et al., 1998; Muirhead, 1992; Uetkes et al., 2001; Shih et al., 1999; Witzke et al., 1997). Although, debates on the improvement in HRQoL after transplantation have addressed in the past five years, but it has not been discussed thoroughly (approximately 50 studies in KT), and focus on WC is limit. Moreover, only little study discusses the level of satisfaction, quality of life and WC after OT for Taiwanese recipients.

The purpose of this study was to explore, compare and contrast the trends of changes in HRQoL and WC for KT, and also compare the changes in HRQoL and WC of KT, hear transplantation (HT), lung transplantation (LT), and orthotopic liver transplantation (OLT) recipients before the surgery and one year after being discharged from the hospital.

METHOD

The subjects were recruited from a university hospital in northern Taiwan. The inclusion criteria were the recipient who was a) older than 16 years old, b) received heart or kidney transplantation, c) able to understand and speak Mandarin or Taiwanese, d) conscious clearly, and e) agreed to participated in the study.

Longitudinal prospective design was used to investigate the recipient's HRQoL and WC before and after kidney transplantation. The measurement includes rating and time-trade-off scales. A visual analog scale was employed to examine the subject's global appraisal of his/her HRQoL and WC at each interview. Time-trade-off scales were used to examine the subject's appraisals of his/her multi-dimensional functional well-being related to HRQoL and WC at each interview. A serious interviews were employed at six stages, including pre-operation, one day before discharge from hospital, and the first, third, sixth, and twelfth month after discharge from the hospital.

The data were analyzed with descriptive and infernal statistics. Changes between pre- and post-operative stages were analyzed by paired sample test with 95% confidence, $p \leq .05$ was accepted as significant.

RESULTS

Demographic Data

By the end of the first post-transplant year, 81 KT recipients, consisting of 42 (51.9%) male and 39 (48.1%) females, were included in this study. The age of the KT recipients ranged from 16 to 57 years old (mean38 ± 8.98). Forty-eight of the subjects are married (59.3%). Twenty-seven of them were single (33.3%). Sixty-three percent of the subjects are Buddhists (n = 51). Sixty-two percent of them are employed (n = 50) (Table 1). Data were analyzed with descriptive and inferential statistics with 95% confidence intervals, A $p < .05$ was considered significant.

Changes in HRQoL and WC for KT Recipients

KT recipients demonstrated a rapid increase in HRQoL at six difference stages. The mean scores of perceived HRQoL at each of the six stages were 57±18% at the pre-operative stage, 68±22% at one day before discharge, 77±16% at the first month after being discharged, 80±16% at the third month after discharge, 83±12% at the sixth months, and 86±13% at one year after discharge form the hospital. In the other aspect, changes in data for HRQoL in KT were identified between before operation and the day before discharge, this consisted of the 1st, 3rd, 6th and 12th month after being discharged, by the paired sample test, t = -4.93, -9.86, -10.62, -12.91, -13.00 ($p < .05$) (Table 2).

The mean scores of WC in KT also exhibited dramatic increases at all six stages. At the pre-operative stage, the mean score was 62±21%. One day before being discharged the increase was 59±23%. At the first month after discharge, statistics showed a 70±17% increase. At the third month after discharge, the mean increased to 76±15%. After six month after discharge, the mean score was 79±16%. Lastly, twelve months after discharge, the mean score increased to 80±16%. Changes in observed WC in KT were identified between each of post-operative stages. This was quantified by the paired samples test, t = -1.51, -3.77, -6.51, -8.17, -8.62 ($p < .05$) (Table 2).

Comparisons on HRQoL and WC for KT, HT, LT, and OLT Recipients

The Degree of Satisfaction with HRQoL

KT recipients who had undergone transplantation reported their degree of satisfaction at each stage of pre-operation, post-op 1 day before discharge, post-op 1 month, post-op 3 month, post-op 6 month, and post-op 1 year after discharge with HRQoL to be 57±18%, 68±22%, 77±16%, 80±16%, 83±12%, and 86±13%. HT recipients reported their degree of HRQoL to be 31±18% at pre-operation, 60±16% at post-op ICU stage, 64±15% at 1 day before discharge, 69±15% at 1 month after discharge, 73±7% at 3 months after discharge, 73±12% at 6 months after discharge, and 71±11% at 12 months after discharge. LT recipients reported their degree of satisfaction with HRQoL to be 37±16%, 67±13%, 67±13%, 71±16%, 71±16%, 63±14% and 63±10%. The degree of satisfaction with HRQoL for OLT recipients are 32±21%, 65±15%, 70±13%, 65±10%, 66±12%, 73±15%, and 88±15%. Overall, 75% of the KT recipients reported their current HRQoL as satisfactory, compared to 63% of HT recipients, 63% of LT recipients, and 66% of OLT recipients (Table 3). The factors which were reported to have facilitated the recipients' HRQoL in the various transplant groups were (a) practicing positive thinking and self care, (b) having a sense of normalization and freedom, (c) lowering down expectations for self and others, and (d) being accompanied

by families with positive value systems, in order. It seems that the longer the post-transplant time, the better HRQoL were perceived by the KT recipients. Contrast to KT, the HT, LT, and OLT recipients felt less satisfied with their HRQoL until the 4th post-transplant year. At this turning-point year KT recipients resumed their satisfaction with HRQoL. Similar to KT recipients' experiences, the turning point of OLT recipients' satisfaction with HRQoL occurred one year later than KT's and at the 5th post-transplant year.

Changes in the Perceived Working Capacity

The mean WC scores of KT recipients were 62±21% pre-operatively, 59±23% pre-discharge, 70±17% at 1 month, 76±15% at 3 months, 79±16% at 6 months, and 80±16% at 12 months after discharge. The mean WC scores of HT recipients were 34±17% pre-operatively, 56±9% at ICU transition, 50±20% at 1 day pre-discharge, 63±12% at 1 month, 71±11% at 3 months, 73±9% at 6 months, and 74±7% at 12 months after discharge. The mean WC scores of LT recipients were 18±12% pre-operatively, 45±15% 1 day before discharge, 59±10% pre-discharge, 61±13% at 1 month, 64±16% at 3 months, 57±15% at 6 months, and 58±17% at 12 months after discharge. The WC scores of OLT recipients in different stages were 51±25%, 56±31%, 60±27%, 56±20%, 59±19%, 70±17%, and 82±16% (Table 3). Differences in the perceived WC were significant between the pre-operative and each of the post-discharge stages: 1day before discharge (t = 1.51), 1 month (t =-3.77*), 3 months (t = -6.51), 6 months (t = 8.17), and 12 months (t = -8.62*). It shows the same significant in HRQoL and WC for HT, LT, and OLT recipients (Table 4,5). The trend of changes in the reported employment and economic status across the seven time points indicated that the first month after discharge from the hospital was the stage of lowest employment and family income. Thereafter, the percentage of the subjects employed and their family incomes steadily increased in the subsequent recovery stages, through the 12th month after discharge from the hospital. In addition, the mean perceived WC score was slightly lower than the mean score of perceived HRQoL across the six post-op stages, although no correlation between the HRQoL and WC was identified (Fig 1).

DISCUSSION

HRQoL is a multidimensional concept and frequently discussed in relation to recovery from illness and living with a chronic condition. It encompasses the recipient's physical and occupation function, psychological state, social interaction, and somatic sensation (Grady, Jalowiec, and White-Williams, 1999), HRQoL also reaches into socioeconomic satisfaction, family satisfaction, coping styles, the impact of the transplant experience on the spouses' life did change after transplantation (Collins, White-Williams, and Jalowiec, 2000), and functional status and activities of daily living (Fisher et al., 1998). Although the literature has remained controversial upon the evaluation of HRQoL on the recipients after OT, specific studies done by Fallon, et al., (1997); Franques, et al., (2000); Grady, Jalowiec, and White-Williams (1999); Hershberger (1997) have demonstrated that HRQoL for most heart and kidney recipients was greatly improved after transplantation.

In this study, the mean score of HRQoL for KT demonstrated a constant increase in each stage, particular during the pre-operation stage and post-operative one day before discharge stage. A comparison between the improvement of HRQoL and WC for KT recipients, the data indicates that HRQoL for HT recipients (1.3%) was over two times better than recipients who undergo KT (0.5%).

Also, the improvement of WC for HT recipients (1.2%) was four times greater than that of KT (0.3%) at the pre-operation and the 12th month after discharge stage from the hospital.

Moreover, Riedmayr, et al. (1998) study state that "quality of life was rated very poor by 84% of patients with congestive heart failure, 6 weeks after HT, 74% rate their quality of life as significantly better" (p.808). This was reiterated when Shih, et al. (2000) observed that LT recipients have significant improvements in their HRQoL after transplantation (pre-operation 32%, pre-discharge 65%, post-discharge 1-month 70%, 2-month 65%, 3-month 66%, 6-month 73%, and 12-month 88%). As a result, these three studies indicate that OT would be the best choice for patients who suffer from end-stage organ failure.

CONCLUSION

End-stage kidney diseases is an ever-present condition, which could reduce one's life-span. Modern medical technology can not cure organ failure, however, OT could extent a person's life expectancy, improve health, HRQoL, WC, and well-being of individuals and families for terminal organ failure client. However, OT does come with a price and there are a multitude of physical and psychiatric complications associated with OT. When cross-referenced, the mean score of HRQoL and WC for KT recipients consistently yielded higher numbers than KT recipients. In other words, the Taiwanese KT recipients, who participated in this study, experienced an increased HRQoL and WC after accepting the transplant surgery.

The subjects in this study also reported significantly higher HRQoL scores at the end of the 12th month after discharge compared with their HRQoL scores in the pre-operative stage. This may be because these subjects had good graft function and better social rehabilitation. Good graft function is the result of successful post-transplant medical and nursing protocols (followed monthly in our study), high subject compliance with protocols, and adequate social support. Social rehabilitation can be a result of improved physical competency. In our study, about 70% of the subjects had resumed their family and other social roles either partially or completely by the end of the 12th month after discharge from the hospital, roles in which they had been limited prior to surgery. In addition, improvements in HRQoL may also be attributed in part to the determination of patients to take advantage of the opportunity provided by the transplantation, despite any hardships they may have to endure.

Employment was cited as one of the factors influencing HRQoL among Taiwanese KT recipients. Meanwhile, monthly family income has also been reported to influence Taiwanese recipients' perceptions of their recovery from KT. From the trend of changes in employment and economic status across the seven stages, the first month after discharge from the hospital appeared to be a critical stage during which patients reported the lowest WC, employment rate, and family income. After this stage, the percentage of the subjects employed, their family incomes, and their perceived WC steadily increased in the subsequent months throughout the end of the study period. The employment rate did not begin to increase until the 3rd month after discharge from the hospital. The need for this delay may be related to the fact that the subjects placed a higher priority on recovery from transplantation than on their economic needs. The availability of financial aid from National Health Insurance, which was instituted in 1995 and covers most of the medical expenses for KT recipients, may have also contributed to the delay by reducing the financial

pressure on patients to return to work.

In conclusion, Taiwanese KT recipients experienced better HRQoL and WC during the first post-transplant year than pre-operatively. Significant changes in the HRQoL were noted at 1 and 12 months after discharge from the hospital, and significant changes in perceived WC were reported between the pre-operative stage and each of the post-discharge stages. Researchers are suggested to further explore (a) factors that might contribute to or threaten patients' perceptions of HRQoL in the early post-transplantation stages; (b) the impact of WC, degree of recovery, and financial status on recipients' HRQoL; (c) the optimal time for recipients to re-enter the community; and (d) what groups are most vulnerable to poor perceived HRQoL and WC during their first post-transplant year, and why.

Table 1. Sample Demographics of Kidney Transplantation Recipients (n = 81)

Demographics	Range	Mean± SD	N	%
Gender	Male		42	51.9
	Female		39	48.1
Age	10-19	38±8.98	2	2.4
	20-29		11	13.5
	30-39		33	41
	40-49		25	31
	50-59		10	12.1
	60-69		0	0
Marital Status	Single		27	33.3
	Married		48	59.3
	Separate or divorced		3	3.7
	Widow		3	3.7
Religious Affiliation	Buddhism		51	63
	Taoism		24	29.6
	Protestant		4	4.9
	Others		2	2.5
Occupation	Employed		50	62
	Unemployed		10	12.1
	Housekeeper		15	18.5
	Student		2	2.5
	Retired		4	4.9

Table 2. Changes in HRQoL and WC for KT Recipients (n =81)

Stages	HRQoL		WC	
	Mean±SD	t value	Mean±SD	t value
Pre-operation	57±18%		62±21%	
Post-operative 1 day before discharge	68±22%	-4.93*	59±23%	1.51
Post-operative 1 month after discharge	77±16%	-9.86*	70±17%	-3.77*
Post-operative 3 month after discharge	80±16%	-10.62*	76±15%	-6.51*
Post-operative 6 month after discharge	83±12%	-12.91*	79±16%	8.17*
Post-operative 12 month after discharge	86±13%	-13.00*	80±16%	-8.62*

Note. HROoL = Health Related Quality of Life, WC = Working Competence;

KT = Kidney Transplantation

Table 3. Degree of Health Related Quality of Life (HRQoL) and Working Competency (WC) by Different Stage perceived by Taiwanese KT, HT, LT, and OLT Recipients

Stages	HRQoL				WC			
	KT	HT	LT	OLT	KT	HT	LT	OLT
	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD	Mean±SD
Pre-operation	57±18%	31±18%	37±16%	32±21%	62±21%	34±17%	18±12%	51±25%
Post-operative ICU transition	–	60±16%	67±13%	65±15%	–	56±9%	45±15%	56±31%
Post-operative 1 day before discharge	68±22%	64±15%	67±13%	70±13%	59±23%	50±20%	59±10%	60±27%
Post-operative 1 month after discharge	77±16%	69±15%	71±16%	65±10%	70±17%	63±12%	61±13%	56±20%
Post-operative 3 month after discharge	80±16%	73±7%	71±16%	66±12%	76±15%	71±11%	64±16%	59±19%
Post-operative 6 month after discharge	83±12%	73±12%	63±14%	73±15%	79±16%	73±9%	57±15%	70±17%
Post-operative 12 month after discharge	86±13%	71±11%	63±10%	88±15%	80±16%	74±7%	58±17%	82±16%

KT = Kidney Transplantation, HT = Heart Transplantation, LT = Lung Transplantation, OLT = Orthotopic Liver Transplantation

Table 4. Changes in HRQoL and WC by stage for Taiwanese KT, HT, LT, and OLT Recipients

Stages	HRQoL				WC			
	KT	HT	LT	OLT	KT	HT	LT	OLT
	t value	*t* value	*t* value	*t* value	*t* value	*t* value	*t* value	*t* value
Pre-operation and postop ICU transition	—	-4.31*	-7.05**	-4.14**	—	-0.88*	-9.44*	-0.31
Pre-operation and postop 1 day before discharge	-4.93*	-3.19*	-7.05**	-4.58**	1.51	-1.52	-9.87*	-0.65
Pre-operation and postop 1 month after discharge	-9.86*	-3.99*	-21.65	-5.33**	-3.77*	-4.00*	-8.31*	-0.42
Pre-operation and postop 3 month after discharge	-10.62*	-5.38*	-18.68	-5.34**	-6.51*	-4.71*	-8.00*	-0.67
Pre-operation and postop 6 month after discharge	-12.91*	-4.61*	-2.61*	-5.54**	8.17*	-4.91*	-4.6*	-1.54
Pre-operation and postop 12 month after discharge	-13.00*	-4.07*	-3.73*	-5.34**	-8.62*	-5.66*	-4.30*	-3.55*

* $p < .05$, ** $p < .01$

KT = Kidney Transplantation, HT = Heart Transplantation, LT = Lung Transplantation, OLT = Orthotopic Liver Transplantation

Table 5. Changes in HRQoL and WC by stage for Taiwanese KT, HT, LT, and OLT Recipients

Stages	HRQoL								WC							
	KT		HT		LT		OLT		KT		HT		LT		OLT	
	t value	F value	*t* value	F value	*t* value	F value	*t* value	F value	*t* value	F value	*t* value	F value	*t* value	F value	*t* value	F value
Pre-op and postop ICU transition	—		-4.31*		-7.05**		-4.14**		—		-0.88*		-9.44*		-0.31	
Pre-op and postop 1 day before discharge	-4.93*	—	-3.19*	9.61**	-7.05**	9.20**	-4.58**	10.62**	1.51	—	-1.52	1.82	-9.87*	29.63	-0.65	0.20
Pre-op and postop 1 month after discharge	-9.86*	12.33	-3.99*	9.00**	-21.65	6.99**	-5.33**	8.94**	-3.77*	1.31	-4.00*	4.34*	-8.31*	20.87	-0.42	0.15
Pre-op and postop 3 month after discharge	-10.62*	16.35	-5.38*	10.05	-18.68	5.77**	-5.34**	7.72**	-6.51*	4.57**	-4.71*	7.37**	-8.00*	14.93	-0.67	0.15
Pre-op and postop 6 month after discharge	-12.91*	16.47	-4.61*	9.71	-2.61*	4.75**	-5.54**	7.03**	8.17*	5.49	-4.91*	9.18	-4.6*	11.04	-1.54	0.53
Pre-op and postop 12 month after discharge	-13.00*	14.71	-4.07*	9.10	-3.73*	4.27**	-5.34**	9.05	-8.62*	5.48	-5.66*	10.51	-4.30*	8.33	-3.55*	1.52

* $p < .05$, ** $p < .01$

KT = Kidney Transplantation, HT = Heart Transplantation, LT = Lung Transplantation, OLT = Orthotopic Liver Transplantation

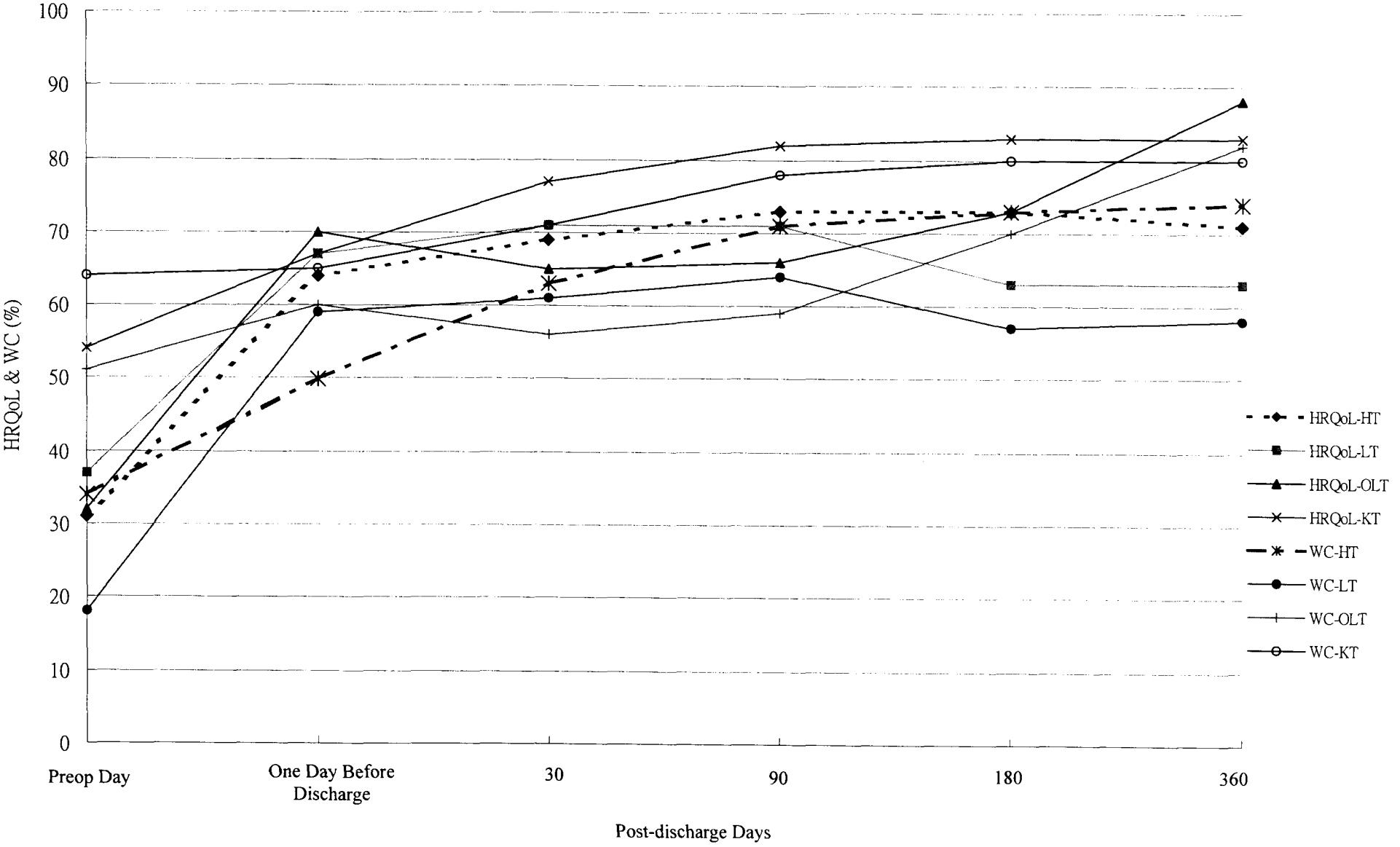

Figure 1. Trends on HRQoL & WC among Taiwanese KT, HT, LT, and OLT, Groups

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