

Health-related Quality of Life of Filipino Pediatric Liver Transplant Recipients and Children with Chronic Liver Disease using PedsQL4.0™ Tagalog Version

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ABSTRACT

Background. The Pediatric Quality of Life (PedsQL4.0™) scale has been shown to be reliable and valid in assessing health related quality of life (HRQOL). However, its Tagalog version has not been field-tested.

Objectives. To determine the reliability and validity of the PedsQL4.0™ Tagalog version and to compare the HRQOL of Filipino liver transplant (LT) recipients, children with chronic liver disease (CLD) and healthy controls.

Methodology. This is a cross-sectional study that included Filipinos 2-18 years who had undergone LT and those with CLD. PedsQL4.0™ Tagalog version was administered as a proxy-report for caregivers and child-report for children >5 years.

Results. 237 PedsQL4.0 questionnaires were completed. Reliability was demonstrated for psychosocial (Cronbach $\alpha=0.86-0.88$), physical ($\alpha=0.86-0.88$) and total ($\alpha=0.89-0.92$) health summary scores. Construct validity showed a medium to large effect size (0.39-1.34) between patients and controls. No difference was noted on the total health summary scores and the individual domains between LT recipients and controls while the scores of patients with CLD were significantly lower compared to LT recipients and healthy subjects.

Conclusions. The PedsQL4.0™ Tagalog version is a valid and reliable HRQOL tool. The HRQOL of LT recipients is similar to healthy children while CLD patients had poorer HRQOL.

Key Words: *quality of life, pediatric liver transplant, chronic liver disease, PedsQL4.0™*

Introduction

Liver transplantation is the standard treatment for end stage liver disease in children. Since the first attempt in 1963, the overall ten-year survival post-liver transplantation

(LT) in children is reported to be between 80%-90%. With optimum survival, interest has now focused on the health-related quality of life (HRQOL) of these children. In a multi-center study¹ on children 2 to 18 years old, LT recipients scored lower in global health and general health perceptions but did not differ from a healthy population in the measurement of physical and psychosocial outcomes. Similarly, in a study² of children ages 5-18 years, lower scores for physical and psychosocial health and for emotional, social and school functions were demonstrated in the pediatric LT recipients as compared to healthy controls. The HRQOL of Filipino pediatric liver transplant recipients has never been reported. Although data from other countries is available, it remains vital to determine the unique local experience of Filipino pediatric liver transplant recipients.

Various HRQOL models had been used by different centers, one of which is the PedsQL4.0™ questionnaire.^{2,3} The PedsQL4.0™ has the ability to measure HRQOL using a single scale for a wider age range, specifically from 2-18 years. PedsQL4.0™ measures individual scale scores for the following domains: physical, social, emotional and school function. It is available as a proxy report for ages 2 years and above, and as a child report for children >5 years old. The proxy report is accomplished by either the parents or caregivers. The items in the child report were derived from the measurement properties of the child's self-report scales whereas the proxy report was constructed to directly parallel the self-report items. PedsQL4.0™ has been reported to be reliable and valid and various translations have been done including a Tagalog version. However, the Tagalog version has not been field-tested.

Our study has two objectives: to determine the validity and reliability of the PedsQL4.0™ Tagalog version and to compare the HRQOL of pediatric liver transplant recipients with that of chronic liver disease patients and healthy children. Field-testing the PedsQL4.0™ Tagalog version will determine its validity and reliability as a HRQOL measurement tool for local use. As a validated tool, scores from the PedsQL4.0™ Tagalog version will allow us to measure the HRQOL of Filipino pediatric liver transplant recipients and to compare this with the HRQOL of children

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with chronic liver disease and healthy children. The information gained in this study will also help the physician elucidate to the parents and recipients the expectations and quality of life after pediatric liver transplantation.

Methods

Setting. This cross-sectional study was conducted from August to December 2008 at a local tertiary hospital. The patients were recruited from the in-patient service and out-patient clinic of the hospital and from the cases referred to the consultants of the Section. The study received ethics approval from the Expanded Hospital Research Office of the institution. Informed consent was obtained from the parents or legal guardian.

Subjects. Included were 15 Filipino children (mean age: 5.9 ± 2.4 years; 9 males) who underwent liver transplant at least 6 months before the study. All these patients were transplanted abroad before the availability of liver transplant surgery in the country. All but one received a living related donation. The majority (60%) is presently on Cyclosporin A as immunosuppressant. Mean duration from the time of transplant is 41 ± 31 months.

Twenty-nine children with chronic liver disease, defined as children with clinical, biochemical or histological evidence of cirrhosis were also investigated. Depending on their Child-Pugh score, 19 patients (mean age: 6.1 ± 3.4 years; 13 males) were classified as compensated liver disease as their scores were seven or higher and 10 (mean age: 3.7 ± 2.2 years; 8 males) as decompensated liver disease having a score of six or less.

As a comparison group, 104 healthy children (mean age: 5.9 ± 2.4 years; 56 males) were recruited from two private schools and one public school in the urban area which was within the vicinity of the institution where the study was conducted. The children were defined as healthy if in the last year before the administration of the questionnaire they had neither surgery nor any underlying medical illness requiring treatment lasting more than 14 days.

The PedsQL4.0™ Tagalog version questionnaire. After informed consent was obtained, the socio-demographic and clinical data of the patients were taken. The PedsQL4.0™ Generic Core Scales Tagalog version in the format of proxy and/or child reports were then self-administered to the respondents, according to age-appropriate versions: 2-4, 5-7, 8-12 and 13-18 years old. Proxy-reports were available for ages 2-18 years while child self-reports were provided for 5-18 years. One of the two authors was always present during the administration of the questionnaire to assist the proxy or the child. The questionnaire employed a Likert scale with negatively-worded statements, thus, items were reverse-scored into values from 0 to 100 with higher scores corresponding to a better HRQOL. The items in the scale measured four domains, namely physical, emotional, social and school functions. From these domains, the physical,

psychosocial and total health summary scores were derived by getting the average scores of answered items. Summary scores for physical health included the items in the physical function domain while that for psychosocial health included those in the emotional, social and school functions. The total health summary score included all the items in the scale.

Sample size estimate. Sample size was estimated based on the reliability and validity testing for the PedsQL4.0™ questionnaire. With 23 items in PedsQL4.0™, at least 69 respondents are needed to validate the questionnaire.⁴

Statistical analysis. Statistical analysis was performed using STATA 9.2 (STATA Corp, Texas). Type 1 error was set at an alpha level of 0.05. The reliability of the questionnaire was assessed by determining the Cronbach alpha, inter-item and item-total correlation. Cronbach alpha was computed if all the items in the domain were included and when one item in the domain was deleted. The questionnaire was accepted as reliable if the Cronbach alpha was greater than 0.60 and inter-item and item-total correlation was greater than 0.20. The validity was measured by determining the magnitude of the difference between the healthy children and the ill subjects, composed of liver transplant recipients and chronic liver disease patients. The magnitude of the difference between the healthy and the ill group was expressed as effect size and was designated as small (0.10), medium (0.30) or large (0.50). Effect size³ was computed as the difference between the mean scores of the healthy school children and the patients divided by the standard deviation of healthy children.

After establishing the reliability and validity of the questionnaire, a comparison of the HRQOL of the four groups was done using Kruskal-Wallis Rank Sums test for equality of populations to detect significant differences among the groups. Distribution-free multiple comparisons to identify pairs with significant differences were done.

Pearson correlation coefficient was also computed to determine the correlation between the proxy and child reports.

Results

A total of 237 reports was completed by 152 parents and 85 children. The reports were collected from 44 patients (15 liver transplant recipients, 19 with compensated and 10 with decompensated liver disease) and 104 healthy school children. Of the 44 patients, 27 (61%) are presently attending school. There were 152 proxy reports from 148 parents as reports from both parents were obtained from three children with chronic liver disease and one healthy child.

Reliability and construct validity of the PedsQL 4.0 Tagalog version. Internal consistency reliability was demonstrated for psychosocial, physical and total health summary scores both for the proxy and child reports (Table 1). The inter-item and item-total correlation was at least 0.26 for all the domains signifying good correlation. In both the

proxy (Table 2) and child (Table 3) reports, the effect size was medium to large for the individual domains and the summary scores, confirming its validity.

Comparison of groups. The results were similar if only the proxy or the child reports were used, thus it was decided to combine the data of both reports (Table 4). There were limited reports on school function among the ill group as only 27 patients (11 liver transplant recipients, 14 with compensated and 2 with decompensated liver disease) were attending school at the time of the investigation.

Overall, there was a significant difference in the domain and summary scores among the four groups with higher scores obtained by LT recipients and healthy controls than patients with chronic liver disease. Comparison of specific pairs showed no significant difference in all domains and summary scores between liver transplant recipients and healthy children. In contrast, children with either compensated or decompensated liver disease had significantly lower domain and summary scores as compared with either the healthy controls or liver transplant recipients. Of the 4 groups, the decompensated liver disease had the lowest summary scores.

Correlation of proxy and child reports. Eighty-seven pairs of proxy and child reports were obtained from 22 patients and 65 healthy children. A significant correlation was noted in the proxy and child reports for the total health summary scores ($r=0.51-0.69$) and the individual domains ($r=0.42-0.63$) in both the patient and the healthy group.

Discussion

The present study shows two important findings: first, that the PedsQL4.0™ Generic Core Scale Tagalog version is a reliable and valid tool to measure HRQOL of Filipino children; and second, that the HRQOL of Filipino pediatric liver transplant recipients is comparable to healthy school children and is better than children with chronic liver disease.

The PedsQL4.0™ Generic Core Scale has been translated into numerous foreign languages using the linguistic validation guidelines of the Mapi Research Institute.^{3,5-9} The exceptional reliability and validity of these translations across different cultures are well-published in literature.¹⁰⁻¹⁵ The results of this study, using for the first time the PedsQL4.0™ Generic Core Scale Tagalog version, provide further evidence that the questionnaire is reliable and valid in assessing HRQOL.

There are different HRQOL models that have been used both in pediatric liver transplant recipients and chronically ill patients. Some of these include the Health Utilities Index Mark II,¹⁶ Child Health Questionnaire Parent Form 50 (CHQPF50),^{1,2} Infant Toddler Quality of Life Instrument,¹ and 15, 16, 17 Dimension tool.¹⁷ A major limitation of all these instruments is that they are age-specific and none of these has an available Tagalog version. On the other hand, the PedsQL4.0™ Generic Core Scale is a validated tool for ages 2 to 25 years with various foreign language translations including the local version that we have used. PedsQL4.0™

Table 1. Reliability testing of PedsQL4.0™ Tagalog version using Cronbach's alpha, inter-item and item-total correlation using proxy and child reports

	Number of items	Cronbach's alpha		Inter-item correlation		Item-total correlation	
		Proxy	Child	Proxy	Child	Proxy	Child
<i>Domain</i>							
Physical function	8	0.86	0.79	0.50-0.77	0.29-0.62	0.63-0.85	0.46-0.73
Emotional function	5	0.79	0.60	0.53-0.72	0.22-0.42	0.71-0.77	0.49-0.70
Social function	5	0.79	0.78	0.50-0.61	0.47-0.63	0.69-0.77	0.66-0.79
School function	5	0.77	0.75	0.41-0.64	0.47-0.59	0.62-0.82	0.67-0.75
<i>Summary Score</i>							
Psychosocial health	15	0.88	0.86	0.44-0.67	0.28-0.69	0.52-0.75	0.37-0.74
Physical health	8	0.86	0.79	0.50-0.77	0.29-0.62	0.63-0.85	0.46-0.73
Total health	23	0.92	0.89	0.38-0.68	0.26-0.65	0.44-0.72	0.33-0.69

Table 2. Validity testing of PedsQL4.0™ Generic Core Scale Tagalog version as measured with effect size for healthy versus ill using PROXY reports

	Number of items	Patients* (n=48)		Healthy children (n=104)		Difference [•]	Effect Size ^ª
		Mean	SD	Mean	SD		
<i>Domain</i>							
Physical function	8	76.46	21.27	85.37	15.50	8.91	0.57
Emotional function	5	71.56	20.68	77.60	15.31	6.03	0.39
Social function	5	77.24	19.18	83.28	14.58	6.04	0.41
School function	5	69.60	16.04	81.13	15.90	11.22	0.71
<i>Summary scores</i>							
Psychosocial health	15	73.54	15.75	80.65	13.09	7.11	0.54
Physical health	8	76.46	21.27	85.37	15.50	8.91	0.57
Total health	23	74.56	16.50	82.40	12.52	7.84	0.63

SD=standard deviation; * include liver transplant recipients and chronic liver disease patients; [•] difference in the mean scores of healthy children and patients; ^ª effect size was computed as the difference between the mean scores of the healthy children and patients divided by the standard deviation of healthy children

Table 3. Validity testing of PedsQL4.0™ Generic Core Scale Tagalog version as measured with effect size for healthy versus ill using CHLD reports

	Number of items	Patients* (n=19)		Healthy children (n=66)		Difference ^o	Effect Size ^a
		Mean	SD	Mean	SD		
<i>Domain</i>							
Physical function	8	74.62	20.76	89.18	12.06	14.55	1.21
Emotional function	5	68.42	20.48	80.76	14.58	12.34	0.85
Social function	5	69.87	24.07	85.00	16.82	15.13	0.90
School function	5	65.59	20.68	84.39	15.28	18.81	1.23
		(n=17)					
<i>Summary scores</i>							
Psychosocial health	15	68.01	20.00	83.38	12.71	15.38	1.21
Physical health	8	74.62	20.76	89.18	12.06	14.55	1.21
Total health	23	70.38	17.91	85.40	11.20	15.02	1.34

SD=standard deviation; * include liver transplant recipients and chronic liver disease patients; ^odifference in the mean scores of healthy children and patients; ^aeffect size was computed as the difference between the mean scores of the healthy children and patients divided by the standard deviation of healthy children

Table 4. Comparison of domain and summary scores on PedsQL4.0™ Tagalog version of liver transplant recipients, patients with compensated and decompensated liver disease and healthy children using combined proxy and child reports

	Liver transplant recipients (n=23)		Compensated liver disease (n=33)		Decompensated liver disease (n=11)		Healthy children (n=170)		p*
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	
<i>Domain</i>									
Physical function	81.29	19.28	75.02	21.19	67.49	22.46	86.85	14.34	0.0006
Emotional function	81.74	16.00	66.06	20.11	61.36	21.80	78.82	15.07	0.0002
Social function	79.11	18.98	72.35	22.72	73.64	20.14	83.95	15.46	0.0235
School function	76.23	9.51	62.59	19.23	75.00	35.36	82.39	15.70	0.0001
	(n=18)		(n=27)		(n=2)				
<i>Summary scores</i>									
Psychosocial health	79.54	9.71	68.13	18.90	67.12	19.09	81.71	12.98	0.0002
Physical health	81.29	19.28	75.02	21.19	67.49	22.46	86.85	14.34	0.0006
Total health	80.00	11.14	70.63	18.29	67.41	19.36	83.57	12.08	0.0001

SD=standard deviation; * Kruskal-Wallis test for equality of populations

has been favorably cited as being brief and easier to complete compared with the CHQPF50 obtaining similar results.² The stability of the questionnaire's items across all age-groups also allows for longitudinal HRQOL re-assessment, as in CLD patients pre- and post-liver transplantation or for short and long term monitoring of LT recipients. Studies on the HRQOL of children with liver disease are limited to LT recipients, comparing them with either healthy subjects or children with non-hepatic chronic illness such as those with asthma or rheumatologic disorders.^{1-2,16-22} In the present study, we compared LT recipients with a subgroup of patients with CLD, either in a compensated or decompensated state as we surmise that the majority of them will eventually become liver transplant candidates. It was clearly shown in our data that LT recipients have better HRQOL than children with either compensated or decompensated CLD, with the latter having the poorest HRQOL. Despite the cost and the burden to the family of having a member requiring LT, the long-term implications appear favorable in terms of the child's physical, psychosocial and global health. This relevant information should be communicated to health care providers, policy makers and caregivers on the overall impact of liver transplant on the global health of the child.

Our findings that the HRQOL of LT recipients is comparable with healthy children is similar to the study of Alonso¹ but is in contrast to the one reported by Bucuvalas.² Both studies investigated recipients who were transplanted in North America. The difference in the results may be partly explained by the difference in the instruments that were used and the age of the subjects that were included. Alonso utilized two different HRQOL models namely the Infant Toddler Quality of Life Instrument for 2-5 years old and the CHQPF50 for children 5 years and older. Since two models were used, this did not allow a standardized comparison of HRQOL between age groups. On the other hand, Bucuvalas compared the PedsQL4.0™ and the CHQPF50 questionnaires on children greater than 5 years in contrast to the present study and Alonso's which included children 2-5 years old. Bucuvalas therefore excluded a significant number of children with biliary atresia, the most common indication for LT, who may have been operated before 5 years of age. It has been reported that improvement in the HRQOL is noted as early as 6 months after LT¹ thus, we have used this criteria in the selection of our liver transplant recipients.

We used multiple informants in the form of child and proxy reports and pooled their data as the use of both

reports allows a better assessment of the overall health perception. While the self-report is the standard for evaluating perceived HRQOL, it is the parents' or the caregiver's perception of the child's HRQOL that influence health care utilization. Interestingly, our study demonstrated a significant correlation between the child and proxy reports in the individual domains and total health summary scores both for the ill group and healthy school children, therefore allowing us to combine the two reports. Reports in literature are conflicting regarding the role of parents in assessing their child's HRQOL. In a systematic review of 14 studies,²³ it was shown that there is a greater agreement with HRQOL that are observable (like physical function) than with non-observable ones (like emotional and social functions). Agreement has also been shown to be better between parents and their chronically sick children, as in cancer patients, compared with parents and their healthy children.²³⁻²⁴ It might well be that in the Filipino culture, where children are highly protected, whether they are healthy or ill, parent-respondents are very cognizant of their child's total health as they are also the full-time caregivers.

Conclusion

In conclusion, the PedsQL4.0™ Generic Core Scale Tagalog version is a reliable and valid tool for measuring HRQOL of Filipino children. The HRQOL of LT recipients is similar to healthy children while a poorer HRQOL was demonstrated among those with CLD. A similar study should be done on other centers attending to LT patients. A longitudinal follow-up on the HRQOL of CLD and LT recipients should also be conducted.

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