

# Health Practices and Quality of Life among Children with Type 1 Diabetes Mellitus

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## ABSTRACT

Type I diabetes mellitus is a common chronic disorder in children. The present study was aimed to assess the health practices and determine the quality of life among children with Type I diabetes mellitus, to find out the correlation between their health practices and quality of life and the association between quality of life and selected sociodemographic and clinical variables. Health promotion model was adopted for the study. This cross sectional study was conducted among 80 children with Type I diabetes mellitus who belonged to the age group of 6 to 18 years and their caregivers who were selected consecutively from the Mittayi clinic of a tertiary care centre in Alappuzha. Health practices were good in 82.5% children. The practice scores were lowest in dietary practices (79.3 %) and highest in follow up (98.1 %). Quality of life was good among 57.5% children with type I diabetes mellitus. A significant positive correlation was found between the health practices and quality of life of children with type I diabetes mellitus ( $r=0.306$ ,  $p=0.006$ ). Health practices were positively correlated with the domains of quality of life such as role limitation, treatment satisfaction, emotional satisfaction, diet satisfaction and physical endurance. A significant association was found between the quality of life of children with type I diabetes mellitus and family history of diabetes mellitus and duration of illness. Quality of life of children with type I diabetes mellitus can be enhanced by improving the health practices among them.

**Key Words:** Children with Type I Diabetes Mellitus, Health practices, Quality of life.

## INTRODUCTION

Diabetes mellitus is defined as a syndrome characterized by chronic hyperglycemia due to defect in insulin secretion, insulin action, or both, which leads to disturbance in the protein, carbohydrate, and fat metabolism of individual. Of these, Type 1 diabetes mellitus is the end result of destruction of pancreatic beta cells, triggered by some unknown environmental factors in a genetically predisposed individual. Type 2 diabetes mellitus affect many people from all type of ethnicity, social and economic level of the society. Diabetes is among the 5 leading cause of death in most countries.<sup>1</sup>

Overall unadjusted estimated incidence rate of type 1 diabetes was reported to have increased in the United States by 1.4% annually (from 19.5 cases per 100 000 youth per year in 2002-2003 to 21.7 cases per 100 000 youth per year in 2011-2012).<sup>2</sup> Among youth less than 15 years of age it has increased by 4.36% between 1995 and 2010, increasing at an accelerated rate after 2006. There are estimates of greater increase in developing countries or those undergoing economic transition in recent decades.<sup>3</sup>

In a cross sectional study, the HRQOL and coping strategies of children with type 1 DM were investigated among 61 children with type 1 DM within the age

group of 8-15 years attending Paediatric Diabetic clinic and Paediatric medicine wards of Sree Avittom Thirunal Hospital, Trivandrum. The study revealed that majority of the children (93.4%) had good generic Quality of Life (QOL). Out of 61 diabetic children, 44.3% of children had good diabetic related QOL, 55.7% of children had moderate diabetic related QOL. 67.2% of children had good HRQOL and 32.8% of children had moderate HRQOL. None of the children had poor HRQOL. Boys showed better HRQOL than girls. Statistically significant association was present between age of disease onset and HRQOL ( $p$  value is  $< .05$ ). HRQOL had a positive correlation with cognitive palliative and acceptance domain and had negative correlation with coping domains such as avoidance, emotional reaction, wishful thinking and distance.<sup>4</sup>

Children with T1DM experience fluctuations ranging from hyperglycemia to hypoglycemia, the acute and chronic effects of which can interfere with daily activities. Thus T1DM affects a child's physical, mental and psychosocial function which impacts the QoL. The quality life also depends on the treatment compliance of the children. Health practices such as diet, physical activity, monitoring of blood glucose level, insulin therapy and management of hypoglycemia and hyperglycemia determine the glycemic control. Children with type 1 diabetes mellitus if managed well can attain good quality of life. This study intended to find out the effect of health practices on quality of life of diabetic children and develop models that tend to improve overall health status of children. Assessment of quality of life and health practices is important in order to evaluate the course of the disease and early detection of problems which contribute to decision making in health care based on the outcome of the study.

## **MATERIALS AND METHOD**

The study used a quantitative approach. The research design of this study

was cross sectional survey design. The sample consisted of children in the age group 6 – 18 years who were diagnosed to have Type 1 Diabetes Mellitus and their care givers attending Mittayi clinic, Department of Paediatrics of a tertiary care centre in Southern Kerala. Samples were drawn consecutively. The study included children diagnosed with type 1 diabetes mellitus for more than six months. Participants who were not willing to participate were excluded from this study.

**Sample size:** The sample consisted of 80 children who were diagnosed to have Type 1 Diabetes Mellitus and their care givers satisfying the inclusion criteria. By considering the prevalence of children with type 1 diabetes mellitus having moderate quality of life as 55.7% from the study conducted in SAT Hospital, Trivandrum<sup>4</sup> the sample size was calculated by using the formula,  $n=4pq/d^2$  and was estimated as 80.

## **Tools and techniques**

**Tool 1:** A structured interview schedule was prepared by the investigator to assess the socio personal and clinical data of children with Type1 diabetes mellitus.

**Tool 2:** A check list was used to assess the reported health practices of the child which included the diet, physical activity, blood glucose level monitoring, insulin therapy, management of hypoglycaemia and hyperglycaemia, and follow up. The total score was 114. Scores above 80% (>91) were considered good, between 50-80%(57-91) as average and below 50%(<57) as poor health practices.

**Tool 3:** Quality of Life Instrument for Indian Diabetes children (QOLID), a standardised tool specifically used to assess the quality of life of diabetic children constructed by Nagpal et al. was used to assess the quality of life.

## **Scoring of QOLID**

Thirty-five questions were scored from 1 to 5. Lower scores indicated poorer QoL and higher scores indicated higher QoL. The total maximum score was 175. A

score for each domain was calculated by the simple addition of item score. Each domain score was standardized by dividing by maximum possible domain score and multiplying by 100. All individual standardized domain scores were added and divided by 8(number of the domain) to obtain an overall score. Eighty percentage was taken as cut off to divide patients into two groups. Those with scores <80% were considered to have impaired QoL and those having the score > 80%, a better QoL.

**Reliability of the tool** -The internal consistency, Cronbach’s alpha of the tool was 0.894.

**Technique:-**Self-report from care givers.

**Data collection process**

Formal permission was obtained from Scientific Review Committee and Human Institutional Ethics Committee of the institution, Kerala University of Health sciences, Nodal Officer of Mittayi clinic and Head of the Department, Paediatrics. Subjects were recruited based on inclusion and exclusion criteria. The purpose of the study was explained to each subject and then written informed consent was obtained to participate in the study. Socio-personal and clinical data were collected from caregivers of children with Type 1 diabetes mellitus and by record review. Health practices were assessed using check list. QOLID was used to assess the quality life of children by self-reports from caregivers.

**STATISTICAL METHOD**

The data collected were analyzed using appropriate descriptive and inferential Statistics with the help of SPSS version 20. Socio personal and clinical variables, health practices and quality of life among children with Type 1 Diabetes Mellitus were analysed by computing the frequencies, percentages mean and standard deviation. The correlation between health practices and QOL was determined by Spearman’s rho correlation co-efficient. The association between QOL and selected variables was determined by Chi-square test. In order to

test the correlation and association following null hypothesis was formulated.

H<sub>01</sub>: There is no significant correlation between quality of life among children with Type 1 diabetes mellitus and their health practices.

H<sub>02</sub>: There is no significant association between quality of life among children with Type 1 diabetes mellitus and selected variables.

**RESULT**

The sociodemographic and clinical data of the study subjects are as shown in table 1 and 2 respectively.

**Table 1: Frequency distribution and percentage of children based on age, gender, area of residence, economic status. (n= 80)**

Sociodemographic variables		f	%
Age (in years)	6-8	9	11.3
	9-12	16	20.0
	13-18	55	68.7
Gender	Male	39	48.8
	Female	41	51.2
Residence	Panchayat	62	77.5
	Municipality	16	20.0
	Corporation	2	2.5
Economic status	BPL	45	56.2
	APL	35	43.8

Table 1 shows that 68.7% children belonged to the age group 13-18 years and 51.2% were girls. Residence of 77.5% were in Panchayat area and 56.2% belonged to BPL category.

**Table 2: Frequency distribution and percentage of children based clinical variables, (n=80)**

Clinical variables		f	%
History of diabetes mellitus in the family	Parents	10	12.5
	Siblings, Uncle/ aunt /cousin	4	5.0
	Grand parents	26	32.5
	None	38	47.5
	Don't know	2	2.5
Co morbidities	Thyroid dysfunction	18	22.5
	Heart disease	0	0.0
	Others	9	11.3
	No co-morbidities	53	66.2
Complications of type 1 diabetes mellitus	Diabetic neuropathy	1	1.2
	Diabetic nephropathy	1	1.2
	Diabetes retinopathy	4	5.0
	Cardiovascular disease	1	1.2
	Diabetes Ketoacidosis	9	11.4
	No complications	64	80

**Health Practices**

Overall health practices of 82.5% of children with diabetes were found to be

good and 16.2% children followed average health practices. The mean percentage of overall health practice among children with

Type 1 Diabetes Mellitus was 82.5% (96.5± 7.7).

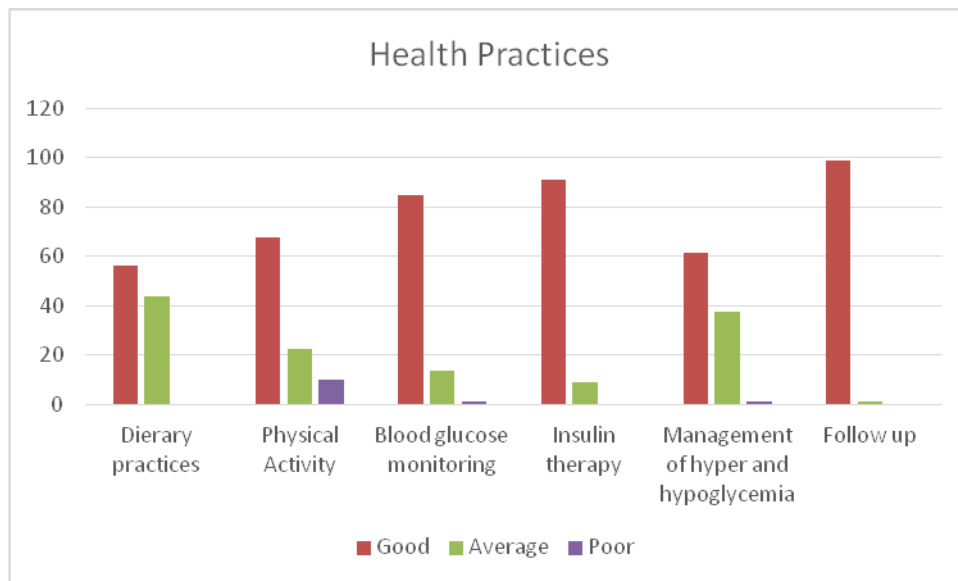


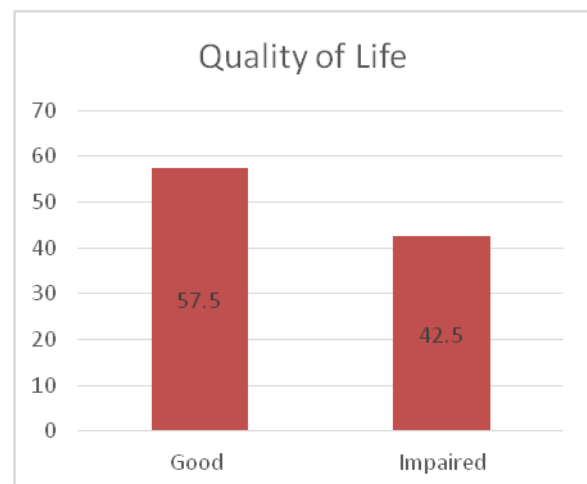
Figure 1: Distribution of children based on health practices

The lowest proportion reported among health practices was regarding the dietary practices in which 56.3% had good dietary practices and 43.7% had average dietary practices. More than 67.5% of the participants had good physical activity. Majority (85%) of children followed good health practice and 13.8% of children followed average health practices regarding blood glucose monitoring. The study findings showed that 91.3% of the participants had average and 8.7% followed good health practices related to insulin therapy. Among the study subjects 61.2% of children had good health practices related to management of hypoglycemia and hyperglycemia. Majority (98.7%) of the participants had good follow up practices, 1.3% had average practice and none of them had poor health practices related to follow up.

score was significantly low in the domains financial worries (54.4%), diet advice satisfaction (78.8%) role limitation (79.5%), and symptom bothersness (79.5%). Mean percentage of general health and treatment satisfaction was (88.9%). The score was 89.5% in the domain emotional satisfaction and (93.9%) in physical endurance.

### Quality of life among children with T1DM

The quality of life among 57.5% children was good and 42.5 % was impaired. The proportion of overall quality of life among children with T1DM was 82% with a mean score 143.2±16.5. The mean



### Correlation between QOL and health practices

There was positive correlation between quality of life among children with Type 1 Diabetes Mellitus and their health practices.

**Table 3: - Correlation between health practices and QOL among children with Type 1 Diabetes Mellitus, (n = 80)**

Variable	R	P
Health practices	0.306**	0.006
Quality of life		

\*\*Significant at 0.01 level

The correlation was found to be statistically significant ( $p < 0.01$ ). It was inferred that when the health practices

improve QOL of children with type 1 diabetes mellitus also improves.

### Association between quality of life and sociopersonal and clinical variables

There was a significant association between family history of Diabetes Mellitus and duration of illness and their quality of life.

**Table 4: Association between quality of life among children with Type 1 Diabetes Mellitus and family history of diabetes mellitus (n=80)**

Sociodemographic and clinical factors		Quality of life				$\chi^2$	df	p value
		Good		Impaired				
		f	%	f	%			
Family history of diabetes mellitus	Parents	3	30	7	70	11.5*	4	0.04
	Siblings, Uncle/ aunt /cousin	3	75	1	25			
	Grand parents	20	76.9	6	23			
	None	19	50	19	50			
	Don't know	1	50	1	50			
Duration of illness	<5 years	3	50.0	3	50	6.1*	2	0.04
	5 – 10 years	29	70.7	12	29.3			
	>10 years	14	42.4	19	57.6			

\*Significant at 0.05 level

## DISCUSSION

The present study observed that 51.2% of children were diagnosed to have Type 1 Diabetes Mellitus at the age between 5 years and 10 years. Similar findings were reported in a study conducted in Kerala at Govt Medical College Kozhikode in the age of onset of diabetes among 73.1 % patients was between 5 and 15 years.<sup>7</sup>

Current study revealed that 22.2% children with diabetes had thyroid dysfunction. The proportion of thyroid dysfunction was found to be higher when compared to the findings of study conducted on Quality of Life of Type 1 Diabetic Indian Children and Adolescents which found that hypothyroidism was reported only in 4% of the total patients.<sup>8</sup>

Present study revealed that 11.4 % diabetes children developed ketoacidosis. The finding of another study done in Kerala regarding Health-related quality of life (HRQoL) in pediatric onset Type 1 diabetes mellitus showed that 14.9% had diabetes ketoacidosis, which is in agreement with the present study finding.<sup>9</sup>

From current study health practices of 82.5% of children were found to be good and 16.2% children followed average health

practices. This finding is well supported by a study conducted in 242 Caucasian patients which revealed that 68.2% had healthy lifestyle habit and 25.6% patients had unhealthy lifestyle habit.<sup>10</sup>

The present study revealed that among the 80 study participants, quality of life among children with type 1 diabetes mellitus 42.5 % was impaired and 57.5% children was good. These findings were similar to those of a cross sectional study conducted among 61 children with type 1 DM within the age 5 group of 8-15 years attending Paediatric Diabetic clinic and Paediatric medicine wards of Sree Avittom Thirunal (SAT) Hospital, Trivandrum, 67.2% of children had good HRQOL and 32.8% of children had moderate HRQOL.<sup>6</sup>

The present study revealed that the total quality of life was 82% which showed good quality of life. These findings differ from the findings of a hospital based cross sectional study to assess the health related (QOL) and factors affecting it among children with type I diabetes the mean (QoL). Total score of 70.2% was found among participant indicating a low life quality.<sup>11</sup>

Current study revealed that the mean total of quality of life was 82% which was significantly low in the domains financial worries (54.4%), diet advice satisfaction (78.8%) role limitation (79.5%), and symptom bothersness (79.5%). Mean percentage of general health and treatment satisfaction was (88.9%). The percentage was 89.5% in the domain emotional satisfaction and 93.9% in physical endurance. These findings are consistent with that of a cross-sectional study to assess the quality of life and factors affecting it in Indian among 97 children with T1DM. The mean total QOLID score was 84.5% which was significantly low in specific domains like general health (71%), diet satisfaction (74%) and financial worries (75%). Eighteen percent (18%) of patients had overall impaired QoL (total QOLID score & lt; 80%), highest seen in the domain of general health (72%).<sup>6</sup>

### Recommendations

- An identity card 'I am diabetic' should be carried by all children with type 1 diabetes mellitus
- Maintenance of a diabetic diary will be useful for ensuring compliance to management of children with diabetes
- Health practice tool can be used for future studies related to health practice among children with type 1 diabetes mellitus
- In-depth study can be conducted each component of health practice such as diet, physical therapy, insulin therapy, management of hyper and hypoglycaemia, follow up
- Awareness programme children with type 1 diabetes mellitus can be conducted to the school and public

### CONCLUSION

The study was found to be significant considering the importance of maintaining QOL in diabetic children. Based on the findings of the study, the investigator found that there is need for children with type 1 diabetes mellitus to

carry an identity card with them stating that they are diabetic. A model of identity card was prepared and given to the clinic. She also found that public need to be educated regarding type 1 diabetes mellitus to treat and prevent complications of the disease and to avoid social stigma. A booklet was prepared regarding health practices to be followed by children with diabetes and distributed in Mittayi clinic. One limitation of the study was that the health practices were assessed by self-report by mothers rather than direct observation. It can be concluded that it is the need of the hour to adopt measures to strengthen secondary and tertiary prevention of Type 1 Diabetes Mellitus in the tertiary care setting.

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