A Cross-Sectional Study of Assessment of Quality of Life among Adolescents with Type-1 Diabetes Mellitus in Bhavnagar, Gujarat

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Abstract :

Introduction : Diabetes mellitus is on the rise and is a prevalent chronic disease in middle and low income countries. Type-1 diabetes mellitus usually develops during infancy and adolescents and as a chronic condition has a hard impact on aspect of life of adolescents. **Objectives :** To assess the quality of life (QOL) of adolescents with type-1 diabetes mellitus in Bhavnagar.. **Method :** A cross-sectional study was conducted among a convenient sample of 57 adolescents with type-1 diabetes mellitus who were registered in Juvenile Diabetes Association, from August-October 2016 with a self-administered questionnaire on Diabetes Quality of Life. **Results :** Among 57 adolescents, 54.3% were males and 45.7% were females. The mean age of the participants was 16.19+3.29 years. The mean duration of diabetes was 91.8+63.3 months. The mean glycosylated hemoglobin (HbA1c) was 9.21+2.02 %, among which 71.9% were in the range of 6-10% and 28.1% were in the range of 10-15% of HbA1c. Out of 57 adolescents, 94.7% were literate and 5.3% were illiterate. 91.2% adolescents reported having a poor quality of life. The median scores for each domain are as follows: Satisfaction 26, Impact 80, and Worries 22. No significant difference was found between the domains and age and glycemic control except between HbA1c and quality of life in worries domain. No association was found between the domains and gender and education. **Conclusion :** Most of the adolescents (91.2%) with type-1 diabetes were having poor quality of life. In worries domain, HbA1c had a significant effect on quality of life.

Key words : Adolescents, Quality of life, Type-1 Diabetes Mellitus.

Introduction :

Diabetes mellitus is a demanding disease and its prevalence is steadily increasing in low and middle income countries. Currently, an estimated 422 million people have diabetes worldwide, and this number is predicted to rise to 592 million by the year 2035.[1]Rapid lifestyle changes, aging of the population, and environmental changes have contributed to a significant increase.

India accounts for most of the children with type-1 diabetes mellitus (T1DM) in South-East Asia. Type-1 diabetes is also on the increase as Type-2 diabetes, but not in the same proportion.Type-1 diabetes mellitus is caused by insulin deficiency which may be autoimmune or idiopathic in nature and cannot be prevented. It usually occurs during infancy and adolescence. The prevalence of diabetes (Type - 1) in India is variable, and three sets of data show 17.93 cases/100,000 children in Karnataka,[2]3.2 cases/100,000 children in Chennai[3], and10.2 cases/100,000 children in Karnal (Haryana).[4] Intensive treatment is required to prevent or delay acute and chronic complications of T1DM, which involves multiple daily injections of insulin (or insulin infusion), monitoring daily blood glucose, carbohydrate consumption and involving in regular physical activity. For this, diabetes in children and adolescents poses serious physical, mental and emotional challenges. In general, T1DM and its complications may affect adolescents' living conditions over the years and may also influence their quality of life (QOL) as adolescents are more resistant to accepting the disease, because they no

longer depend on their parents or guardians for their care and are responsible for their own health. Quality of life among adolescents with T1DM has not been studied in Gujarat. Hence, the present study attempts to assess the Quality of Life among adolescents with Type-1 Diabetes mellitus in Bhavnagar city, Gujarat.

Method :

Study setting: This study was conducted at Government Medical College, Bhavnagar in collaboration with Juvenile Diabetes Association.

Study design : It was a cross-sectional study conducted among adolescents with type-1 diabetes mellitus.

Study duration: The study was conducted for a period of 3 months from August– October 2016.

Sample size: All 57 adolescents who were registered under Juvenile Diabetes Association and have participated were included in the study.

Sampling Method: Convenience sampling method was used in this study.

Data Collection: The purpose of the study was explained to the participants. A written informed consent was taken from the willing participants. The willing participants gave data via the completion of a structured questionnaire, which consisted of questions regarding Diabetes Quality of life.[5] The Questionnaire was divided into three sections: Satisfaction, Impact and Worries consisting of a total of 32 questions. The socio-demographic profiles of the participants were also elicited. Satisfaction section consists of two domains including treatment and diet using a scale of 1-5 (1-very dissatisfied, 2-moderately dissatisfied, 3-neither dissatisfied, 4-moderately satisfied, 5-very satisfied). Impact section consists of three domains including impact on physical health, general health and emotional health using a scale of 1-5 (1-always, 2-frequently, 3-often, 4-sometimes, 5-never). Worries section consists of two domains including symptom suffering and financial worries using a scale of 1-4 (1-alot, 2-highly little, 3-very little, 4-not at all). The total score

is the sum of the domain scores. There was no cutoff score for this questionnaire [5]. Thus the median score of each section has been taken, and the value more than the median value corresponds to good quality of life.

1. Total Quality of Life: A score of >239 indicates a good quality of life.

2. Satisfaction: A score of >26 indicates a good quality of life.

3. Impact: A score of >80 indicates a good quality of life.

4. Worries: A score of >22 indicates a good quality of life.

Inclusion criteria: The adolescents aged 10-19 years who were registered in Juvenile Diabetic Association in Bhavnagar and were willing to participate.

Ethical issue: The study was conducted after due ethical and institutional permission. A written informed consent was taken from their parents.

Statistical Analysis: Data entry was done in Microsoft Excel and data analysis was done in SPSS version 21. Frequencies, Percentages, Means and Standard Deviation were calculated. Chi square test and Student's t-test were applied. The value of $p<0.05$ were considered statistically significant.

Results :

The present study is based upon responses received from the 57 adolescents who were registered in Juvenile Diabetes Association and has given consent. The mean age of the participants was 16.19 ± 3.29 years. The socio-demographic profiles of the adolescents have been elucidated in Table 1. As shown in the table, 54.3% were males and 45.7% were females. The mean duration of diabetes was 91.8 ± 63.3 months. The mean glycated hemoglobin (HbA1c) was 9.21 ± 2.02 %, among which 71.9% were in the range of 6-10% and 28.1% were in the range of 10-15% of HbA1c. Among the participants, 94.7% were literate and 5.3% were illiterate.

Table 1: Socio-Demographic profile of the adolescents (n=57)

Characteristics	Category	Frequency (%)
Age	10-14 years	17(29.8)
	15-19 years	40(70.1)
Gender	Male	31(54.3)
	Female	26(45.6)
Education	Literate	54(94.7)
	Illiterate	03(5.2)
Duration of Diabetes	1-5 years	25(43.8)
	5-10 years	15(26.3)
	10-15 years	11(19.3)
	15-19 years	06 (10.5)
HbA1c (%)	6-10	41 (71.9)
	10-15	16(28.1)

Table 2: Frequency distribution table of Total Quality Of Life (QOL), Satisfaction, Impact and Worries domains.

Domains		Frequency (%)	2x1 Chi square value	p-value
Total Quality of life	Poor QOL	52(91.2)	38.754	<0.001
	Good QOL	05(8.8)		
Satisfaction	Poor QOL	31 (54.4)	0.439	0.508
	Good QOL	26 (45.6)		
Impact	Poor QOL	29 (50.9)	0.018	0.895
	Good QOL	28 (49.1)		
Worries	Poor QOL	31 (54.4)	0.439	0.508
	Good QOL	26 (45.6)		

(Table 2) 91.2% adolescents with T1DM had poor quality of life and 8.8% had good quality of life, which is statistically highly significant (p<0.001). For satisfaction domain, 54.4%have opined that they had poor quality of life as compared to 45.6% who replied that they had good quality of life.Observation depicts that regarding impact domain, 50.9% of adolescent had poor quality of life in contrast to 49.1% who had good quality of life. It was noticed in the study that for worries domain, 54.4% of adolescent had poor quality of life, while 45.6% had good quality of life.

Table 3 shows Domains of quality of life (Satisfaction, impact, worries and total quality of life) versus age and HbA1c. As demonstrated in the table,

Table 3: Independent sample t-test between QOL domains and variables (Age & HbA1c)

1. Quality Of Life(QOL)	Poor QOL Mean(+SD)	Good QOL Mean(+SD)	p-value
Age	16.06(+3.40)	17.60(±1.34)	0.070[†]
HbA1c	9.34(+2.033)	7.79(±1.372)	0.102[*]
2. Satisfaction			
Age	15.45(+3.623)	17.08(±2.667)	0.057[†]
HbA1c	9.32(+1.984)	9.067(±2.10)	0.640[*]
3. Impact			
Age	15.72(+3.442)	16.68(±3.151)	0.279[*]
HbA1c	9.41(+2.162)	8.99(±1.884)	0.436[*]
4. Worries			
Age	15.48(+3.604)	17.04(±2.720)	0.069[†]
HbA1c	9.84(+2.323)	8.44(±1.262)	0.006[†]

Independent sample t test; *Equality of variances assumed as Levene's test p -value >0.05;

†Equality of variances not assumed as Levene's test p-value<0.05

those adolescents who had poor quality of life had a mean age of 16.06 (+3.40) years. By comparison, those adolescents who had good quality of life had a higher mean age of 17.60 (+1.34) years. To test the hypothesis that those with a poor quality of life were associated with a statistically significantly different mean age, an independent sample t-test was performed. The assumption of homogeneity of variances was tested and was satisfied via Levene's F test.

The independent samples t-test was associated with a statistically insignificant effect, p=0.070. The independent t-test has also been performed for the domains (satisfaction, impact and worries), so as to test the hypothesis that those adolescents with a poor quality of life were associated with a statistically significantly different mean age. It was also associated with statistically insignificant effect. Thus there was no association between the domains of quality of life of the adolescents and their age. Similarly, on applying independent sample t-test, there was no statistically significant difference between HbA1c and total quality of life, satisfaction and impact domains. However, there is a statistically significant difference between those adolescents with a poor quality of life and worries, p=0.006.

Table 4 shows Domains of quality of life (satisfaction, impact, worries and total quality of life) versus gender and education. The association between these variables was statistically insignificant, shows that there was no association between the domains of quality of life of adolescents and gender and education.

Discussion :

The research focused on the assessment of quality of life of the adolescents with type-1 diabetes mellitus who were registered in Juvenile Diabetic Association in Bhavnagar. The current study found that most of the adolescents (91.2%) had poor quality of life. This was in contradiction with what the study by Costa LM, et al.(2015)[6] found that the adolescents consistently reported having a good quality of life. The present study found that there was

Table 4: Association by Chi square test between the QOL domains and variables

Variables / QOL		Poor QOL n (%)	Good QOL n (%)	Chi Square value	p- value
Gender	Male	29(93.6)	2(6.5)	0.457	0.651
	Female	23(88.5)	3(11.5)		
Education	Literate	49(90.7)	5(9.3)	—	0.7553 (Mid -P Exact)
	Illiterate	03(100)	0		
Satisfaction					
Gender	Male	18(58.1)	13(41.9)	0.371	0.600
	Female	13(50)	13(50)		
Education	Literate	28(51.9)	26(48.1)	—	0.1536 (Mid -P Exact)
	Illiterate	03(100)	0		
Impact					
Gender	Male	15(48.4)	16(51.6)	0.169	0.792
	Female	14(53.8)	12(46.2)		
Education	Literate	26(48.1)	28(51.9)	—	0.1249 (Mid -P Exact)
	Illiterate	03(100)	0		
Worries					
Gender	Male	18(58.1)	13(41.9)	0.371	0.600
	Female	13(50)	13(50)		
Education	Literate	29(53.7)	25(46.3)	0.193	1.000 (Mid -P Exact)
	Illiterate	02(66.7)	01(33.3)		

no association between the gender and quality of life. This was again in contradiction with what the study by Costa LM et al. (2015)[6] which found that there wasan association between quality of life and female gender. The study by Abolfotouh et al.[7] in Alexandria found that there was an association between male gender and quality of life. Some other studies also demonstrated that diabetes had more impact on girls [9-12]. The present research found that there was no statistically significant difference between age and the domains of quality of life. This was supported by a study conducted by Eman M.M. Monazea, et al.[8] (2012) which revealed no significant association between age and total quality of life, but study conducted in Alexandria by Abolfotouh et al.[7] (2011) found that there is a significant association between age and QOL.The current study found that there is no association between HbA1c and quality of life, except the finding of worries domain, which revealed that there is an association between HbA1c and poor quality of life. Al-Akour et al.[13] found that higher HbA1c values were associated with lower scores of QOL. Hoey et al. [14] reported a significant positive association exists between improved glycemic control, even over a short time period and improved QOL in patients with diabetes. Other researchers

found no association between QOL and metabolic control. [15-17] It would be expected that the quality of life would be positively correlated with age, gender, glycemic control and education but the current research could not establish any such association.

Conclusion :

We conclude from the study that majority of the adolescents with type-1 diabetes mellitus was having poor quality of life. We also concluded that HbA1c was correlated with poor quality of life in worries domain. The study also highlighted that the quality of life was not associated with age, gender, education and glycemic control. Regular visit to health centers and counseling intervention might improve the quality of life.

Declaration :

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Conflict of Interest: Nil

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