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Original Article

Comparison of Quality of Life among Adolescents with and without Diabetes in Gujrat, Pakistan

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ABSTRACT

Objective: To compare the quality of life among adolescents with and without diabetes and explore the association of age and gender with diabetes.

Study Design: Cross-sectional comparative study.

Place and Duration of Study: Different Clinics and Hospitals, of District, Gujrat Pakistan, from Sep 2020 to Mar 2021.

Methodology: Adolescents with diabetes who had an HbA1C level of ≥6.5%, and age-matched, healthy adolescents as controls were included. The adolescents with diabetes were sub-grouped into early and late adolescents based on age (10-14 years and 15-19 years, respectively). Youth Quality of Life Questionnaire was used as the investigative tool.

Results: Twenty-nine adolescents (mean age: 14.2±2.9 years) were in the Diabetes-Group, and 356 adolescents (mean age: 14.8±2.7 years) were in the Control-Group. The Control-Group had significantly better mean scores in each domain than the Diabetes-Group (p<0.001). Early adolescents with diabetes had better scores in the self-care domain (p=0.014) than late adolescents. The scores remained uninfluenced by gender in adolescents with diabetes (p=0.118, 0.284, 0.185, 0.419, and 0.169, respectively).

Conclusion: The quality of life scores among our study adolescents with diabetes was poor as compared to the age-matched healthy adolescents. Age appeared to be a negative factor for the quality of life parameters among adolescents with diabetes.

Keywords: Adolescent, Diabetes mellitus, Quality of life.

How to Cite This Article: *Iqbal S, Ayaz SB, Rahman F, Ejaz S, Waheed L, Amjad A. Comparison of Quality of Life among Adolescents with and without Diabetes in Gujrat, Pakistan. Pak Armed Forces Med J 2023; 73(6): 1611-1614. DOI: https://doi.org/10.51253/pafmj.v73i6.7105*

INTRODUCTION

Diabetes mellitus (DM) influences people's lives, alters their self-confidence, makes them question their existing presence, and renders them feel insecure about the future.[1,2] Like all people, adolescents suffering from DM also feel a lower quality of life (QoL) along with a higher risk of experiencing psychological difficulties than healthy children.[3,4] It has been discovered that adolescents with DM are 2-3 times more likely than healthy adolescents to have sadness and emotional disturbance.[5]

Diabetes-related stress is a dangerous condition since it has a detrimental impact on these teenagers' QoL, which can lead to inadequate DM self-management and glycemic control failure.[6,7] Because of decreased insulin sensitivity and other factors, such as family disputes and decreasing parental involvement in diabetes care during adolescence, proper metabolic control and adherence to medicine may become more difficult to manage.[8,9] Identifying issues related to QoL in such adolescents is an area that is still under-researched in Pakistan. With this study, we aimed to improve the database of these adolescents by including people from the Gujrat district to see if the added data removed bias in the results previously gathered from these cross-sectional studies. We utilized a different evaluation tool than the Diabetes Quality of Life for Youths, WHO QOL-BREF, Acceptance of Illness Scale, and Diabetes Distress Scale used in prior studies. The primary aim of this study was to compare the QoL between adolescents with and without diabetes.

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Received: 15 Jul 2021; revision received: 09 Aug 2021; accepted: 24 Aug 2021

METHODOLOGY

The cross-sectional comparative study was conducted from September 2020 to March 2021 at Different Clinics and Hospitals of District Gujrat, Punjab, Pakistan after approval from the Institutional Ethics Review Committee and the administration of the targeted Clinics and Hospitals, i.e., Tehsil Head Quarters Hospital Sarai Alamgir, Zainab Hospital Sarai Alamgir, Aziz Bhatti Shaheed Hospital Gujrat, and City Hospital Gujrat Pakistan.

Inclusion Criteria: Adolescents with diabetes (aged 10 to 19 years) who had an HbA1C level of ≥6.5%, and age-matched, healthy adolescents as controls were included.

Exclusion Criteria: Adolescents with a positive HbA1C test but with associated cystic fibrosis, mental illness, anaemia, kidney disease, or cardiovascular disease were excluded.

All included adolescents were asked to produce the result of their HbA1C report or undergo HbA1C testing if they had symptoms suggestive of DM, e.g. polyuria, polydipsia, unexplained weight loss, etc. Those who had HbA1C levels of 6.5% or more were considered adolescents with diabetes. For the control group, the age-matched individuals without signs and symptoms suggestive of DM were sampled through consecutive sampling.

A face-to-face interview was adopted to improve the accuracy of data collection. Every point of the questionnaire was clarified to the individuals through the language they understood. If the participants had any queries, they were addressed and simplified before any further data collection procedure. Questionnaires were directly asked of the children, but the primary caregivers/guardians/parents were interviewed where necessary to remove any ambiguity.

Youth Quality of Life Questionnaire (YQoLQ-SF),[7,10] was used to collect data. It consisted of 15 questions that scored from 0-10 and pertained to different domains of QoL, including Self-care, relationships, environment, and General QoL. 0-1 meaning "Not at all", 2-3 meant "Little Bit", 4-5 meant "Little More", 6-7 meant "Even More", 8-9 meant "Whole a Lot", and 10 meant "Very Much". It took almost 8-10 minutes and scored from "0" to "100". Lower scores indicated poor QoL and higher scores indicated high QoL. The mean score was divided by ten and multiplied by 100 to convert it into a percentage value.

Statistical Package for Social Sciences (SPSS) version 24.0 was used for the data analysis. Quantitative variables were expressed as Mean±SD, median and interquartile ranges and qualitative variables were expressed as frequency and percentages. The Mann-Whitney U test was used to compare median values between the two variables. The *p*-value of 0.05 or less was taken as significant.

RESULTS

A total number of 932 individuals were recruited. After the HbA1C evaluation, 29 adolescents were included, and 356 were selected for the Control Group. The mean age for the Diabetes Group was 14.2±2.9 years, which matched with the mean age of the Control Group, i.e. 14.8±2.7 years. The Control Group had a significantly better median score in each domain than the Diabetes Group ($p<0.001$). Similarly, the total QoL score in the healthy individuals (51,18) was much better than the adolescents with diabetes (40,10.5) ($p<0.001$) (Table-I).

Table-I: Comparison of Scores for Different Domains of Quality of Life among Adolescents with and without Diabetes (n=385)

Domains	Adolescents without Diabetes (n=356)	Adolescents with Diabetes (n=29)	*p*-value
	Median (Interquartile range)	Median (Interquartile range)	
Self-care	19(3)	14(7.5)	<0.001
Relationships	18(4)	14(3)	<0.001
Environment	15(3)	11(6.5)	<0.001
General QoL	4(1)	2(1)	<0.001
Total Score	55(7)	42(17.5)	<0.001

Regarding the association of QoL score with age and gender among the adolescents with diabetes, we found a significantly better total score in "Early Adolescents" than in "Late Adolescents" ($p=0.025$) as well as in the domain of self-care ($p=0.014$), however, no significant difference was observed in the scores representing domains of Relationships, Environment, or the General QoL (Table-II).

Table-II: Comparison of scores for different domains of Quality of Life among Adolescents with diabetes based on Gender and Age-Groups (n=385)

Domains	Early adolescents Median (Interquartile range)	Late Adolescents Median (Interquartile range)	*p*-value	Girls Median (Interquartile range)	Boys Median (Interquartile range)	*p*-value
Self-care	18(7.5)	12(4.75)	0.014	12(5)	15(7.25)	0.118
Relationships	15(13.5)	14(2.75)	0.307	13(4)	14.5(3)	0.284
Environment	15(6)	11(3.75)	0.095	10(4)	14(6.25)	0.185
General QoL	3(1)	2(1)	0.126	2(1)	3(1)	0.419
Total Score	51(18)	40(10.5)	0.025	38(9)	47(17.5)	0.169

DISCUSSION

We found that the adolescent with diabetes had a significantly poor QoL compared to their age-matched healthy adolescents, and that included all domains of life, including self, relationships, environment, and general QoL. Smardzic *et al*. also showed that children and adolescents with DM had lower HRQoL in the domain of "Psychosocial health" and "School functioning" compared with a healthy population (p= 0.008 and p≤0.001, respectively).[8]

Another study showed that children with DM reported poorer physical HRQoL (p=0.001), poorer emotional HRQoL (p=0.026), poorer school HRQoL (p=0.005), and poorer total generic HRQoL (p=0.009) in comparison to healthy controls.9 Murillo *et al*.[10] evaluated the QoL through the Internet in 136 participants from Spain with a mean age of 13.4 years. Data were collected by using EuroQol-5D and KIDSCREEN. Results showed that physical well-being and physical QoL were poorer in adolescents with diabetes than in adolescents without diabetes. Another study by Sundberg *et al*.[11] was conducted to find the QoL of children with diabetes compared to healthy children of the same age. A total of 51 participants were included, of which 24 were adolescents with diabetes and 27 were healthy. Pediatric QoL Inventory 4.0 Generic core scales and Pediatric QoL Inventory 3.0 Type-1 Diabetes Module Scales were used. Results showed that individuals with diabetes had low QoL as compared to healthy individuals. However, some studies negate these findings and instead give the opposite picture. Konstantaki and colleagues could not find significant difference (p=0.56) in mean HRQoL scores among Greek children with diabetes than those without diabetes.[12] Similarly, Monir *et al*. found no significant differences between studied Egyptian children with and without diabetes aged 8–12 years in the total HRQoL scores (77.05±14.58 vs. 79.32±11.15, respectively).[13]

In coming to the secondary goals of the study, we found a significantly better HRQoL score in early adolescents than in late adolescents. However, there was no significant difference among males and females regarding HRQoL score, though boys scored better than girls. Similarly, several research, such as those conducted by Emmanouilidou *et al*.[1 4] Baş *et al*.[15] and Arabiat *et al*.[16] have found no significant differences in HRQoL scores between girls and boys with diabetes. Gadallah *et al*.[17] found that gender had no significant impact on any QoL factors except for school functions, where girls scored considerably higher.

The lower scores in female adolescents with diabetes are supposedly attributed to multiple reasons. It is proposed that girls, from the age of 13 years , differ in their hormonal functions from boys, such as more rapid puberty, the commencement of menstruation, and hormonal swings.[18] Other elements are higher intensities of perceived stress and stress-related health disorders in adolescent girls than boys, inward coping strategies, less body image satisfaction and self-esteem, more sensitivity, empathic concern, and argument due to social obligations placed on girls, which are more overwhelming and difficult to achieve.[19] Girls and boys have different peer interactions and social relationships in adolescence, and boys often have more advantages and are given more space than girls.[20]

CONCLUSION

The quality of life scores among our study adolescents with diabetes was poor as compared to the age-matched healthy adolescents. Age appeared to be a negative factor for the quality of life parameters among adolescents with diabetes.

Authors Contribution

Following authors have made substantial contributions to the manuscript as under:

SI & SBA: Data acquisition, data analysis, critical review, approval of the final version to be published.

FR & SE: Study design, data interpretation, drafting the manuscript, critical review, approval of the final version to be published.

LW & AA: Concept, data acquisition, drafting the manuscript, approval of the final version to be published.

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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