

**THE RELATIONSHIP BETWEEN CHILDREN'S ATTITUDE, FAMILY SUPPORT AND GLYCEMIC CONTROL IN TYPE-1 DIABETES MELLITUS OF SCHOOL CHILDREN IN ALEXANDRIA CITY**

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**ABSTRACT**

**Introduction:** the diagnosis of a chronic condition of any child places this family at risk, the physical health and emotional well-being of all members of the family are disturbed so, a family physician scope of service is to cope with chronic disease in children biopsychosocially.

**Objectives:** (1) To determine attitude of type -1diabetic children. (2) To study the effect of family support on glycemic control. (3) To study the effect of family support on compliance of diabetic children. (4) To study relationship between children's attitude, patient compliance and glycemic control.

**Methods:** this study is a descriptive (cross-sectional) study which was carried out on diabetic students who were attending out patient clinic sporting health insurance hospital of students in Alexandria. The representative sample (100) was selected by simple randomization from type -1 diabetic students. The out come of study was achieved by a modified questionnaire which was applied during the period of April 2008 up to April 2009.

**Results:** the results illustrated that there was a significant relationship between children's attitude, family support, diabetic control and adherence of diabetic children at diabetic clinic of sporting student hospital.

**Conclusion:** this study showed that there were different attitudes of diabetic children towards the disease. We conclude that the improvement of the quality of family support which introduced to diabetic children and the quality of diabetic care by the physician and the family leading to good metabolic control and lowering of HbA1c.

**Key words:** Diabetes Mellitus, Type 1, Socioenvironmental Therapy, Evaluation Studies, Middle East, Egypt.

**Abbreviations:**

- **IDDM:** Insulin-Dependent-Diabetes Mellitus
- **WHO:** World-Health-Organization
- **CBC:** Child-Behavior-Checklist.

**INTRODUCTION**

Children with chronic disease and illnesses are a significant group of the population. They also comprise a considerable component of the work of general practice dealing with children. Such care of children and adolescents with chronic diseases is especially important because these children are a particularly vulnerable population. They are requiring both family and professional support in order to become healthy and productive adults.<sup>(1)</sup>

Chronic illnesses affect the lives of children through the limitations they impose on schooling, recreation, and vocational choice. The resources to support their adjustments to these activities are often lacking in our society that is oriented particularly to the well and able.<sup>(2)</sup> Chronic illness presents different challenges at different life stages. Illness with its onset in early childhood is interpreted differently by the child from the one that appears during adolescence. In the former; the concerns of separation and fears about the various procedures that child can not understand or does not have explanation .To the adolescent, the impairment is much more likely to evoke concern about the future.

Perceptions of family life, body image, the dependency and inadequacy of childhood from which they are escape.<sup>(2)</sup>

The diagnosis of a chronic condition of any child places his family at risk. The physical health and emotional well –being of all members of the family are disturbed. The daily burden of care on families makes them vulnerable to major psychological and social disturbances.<sup>(3)</sup> Diabetes mellitus is one of important diseases that affect children. A series of surveys have been performed in Egypt recently, using a common protocol and "World Health Organization" "WHO" criteria, found that average prevalence of diabetes mellitus is estimated to be 9.8%, expected to reach 12.3%in year 2025. Wherever, as a whole for people above the age of 10 was 4.3%, with distinct geographical differences; 5.7%in urban areas, 4.1%in rural agricultural areas, and 1.5% in rural desert areas. Surveys among younger ages indicate prevalence of 0.01%, 0.06% and 0.14% among children at preparatory, primary and secondary school respectively. Specifically type-1 diabetes in children less than fifteen years is estimated to be 8.0 per100.000/year.<sup>(4)</sup>

Many studies proved that two thirds of children in first stage of disease is prone to psychological depression and anxiety leading to loneliness and

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isolation away from surrounding community.<sup>(5)</sup> The psychological impact of diabetes in childhood is ubiquitous and involves the entire family, as well as schools and society as a whole. Any potentially life threatening condition has some psychological impact, and that of diabetes is profound.<sup>(5)</sup> If the care regimen is complex the impact is greater in terms of financial cost, misunderstanding, external influences (e.g., patients may be accepted or rejected by the community), and the need imposed by the disease itself.<sup>(5)</sup>

Family members then experience the classic stages of grief, progressing from anger and denial to bargaining, depression, and finally resolution or acceptance. Unresolved grief leads to turning of a family into dysfunctional one, although most families reach grief resolution. Adjustment to diagnosis of diabetes takes 6-9 months for children and 9-12 months for parents.<sup>(6)</sup> Because diabetes affects not only the children who have it but also their whole family, it needs to be addressed with the whole family in mind. Although mothers usually take on most of the care of children with diabetes, others need to be involved. Both to support mothers and to demonstrate to the children that their lack of involvement in day-to-day management does not mean rejection or a lack of caring.<sup>(7)</sup>

Families have primary responsibility for their children development and well-being. They need resources support that will enable them to fulfill that responsibility effectively as family support and family preservation demonstrate many services to the family as a whole. Counseling, conflict resolution, improved family functioning, increase parents confidence and competence in their parenting abilities in order to successfully management of their children, enhance child development & helping children & families.<sup>(7)</sup>

Finally, chronic illness doesn't affect the person with the condition, the whole family must come to terms with the illness, make major changes in schedules and some how manage to remain as a family.

As a family physician scope of service is to cope with chronic disease in children biopsychosocially. It is very important to assess the effect of family support on glycemic control of diabetes children with type-1 diabetes mellitus.

The aim of study is to determine the attitude of type1diabetic children, to study the effect of family support on glycemic control and on compliance of diabetic children and to test the relationship between children's attitude, patient compliance and glycemic control.

## METHODS

A Descriptive (cross - sectional) method was selected to carry out this study. The study setting

was the Diabetes out patient Clinic of "Health Insurance Hospital Of Students in Alexandria city The hospital is located in "Sporting Area" at Elhoria street, where students with diabetes mellitus attend daily to receive insulin.

The representative sample, one hundred students were selected by simple random technique from type-1diabetic school children who attended the "Health Insurance" hospital.

**Children were included in the study if they met the following study inclusion criteria:**

- a- Male and female children aged (10-18) years.
- b- A diagnosis of type 1 diabetes
- c- No other chronic disease.
- d- No medications were taken for other chronic disease other than insulin at least for a year.

**Study variables include:-**

- Attitude of diabetic school children.
- Measure for family support to children.
- Measure for children adherence to insulin administration.
- Glycosylated Hb of those children.

**Tools:**

(1) Structured questionnaire modified from "Child Behavior Checklist"<sup>(85)</sup> validated from English to Arabic, where the collection of data was carried out by interview the participants/children. This questionnaire included the followings:

\* *Socio demographic data such as:* Age, gender, religion, educational stage, number of family members and order of the child.

\* *Family reaction towards the disease.*

\* *Child attitude towards the disease:* participants responded to statements about their different feelings such as shyness, pain and fairness.

\* *Effect of disease on school performance.*

\* *Family coping:* If the family copes with the disease or making a load on the family.

(2)\**Diabetes Social Support Questionnaire-family Version.*<sup>(86)</sup> This questionnaire assess children's perceptions of family behaviors that were supportive for their diabetes care. Family support is measured by estimating the family behaviors towards five key areas of diabetes care which are:

- 1) Insulin administration.
- 2) Testing of blood glucose.
- 3) Meals.
- 4) Exercise.
- 5) Emotional support.

(3)\**Assessment of glycemic control* by testing of glycosylated hemoglobin (HbA<sub>1c</sub>) for all children where a blood sample (2 ml) was drawn by trained clinic staff as part of each patient's routine visit to assess Hb (A<sub>1c</sub>).

(4)\**Assessment of the compliance of diabetic children*<sup>(87)</sup> both self and physician report of

adherence where included.

Data was collected by the researcher and was processed using SPSS V.11.

- Chi- square test was used for categorical variables.
- T- test was used for continuous variables.
- Other significant tests were used according to the type of variable.

#### Ethical Consideration

1. The aim of research was explained to both children and their parents.
2. Approval was taken from health insurance before taking any data.
3. A written consent was taken from children's parents.
4. All data were kept confidential in appendixes and were not used outside this study without patient approval.
5. Children with psychosocial problems in study population were referred to specialists.
6. Coding of questionnaire and blood samples was done.
7. Safe disposal of all drawn blood samples after their usage and never used in other purpose.

### RESULTS

*Table I:* shows the sociodemographic characteristics and mean values of HbA1c for the studied sample. Male children represented 43% whereas females were 57% of the sample. Females were significantly older than males (mean age  $13.05 \pm 2.47$  versus  $11.13 \pm 3.74$  years). Overall, the mean family size of children in the study was around 3 members in the family. However, family size was not significantly different between males and females.

The mean HbA1c for males was ( $7.81 \pm 1.37$ ) as compared to that of females ( $8.78 \pm 2.14$ ) where the mean HbA1c for females was statistically higher than that of males.

**Table I:** Distribution of studied sample according to sociodemographic characteristics and mean values of Hb A1c

Variables	Male "n=43"	Female "n=57"	T	p
Age	11.13±3.74	13.05±2.47	3.85	0.003*
Family size	3.40±2.02	3.61±1.84	0.29	0.588
Hb A1c	7.81±1.37	8.78±2.14	2.321	0.012*

**Table II:** Distribution of the studied sample regarding attitude of diabetic children, school achievement and family coping.

Attitude of children	Yes (%)	No (%)
Feeling of fairness	40	60
Feeling of shyness	57	43
Feeling of pain	69	31
Feeling different	38	62
School achievement	71	29
Family coping	56	44

*Table II:* shows distribution of the studied sample regarding attitude of diabetic children. There were different attitudes of children towards the disease. According to feeling of fairness ;40% of female and male children felt fairness whereas 60% felt injustice for being diabetic. 57% of the represented sample felt shyness from diabetes versus 43% didn't feel. Diabetes mellitus was a painful event to 69% of children whereas 31% didn't feel that. However 62% of diabetic children in our study felt that they were like their friends but 38% of them felt they were different. According to school achievement 71% of children showed good achievement but 29% didn't. Overall 56% of families coped with diabetes compared to 44% felt this event as a load.

*Table III:* shows all of the list of items for family support were viewed as supportive for the majority of children except for the item of family appreciation of the difficulty of insulin administration where only 61% of children families responded positively for this item.

Figure (1) shows the family reaction towards the discovery of the disease. It was found that nearly one third of the children (33%) stated that their families accommodate with the event, and (34%) of them stated that their families were shocked whereas (31%) of children families were adapted to the disease.

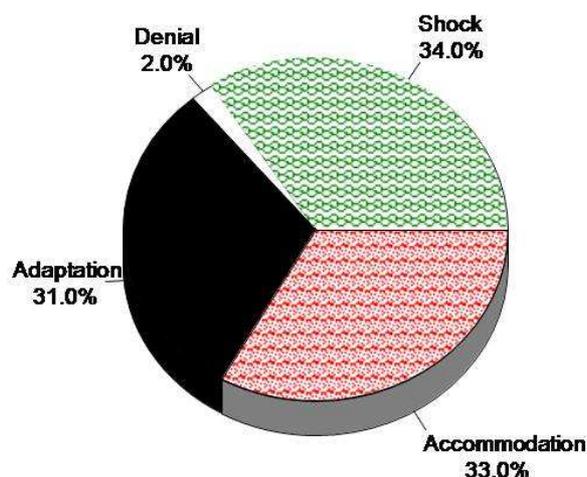
*Table IV:* illustrates multiple regression analysis, which included HbA1c as a dependent variable and family support, children's attitude and adherence of diabetic children as independent variables. There was significant inverse relationship between all of the independent variables and HbA1c. The greater family support, positive children's attitude, adherence of diabetic children, the better metabolic control and the lower HbA1c.

**Table III:** Family support regarding Insulin administration:

	Yes (%)	No (%)
Remind you to take your shots.	74	26
Praise you for giving yourself shots correctly or on time.	82	18
Help you for giving insulin to your self.	72	28
Appreciate how difficult it is to take insulin shots.	61	39
Check that you've taken your shots completely.	85	15
Ask you about the results of your blood tests.	90	10

**Table IV:** Multiple regression analysis of different variables affecting glycosated hemoglobin level.

	unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	2.534	.510		-4.971	.000
Family support regarding Insulin.	.156	.107	.149	-2.459	.008
Family support in measuring blood glucose.	-.752	.310	-.254	-2.422	.017
Family support in diet.	-.138	.075	-.203	-2.825	.011
Family support in training.	.038	.073	.056	-3.526	.001
Family support in Moral support.	-.134	.096	-.168	-2.392	.0016
Attitude	.057	.069	.098	-2.828	.0041
adherence from physician's opinion	-.010	.075	-.015	-2.138	.0089
Adherence from patient's opinion	.047	.073	.068	-3.651	.0051

**Fig 1:** Distribution of the studied sample regarding their reaction towards discovery of diabetes mellitus. This figure illustrates the variable reactions of diabetic children toward discovery of diabetes mellitus Type 1.

## DISCUSSION

Little research has examined the specific family behaviors associated with children disease management, although families play an important role in disease management and adaptation for youths with chronic pediatric conditions especially diabetes mellitus. In support of these results, In Florida, one study was done by DUCK<sup>(88)</sup> to examine predictive and mediated relationships among youth perception of critical parenting using (Child Behavior Checklist) externalizing problem scores, adherence, and (Hb A1c), in youth

with type 1 diabetes from low socioeconomic status families. The results illustrated that combined measures predicted 44% of the variance in (Hb A1c). The research concluded that the presence of youth perceptions of critical parenting and youth externalizing behavior problem may interfere with adherence leading to increased (Hb A1c)

Similarly another, study carried out in London by Anderson<sup>(89)</sup> to examine social support and peer and family involvement in relation to diabetes management within a developmental context. The results illustrated that adolescents perceived greater

diabetes – related peer support than did normal school-age children. Perceived peer and family support were correlated with better metabolic control. In addition peer participation in the intervention was correlated with better metabolic control also.

Many professionals who work with children and adolescents with type 1 diabetes have recognized the potential positive impact that support from multiple systems involved in a youth's life could have on the youth's disease management. However, how to mobilize this support in ways that are effective and helpful to the youth is less clear.

An understanding of all of these various relationships is essential to develop interventions that match what youths and their families need within a developmentally relevant context. However, supporting families may also be related to conflict this result was reported by Anderson and Auslander.<sup>(90)</sup> One possible explanation may be that when there was greater family involvement around diabetes tasks, there may also be greater conflict, simply because of a greater amount of interaction around diabetes care overall. When parents were less involved in their child's diabetes care, there may be less interaction around diabetes and fewer opportunities for conflict. These results may also be explained by different interpretations between parents and youth as to what was supportive versus what was conflictual.

In this current study there were different attitudes of children towards the disease. According to feeling of fairness 40% of female and male children felt fairness whereas 60% felt injustice for being diabetic as they may have physical and psychological disabilities. 57% of the represented sample felt shyness from diabetes because they would feel inferior to their colleagues. Diabetes mellitus was a painful event to 69% of children that may be due to administration of insulin for life. However 38% of them felt they were different because they may not practice their hobbies. According to school achievement 29% didn't have good achievement due to recurrent absence from school or lack of concentration from having hypoglycemic attacks. Overall 56% of families coped with diabetes compared to 44% felt this event as a load financially, psychologically and socially (table II).

According to family support regarding insulin administration it was viewed as supportive for the majority of children except for the item of family appreciation of the difficulty of insulin administration where only 61% of children families responded positively for this item as they thought insulin administration is a simple event (table III).

In our study adherence to treatment regimen, and metabolic control were also significantly related similarly Hanson and Burgen<sup>(90)</sup> found that overall,

children who reported more negative and critical relationships with their parents were in worse metabolic control. An adolescent's non adherent behaviors may elicit parent criticism, which in turn could lead to more struggles between parent and youth. Overtime, the rate and intensity of parental negativity increased, fostering less child adherence. Also it was found in Hanson's study<sup>(91)</sup> that child report of parental negativity and criticism (related to diabetes management) was not predictive of metabolic control in younger children but in older ones.

Moreover A recent cross-sectional study conducted by colleague Lori Laffel in Boston.<sup>(92)</sup> "It was found that diabetes-specific conflict significantly predicted glycemic control, with higher conflict linked with poorer control, as measured by Hb A1c. Patients whose parents were more involved in diabetes management tasks were more adherent to blood glucose monitoring and were in better glycemic control. Thus even though parents of youth 13 – 17 years of age were significantly less involved in diabetes management than were parents of younger patients (8-12 years of age), in both age groups, parent involvement was strongly related to better adherence and better glycemic control"

A study carried out by La Greca<sup>(94)</sup> indicated that children reporting more diabetes management responsibilities demonstrated less adherence and worse metabolic control. Overall, these findings linking metabolic control to diabetes specific family processes (such as parental involvement in diabetes tasks and the child's perception of the valence of diabetes-related parental behaviors and support) highlight the importance of these constructs.

Wallender and Frasier<sup>(95)</sup> developed a "theory that family support is multidimensional and consists of at least three different critical dimensions: warmth-caring, guidance-control, and problem-solving. The authors reported that for children of 7-17 years, the guidance – control item "parents tests sugar" was significantly correlated with better metabolic control (lower Hb A1c), whereas the items "I do my own sugar testing", "I take care of my diabetes myself" and "My parent believes testing sugar is up to me" were all significantly but inversely related to control. Two items on the warmth – caring subscale; which tapped the children's perceptions that they could talk about diabetes were significantly related to better metabolic control for both age – groups. The authors concluded that for younger school – aged patients, more diabetes – related family guidance and control was linked to better metabolic outcomes and that diabetes – related parental warmth and caring were important both for school – aged children for adolescents."

As we showed all of these were studies that were consistent with our study; there were other past

studies that inconsistent with our results. From these studies one study was done by Johnson and Kelly M,<sup>(96)</sup> it suggested that in adolescent populations, the relationship between parental guidance / control and HbA<sub>1c</sub> was weaker. This scale was neither related to parental negativity nor parental responsibility. As most adolescents strive for autonomy, parents had less influence regarding whether or not they attempted to provide guidance and control.

Another study was performed by Schafer and Glasgow.<sup>(97)</sup> This study indicated that there were bad metabolic control and fewer adherences despite of good family support and presence of parenting warmth. It speculated that insufficient sample size contributed to lack of correlations found between family support, adherence and metabolic control.

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