

# Impacts on the Family due to Living with Child having Type 1 Diabetes Mellitus

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## ABSTRACT

**Background:** Type 1 diabetes is increasing by approximately 3% each year globally. Type 1 diabetes can manifest at any stage during the human life cycle, but particularly demanding when it present in a child. The diagnosis in a child can cause parental distress and anxiety, the effects of which can be long lasting. The diagnosis of a T1D affects not only the parents but the whole child family.

**Objectives:** To determine impacts on the family living with child having T1D.

**Method:** Cross sectional study conducted on 138 families in Sana'a city. Convenience sampling used to select parents of diabetic children aged 6-14 years. Structured questionnaire was completed using face to face interview.

**Results:** In the current study. Parents in relationship of to the participate to the child was father (49.2%), mother was (50.8%). The mean age of parents was  $37 \pm 10$  years. Most of the parents were illiterate or had basic education. The mean age of parents at diagnosed of diabetes was ( $33 \pm 10$  years). The diabetic children aged 6-14 years old. The mean age of the children was  $11 \pm 2.6$  years. More than half of them were female. The majority of the children 92% in basic school level. Mean duration of diabetes was  $4 \pm 3$  years. The greatest portions were diagnosed at age group 5-8 years. The mean age of diagnosed of diabetes was  $7 \pm 3.2$  years. Diabetes duration was 1-4 years for most of the diabetic children. Most of families had one child with T1D.

**Conclusion:** Further studies on impact of T1D are needed. Protective health behavior education efforts are made to increase health care provider knowledge about T1D and promote family and T1D child life.

**Keywords:** Type 1 diabetes; Impacts on the family; Child; Living with type 1 diabetes; Sibling

## INTRODUCTION

Type 1 Diabetes Mellitus (T1DM) is an autoimmune condition in which the insulin secreting beta cells of the pancreas have been destroyed, therefore ceasing to functional. The resulting inability to produce insulin, a protein storage hormone which regulates carbohydrate metabolism, conditions such as glycosuria, ketanaemia and ketonuria [1]. The diabetes is one of the most common diseases in school aged children [2]. The incidence of type 1 diabetes is Increasing worldwide [3,4].

The diagnosis of type 1 diabetes mellitus in a child triggers strong emotional responses from parents; they are overwhelmed and report anxiety, stress, and feelings of isolation, worry and even grief [5-7]. The diagnosis in a child can cause parental distress and anxiety, the effects of which can be long lasting [8]. Parents also struggle with self-doubt, living a difficult life, parenting competence, self-confidence and dealing with the disease over time [9], in addition to decreased quality of life, increased worrying, decreased family

activities, and employment difficulties [10].

The diagnosis of a chronic illness in a child affects not only the patient, but the child' family, as well [11,9]. Treatment of type 1 diabetes is aimed at normalizing blood glucose levels of four to eight mmol/l [12], and involves the administration of subcutaneous insulin, the regulation of carbohydrate intake and activity, and frequent monitoring of blood glucose levels [13]. The optimal treatment type 1 diabetes requires a high degree of self-motivation, as well as the individual interpreting and responding appropriately to changing blood glucose levels. Appropriate action must be taken when blood glucose is outside safe parameters, including emergency management to preventative treatment when blood glucose levels are elevated [14]. Health professionals recognize the large burden that treatment of T1DM places on families [15].

## METHODS

The majority of sample size reported 73.9% of the diabetic children absence from school declined in education performance.

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**Received:** February 01, 2021, **Accepted:** February 15, 2021, **Published:** February 22, 2021

**Citation:** Albourhi A, Halim FA (2021) Impacts on the Family due to Living with Child having Type 1 Diabetes Mellitus. J Diab Metab. 12:864.

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### Study design

Cross sectional study to study impacts on the family due to living with child having T1D.

### Study setting

The study was in Al Thawra Modern General Hospital (national diabetic center), Ministry of public health and population in Yemen (central pharmacy), Al-Gumhorhi Teaching Hospital, Azal Hospital, and University of Science and Technology Hospital which included in the present study.

### Study population

The study population was on families with child having T1DM age 6-14 years.

### Sample size

The study population is (313) families have children age between 6-14 years living with type 1 diabetes mellitus. The sample size estimated by EPI-INFO Program at, the confidence level 95% will be 138 families [16].

### Sampling technique

Convenience sampling used to selected diabetic children age 6-14 years in Sana'a city.

**Inclusion criteria:** Parents of diabetic child aged 6-14 years. Child who diagnosed with type 1 diabetes at last one year. If family with more than one child with T1DM only one child will be studied.

### Data collection technique

The structured questionnaire will completed using face to face interview. Each participant will interviewed at outpatient or place take insulin (central pharmacy) by the researcher after explaining the purpose of the study and assuring the confidentiality of collected data, and verbal consent to participate in the study.

### Ethical consideration

Permission and letter from faculty of medicine and health science Sana'a university to Al-Thawra Modern General Hospital (national diabetic center), Ministry of public health and population in Yemen (central pharmacy), Al-Gumhorhi Teaching Hospital, Azal hospital, and University of Science and Technology Hospital which include in the present study.

### Pilot study

Pilot study done for ten parents with child having type 1 diabetes with same modified in questionnaire.

### Data analysis

To analyze the collected data, Statistical Package for Social Sciences (SPSS) program version 21 for data entry then data were analyzed. Data were coded and transferred into specially designed formats.

## RESULTS

The participants in relationship to the child was father (49.2%), mother was (50.2%). The study shows, the mean age of participants was  $37 \pm 10$  years, age at diagnosis of diabetes was  $33 \pm 10$ . The majority of the parents were illiterate (31.9%), around third of parents 29% had basic education. 18.8% of the parents had secondary education, and 20.3% had a diploma and above.

In the current study, the diabetic children 6-14-years-old. The mean

age of the children was  $11 \pm 2.6$  years. Most of them aged 11-14 old was (68.8%). The females were 55% and 44.9% males. The majority of the children were in basic school level (92%). Insulin was delivered to the children by syringe and vial 77.5%, by pen 21.1%, by insulin Pump only (1.4%). The mean age at diagnosis of diabetes was  $7 \pm 3.2$  years. The mean duration of diabetes was  $4 \pm 3.03$  years.

The highest the diabetic children in our study 60.9% live in a small family, 39.1% of the diabetic children are living in a large family. About family income, about half of the families 53.6% had an insufficient income, 34.8% of the participants had more than sufficient income, only 34.8% had sufficient income. Most of the families had less than five children 82.6%, only 17.4% of families mentioned more  $\geq 5$  children. Also, most the families had  $\leq 5$  adults, 24% of families had  $\geq 5$  adults. The majority 88.4% of the families had one child with T1D. About 8.7% of the families had the two children suffering from T1D, and 2.9% having three children diagnosed T1D.

The majority of sample size reported 73.9% of the diabetic children absence from school. More than half 56% of the children had declined in education performance.

## DISCUSSION

Diabetes is one of the most complex chronic medical conditions, where a high degree of patient self-management within a supportive network is required to ensure optimal outcomes. Diabetes has the potential to have a significant impact on the families, parents and sibling because its management "requires complex daily monitoring and treatment and has an effect on aspects of family life.

This present study was conducted on 138 families in Sana'a city to determine impacts on the family living with child having T1D, considering impacts on the diabetic child, parents and siblings. To our knowledge this first study in Yemen focusing on the impacts on the family due to living with child having T1D. The result shows that 68.6% of the diabetic children were adolescent, this study family current insulin delivery system by syringe and vial as developing country. Most incidence age at first diagnosis in school age, incidence in male is less than in female. The children spend a high proportion of their life with T1D.

Regarding impact on the child, educational performance most of them 73.9% reported absence from school, the result is consistent with findings of Sultan et al. in Saudi Arabia. Similar studies reported the same observation. Explaining absence from school or missing classes time, may be in order to check glucose level or children may get away with using their illness to avoid participation in activities that in fact not harmful to them.

The association between diabetes and educational achievement can be explained by several factors. According to the human capital theoretical framework, differences could be explained by reduced incentives to invest in education because of increased uncertainty about future productivity and life expectancy. This interpretation may apply in particular when interpreting the results for upper secondary school, where individuals are closer to adult life and may be thinking of education as investing in the future. At both school stages, the time demands of handling the disease compete

with study time; early severe hypoglycemia, as well as attention and memory difficulties due to minor episodes of hypoglycemia, may also have short- and long-term effects on grades at both educational levels studied. Earlier studies have indicated increased absenteeism from school in children with diabetes, which can be expected to negatively affect educational achievement observed no overall difference in school performance between diabetic children groups and non-diabetic peers, and no decline over time within the group with diabetes. In the future, these data will be able to be assessed to examine changes in school performance in depth over a longer term and within a larger cohort, other evidence indicate that T1D in children and adolescent is not associated with lower academic performance, especial in those with fair to good metabolic control, recent study comparing children with T1D to the matched controls, children with T1D were found to have scholastic grades lower than those of healthy subjects.

The current study revealed drop out of school percentage 5.1% comparable findings were reported in recent study using data from the National Longitudinal Study of Adolescent found 6% that young adults with diabetes were more likely to drop out of high school and completed fewer years of schooling than peers, recommend that attention must be paid in school to the particular needs of children with diabetes and suggest that their findings support collaboration between families, clinicians and teachers to identify and assist particularly vulnerable children and teenagers.

For decades, clinicians have observed emotional and behavioural problems in children with T1D. Depression symptoms have been shown to be a significant predictor of reductions in metabolic control.

The child needs psychological and social support from various sources including health team care givers, peers and teacher in order to achieve effective diabetic self-management practice and long and short term disease specific outcome. The psychosocial aspects of diabetes in children's and adult in T1D management. It needs regular interaction.

In the current study revealed that 80% of diabetic Yemeni children have anxiety. Anxiety disorder is common in adolescents with T1D the percentage of anxiety feeling revealed by this study is much higher than that reported by in Australia (60%), this huge difference in percentage may be because Yemen as Developing country, there is shortage of community resources. Anxiety is associated with increased fear of diabetes-related events such as nocturnal hypoglycemia or complications, and with poorer disease management such as deceptive or obsessive self-care and blood glucose monitoring behaviour. Anxiety may also lead to distress specifically associated with individual elements of the care regimen such as insulin injections or finger pricks for blood glucose monitoring. Adolescents require social support from various sources, including caregivers, peers, and teachers in order to achieve effective diabetes self-management practices and long and short-term disease-specific outcomes. Reynolds performed a meta-analysis and found that children with diabetes did in fact report more symptoms of depression, were more likely to have clinical depression, had higher anxiety levels, and had more psychological distress than children who were unaffected by chronic illness.

The participants expressed their diabetic children 64.5% suffered from mood changes, the result is in line with similar studies reporting the diabetes is a risk factor for psychosocial problems. The prevalence and characteristics of psychological impairment in

children with type 1 diabetes are not well understood. The lack of knowledge concerning rates and characteristics of disordered affect in young people with type 1 diabetes presents a potentially significant shortcoming in treatment capacity as the affective disorder.

The participants reported. More than half 55.8% of diabetic children were having low-self-esteem, the result is agreeable with the previous report that T1D was related with lower self-esteem.

Effect of T1D on the social growth and abilities of the child. Most of the diabetic children 63.8% uncooperative with different individuals. Another issue centered on the difficulty of motivating an adolescent to be compliant with the prescribed treatment regimen.

The study showed that most of diabetic children 60% have problems in communication with other individuals and peers. More than half 52.8% of the diabetic children had problems in performance of their role in the family. The result is consistent with previous study found that diabetic children often feel they are different from other children around them. In some studies child with chronic condition have been found to have lower social competence and delayed psychosocial development compared to their healthy peers. Child with chronic condition has reported having fewer friends compared healthy children, but there was no difference in opportunities to see friends.

The result of the study indicated that parents reaction to the diagnosis of the child was connected with a various emotional problem, other studies have also indicated that suffering a chronic disease in children for their parents is frightening and disturbing. Needs regular interaction between parents, nurse, doctors, teachers, and the school authorities, which must be assured for close monitoring. The child must be encouraged to participate in the school and family activities. Proper education of self-care must be given to the child so that the child can cope with his/her existing disease, maintain self-confidence, ensure self-management and adapt with life at large.

The results of present study revealed that almost all the parent experienced grief and worries (92%, 88.4) consequentively, the results confirm the previous finding. In all of the qualitative discussions, parents talked about their fears related to diabetes. The specifics of fear varied, but it was clear that parents universally struggle. In diabetes, fears compound, grow, change, and they never fully go away. Parents had fears around their children having diabetes-related emergencies and about what the future would hold for their children. Their fears centered on the possibility of the child having severely low blood sugar, or on the impact that the diabetes may have on the future quality of life of their children, should long-term complications occur. The parents felt that careful monitoring of the diabetes would prevent the children from suffering from long-term complications in the future and they had to live with this pressure to keep the diabetes managed while still going about their daily lives. Parents utilized several strategies to manage their worries and fears so that they could stay positive and motivated to parent their children as best they could. Some parents chose to look at the diabetes from a more positive point of view in order to stay motivated to care for the children as well as to set a good example for them. Identifying beneficial changes resulting from the diabetes also helped them to stay positive. This research reinforces findings by Barnard that parent's need assistance with

fear-based behaviours and perceptions.

Family reaction to diagnosis of the child T1D was feeling of alert watchful 94.9% may be related to ignorance of the family and dealing with the disease management. Our study confirms other results that an intense feeling of constant vigilance associated with their child's diabetes as well as a profound feeling of responsibility. Parents' responsibility may include blood glucose monitoring, meal planning, and insulin administration, among other things, one mother in this study observed that she felt a stronger connection to her child after diagnosis than before, as she was now more important to him than to his sibling. However, this closeness could also adversely affect parenting behaviours. The mother concerned reported she "dare not let go of him as much as I did with his older brother. The effect of hypervigilance, such as reported by this mother, can be a negative influence on diabetes health.

Findings showed the vast majority of participants experienced distress 87.7%, distress of parents of the child with T1D has been comprehensively reported.

Most families with school-aged children are able to manage well with diabetes but the burden placed upon parents can exacerbate depression symptoms, and care for the child may be accompanied by important consequence.

Finding, show the majority of participants had the feeling of loneliness and isolation 79% as result of providing care for the child with diabetes limits the scope of social activities of the caregivers, often makes impossible to fulfill plans, Also it was reported children and their parents described how stigmatization (feeling different, concealing signs of the disease, keeping illness as secret) and social constraints (restricting social events, gender implications, excluded from school activities, imposing economic burden) impacted their daily life as a result of fear of disclosing the disease, which could affect their social status.

Findings show the majority of participants with the diabetic children sense of guilt 71.7% about not providing appropriate care; comparable finding was reported, the difficulties of adhering to complex regimens and feelings of personal failure when regimens are strictly followed. Other parents also shared stories of their children's blood sugar becoming too low and experiences like these tended to increase feelings of guilt because they were not able to predict emergencies and because the parents worried that they gave their children too much insulin, causing their children to lose unconscious or have a seizure.

The study showed that most 65.3% of the participants felt discouraged. In previous the vast parent-reported burden of diabetes was feeling discouraged. The researcher commented that this meanings. For example, the parents may feel that they exert substantial efforts and the results do not match their expectations with respect to optimizing or normalizing glycaemic control. It could also mean that parents do not think that current treatment tools are adequate to manage their child diabetes and glycaemic variability. To address this very common concern, it may be beneficial to families if health care team members discuss expectations around treatment plans with parents of young children with type 1 diabetes. Certainly, future research would benefit by more in depth exploration of this theme using qualitative methods.

In respect to the problems facing the family the most common problem was financial problem presented by 90.6% of the sample. Vast majority of families face financial problems, the results

are consistent with earlier studies indicating that the child diagnosis has an impact on the family health-related quality of life and also an impact on the family economy in terms of parental work restrictions and high medical costs. Also Insulin availability, acceptability, and affordability are also major problems.

Result, the majority the families have the problems insulin storage in the home 84.1%, comparable findings was reported in India the problem persist with insulin storage; up to 80% patients lack a good storage facility at home.

This study showed that the majority 71% of families having a child with T1D complaint of disease lifestyle restriction, the results are in line with studies indicate the following difficulties associated with providing care for children with diabetes, adhering to dietary restriction. Social limitation experienced by the child make the caregiver feel their social activity is limited. Low level of social activity, financial difficulties, and notion that the child disease has impacts on everyday life are associated with burnout syndrome.

The current study shows that most the families had problems in work performance. The percentage in the present study much higher 70.3%, comparabled to 31% demonstrated in earlier studies, other researcher reported parents with the T1D need for flexible working arrangements to help care their child.

The results, show most of the participants 69.6% had the problem in family social relationship, similar findings, Providing care to a child with diabetes limits the scope of social activities of the caregiver, often makes it impossible to fulfill plans, and leads to avoiding friends due to problems experienced with the child. Caregivers limit their social relationships and are unable to leave the child with others, who fear the responsibility, for long periods of time.

The results revealed that child diabetes disrupted of most 68.8% the families lifestyle. The disruption experienced by families has various causes and takes different forms. Social isolation resulting from difficulties in maintaining social relationships with people outside the family after diagnosis is one form of disruption that affects the whole family. The child with T1D may be not able to experience normal childhood activities such as a playing at friends' house or going to sleep-overs. This disruption affects the freedom of not only the child, but also how whole family functions within wider social networks and participates in leisure activities. It is important for health professionals to recognise the positive link between effective family functions within wider social networks and participates in effective family functioning, where previous ways of living are maintained and optimal diabetes management. Any nursing approach that reduces social isolation for families will be beneficial to their well-being and ultimately beneficial to the health of the child with T1D. Empowering friends and family members outside the family home with diabetes-related knowledge so they are confident in caring for the child will help relationships outside the family to be maintained.

Half of the children 50.7% had the problem in their relationship with sibling, that agreeable with other study, childrens with T1D are at a great risk for emotional and behavioural problem. The needs of the siblings often take second place to immediate health demands of child 1 diabetes. In previous study five of the six children with type 1 diabetes were the oldest in the family and the siblings, therefore, had not experience life with an older brother or sister without diabetes.

Health professional need to understand the potential for associate negative feelings such as jealousy or resentment towards the child living with T1D. These feeling will not only contribute to breakdown of relationships, but also increase the disruption that is already associated with diabetes within the family unit. Health professional also to be aware that sibling can play an integral part in the well-being of the affected child and the family as a whole. Age-appropriate diabetes education that involves rather than alienates siblings should form part of nursing practice. This will benefit the child with T1D, the sibling and family as a whole. Increased responsibility related to having children with T1D.

Result showed, more than half of children suffered health problem as complication of T1D, As long-term complications, related to type 1 diabetes are for example cardiovascular diseases, stroke, chronic wounds and renal insufficiency. The risk of late complications increase directly with a high HbA1c value. According to the national guidelines.

The conducted analyses showed that highest the level of burden was experiencing physical and psychological exhaustion due to activities associated with providing care, occurrence of difficult problems, time required to provide care, and the feeling of responsibility resulting from caregiving. May be increased felt exhausted with families who having tow diabetic child, low family income, young child.

The results of present study revealed that most of participant 69.6% suffered a change in sleep deprivation that agreeable with previous study that parents of children with complex needs experience sleep deprivation that can be both relentless and draining and affects the parents themselves and their relationships. The degree of sleep deprivation varies by diagnosis, but a key contributing factor is the need for parents to be vigilant at night particular importance to health care professionals is the inadequate overnight support provided to parents of children with complex needs, potentially placing these parents at risk of poorer health outcomes associated with sleep deprivation and disturbance. This needs to be addressed to enable parents to remain well and continue to provide the care that their child and family require. Exploration of sleep in relation to diabetes management is a relatively new area. Another study, the same group found that 79% of parents indicated that nocturnal BG checks disrupted their own sleep, although glycaemic control was unrelated to either the number of nocturnal BG checks or sleep disruption. Study confirm that up to half of parents lose at least 30 minute of sleep each time their child awakens at night.

This present study, most of participants 65.3% feeling depressed, similarly reported that living with diabetes was a psychological burden, with individuals taking insulin medication or diagnosed with type 1 diabetes reporting the most distress. Half of all family members sampled reported that living with diabetes impacted them negatively.

Result showed that most of participants 62.3% lower level of parenting satisfaction, parental satisfaction with care is due to various factors such as: Feeling secure with the staff, receiving support and being involved in their child's care. Secure and well-informed parents are more likely to provide information to their children so that they also feel secure. Both in earlier and recent studies. Results show that parents are overall satisfied with their childs diabetes care. An important component in parent's satisfaction with the diabetes care was that health care workers listened and provided feedback to the parents. This confirmed that

having a diabetic child does impact the lives of the family and the parents and that the roles of the parents do indeed change.

This study more than half of participants 58% mention impacts on the doing the work and relationship with others, the results are consistent. Result showed more than half 55.1% of participants had alteration in eating habits, the result is consistent with previous study, related to life with diabetes. Frustration came from relentless effort required to manage type 1 diabetes, despite their parents expressed the difficulties in maintaining their childs blood glucose level within the desired target range. Less than half of participants 45.3% felt failure, similarly result most of parents experienced frustration.

Families are the primary socializing agents of children, and thus it is important to consider the family context, parental variable risk, and protective factors that play a role in how siblings adjust to childhood chronic illness. This section specifically addresses the ways in which siblings adjust to illness, whether it is a positive experience, negative experience, or (more often) a combination of both.

The timing and chronology of support offered to parents, in particular for parents to be offered emotional support soon after diagnosis to better enable them to assimilate diabetes management information at a time of great distress. Health professionals should also consider ways to provide more practical support to parents soon after they return home with their child, to help them integrate diabetes management into their family's normal lifestyle. Further indicated that Ireys, social support for parents of children with a chronic illness can potentially decrease parental distress, Better diabetic management occurs when caregivers are more involved, and poorer outcomes, such as depression and poor glycaemic control, arise when caregivers are less involved. Recommendations from the parents in previous study indicated the desire for increased social support, resource information, the opportunity to have contact with other parents, and the indication that the program could be particularly helpful closer to the time of child's diagnosis. The study heightened level the families need for health services (87.7%), the result is in line with other studies that revealed need for health professional to spend more time parents to provide them with knowledge about T1D and reassure them about their children condition.

## CONCLUSION

The Socio-demographics of the family illiterate or had basic education, have small families, have four or less adults in the family, have five or less children, and have only one diabetic child in the family. Most of the children aged 11-14 years, the mean age was  $11 \pm 2.6$  years. More than half of them were female. The great majority were basic education. The greatest portion was diagnosis at age group 5-8 years. The mean age of diagnosis of diabetes was  $7 \pm 3.2$  years. Diabetes duration was 1-4 years for most of the diabetic children. The mean for diabetes duration was  $4 \pm 3$  years. Most of them are receiving insulin by syringe and vial.

The problem facing family in care of the child. Most of parents had problems with insulin storage, family social relationship, disruption of the family dynamic, child health (complication of T1D ). The effect on siblings, half of the children had problem in their relationship with their sibling. Less than half of parents reported satisfaction with management of T1D. The family sources of emotional support family members and friends presented by

the biggest portion, then health care professional, peer families mentioned by more than half of the sample. The family needs to meet T1D child care requirement. The great majority of parents expressed a family need for information about T1D, equipment and supplies such as glucometer and strips, social support and health services.

## REFERENCES

1. American diabetes Association. Diagnosis and classification of diabetes mellitus. *Diabetes Care*. 2009.
2. American association of diabetes educators. Educator insight in using chronicle diabetes: A Data management system diabetes education. 2013.
3. Fourlanos S, Honeyman M, Varney M, Colman P, Trait B, Hairrison L, et al. The rising incidence of type 1 diabetes is accounted for by cases with lower-risk human leukocyte antigen genotypes. *Diab care*. 2008;8:1546-1549.
4. Spring diabetes New Zealand. 2012.
5. Bowes S, Lowes L, Warner J, Gregory J. Chronic sorrow in parents of children with type 1 diabetes. *J Advanced Nurs*. 2009;5(65):992-1000.
6. Sullivan-Bolyai S, Bova C, Leung K, Trudeau A, Lee M, Gruppuso P. Social Support To Empower Parents (STEP): An intervention for parents of youetesng children newly diagnosed with type 1 diab. *J diab*. 2010;36:88-97.
7. Streisand R, Mackey E, Herge W. Associations of parent coping, stress, and well-being in mothers of children with diabetes: Examination of data from a national sample. 2010;14:612-617.
8. Haugstved A, Wentzel-Lasen T, Rokne B, Graue M. Perceived family burden and emotional distress: Similarities and differences between mothers and fathers of children with type 1 diabetes in a population-based study. *Ped Diab*. 2011;12:107-114.
9. Knalf D. Parental perceptions of the outcome and meaning of normalization. 2010;33:87-98.
10. Goldbeck L. The impact of newly diagnosed chronic paediatric on parental quality of life. 2006;15:1121-1131.
11. Kratz K, Uding N, Trahms C, Villareale N, Kieckhefer G. Managing childhood chronic illnessparent perspective and implication for parent provider relationships. 2009;27(3):303-313.
12. Ambler G, Barron V, May C, Ambler E. Caring for diabetes in children and adolescents: Parent's manual. 2002.
13. Silverstein J, Kilgensmith G, Copeland K, Plotnick L, Kaufman F, Clark N. Care of children and adolescent with type 1 diabetes. *Diab care*. 2005;1:186-212.
14. Ryan C, Gurtunca N, Becker D. Hypoglycemia: A complication of diabetes therapy in children in sperling. 2005;1705-1733.
15. Faulkner M, Change L. Family influence on self-care, quality of life, and metabolic control in school-age children and adolescent with type 1 diabetes. *J Ped Nurs*. 2007;22(1):59-68.
16. Gurtunca N. Open sources epidemiologic statistics for public health. 2013.