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Basic Diabetes Knowledge and Care Activities on Caregiver's Missed Work and School Absenteeism– a Pilot Study

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Abstract

There is increasing prevalence of diabetes among children. Caregivers' skill is necessary for effective management of the disease. The purpose of this study is to understand caregivers' knowledge, perception and challenges in caring for children as they impact work and school absenteeism. A modified version of the Diabetes Self-Management Questionnaire (DSMQ) was administered to caregivers of diabetic children who consented during "Diabetes Parents Night" (DPN) organized by the Cumberland County School (CCS) Health Advisory Council (SHAC). Twenty of 25 questionnaires were useable. Diabetes knowledge regarding symptoms identification in this group was relatively low. Adequate care for their diabetic children was moderate. Thirty five percent reported either forgetting or skipping administering drugs most or all of the time. Forty five percentreported occassionally feeding their children lots of sweets or other foods rich in carbohydrates all or some of the time. Forty percent indicated their children do not exercise enough. Forty seven percent children miss school one or more times a month. Thirty five percent reported missing work one or more times a month. This pilot study indicates that caregivers need improved knowledge and care skills to manage children's diabetes in order to reduce both school and work absenteeism.

Keywords: Diabetes, Caregivers, Perceptions, Absenteeism

1 - Introduction

Diabetes continues to grow as a source of economic and social burden on societies despite improvement in treatment and management of the disease. Globally, about 422 million people suffer from diabetes and 1.6 million die from it every year(WHO). With nearly 34.2 million people in the U.S. diagnosed with diabetes, the incidence rate is estimated 6.9 per 1,000 population(CDC, 2020).About 210,000 children and adolescents younger than 20 years of age are diabetic. The growing numbers of both type 1 and type 2 diabetes among young people(CDC 2020)should be of public health interest as the burden of care is on parents and adult caregivers who may have their share of other life challenges. Of equal concern is the increasing prevalence of prediabetes among U.S. adolescents. One study found that 18% of US adolescents (1 in 5) had prediabetes during 2005–2016 (Andes, Cheng, Rolka, Gregg, Imperatore 2019).This trend will further exacerbate the burden on caregivers in the foreseeable future.In 2017, Diabetes mellitus was the 7th leading cause of death among 15-24-year-old in the United States(CDC 2017).

In 2016, 10.1% of North Carolinians adults had Diabetes. North Carolina recorded 23.9 deaths per 100,000 people in 2018,making diabetes the seventh leading cause of death in the state. In 2017, 12.3% of NC Cumberland County adult residents had diabetes(CDC 2019).The prevalence of both type 1 and type 2 diabetes among children and adolescents is increasing at a fast pace and the causes are yet to be fully understood (Dabelea, Mayer-Davis, Saydah, et. al. 2014). Diabetes prevalence among privately insured youths in NC is 11.3 -12.5 per 10,000 person-year (Rogers M., Rogers B.and Basu2018)and there are no indications of it abating in the nearfuture.

Studies have shown that students with diabetes missed more school days than their non-diabetic counterparts (Ryan, Longstreet and Morrow 1985; Vetiska, Glaab, Perlman and Daneman 2000; Thingholm, Gaulke, Eriksen, Svenson and Skipper 2020). Although there are inconsistencies in reports about academic achievements (Yu, Kail, Hagen and Wolters 2000),

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There is evidence that children with poor diabetes management do worse academically (McCarthy, Lindgren, Mengeling, Tsalikian and Engvall 2002). The combination of school absenteeism and poor diabetes management further jeopardize students' academic success.

Since children diabetes management and school attendance rest on parents or the attending adult caregivers, they must possess basic knowledge of diabetes which undergirds the self-care activities related to their children diabetes. By the same token, it is conceivable that their children's school absences will be disruptive to their (caregivers) normal daily routine and responsibilities like job. Caregivers of diabetic children are faced with numerous tasks which include but not limited to insulin administration, Blood Glucose Monitoring (BGM), close attention to dietary intake and physical activity doctor appointments, response to diabetic emergencies, etc.(Fichna, Skowronska and Stankiewicz 2005).Studies have shown that the overall outcome of diabetes is improved by parental or caregiver management of their child's diabetes-related tasks(Anderson, Vangsness, Cornell, Butler, Goebel-Fabbri and Laffel 2002; Ellis, Podolski, Frey, Naar-King, Wang and Moltz 2007). In addition to other extenuating factors that contribute to good outcome of diabetic management, caregivers must have basic knowledge on diabetes. Stallwood(2006) reported that "higher caregiver knowledge was associated with lower hemoglobin A $_{1c}$ (HbA_{1c}) levels …." and recommended "… ongoing knowledge assessments and educational interventions related to deficits, with a special focus on families in lower socioeconomic situations". Similar significant improvement in diabetes knowledge was recorded with an online knowledge evaluation (Zaldivar 2017). However, the literature is scanty when it comes to the impact of caregivers 'diabetes knowledge and care activities on the diabetic child school absences. The goal of this descriptive pilot study is two-fold: 1) to investigate the impact of caregiver's basic diabetes knowledge on diabetic child school absenteeism and caregiver's work absenteeism, and 2)to investigate the relationship between caregivers' overall perception of their care activities and child school and caregiver's work absenteeism. Results from this pilot study can be used to develop a more comprehensive investigation into the education of caregiver in order to enhance their diabetes management skills.

2 - Method

A modified version of the Diabetes Self-Management Questionnaire – DSMQ (Bukhsh, Lee, Pusparajah, Schmitt and Khan 2017) was administered during "Diabetes Parents Night" (DPN) by the School Health Advisory Council (SHAC) of the Department of Health Services within the North Carolina Cumberland County Schools (CCS) in 2018. The health Services Department is charged with, among other things, raising the level of health and enhancing the quality of students' lives. Cumberland County is situated in the southeastern region of North Carolina with a public school system of about 50,880 students. The DPN was organized by SHAC in an effort to combat the problem of diabetes in CCS(CCS 2021) by providing information and skill-building for parents and their diabetic children. Information about drug administration, nutrition, physical activity and county services was provided. It was also a night of fun for the children.

The modified DSMQ has basic signs and symptoms of hyperglycemia (high blood sugar) and hypoglycemia (low blood sugar), items inquiring about the parent/caregiver missing work and their children missing school due to diabetes and basic demographic items. The questionnaire was offered to parents who signed a consent form at the entrance of the event hall. Completion of the questionnaire took about ten minutes.

3 - Results

About 45 parents were in attendance at the DPN. Unfortunately, willingness to complete the questionnaire was overshadowed by the activities in the event hall as parent and children were eager to join in on the seemingly festive activities. Twenty-five (25) parent/caregivers with no indicated identity, completed the questionnaire out of which only 20 were usable. The participants comprised of thirteen (13) females, two (2) male and five (5) unidentified gender. Their age ranged from 28 to 68 years and level of education was varied. Table 1 shows the demographic breakdown. Four of the participating parents were diabetic themselves.

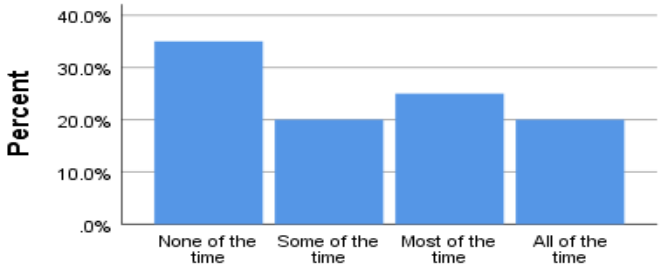
Table 1: Participants Demographic Characteristics

Participants Demographic Characteristics		
Characteristics	**Frequency**	**Percentage**
Gender		
Female	13	65
Male	2	10
Missing	5	25
Education		
Elementary School	2	10
High School	1	5

Vocational (2years)	5	25
Some college	4	20
BS	2	10
MS	5	25
PHD	1	5
Age		
25 - 34	3	15
35 - 44	8	40
45 – 54	2	10
55 – 64	1	5
65 - 75	1	5
Missing	5	25
Ethnicity		
Black/African American		70
Hispanic/Latino	3	15
White/Caucasian	2	10
Missing	1	5

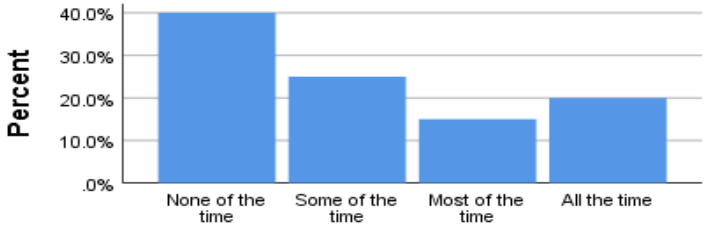
It is critical for diabetic patients to take responsibility for their disease through self-management like monitoring blood sugar level regularly and keeping doctor's appointment.Forty five percent (45%) of respondents in this study indicated that they do not check their child's sugar level most or all of the time as would be required for achieving good blood glucose control (Table 2).

Table 2: I do not check my child's blood sugar levels frequently enough



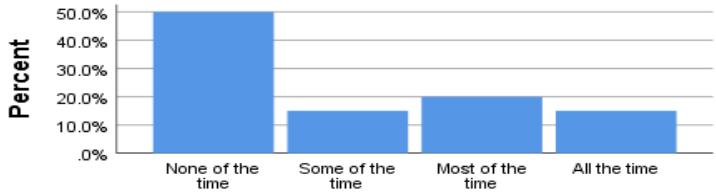
Seventy percent (70%) reported keeping doctor's appointments recommended for their children's diabetes treatment all of the time while 45% tend to avoid diabetes-related doctor's appointment most or all of the time. However, 35% of respondent indicated they mostly or totally agree they should see the medical practioner(s) more often regarding their children's diabetes care (Table 3)

Table 3: I should see my child's doctor more often



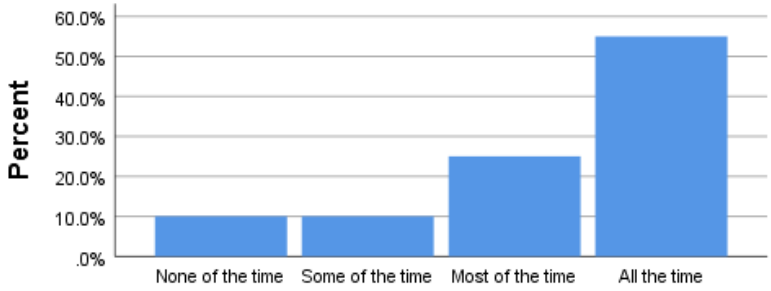
There are pharmaceutical options in the managemenet of diabetes (Libianto, Ekinci 2019)but taking these agents as prescribed is crucial to successful outcomes. In this pilot study, 50% of respondents reported never forgetting to give diabetes medication (e.g. insulin, tablets) to their children as prescribed while 35% reported they tend to forget or skip giving diabetes medicationall or most of the time(Table 4).

Table 4: I tend to forget/skip giving medication



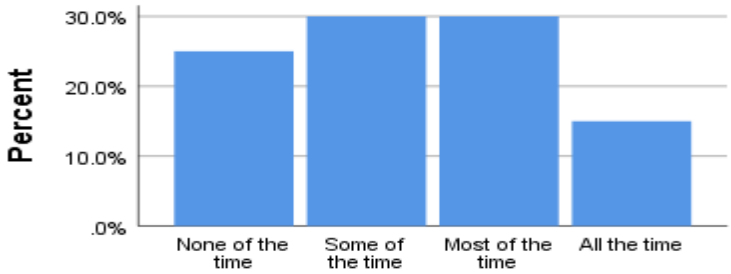
Healthy dietary habits and regular physical activity can help control diabetes(Lanhers, Walther, Chapier,Lesourd, Naughton,Pereira and Dutheil 2017). Seventy five percent (75%) of responents said they always choose food that makes it easy for their kids to achieve good blood sugar levelsand 80% indicated they strictly follow the dietary recommendations given by their children's doctors or diabetes specialist all or most of the time (Table 5).

Table 5: Do you strictly follow diet recommendation?



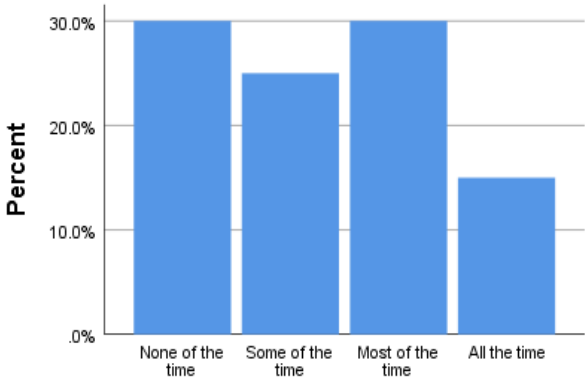
However, 45% said they occassionally feed their children lots of sweets or other foods rich in carbohydrates all or some of the time (Table 6).

Table 6: Do you occasionally feed your child lots of sweets?



The majority (70%) of respondents admitted that their children eat too much food during meals all, most or some of the time (Table 7). There is evidence that overeating reduces whole-body insulin sensitivity in young and healthy adults (Parry, Woods and Hodson 2017) and overeating is likely to interfer with sugar level management despite administration of medication to recommended insulin dose.

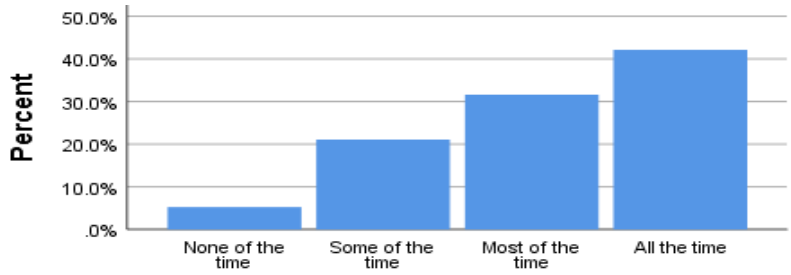
Table 7: Sometimes My child eats too much during meals



Regarding physical activity, 74% of respondents claimed their children do regular physical activity to achieve good blood sugar level most or all of the time (Table 8), but 40% and 45% of respondents respectively indicated that although it would improve their diabetes, their children do not exercise enough and that their children tend to skip planned physical activity. Although it is not indicated herein whether not getting enough or skipping planned physical activity is as a

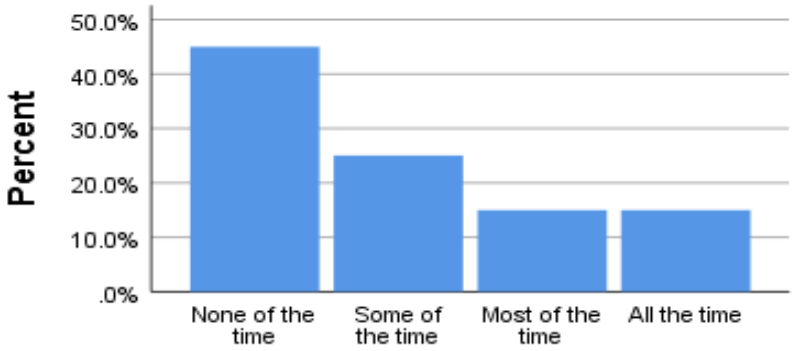
result of diabetic negative consequences or apprehension, a 2019 study has have reported that 30% of their type 1 diabetic youths study participants indicated that fear of hypoglycemia influenced their practice of physical activity(Boulbaroud, El Aziz and Chadli 2019).

Table 8: Does your child exercise regularly?



A sizeable number of participants do not believe that their children's diabetes self-care is good enough all of the time. (Table 9). Poor diabetes management not only worsens or complicates the disease, it may also result in other maladies(Krein, Heisler, Piette, Makki and Kerr 2005)and other social and economic difficulties.

Table 9: My child's diabetes self-care is poor



Forty seven percent (47%) of respondents in this survey reported their children miss school one time a month with 20% missing two or more times. Thirty five percent (35%) of respondents (parent/caretaker) reported missing work one time a month while 10% reported missing two or more workdays a month.

Diabetes knowledge, especially regarding symptoms recognition and skill efficacy, are paramount to proper management of the disease. In this study, only 30% correctly identified frequent thirst and urination as symptoms of diabetes while 15% identified unexplained weight loss, blurred vision and feeling tired as such. Dry mouth was identified by only 10% of respondents as a symptom of diabetes. There was no relationship between caretakes' knowledge and child school absenteeism or caretakers' missed workdays. However, poor children's diabetes self-care (a responsibility of the parent/caretakers) was related to children's school absenteeism and parents/caretakers missed workdays.

4 – Discussion

This study investigated the impact of caregiver's diabetes knowledge on diabetic child school absenteeism and caregiver's work absenteeism; and also the relationship between caregivers' overall perception of their care activities and child school and caregiver's work absenteeism. Although there was no relationship between caretakes' knowledge and child school absenteeism or caretakers' missed workdays, it is evident that there is much to be desired in this group's diabetes knowledge level. As in this study, diabetes knowledge deficit has been observed in both patients and healthcare providers (Speight and Bradley, 2001).

Research have shown that diabetes education or knowledge is important in the control of blood glucose level (Stallwood, 2006; Rothman, Malone, Bryant, Horlen, DeWalt and Pignone 2004). Thus, by extrapolation, diabetes knowledge level affects care activities and the overall management of the disease.

This study shows that poor children's diabetes self-care (a responsibility of the adult caretakers) was related to children's school absenteeism and parents/caretakers missed workdays. Therefore, in order to reduce the economic and social burden of diabetes, intervention should focus on providing relevant diabetes knowledge and management skill for both children and their caregivers.

5- Conclusion

One major limitation of this pilot study is the low number of participants. The survey was conducted during a parent diabetes night organized by the North Carolina Cumberland County School Health Advisory Council.

It was a night full of various activities and the survey was being administered in direct view of the activities, hence the low participation. The interpretation of the results of this pilot study is therefore limited by the low number of participants. Subsequent studies should endeavor to recruit more participants. There are indications in this pilot study that attention should be given to self-care activities related to children's diabetes for the welfare of both children with diabetes and their caregivers. Due to the low number of participants in this study, the significance of the relationship between school or work absenteeism and caretakers' knowledge of diabetes could not calculated. However, parents or caregivers of diabetic children should beequipped with knowledge beyond diabetes symptoms. Schools and communities should provide workshops that focus on diabetes symptoms recognition and the implications of proper management of diabetes. This should include proper drug administration, regular blood glucose monitoring, nutritional and physical activity habits and regular check-up with their healthcare providers. Diabetes is by and large a disease that can be managed through prudent and deliberate behavior modifications.

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