Parents Empowerment regarding Care of their Children with Diabetes Mellitus

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Abstract

Background: Family centered empowerment model helps parents with children with diabetes mellitus recognize the deficiencies and feel enough power in order to change the situation. **Aim of study:** Was to assess parents' empowerment regarding care of their children with diabetes mellitus. **Research design:** A descriptive research design was utilized to conduct this study. **Setting:** The study was conducted at Hassan Awad clinics affiliated with Health Insurance in Benha City. **Sample:** Simple random sample by random lottery was used sample was 188. **Two tools** were used: **Tool I**: A structured interviewing questionnaire was used to assess (a) Demographic characteristics of parents and their children, (b) Knowledge of parents and (c) Parents reported practices regarding care of children with diabetes mellitus. **Tool II:** Family empowerment scale to assess the level of family empowerment. **Results:** 41.5% of the studied parents aged from 25 to less than 35 years old with mean age was 37.52±6.15years. 68.6% of them were female and 91.0% were married. There was a positive correlation between total knowledge, total reported practices and total family empowerment among studied parents. **Conclusions:** 61.7% of the studied parents had a good total knowledge regarding diabetes mellitus, 51,1% of studied parents had satisfactory total reported practices and 24,4% of the studied parents had high total family. **Recommendations:** Health educational programs should be developed and implemented for parents to educate them with the most current information and proper practices regarding diabetes mellitus.

Keywords: Children, Diabetes Mellitus, Family centered empowerment model, Parents

Introduction

School age children aged from 6 years to 12 years which is the period of growth and consolidation and characterized by multiple dramatic inflection points during growth and development, as well as behavioral and psychosocial events occurring around the arrival of puberty. School age children may be affected with chronic diseases such as; asthma, epilepsy, developmental disabilities, including cerebral palsy, and autism spectrum disorders and metabolic diseases such as Diabetes Mellitus (DM) **(Saavedra & Prentice, 2023).**

Diabetes mellitus is a harmful and chronic illness characterized by persistently high blood glucose levels due to inadequate insulin production or when the body fails to utilize the insulin that is produced. DM affects individuals of all ages, genders, and geographic locations which is one of the most prevalent global causes of mortality and morbidity **(Hossain et al., 2024).** It has been estimated that Type1 Diabetes Mellitus (T1DM) represents approximately 5–10% of the total prevalence of diabetes. Six percent of prevalent cases were in the 0–14 year's age group (**Green et al., 2021).**

Diabetes mellitus classified to four types; T1DM, Type 2 Diabetes Mellitus (T2DM), Gestational Diabetes Mellitus (GDM) and Maturity Onset Diabetes of the Young (MODY). T1DM is an autoimmune

disease that results in the destroying of pancreatic islet β-cells, leading to metabolic failure requiring lifelong insulin treatment **(Herold et al., 2024).** T2DM is characterized by insulin resistance, where the body's cells do not respond properly to insulin, and eventually, insulin deficiency, when the pancreas cannot produce enough insulin to overcome this resistance leading to little or no insulin being produced **(Müssig, 2024).**

The classic symptoms of DM include polyuria, polydipsia and polyphagia. Fatigue and restlessness and body pain are also common signs of undetected DM. Persistent fatigue, weakness, and a general lack of energy are often associated with DM, affecting daily activities. Vision issues, such as blurred or hazy vision, may signal fluctuations in blood sugar levels affecting the eyes. Slow healing like wounds, cuts, or bruises taking longer to heal than usual may be indicative of impaired blood sugar control **(Abdullayevich, 2024).**

There are numerous approaches to blood glucose control, depending on the type of DM. T1DM is typically controlled with insulin therapy while T2DM may require oral drugs or insulin injections depending on the degree of severity. To effectively treat DM, a balanced, nutritious diet must be adopted, along with careful attention to carbohydrate intake and portion control. Physical activity helps regulate blood glucose levels. Regular check-ups with healthcare professionals ensure ongoing assessment, monitoring, and adjustments to the treatment plan based on children's responses and health status **(Dharmarathne et al., 2024).**

Family Centered Empowerment Model (FCEM) is defined as an effective partnership between health service providers and families on all aspects of health delivery. Family involvement at all stages of the diagnosis or rehabilitation has a positive impact on child development and better support practices **(Mohammadzadeh et al., 2023).**

Community Health Nurse (CHN) plays a crucial role in providing quality healthcare services for the community. CHN takes care of children with DM and helps them to deal with disease or chronic disability. CHN provides assistance to the parents and children for blood glucose. The CHN plays an important role in providing psychosocial encouragement and support for parents throughout counselling, treatment and follow up **(Brentari et al., 2023).**

Significance of the study

Diabetes mellitus is one of the most common endocrine diseases in children worldwide. DM incidence was greater in boys than in girls and was greater in 5 to 9 years. DM prevalence is rapidly increasing due to factors such as economic progress, urbanization, dietary shifts, decreased physical activity, and changes in lifestyle **(Stahl-Pehe et al., 2024).** The incidence of DM is 8/100 000 per year in Egypt in children under the age of 15 years. Ages between 10-15 years were more commonly affected than the younger age group (5-10) years. According to study performed in Menoufia Governorate, the prevalence rate of DM among school-age children was 3.75/1000. It was more prevalent in urban areas 4.5/1000 than in rural areas 3/1000 and in boys 66.7% than in girls 33.3%, so, the parents should be aware of the nature of the disease and its effects to increase the knowledge and practices regarding the children with DM **(Hassan et al., 2024).**

Aim of study:

The aim of the present study was to assess parents' empowerment regarding the care of their children with diabetes mellitus.

Research questions:

1-What is the knowledge of parents regarding diabetes mellitus?

2-What is the parents reported practices regarding care of their children with diabetes mellitus?

3-What is the parents' empowerment level regarding care of their children with diabetes mellitus?

4-Is there a relation between knowledge, reported practices and family empowerment of parents regarding their children with diabetes mellitus and demographic characteristics?

5-What is the correlation between total knowledge, reported practices and family empowerment level of parents regarding their children with diabetes mellitus?

Research design:

Descriptive research design was utilized to carry out this study.

Setting:

The study was conducted at Hassan Awad clinics affiliated to Health Insurance in Benha city.

Sampling type:

Simple random sample of children with diabetes mellitus was used in this study and chosen by random lottery. The total number of children diagnosed with diabetes mellitus that attended was being chosen according to inclusion criteria; children aged 6-12 years, children with diabetes mellitus, children are free from any other disease. The total number of children aged 6-12 years was 188 children.

Tools of data collection: Data was collected through the following tools:

Tool (1): Structured interviewing questionnaire was used in this study; It was developed by researchers based on review, written in simple Arabic language. It consisted of four parts:

The first part: It was concerned with demographic data of studied sample and included two parts**:**

A-Demographic characteristics of parents of children with diabetes mellitus consisted of nine questions included age, sex, marital status, education level, residence, job, number of children, income and type of family.

B-Personal data of children with diabetes mellitus consisted of four questions included age, sex, child ranking and weight.

The second part: It included a questionnaire to assess knowledge of parents of children with diabetes mellitus regarding diabetes mellitus consisted of seven questions.

Scoring system of knowledge:

The scoring system of parents' knowledge was calculated as follows (2) score for complete and correct answer, while (1) score for incomplete and correct answer and (0) score for wrong and don't know answer. For each question of knowledge, the score of the items was summed-up and the total divided by the number of items. These scores were converted into a percent point and the total knowledge score was classified as the following:

Total scores of knowledge = 14 points

- **Good** when total score is >75% to 100%: (>11 points)
- **Average** when total score is between 50% and 75% (7-11 points)
- **Poor** when the total score is < 50% (< 7 points)

The third part: It included a questionnaire to assess parents reported practices regarding care of children with diabetes mellitus. It consisted of 4 main sections and 28 questions:

A-Parents reported practices regarding feeding that consisted of eight questions.

B-Parents reported practices regarding treatment and follow-up that consisted of eight questions.

C-Parents reported practices regarding rest and sleep that consisted of five questions.

D-Parents reported practices regarding the care of children that consisted of seven questions.

Scoring system of practices:

It was calculated as follows (1) score for done practicing while, (0) score for not done practicing. The score of each question of reported practices was summed- up and the total is divided by the number of items. These scores were converted into a percentage score and the total reported practice score was classified as the following:

Total scores of practices = 28 points

The total practices scores were considered:

- **Satisfactory** if the score of the total practice is ≥ 60% (≥ 17points).
- **Unsatisfactory** if the score of the total practice score < 60%: (< 17 points).

Tool 11: Included family empowerment scale to assess level of family empowerment. That adapted from **(Segers et al., 2019)** and was modified by the researchers. It included 34 items in three domains.

The first domain: Was family that consisted of twelve items.

The second domain: Was services system that consisted of twelve items.

The third domain: Was community participation which consisted of ten items.

Scoring system of family empowerment scale:

It was calculated as: (2) score for always, (1) sometimes and (0) score for never. The score of each question of reported family empowerment scale was summed- up and the total is divided by the number of items. These scores were converted into a percentage score and the total reported family empowerment level score was classified as the following

Total scores of family empowerment: 68 points

- **High** when the total score is >75% to 100%: (51points)
- **Moderate** when total score is between 50% and 75%: (34-51points)
- **Low** when the total score is < 50 %: (34points)

Content validity of the tool:

Content validity of the tool was ascertained by three of Faculty's Staff Nursing Experts from the Community Health Nursing Specialists three from (Faculty of Nursing Benha University) who reviewed the tool for clarity, relevance, comprehensiveness, applicability, and easiness for implementation and according to their opinion minor modifications were made.

Reliability of the tools:

Reliability was done by Cornbrash's Alpha coefficient test which revealed that each of the two tools consisted of relatively homogenous items as indicated by the moderate to high reliability of each tool. The internal consistency of knowledge was =0.92, practices was =0.89 and empowerment =0.93.

Ethical consideration:

Ethical approval was obtained from the Scientific Research Ethical Committee at the Faculty of Nursing at Benha University before starting the study. All ethical issues were assured; Oral consent has been obtained by parents of children with diabetes mellitus before conducting the interview and given them a brief orientation to the purpose of the study. They were also reassured that all information gathered would be treated confidentiality and used only for the purpose of study at any time without giving any

reasons. The study didn't show any physical, social, or psychological risks. Ethics, values, and cultures were respected.

Pilot study:

The pilot study was carried out on 19 parents of children with diabetes mellitus who represented 10% of total sample size (188). The pilot was made to assess the validity, clarity, applicability of tools and time needed was 30-45 minutes to fill each sheet as well as to identify any obstacles that may hinder the data collection. The pilot study was included as no modifications were made and all samples included.

Field work:

A review of recent, current, national and international literature in various aspects of the problem and to prepare the tools of data collection. The study was carried out through a period of six months from the beginning of February 2024 to end July 2024. The researchers introduced herself and explained the aim of the study to each subject, data collection was done through interviewing with the parents. Data collection were done at Hassan Awad clinics affiliated to Health Insurance in Benha City and average number of parents was between 3-5 parents a day depending on the responses. The average time needed for each tool was around 30-45 minutes. The researchers visited the selected clinics from 9 am to 11 am, two days/week (Saturday& Monday) to collect data.

Statistical analysis:

All data were organized, categorized, tabulated and analyzed by using Statistical Package for Social Science (SPSS) version 21, which used frequencies and percentage for qualitative descriptive data and chi square was used for quantitative data. Data was presented by using proper statistical tests that were used to determine whether there were significant relation or not and if there were positive correlation or not. P-value was used to determine the significance of results.

- P value >0.05 is no statistically significant difference.
- P value <0.05* is statistically significant difference.
- P value <0.001** is highly statistically significant difference.

Results:

Table (1): Reveals that 41.5% of the studied parents aged from 25 to less than 35 years old with mean age was 37.52±6.15years. 68.6% of them were female and 91.0% were married, while 50% of them had secondary education. Regarding residence 64.4% of them were from rural areas and 43.6% weren't working. As well, 47.3% of them had two children and 62.2% had enough income. Meanwhile 53.7% of them lived in nuclear families.

Table (2): Reveals that 42.5 % of the studied children aged from 6 to less than 8 years old with mean age 8.61±2.12 years old and 69.7% of them were boy. Also, 46.3% of the studied children were second in ranking and 50.0 % of them were at normal weight.

Figure (1): Illustrates 61.7% of the studied parents had a good total knowledge regarding diabetes mellitus, while 21.8 % of them had average total knowledge and only 16.5% of them had poor total knowledge regarding diabetes mellitus.

Figure (2): Demonstrates that 51.1% of studied parents had satisfactory total reported practices regarding care of their children with diabetes mellitus and 48.9% of them had unsatisfactory total reported practices regarding care of their children with diabetes mellitus.

Figure (3): Illustrates that 24.4% of the studied parents had high total family empowerment level regarding their children with diabetes mellitus and 58.0% of them

had moderate total family empowerment level. While 17.6% only had low total family empowerment level.

Table (3): Describes that there was a highly statistically significant relation between total knowledge score of parents and their age, marital status, education level and income at P value ≤ 0.001. Also, there was statistically significant relation between total knowledge score of parents and their sex, residence and occupation at P value < 0.05.

Table (4): Indicates that; there was high statistically significant relation between total practices scores of parents and their age, sex, marital status, education level and income at P value ≤ 0.001. While there was statistically significant relation between total practices scores of parents and their occupation at P value < 0.05, and there was no statistically significant relation between total practices scores of parents and their residence.

Table (5): Indicates that; there was a highly statistically significant relation between total family empowerment level of parents and their age, education level, residence and income at P value ≤ 0.001. While there was statistically relation between total family empowerment level of parents and their sex, marital status and occupation at P value < 0.05.

Table (6): Reveals that there was a positive correlation between total knowledge, total practices and total family empowerment among studied parents.

Table (1): Distribution of studied parents regarding their demographic characteristics (n=188).

Items	No.	%
Age		
25 - < 35 years	78	41.5
35 - < 45 years	74	39.4
45 - < 55 years	36	19.1
Mean ±SD	**37.52±6.15**	
Sex		
Male	59	31.4
Female	129	68.6
Marital status		
Married	171	91.0
Divorced	9	4.8
Widow	8	4.2
Education level		
Basic education	15	8.0
Secondary education	94	50.0
University education	79	42.0
Residence		
Urban	67	35.6
Rural	121	64.4
Occupation		
Free work	34	18.1
Employee	72	38.3
Not working	82	43.6
No of children		
One	9	4.8
Two	89	47.3
Three	70	37.3
Four	20	10.6
Income		
Enough and save	40	21.3
Enough only	117	62.2
Not enough	31	16.5
Type of family		
Nuclear family	101	53.7
Extended family	87	46.3

Table (2): Distribution of studied children regarding their personal characteristics (n=188)

Items	No.	%
Age		
6 - < 8 years	80	42.5
8- <10 years	50	26.6
10 - ≤12 years	58	30.9
Mean ±SD	**8.61±2.12**	
Sex		
Male	131	69.7
Female	57	30.3
Child ranking		
First	73	38.8
Second	87	46.3
Third	28	14.9
Weight		
Under weight	13	6.9
Normal	94	50.0
Over weight	81	43.1

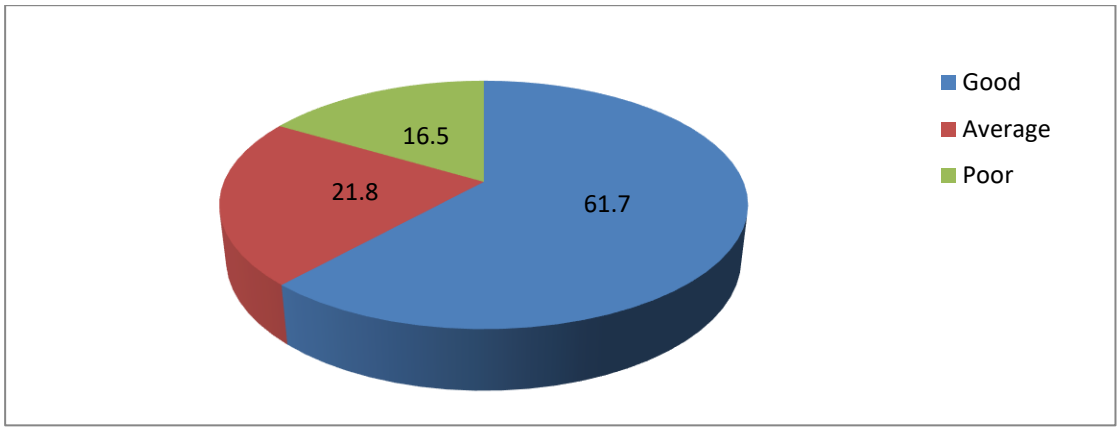

Figure (1): Percentage distribution of studied parents regarding their total knowledge scores about diabetes mellitus (n=188).

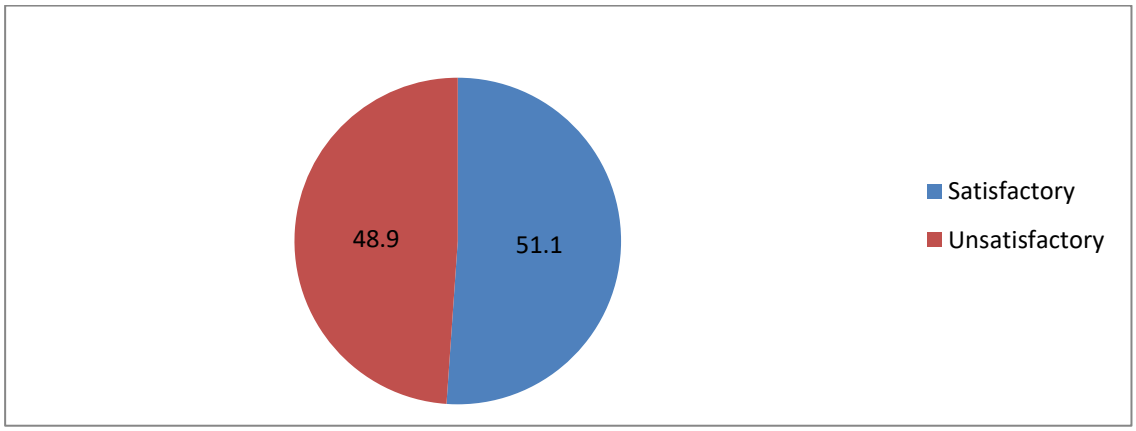

Figure (2): Percentage distribution of studied parents regarding their total reported practices level about diabetes mellitus (n=188).

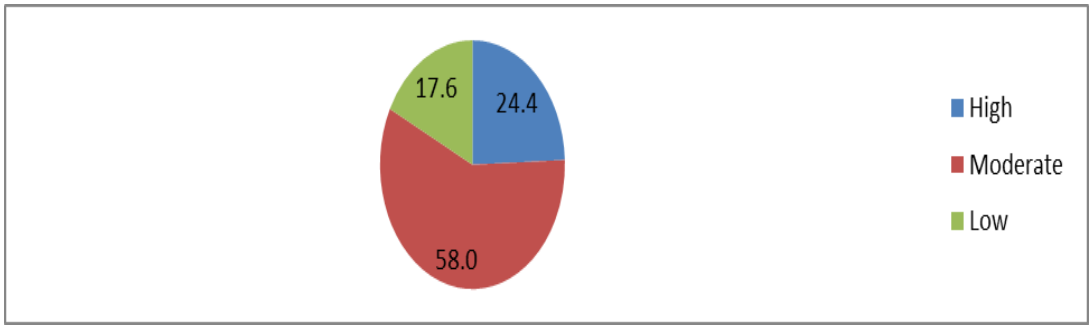

Figure (3): Percentage distribution of studied parents regarding their total family empowerment level about diabetes mellitus (n=188).

Table (3): Relations between the parents' demographic characteristics and their total knowledge score about diabetes mellitus (n=188).

Demographic characteristics	Total knowledge score						X^2	P-value
	Poor (n=31)		Average (n=41)		Good (n=116)			
	No.	%	No.	%	No.	%		
Age								
25-<35 years	4	12.9	18	43.9	56	48.3	50.8	0.000*
35-45 years	22	71.0	3	7.3	49	42.2		
45-<55	5	16.1	20	48.8	11	9.5		
Sex								
Male	13	41.9	19	46.3	27	23.3	9.40	0.009*
Female	18	58.1	22	53.7	89	76.7		
Marital status								
Married	31	100.0	33	80.5	107	92.2	35.0	0.000*
Divorced	0	0.0	0	0.0	9	7.8		
Widow	0	0.0	8	19.5	0	0.0		
Education level								
Basic education	11	35.5	4	9.8	0	0.0	60.32	0.000**
Secondary education	20	64.5	23	56.1	51	44.0		
University education	0	0.0	14	34.1	65	56.0		
Residence								
Urban	4	12.9	19	46.3	44	37.9	9.29	0.010*
Rural	27	87.1	22	53.7	72	62.1		
Occupation								
Free work	9	29.0	8	19.5	17	14.7	11.57	0.021*
Employee	4	12.9	19	46.3	49	42.2		
Not working	18	58.1	14	34.1	50	43.1		
Income								
Enough and save	0	0.0	22	53.7	18	15.5	117.11	0.000**
Enough only	8	25.8	19	46.3	90	77.6		
Not enough	23	74.2	0	0.0	8	6.9		
Type of family								
Nuclear family	9	29	28	68.3	64	55.2	11.20	.004
Extended family	22	71	13	31.7	52	44.8		

Table (4): Relations between parents' demographic characteristics and their total reported practices regarding their children with diabetes mellitus (n=188).

Demographic characteristics	Total reported practices.				X^2	P-valu
	ısatisfactory (n=92)		Satisfactory (n=96)			
	No.	%	No.	%		
Age						
25-<35 years	27	29.3	51	53.1	26.57	0.000**
35-45 years	34	37.0	40	41.7		
45-55 years	31	33.7	5	5.2		
Sex						
Male	43	46.7	16	16.7	19.72	0.000**
Female	49	53.3	80	83.3		
Marital status						
Married	84	91.3	87	90.6	16.97	0.000**
Divorced	0	0.0	9	9.4		
Widow	8	8.7	0	0.0		
Education level						
Basic education	15	16.3	0	0.0	67.02	0.000**
Secondary education	65	70.7	29	30.2		
University education	12	13.0	67	69.8		
Residence						
Urban	27	29.3	40	41.7	3.10	0.078
Rural	65	70.7	56	58.3		
Occupation						
Free work	23	25.0	11	11.5	6.13	0.047*
Employee	34	37.0	38	39.6		
Not working	35	38.0	47	49.0		
Number of children						
One	5	5.4	4	4.2	16.597	0.001**
Two	30	32.6	59	61.5		
Three	46	50.0	24	25.0		
Four	11	12.0	9	9.4		
Income						
Enough and save	16	17.4	24	25.0	21.67	0.000**
Enough	49	53.3	68	70.8		
Not enough	27	29.3	4	4.2		
Type of family.						
Nuclear family	43	46.7	58	58.6	3.535	.060
Extended family	49	53.3	38	38.4		

Table (5): Relation between demographic characteristics of studied parents and their total family empowerment score regarding their children with diabetes mellitus (n=188).

Demographic characteristics	Total family empowerment scores						X^2	P-value
	Low (n=33)		Moderate (n=109)		High (n=46)			
	No.	%	No.	%	No.	%		
Age								
25-<35 years	4	12.1	52	47.7	22	47.8	32.16	0.000**
35-45 years	14	42.4	36	33.0	24	52.2		
45-55 years	15	45.5	21	19.3	0	0.0		
Sex								
Male	19	57.6	29	26.6	11	23.9	12.86	0.002*
Female	14	42.4	80	73.4	35	76.1		
Marital status								
Married	29	87.9	100	91.7	42	91.3	9.94	0.041*
Divorced	0	0.0	5	4.6	4	8.7		
Widow	4	12.1	4	3.7	0	0.0		
Education level								
Basic education	15	45.5	0	0.0	0	0.0	134.05	0.000**
Secondary education	18	54.5	72	66.1	4	8.7		
University education	0	0.0	37	33.9	42	91.3		
Residence								
Urban	0	0.0	39	35.8	28	60.9	31.04	0.000**
Rural	33	100.0	70	64.2	18	39.1		
Occupation								
Free work	13	39.4	10	9.2	11	23.9	17.19	0.002*
Employee	10	30.3	45	41.3	17	37.0		
Not working	10	30.3	54	49.5	18	39.1		
Number of children								
One	0	0.0	9	8.3	0	0.0	34.500	0.000**
Two	12	36.4	46	42.2	31	67.4		
Three	10	30.3	45	41.3	15	32.6		
Four	11	33.3	9	8.3	0	0.0		
Income								
Enough and save	6	18.2	23	21.1	11	23.9	50.68	0.000**
Enough	8	24.2	78	71.6	31	67.4		
Not enough	19	57.6	8	7.3	4	8.7		
Type of family								
Nuclear family	15	45.5	60	55.0	26	56.5	1.129	.569
Extended family	18	54.5	49	45.0	20	43.5		

Table (6): Correlation matrix between total knowledge, total reported practices and total family empowerment among studied parents (n=188).

Items		Total knowledge	Total practices	Total family empowerment
Total knowledge	r	1	.865	.760
	P-value		.000**	.000**
	N	188	188	188
Total practices	r	.865**	1	.900
	P-value	.000**		.000**
	N	188	188	188
Total family empowerment	r	.760	.900	1
	P-value	.000**	.000**	
	N	188	188	188

Discussion

Diabetes mellitus is one of the most common chronic childhood conditions and its incidence is rising worldwide, including among pre-school aged children. This condition is now mostly managed using flexible intensive insulin regimens, which involve multiple daily tasks and may present different issues and challenges to conventional regimens based on fixed schedules and insulin doses **(Kimbell et al., 2021).**

As regard to the studied parents' demographic characteristics: the current study revealed that, more than two fifths of the studied parents aged from 25 to less than 35 years old with mean age 37.52±6.15. This result was agreed with the study performed by **Noser et al., (2019),** who studied "Parental Depression and Diabetes-Specific Distress after the Onset of Type 1 Diabetes in Children", this study was conducted at Los Angeles, n=126, and revealed that the mean age of parents was 36.62±6.40. From the researchers' point of view, this might be due to the sample size inclusion criteria which indicating parents' age not less than 25 years.

Regarding to sex of parents, the current study revealed that more than two thirds of the parents were female. This result was consistent with **Saßmann et al., (2022)**, who studied "Understanding Daily, Emotional, and Physical Burdens and Needs of Parents Caring for Children with Type 1 Diabetes", this study was conducted at Germany, and revealed that more than three quarters 83% of participants were female. From the researchers' point of view, this might be due to mothers bear the greatest burden of caring for their children or might be attributed to fathers work.

As regards to marital status, this study revealed that the most of the parents were married. This result was agreed with the study done by **Rifshana et al., (2017)**, who revealed that four fifths 80 % of the studied parents were married. From the researchers' point of view, this might be due to the family bond and understanding between the spouses to protect their children from disintegration.

Regarding to child's personal characteristics, the current study revealed that more than two fifths of the studied children aged from 6 to less than 8 years old with mean age 8.61±2.12 years old. This result was consistent with the study done by **Rostaminasab et al., (2023)**, who studied

"The Effect of Family-Centered Empowerment Model on Burden of Care in Parents and Blood Glucose Level of Children with Type I Diabetes Family Empowerment on Burden of Care and HbA1C", this study was conducted at Iran, n=100, and found that the mean age of the children was 9 years. From the researchers' point of view, this might be due to the sample inclusion criteria and might be as a finding of the possibility of an increased incidence of diabetes in this age group.

Regarding to sex of children, the current study revealed that more than two thirds of the children were male. This result was incongruent with the study done by **Rostaminasab et al., (2023)**, who reported that the more than 56% of children were girls. From the researchers' point of view, this might be due to type I diabetes is more common in males than females according to the previous studied.

Regarding to the total knowledge scores about diabetes mellitus, the current study illustrated that more than three fifths of the studied parents had a good total knowledge regarding diabetes mellitus. This result was different with the study conducted by **Hussien & Tantawi, (2019)**, who studied "Mothers' Knowledge and Practices toward their Children Suffering from Juvenile Diabetes", this study was conducted at Ain Shams University in Egypt, n=77, and revealed that nearly two thirds 64,9% of the studied mothers had unsatisfactory knowledge about juvenile diabetes. From the researchers' point of view, this might be due to health education provided by health care team members besides knowledge availability on social media.

Concerning the studied parents` total reported practices level about diabetes mellitus, the current study demonstrates that more than one half of studied parents' had satisfactory total reported practices regarding care of their children with diabetes mellitus. This result was different with **Girma & Arefayine, (2023)**, who studied "Knowledge and Practices on Diabetic Care among the Caregivers of Children with Type 1 Diabetes Mellitus: A cross-Sectional Study", this study was conducted at Ethiopia, n= 158, and revealed that about three fifths 57.6 % of caregivers have a poor level of practice. From the researchers' point of view, this might be due to parents' good knowledge levels and received health education which reflects on their practices.

Regarding the studied parents' total family empowerment level about diabetes mellitus, the current study illustrated that nearly one quarter of the studied parents had high total family empowerment level regarding their children with diabetes mellitus. This result was incompatible with the study performed by **Rondhianto et al., (2020)**, who studied "Development Family Caregiver Empowerment Model (FCEM) to improve Family Caregiver Capability on Type 2 Diabetes Self-Management" this study was conducted at Russia, and revealed that most 96.6% of the respondents, have empowerment stages in the high category. From the researchers' point of view, this might be due to parents' avoidance of interactions with other families and events in addition to lack of perceived support from their families that may be due to family members' limited knowledge.

As regards to relations between the parents demographic characteristics and their total knowledge score about diabetes mellitus, the current study described that; there was a highly statistically significant relation between total knowledge score of parents and their age, marital status, education level, income. Also, there was statistically

significant relation between total knowledge score of parents and their sex, residence and occupation.

This result was supported by **Babiker et al., (2023)**, who studied "Diabetes Knowledge among Caregivers of Pediatric Diabetic Patients in Sudan, Khartoum", and found that females had significantly higher knowledge scores than males and a significant difference between educational levels and knowledge was found. From the researchers' point of view, this might be explained by increased lived and age experiences with old age and spouse support to manage children condition and education level that help parents to acquire knowledge well. From the researchers' point of view, this might be due to increased lived and age experiences with old age and spouse support to manage children condition and education level that help parents to acquire knowledge well.

Regarding to relations between parents' demographic characteristics and their total reported practices regarding their children with diabetes mellitus, the current study indicated that; there was high statistically significant relation between total practices scores of parents and their age, sex, marital status, education level and income. While there was a statistically significant relation between total practices scores of parents and their occupation, and there was no statistically significant relation between total practices scores of parents and their residence. This result was compatible with **Rahman et al., (2021),** who revealed that parents who completed secondary education had well practice than those completing primary education. From the researchers' point of view, this might be due to mothers' close relationship with children in addition to their adherence to child management practices more than fathers who stay long hours away from home and the inappropriate practice of educated parents can be easily corrected.

Regarding the relation between demographic characteristics of studied parents and their total family empowerment level regarding their children diabetes mellitus, the current study indicated that; there was a highly statistically significant relation between total family empowerment level of parents and their age, education level, residence and income. While there was statistically relation between total family empowerment level of parents and their sex, marital status and occupation. This result disagreed with **Lebo, (2022)**, who studied "Social Support and Empowerment among Caregivers of Children with Asthma", this study was conducted at University of Central Florida and found that there was no relationship between income level and empowerment. The current study revealed that; there was positive correlation practices and total family empowerment among studied parents (table 6). This result was similar with the study conducted by **Nassar et al., (2022),** who studied "Effect of Mothers' Care Adherence on Control of type 1 Diabetes Mellitus Among their Children", this study was conducted at Menoufia in Egypt, n= 100, and revealed that there was a positive correlation between total score of the mother's knowledge about type 1 diabetes in children and total score of the mothers' practices.

Conclusion

Less than two third of studied parents had a good total knowledge regarding diabetes mellitus and more than half of them had satisfactory total reported practices regarding care of their children with diabetes mellitus. More than half of them had moderate family empowerment level. There was a highly statistically significant relation between the total knowledge score of parents and their age, marital status, educational level and

income. There was high statistically significant relation between total practices scores of parents and their age, sex, marital status, educational level and income. There was highly statistically significant relation between total family empowerment level of parents and their age, educational level, residence and income. There was positive correlation between total knowledge, total reported practices and total family empowerment among studied parents.

Recommendations:

Health educational programs should be developed and implemented for parents to educate them with the most current information and proper practices regarding diabetes mellitus.

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تمكين الآباء فيما يتعلق برعاية أطفالهم المصابين بمرض السكر

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يساعد نموذج التمكين الاسرى الوالدين الذين لديهم أطفال مصابين بمرض السكرفى التعرف على أوجه القصور، والشعور بالقوة الكافية لتغيير وضع اسرهم. لذلك هدفت الدراسة إلى تقييم تمكين الوالدين فيما يتعلق برعاية أطفالهم المصابين بمرض السكر. وقد أجريت هذة الدراسة على ١٨٨ عينة عشوائية من الاطفال المترددين على عيادات حسن عوض التابعة للتأمين الصحي بمدينة بنها. حيث كشفت النتائج عن ٦١,٧٪ من الوالدين لديهم معرفة جيدة فيما يتعلق بمرض السكر، ٥١,١٪ من الوالدين لديهم مستوى مرضى من الممارسات، و٢٤,٤٪ من الوالدين لديهم مستوى عالى من التمكين الاسرى. وقد لخصت النتائج على أن هناك علاقة ارتباطية موجبة بين معلومات الوالدين وممارساتهم و التمكين الأسرى، و أوصت الدراسة بتطوير وتنفيذ برامج تثقيفية صحية للوالدين لتثقيفهم بأحدث المعلومات والممارسات السليمة فيما يتعلق بمرض السكر.