Effect of Fluid & Electrolytes and Glucose Monitoring Implementation on Length of Stay for Patients with Diabetic Ketoacidosis

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Abstract

Background: A serious global health issue, diabetes mellitus (DM) affects millions of individuals globally. Often a serious medical emergency, diabetic ketoacidosis (DKA) is a consequence of diabetes. **Aim of the Study**: to evaluate the effect of fluid & electrolytes and glucose monitoring implementation on length of stay for patients with diabetic ketoacidosis. **Research Design:** a quasi-experimental study design utilized to fulfill the aim of this research (study and control group). **Subjects and Setting:** the research were conducted at medical care unit department at Minia University Hospital. A purposive sample of sixty adult DKA patients were be utilized in the current study. **Tools:** Data collection utilized by **First tool *1st part:*** the demographic characteristics of patient, ***2nd part:*** medical data assessment tool. **Second tool** Hospital Length of Stay chart. **Third tool** Blood glucose & HbA1c findings chart. **Fourth tool** fluid and electrolytes monitoring items chart. **Results:** shows that above half of the study as well as control groups (63.3%, 50%) respectively were within the age (18–30) years. Also, above half of the study as well as control groups were females (63.3%, 56.7%) respectively there was no statistically significant variations among both groups (study as well as control) toward blood glucose level measurements on the 1st day. While, there was a highly statistically significant variations among both groups (study as well as control) regard blood glucose level measurements on the 2nd day and 3rd day, but found statistically significant variations among both study as well as control groups toward blood glucose level measurements on the 4th day and 5th day. **Conclusion:** results revealed that fluid& electrolytes and glucose monitoring implementation had reduced hospital length of stay for patients with diabetic ketoacidosis. **Recommendation:** Future research and training programs should focus on tailored nursing interventions to address DKA severity and recovery managements.

Keywords: *Fluid & Electrolytes, Glucose Monitoring, Length of Stay, Ketoacidosis.*

Introduction:

A serious global health issue, diabetes mellitus (DM) affects millions of individuals globally. Regarding the International Diabetes Federation (IDF), the number of adults with DM has increased significantly over the past few decades; as of 2021, there were over 537 million individuals (aged 20–79) with DM. Regarding projections, this number will raise to 643 million by 2030 as well as 783 million by 2045 if present trends continue **(Ali & El-Sherbiny, 2023; Aly & Omairan 2022, IDF., 2021).**

When the body is unable to create enough insulin, glucose cannot enter cells to be used as fuel and carbs cannot be used as an energy source, resulting in diabetic ketoacidosis (DKA). Rather, the body breaks down fat to use as fuel. Ketones are an acidic byproduct of the body's breakdown of fat that can accumulate in the blood and urine. Rapid ketone generation causes DKA, which can be hazardous since it causes the blood to become acidic **(Mekky, et al, 2023).**

The goal of primary care is to reduce the risk of complications and stop diabetic ketoacidosis

from getting worse. More accurate treatment of fluid and electrolyte imbalances as well as insulin therapy, which can quickly lower blood glucose levels and raise the danger of hypoglycemia, have been made possible by monitoring techniques. Likewise, fluid therapy, especially in patients with underlying comorbidities, can result in fluid overload and associated problems **(Elendu et al., 2023).**

Insulin is one of three primary concerns that should be addressed in order to treat DKA and address the underlying cause of the illness. replenishment of fluids to address total body water and hypovolemia, if any. replacement of electrolytes, paying special attention to changes in serum potassium that could be fatal. The first-do-no-harm strategy is crucial. Determine whether the patient exhibits obvious symptoms of hypovolemia right away, and take a quick measurement of the serum potassium level. Give the patient 250–500 mL fluid boluses until the hypovolemia is corrected if they exhibit symptoms like tachycardia and hypotension (typically within one hour of presentation) *(***Besen, Ranzani & Singer, 2023).**

Resolving dehydration and addressing hyperglycemia, ketosis, and acidity are the ideal primary objectives of treating DKA. These objectives should be closely monitored along with the clinical signs and symptoms and lab results **(Calimag, et al 2023).**

In addition to their duties to guarantee the secure provision of care's patient in conformity with regional and national guidelines for clinical practice, nurses play a significant role in the care of patients with DKA. Continuous clinical and physical evaluation as well as hemodynamic status monitoring are all part of nursing care. Capillary blood glucose and ketone levels, which must be checked at least hourly throughout the acute phase, as well as vital signs, consciousness, and fluid balance—including precise intake and outflow charts—are all part of this **(French et al., 2019**).

Significance of the study:

Global estimates indicate that the prevalence of diabetes was 9.3percent in 2019 (463 million personnel); by 2030, it will have increased to 10.2percent (578 million) as well as by 2045, it will have risen to 10.9percent (700 million). Also, the incidence is greater in high-income nations (10.4percent) than low-income nations (4.0percent), and it is greater in urban regions (10.8percent) than in rural ones (7.2percent). Diabetes is thought to be the cause of 4.2 million deaths among persons aged 20 to 79. According to estimates, diabetes accounts for 11.3percent of fatalities worldwide, with the Middle East and North Africa having the greatest rate at 16.2percent as well as the Africa Region having the lowest rate at 6.8percent **(Omar et al., 2023).**

Egypt is one of the top ten countries in the global for the number of diabetic patients, regarding the IDF. About 15,56percent of individual in Egypt between the ages of twenty and seventy-eight have DM, and the DM is responsible for 86,478 fatalities every year. From about 4.4 million in 2007 to 7.5 million in 2013, Egypt's diabetes prevalence has grown significantly in a comparatively short period of time, and it is predicted to reach 13.1 million by 2035 **(Hegazi et** *al., 2016).*

The viewpoint the researcher that diabetes mellitus and its complications, nursing care at critical units with this patients were insufficient competent. So readmission occur from same patients. Which DKA increase length of stay at hospital. Also, increase rate of DKA cases in Elminia university hospital related to bad habits and decrease rate of annually check-up for this cases.

Aim of the study

Evaluate the effect of fluid & electrolytes and glucose monitoring implementation on length of stay for patients with diabetic ketoacidosis.

Research Hypothesis

Fluid & electrolytes and glucose monitoring implementation will reduce hospital length of stay for patients with diabetic ketoacidosis.

Subjects and Methods:

Study Design

This research utilized a quasi-experimental design to achieve its goal (study and control group).

Setting

The current study was carried out at (MCU) the medical care unit at Minia University Hospital were included in the study that affiliated to Minia University hospital.

Subjects

A purposive sample from patients whom were agreed to participate in current study included patients who were presented with DKA aged from 18 to ≤ 65 years related to inclusion criteria.

Diabetic ketoacidosis patients admitted at MCU at Minia University Hospital were about 60 patients the necessary size of sample was computed by the **Isaac & Micheal (1995),** formula as

$$N = \frac{n \times 30}{100}$$

- N = the size of sample.
- n = Total number of DKA patients admitted at Minia University Hospital through 2019:2020.

$$N = \frac{n \times 30}{100}$$

$$N = \frac{100 \times 30}{100}$$

- N = 30 Patient

Study group 30 patients + 30 patients for control group = 60 patients

Inclusion Criteria:

- Adult patients age from18 ≤ 65 years.
- Newly admitted patients to MCU with any levels of DKA diagnosis.
- All patients accept to share in the current study.

Exclusion Criteria:

- Patients who refuse to share in this research.

Study Duration: the data was gathered during the period from August 2021 to August 2023.

Tools: **The** 4 tools were formed and utilize to collect data for this research, these tools designed as well as examined by the researcher post extensive relevant evidences.

First tool: Structured assessment sheet it involved **[two parts]**

Part (1): patient's demographic characteristics chart: It was included items regard to patient as age, gender, occupation…..etc.

Part (2): Patient's medical data assessment sheet:- It was included details of DM and DKA …etc.

Tool II: Hospital Length of Stay chart: it was recorded for patients that cover three details of date of admission as well as discharge and the mean average of patient's hospitalization days for control and study group.

Tool III: Blood glucose &HBA1C findings chart: it was recorded blood glucose level through glucometer and HbA1c test would be done for current study sample (study and control group).

Tool IV: Fluid and Electrolytes Monitoring: this tool was consisted of nine (9) items used to evaluate fluid and electrolytes monitoring as following: intake and output chart, patient weight, signs and symptoms of dehydration, jugular vein and body edema assessment, record regard electrolytes, electrocardiography (ECG) changes and vital signs.

Validity and Reliability: The content validity was confirmed by a jury committee of five experts from various academic fields in medical-surgical nursing at Minia University. The tools were slightly modified based on their feedback. Reliability was estimated using the Cronbach alpha test, resulting in a score of 0.897.

Using Cronbach's alpha test (coefficient alpha), a statistical analytic method to verify the stability of the tools' internal consistency, the content dependability of the tools was evaluated.

Pilot study

Pilot research was, conducted on ten percent (6 patients) of involving DKA patients in medical care unit (MCU) who met the inclusion criteria.

The purpose of this pilot research was to assess the viability, objectivity and relevance of this research tools, as well as to estimate the time that required for data gathering. Upon analyzing the outcomes of the pilot research, it was determined, that no adjustments or modifications were deemed, necessary for the data collection tools. Those patients were included in the current research

Ethical Considerations:

- The current study was approved by the Dean of Nursing Faculty, the Faculty of Nursing's ethical and research committee, and the manager of the Minia University Hospital's Medical Care Unit (MCU).

- A month before the current study began, an official formal agreement was taken.
- Consent based on knowledge Following an explanation of the research's objective as well as nature, oral consent was voluntarily acquired from each patient involved in the research. told them that without a second agreement, the collected data would not be used in any future studies.
- To ensure secrecy and anonymity, every assessment sheet was coded as well as did not include the individuals' names. Patients may leave the present trial at any moment and without explanation.

Study procedure: -

- The current research was carried out in three phases

I- Preparatory phase

Using books, papers, periodicals, and magazines, a survey of recent, domestic, and foreign literature on a variety of problem-related topics was conducted. The number of newly admitted patients with a diagnosis of DKA at any level at Minia University Hospital's medical care unit was evaluated as part of the study. Once the hospital authorities have given their approval, the intended current study can begin. Data was gathered by the researcher from adult volunteers who fulfilled the study's inclusion requirements.

II- Implementation Phase

- Total study sample (30 study patients plus 30 control patients were observed first admission hour of DKA onset till day of discharge was completed. Data collection by researcher started over three days per week and other three days DKA patients were cared by hospital nursing staff in MCU who already taught ideal nursing care from the researcher and becoming competent in nursing practices for patients with DKA
- The researcher was monitored blood glucose level every hour in the first 6 hours then every 2 hours over five days, fluid intake and output every hour for the studied group DKA patients, monitored hemodynamic measurements every 2 hours over five days for the same group, electrolyte disturbances according to hospital policy and monitored lower limb edema measurement among the same group once daily, evaluated dehydration manifestations every day over five days for the same group, and calculated the hospital length of stay by subtracting date of discharge from date of admission.

III- Evaluation Phase

- Study group were cared by the researcher until discharge while control group were cared by hospital nursing staff in MCU at Minia University Hospital.
- The researcher was monitored blood glucose level every hour in the first 6 hours then every 2 hours over five days, fluid intake and output every hour for the studied group DKA patients, monitored hemodynamic measurements every 2 hours over five days for the same group, monitored electrolyte disturbances according to hospital policy and monitored lower limb edema measurement among the same group once daily, evaluated dehydration manifestations every day over five days for the same group, and calculated the hospital length of stay by subtracting date of discharge from date of admission

Data Analysis

Version 20 of SPSS was utilized to analyze the data. Findings were summed up using descriptive statistics (standard deviation, mean, frequency, as well as percentage). Relation between outcomes, nursing care, and stroke severity were examined using Pearson's correlation. The significance threshold was p less 0.05, while p below 0.001 was regarded as extremely significant.

Results:

Table (1): Representing Percentage Distribution of Studied Groups Regarding to their Socio-demographic Characteristics (n= 60)

Characteristics	Study Group (n=30)		Control Group (n=30)		X^2	p-value
	n.	%	n.	%		
Age						
18 – <30	**19**	**63.3**	**15**	**50**	**2.04**	**0.574**
30 – <40	**4**	**13.3**	**6**	**20**		

Characteristics	Study Group (n=30)		Control Group (n=30)		X^2	p-value
	n.	%	n.	%		
40 – <50	4	13.3	3	10		
≥ 50	3	10	6	20		
Gender						
Male	11	36.7	13	43.3	0.278	0.598
Female	19	63.3	17	56.7		
Marital Status						
Single	12	40	8	26.7	1.200	0.237
Married	18	60	22	73.3		
Residence						
City (urban)	10	33.3	12	40	0.073	0.787
Village (rural)	20	66.7	18	60		
Educational Level						
Illiterate	13	34.3	9	30	8.56	0.073
Read and write	1	3.3	5	16.7		
Elementary/ Secondary	3	10	4	13.3		
Diploma	11	36.7	5	16.7		
Bachelor or higher	2	6.7	7	23.3		
Occupation						
Work	9	30	12	40	0.659	0.417
Not Work	21	70	18	60		
Income						
Enough	5	16.7	13	43.3	5.079	0.024
Not Enough	25	83.3	17	56.7		

*** p = ≤ .05 (statistical significance)**

Table (1) shows that, above half of the study as well as control groups (63.3%, 50%) respectively were within the age group of (18–30) years. Moreover, the table revealed that above half of the study as well as control groups were females (63.3%, 56.7%) respectively. In regards to marital status, (60.0%, 73.3%) of the study as well as control groups were married and highest (66.7% &60%) of the groups were lived in rural areas. In additions above one third (34.3%) of the study group was illiterate as well as one third (30%) of the control group was illiterate. Results also, revealed that above half of study as well as control groups not had occupation.

Lastly, the table founded that most (83.3%) of study group were had not enough income while the highest percentage (56.7%) among control group where hadn't enough income. There was not statistically significant variations between both groups regard their socio-demographic characteristic.

Table (2): Percentage Distribution of Groups Regarding to their Medical Data (n= 60)

Data	Study Group (no-=30		Control Group (no-=30		X^2	p-value
	n.	%	n.	%		
DM Duration						
Less than One Year	19	63.3	17	56.7	0.787	9.861
1<5 Years	3	10	4	13.3		
5-10 Years	5	16.7	7	23.3		
More than 10 Year	3	10.0	2	6.7		
Treatment of DM						
Oral	6	20	4	13.3	4.790	0.188
Insulin	23	76.7	24	80		
Both oral & insulin	1	3.3	2	6.7		
Glycosylated Hemoglobin (HbA1c)						
Didn't Measure	10	33.3	11	36.7	18.04	0.052
Within normal measure	3	10	0	0		
Abnormal measure	17	56.7	19	63.3		
Mean± SD	7.16 ± 5.81		6.60±5.27			

*** p = ≤ .05 (statistical significance)** **** p = ≤.01 (highly statistical significance).**

Data	Study Group (no-=30		Control Group (no-=30		X^2	p-value
	n.	%	n.	%		
DM Duration						
Less than One Year	19	63.3	17	56.7	0.787	9.861
1<5 Years	3	10	4	13.3		
5-10 Years	5	16.7	7	23.3		
More than 10 Year	3	10.0	2	6.7		
Jugular Vein Assessment					0.741	0.389
Normal	26	86.7	28	93.3		
Abnormal	4	13.3	2	6.7		
Length of Hospital Stay						
1 – > 5 days	30	100	0	0	59.00	0.001**
5 – 7 days	0	0	30	100		

Table (2) shows that above half (63.3%) of the study group as well as above half (56.7%) of the control groups were had diabetes mellitus from less than one year but lowest percentage (10.0% & 6.7%) of the study as well as control group had DM from more than ten year. respectively treatment of diabetes mellitus, above half of study group (76.7%) was treated with insulin. While the majority (80%) of the control group was treated with insulin.

However, the table results found that above half (56.7% & 63.3%) of studied groups abnormal findings in level of glycosylated hemoglobin (HbA1c) measurements respectively. Also, the table clarified that, most of the groups (86.7% &93.3%) were had normal jugular vein assessment.

Lastly, according to length of hospital stay for study group the table founded that (100%) among all study group were stay less than five days in (MCU) but all control group were stay from five to seven days in MCU.

Finally, no statistically significant differences all items of patient's medical data among studied groups except length of hospital stay, results founded that highly statistical significance differences 0.001**.

Also, this table results found that above half of control and study group abnormal level of glycosylated hemoglobin (HbA1c) measurements (56.7% & 63.3 %) respectively. Also, the table displayed that, the majority of the study group were staying in unit from 1 to > 5 day (100%) of the study group staying less than five days in (MCU) but all control group (100%) staying from five to seven days in unit. Finally, no statistically significant variations in socio-demographic characteristics were found between the study as well as control groups and highly statistical significance variations in length of hospital stay were found between the study as well as control groups.

Figure (1): Mean Score of Length of Hospital Stay Days among Study as well as Control Groups (n=60)

Figure (1): Illustrates that, the table results reveal that the mean score of length of hospital stay days among study less than five days and control groups were more than five days constituted (6.33±0.727&3.56±0.844) respectively.

* p = ≤ .05 (statistical significance) ** p = ≤.01 (highly statistical significance).

Table (3): Comparison between the Study as well as Control Groups Toward their Blood Glucose Measurement Mean± SD over the Five Days (n= 60)

Blood Glucose Level	Study Group (n.-=30)	Control Group (n.-=30)	T	p-value
	Mean± SD	Mean± SD		
1st Day	388.1 ± 59.1	375.1 ± 30.6	1.33	0.230
2nd Day	199.4±45.2	136.9 ± 27.7	6.44	0.001**
3th Day	190.7± 40.1	145.3 ± 29.1	5.01	0.001**
4th Day	106.1± 68.1	140.1 ± 22.5	2.60	0.012*
5th Day	124.6 ± 49.1	108.7 ± 28.4	2.62	0.011*
Anova (P value)	85.1(0.001**)	62.3 (0.001**)		

Table (3) the table results revealed that, there was no statistically significant variations among groups toward blood glucose level measurements on the 1st day. While, there was a highly statistically significant variations among same group regard blood glucose level measurements on the 2nd day and 3rd day, but found statistically significant variations among study group as well as control group toward blood glucose level measurements on the 4th day and 5th day.

Table (4): Comparison between the Study as well as Control Groups toward the Fluid Intake measurements Mean± SD over the Five Days (n= 60)

Time	Fluid Intake					
	Oral (cc/24 hrs.)		t (P value)	IV (liter / 24 hrs.)		t (P value)
	Study (n-=30)	Control (n-=30)		Study (n-=30)	Control (n-=30)	
	Mean± SD	Mean± SD		Mean± SD	Mean± SD	
1st Day	-----	------	0.780 (0.438)	4.3 ± 3.03	4.31 ± 0.904	0.216 (0.830)
2nd Day	1530 ± 452.4	940 ± 247.5	6.26 (0.001**)	3.5 ± 7.26	3.1 ± 2.16	0.740 (0.462)
3th Day	1289.3 ± 51.3	983.3 ± 193.1	1.79 (0.079)	2.2 ± 11.4	1.9 ± 0.707	1.04 (0.302)
4th Day	1095.6 ± 37.3	960 ± 158.3	1.07 (0.287)	1.44 ± 2.06	1.6 ± 1.04	6.67 (0.001**)
5th Day	209.7± 42.8	845 ± 201.8	22.9 (0.001**)	1.46 2.06	1.4 ± 1.57	11.2 (0.001**)
F (P value)	54 (0.001**)			256 (0.001**)		

NB: First day NPO * p = ≤ .05 (statistical significance) ** p = ≤.01 (highly statistical significance).

Table (4): Displayed that, there was no statistically differences between the groups toward oral fluid intake (cc/24 hrs.) measurement in all five days except highly statistically significant (0.001**) in second day only. Also, the table reflected that, there was highly statistically significant differences among studied groups regarding intravenous fluid intake (liter / 24 hrs.) measurement only 4th day and 5th day as documented by *p*-value (0.001**, 0.001**) respectively but no statistically differences in other days.

Table (5): Comparison between the Study as well as Control Groups toward the Minerals & the Electrolytes Mean± SD Measurements Over the Five Days (n= 60).

Minerals	Study Group (n.-=30	Control Group (n.-=30	Test of Sig.	p-value
	Mean± SD	Mean± SD		
Potassium (K^+) (Normal 3.5: 5 mmol/L.)				
1st Day	4.71 ± 0.578	4.24 ± 0.191	1.73	0.088
5th Day	3.51 ± 0.520	3.99 ± 0.768	2.01	0.049*
Calcium (Ca^{++}) (Normal 2.12 : 2.62 mmol/L)				
1st Day	1.74 ± 0.613	1.51 ± 0.349	1.74	0.087
5th Day	1.48 ± 0.623	1.39 ± 0.583	0.572	0.570
Sodium (Na^+) (Normal 135: 145 mmol/L.)				
1st Day	133 ± 2.54	131.7 ± 2.70	1.69	0.095
5th Day	135.6 ± 2.79	138.1 ± 3.28	1.98	0.046*

* p = ≤ .05 (statistical significance) ** p = ≤.01 (highly statistical significance).

Table (5): Displayed that, there were no statistically significant variations between study as well as control groups toward their potassium measures in the 1st day as documented by *p*-value (0. 088) but highly no statistically variations in 5th day as documented by *p*-value (0.049*). While, the table showed that, there

was no statistically significant variations among study as well as control groups toward there calcium measures in the 1st day and 5th day as documented by *p*-value (0.087 & 0.570) respectively.

While, there was no statistically significant variations among studied groups toward there sodium measures in the 1st day documented by p-value (0.095) and but highly no statistically significant in 5th day as documented by *p*-value (0.046*).

Table (6) Correlation between Glucose Level, Oral Intake, Intravenous Fluid Intake and Urinary Output with Length of Hospital Stay among Studied Groups (n=60)

Variables	Length of Hospital Stay			
	Study		Control	
	R	*P*	*R*	*P*
Random glucose level	0.369	0.048*	0.225	0.197
Oral intake	0.098	0.613	0.203	0.281
Intravenous intake	0.449	0.040*	0.239	0.212
Urinary output	0.153	0.400	0.053	0.855

* p = ≤ .05 (statistical significance) ** p = ≤.01 (highly statistical significance).

Table (6): Shows that, there was a statistically significant positive connection between the study group regarding glucose level and intravenous fluid intake with their length of hospital stay but the table reveled that, there were no statistically significant correlations between the study group regarding oral intake and urinary output.

While, there were no statistically significant correlations among the control group toward all DKA parameters and their hospital stay length.

Discussion

Patients in hospitals are disproportionately affected by DM, which is currently on the verge of becoming an epidemic. Since in-hospital hyperglycemia indicates a higher risk of morbidity, death, intensive care unit admission, and longer hospital stays, all patients with hyperglycemia should be evaluated for diabetes **(Demidowich, Stanback & Zilbermint, 2024).**

A decreased in insulin or insulin resistance directly lead to DKA, a potentially dangerous clinical emergency that elevated levels of counter-regulatory hormones as cortisol, glucagon, catecholamines as well as results in hyperglycemia **(Demidowich, et al, 2024).**

Diabetic ketoacidosis (DKA) is a condition of diabetes mellitus that is life-threatening and occurs whenever blood sugar levels rise, ketones are produced and the body begins to get acidosis. The issue of timely and appropriate management is critical to avoid the development of fatal conditions **(Alshorfa , 2024).**

Aim of the Study

The aim of this study was to evaluate the effect of fluid & electrolytes and glucose monitoring implementation on length of stay for patients with diabetic ketoacidosis. This aim was achieved throughout the study findings and the research hypotheses were accepted.

Patient demographic data: It involved items regard to demographic traits of patient socioeconomic as (age, occupation, gender, marital status & level of education, etc.).

Based on this research showed that, their patients' age of the study group ranged from 18-30 year with mean average about two thirds and their age of the control group were between 18-30 year about half. From the viewpoint of the researcher, this is regard to the risk of DM increases with age among Egyptian populations because the risk of DM increases with obesity, gestational diabetes mellitus (GDM), hypertension, sedentary life (poor physical activity), life stressors carbohydrate or fat diets, family history of type 2 diabetes (T2D) risk factor for DM in Egypt.

This finding was consistent with **Alhazmi et al. (2017),** who showed that patients with type 1 diabetes (T1D) and type 2 diabetes (T2D) may exhibit both DKA and HHS; however, DKA is more frequently seen in younger T1D patients, while HHS is more frequently seen in adult and elderly T2D patients.

It is evident from the actual study's findings that women made up above half of the groups under investigation. According to **Raffoul et al. (2025),** the average gender of DKA patients was 147, with 64 (43.5%) males and 83 (56.5%)

females among the patients included in the analysis.

A large majority of patients in two groups married status this finding was in concordance with**, Alanazi, et al., (2024)** showed that, married were married 366 (51.6%). Several studies have come to the same conclusion **Eltom, et al., (2024).** But this present current finding is in disagreement with **Alsaedi, et al, (2024)** the result revealed that, A total of 238 (59.5%) were single.

A large majority of patients in both groups came from rural settings; this finding was in concordance with **Shahin et al., (2023)** who approximately had the same findings that, less than three quarters of them were from rural area. But, this present current finding is in disagreement with **Hajomer, et al., (2025)** the result revealed that, a total of (138) 73% lived in urban. Being from rural areas (from the viewpoint of the researcher) interferes with access to healthcare facilities and leads to a lack of awareness of DM complication as DKA crisis except in the urban city of the Minia government.

A large majority of patients in both groups income not enough (low); this finding was in concordance with **Hussien, et al., (2022).** Also, the actual results revealed that, above half of both studied groups not had occupation. This is not consistent with study of **Ganz et al., (2014)** in which employee numbers increased in a way that was statistically significant among diabetic patients than non-diabetics with p-value.

Furthermore, the results of the current study revealed that whereas over one-third of the control group held a diploma degree, over one-third of the study group was illiterate. These results were consistent with **Metwally et al. (2019),** which included 197 patients and found that over one-third of them were illiterate and over half of them were unemployed.

The results of a recent study on the treatment of diabetes mellitus made it clear that, whilst the majority of the control group received insulin treatment, over half of the study group received it. In a similar vein, **Schwarzfuchs et al. (2020)** found that less than half of the 307 patients in their study had recently developed DM, and over two thirds of them were insulin injection dependent.

Additionally, the current study found that the majority of the study group majority had insufficient income, whereas the control group above half had the largest percentage. that is comparable to the research done by **Ehrmann et al. (2020),** who found that psychological stress, lack of therapy, and low socioeconomic status were risk factors for DKA. However, this recent result contradicts **Shahin et al.'s (2023)** findings, which indicated that half of the patients in the study had DM disease for five to ten years.

However, the current investigation discovered that abnormal results in the levels of glycosylated hemoglobin (HbA1c) readings were detected in more than half of the groups that were tested. Similarly, a recent study by **Kamal et al. (2019)** found that patients with DKA had higher HbA1C levels. Found that majority of patients in the diabetic group had HbA1c was greater than or equivalent to 7 mg%. Additionally, the researcher emphasizes that the best method of preventing DKA is to assess blood sugar levels on a regular basis and to emphasize the significance of follow-up.

The results of the current investigation showed a statistically significant difference and positive link between the length of hospital stay and the management of fluids and electrolytes. This research illustrated that, the mean score of length of hospital stay days among study group low five days and control groups were more than five days constituted six day and more.

Ata et al., (2023) who stated that, the length of stay (LOS) for DKA patients in hospital remains a significant concern, often leading to increased healthcare costs and resource utilization. Extended hospitalization can result from severe DKA episodes, underlying comorbidities, or delays in treatment initiation. This finding is supported by **(Gosmanov et al., 2018)** our studies have shown that, early and aggressive management of DKA, including prompt insulin therapy and fluid replacement, can significantly reduce the length of hospital stay. Implementing standardized treatment protocols and continuous monitoring can further enhance patient outcomes and minimize hospital resource utilization.

The significance of the best possible management of DKA is underscored by the fact that the average length of hospital stays for patients with DKA in the United States is 3.4 days, and the costs of healthcare facilities amount to 2.4 billion dollars **(Dunn, et al 2024)**.

Alshorfa et al, (2024) in our study, reported that, Supporters of fast treatment say that it shortens the length of hospitalization, makes it less costly, and minimizes brain edema, which is one of the complications.

According to **Raffoul et al. (2025),** patients with DKA had a median length of stay (LOS) of 7 days at the hospital. From the perspective of the researcher, this has to do with the possibility of administering intravenous solutions ineffectively, which lowers mortality and length of stay (LOS) in patients with DKA. **Msagha et al. (2024),** infection was a significant factor (aOR 2.63), and the median length of hospital stay was 6 days. The median time for DKA to resolve was three days, with a range of one to five days. In-hospital mortality from DKA was one tenth samples and new-onset diabetes mellitus was a significant predictor.

The current present results illustrated that, there was a statistically significant positive connection between the study group regarding glucose level and intravenous fluid intake with their length of hospital stay but the table reveled that, there were no statistically significant correlations between the studied group regarding oral intake and urinary output.

While, there were no statistically significant correlations among the group regarding all DKA parameters and their hospital stay length**. Abdelgaleel, et al., (2023)** they revealed that, there was a statistically significant connection between lengths of hospital stay of the patient group with Complication. Patients with hypertension, hyperlipidemia, stable angina, cardiomyopathy, myocarditis, and pericardial disease had prolonged hospital stay. There was statistically significant connection between these comorbidities and hospital stay. There was no statistically significant correlation between coronary heart disease (CHD) or MI with length of hospital stay.

The results of this study concluded that:

Application of infection control guidelines specifically improves health team staff knowledge and practices with positive effect on the infection rate for patients and hea1lth team staff in hemodialysis units.

The results of this study recommended that:

1. Developing patients' DKA care guidelines about nursing interventions for long-term improvement of DM and DKA crisis.
2. A structured discharge plan process should include education regard management of DKA for all patients who risk for these crises to prevent its recurrence and their readmission.
3. Future research and training programs should focus on tailored nursing interventions to address DKA severity and recovery managements.

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