The Effect of Educational Guidelines on Early Detection of Chronic Kidney Failure among Diabetic Patients

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Abstract

Background: Diabetes is the leading cause of end-stage kidney disease (ESKD), accounting for approximately 50% of patients starting dialysis. However, the management of these patients at the stage of chronic kidney disease (CKD) remains poor, with fragmented care pathways among healthcare professionals (HCPs). Diagnosis of CKD and most of its complications is based on laboratory evidence. **Aim**: To evaluate the effect of educational guidelines on early detection of chronic kidney failure among diabetic patients. **Design:** In this study, a quasi-experimental research design was used. **Setting**: The current study was conducted at the General Medical Departments and Diabetic Out-Patients Clinic at Sohag University Hospital. **Subjects**: A convenient sample technique of a total of 200 elderly diabetic patients was included in the study. **Three tools were used for data collection**; Tool (1): Patients' demographic data; Tool (2): Patients' knowledge about chronic kidney failure (pre/post), Tool (3): Patients' reported practice about early detection of chronic kidney (pre/post). **Results:** The study's findings showed that elderly diabetes patients' reported practices and knowledge of early chronic kidney failure diagnosis differed significantly (highly statistically) between the pre-and post-educational guidelines. Regarding the early detection of chronic kidney failure, there was a statistically significant positive association found between the total knowledge and total practice scores of the elderly diabetic patients under study. **Conclusion:** Patient knowledge and reported practices regarding early detection of chronic renal failure improved as a result of educational guidelines. **Recommendations**: Elderly diabetes patients should receive educational programs about the significance of early detection of chronic kidney failure.

Keywords: Elderly diabetic patients, Educational guidelines, Early detection of chronic kidney failure.

Introduction

Over 450 million people worldwide are believed to have diabetes, and by 2045, that number is predicted to rise to over 700 million. This represents over 8% of the world's population. The primary causes of the increased incidence of type 2 diabetes (T2D) worldwide are sedentary lifestyles, obesity, and population aging. Chronic kidney disease (CKD) may occur in up to 40% of diabetics. Though it can exist before the outset of T2D, CKD typically appears ten years after T1D diagnosis **(Kidney Disease: Improving Global Outcomes (KDIGO) Diabetes Work Group, 2022).**

According to research, 29% of T2D patients have CKD, and 6% of individuals have diabetes. Half of patients with end-stage kidney disease (ESKD) have diabetes and renal failure significantly increases the morbidity and mortality from cardiovascular (CV) diseases in

diabetics. According to **Eberly et al. (2021),** diabetics are more susceptible to cardiovascular disease (CVD), cardiorenal syndrome, costly kidney replacement therapy (KRT), and shorter lifespans due to chronic kidney disease (CKD). About 20–40% of people with diabetes develop DKD, usually within ten years after the commencement of the disease. People with diabetes can avoid the development and progression of microvascular problems by maintaining strict glycaemic control and managing other risk factors such as blood pressure. It can be difficult to attain and maintain ideal risk factor control in LMICs, though. Kidney replacement treatment (KRT) choices are not always available or inexpensive, and the high cost of care for individuals with diabetes and chronic kidney disease (CKD) is putting pressure on low- and middle-income

countries (LMICs) to prioritize screening for both diseases **(United States Renal Data System, 2020).**

There is strong financial motivation to increase the early identification of diabetes-related CKD in low- and middle-income countries (LMICs) due to the high expense of treating advanced CKD. The goal of this approach is to identify persons who are at risk of acquiring chronic kidney disease (CKD) and to identify those who already have it to slow the course of kidney failure or prevent mortality from cardiovascular consequences **(Levin et al., 2017).**

Reducing CV events and mortality, maintaining kidney function, and reducing the development of ESKD are the main objectives of CKD treatment for T2D patients. Many international guidelines recommend pharmaceutical and lifestyle modifications in combination to prevent CV events and CKD progression in T2D patients. Screening for CKD is essential due to the effectiveness of these therapies. Risk assessment and CKD screening ought to be prioritized in public health initiatives. KDIGO recommends measuring the urine albumin-to-creatinine ratio (UACR) and estimated glomerular filtration rate (eGFR). This paper provides recommendations to improve CKD diagnosis and treatment in T2D patients as well as insights into laboratory evidence of CKD **(Wan et al., 2020).**

Avoiding therapeutic inertia is essential since numerous therapies are frequently required to optimize the management of patients with diabetes and chronic kidney disease (CKD). Although there are more alternatives for risk mitigation, the majority of individuals with diabetes and chronic kidney disease (CKD) still have substantial residual risks of cardiovascular disease and CKD development even with treatment. Patients would require repeated visits to determine and administer a variety of medications, some of which may interact **(Davies et al., 2018).**

Patients and professionals can benefit from an integrated treatment approach and patient education. Patients are the ones who know themselves better than anybody else, and even though medical professionals have training in medicine, patients' lives will improve when they work together to create a treatment plan that involves shared decision-making **(Sadusky**

&Hurst, 2021). Moreover, less time will be needed for the medical expert to oversee the patient's care. Priorities among patients and healthcare professionals frequently diverge. Healthcare providers should ask patients about their priorities and work with them to create a treatment plan that is mutually agreed upon **(Tuttle et al., 2021).**

Patients can collaborate with their healthcare providers to manage their diabetes and chronic kidney disease (CKD) by asking questions, learning about nutrition, exercise, quitting smoking, glycemic control, and medication, reaching out to peers and support groups within the diabetes and CKD community, and comprehending test results before appointments. interdisciplinary Team Healthcare The best management of diabetes and chronic kidney disease (CKD) occurs when a multidisciplinary team comprising the patient, physician, and other healthcare providers is included in the healthcare system model of care **(American Diabetes Association, 2022**).

Healthcare systems must emphasize both short- and long-term treatment programs, as well as team-based patient care. To guarantee that each patient's preferences are taken into account and that everyone on the team, including the patient, sets goals, lifestyle interventions for the patient must be taken into consideration when creating an overall plan of care. Every patient with diabetes should have behavioral evaluation taken into account at the initial assessment. To identify potential psychosocial barriers to treatment and self-management should also be taken into consideration for patients who are not meeting their goals **(Draznin et al., 2022**).

Way of life For the best possible management of diabetes, medical nutritional therapy—which includes having appropriate access to dietary guidance from a registered dietitian nutritionist (RD/RDN) with specialized training—is essential, according to both the ADA and KDIGO guidelines. Both the ADA and KDIGO guidelines suggest customized, well-balanced meals that are low in processed carbs and sugar-sweetened beverages and abundant in fruits, vegetables, and whole grains **(Kidney Disease: Improving Global Outcomes (KDIGO) Diabetes Work Group, 2022).**

To lower cardiovascular risk and regulate blood pressure, both recommendations include a low-sodium diet. The dietary protein intake of 0.8

g/kg/day is likewise advised by the ADA and KDIGO guidelines; this is the same amount that the World Health Organisation recommends for the general population. Increased protein intakes have the potential to accelerate the deterioration of renal function (**Draznin et al., 2022**).

Significance of the study:

Diabetes patients frequently develop CKD, which is costly and morbid. According to estimations from the International Diabetes Federation, 537 million people worldwide had diabetes in 2021, and that number is projected to rise to 784 million by 2045. It is expected that 40% of individuals with diabetes will develop CKD at some point in their lives. The prevalence of CKD among those with diabetes is greater than 25%. The incidence of CKD linked to diabetes has climbed in proportion to the rise in the prevalence of diabetes (**Centers for Disease Control and Prevention, 2020**).

The effectiveness of education can be improved by concentrating on individuals with progressive illnesses, implementing interdisciplinary care management teams that include community health workers, and offering instruction in group settings. Research and efforts to enhance quality are leading to the development of new educational approaches; nevertheless, difficulties in assessing patient education and public awareness initiatives make it difficult to identify effective tactics for wider adoption. Nonetheless, there may be new ways to effectively educate CKD patients due to the increased focus on enhancing patient-centered outcomes (**Shlipak et al., 2021**).

The idea behind testing asymptomatic individuals for chronic kidney disease (CKD) is that early discovery could lead to the use of therapeutic interventions and prevent unwarranted exposure to nephrotoxic substances, both of which could reduce the disease's progression to end-stage renal diseases. It is commonly known that in both developed and developing nations, the prevalence and incidence of CKD are rising in tandem with the rise in diabetes and other CKD risk factors. This setting has a high burden of chronic kidney disease (CKD) morbidity and mortality, which is a finding that extends into the early stages of the disease and is made worse by the coexistence of diabetes. Early-stage CKD management is essential for preventing the progression of RRT and CKD-related problems, and several treatments are currently available (**Shlipak et al., 2021 & Delgado et al., 2021**).

Since CKD is often quiet and not discovered until advanced stages, there are few possibilities to prevent negative consequences when patients are discovered just before symptomatic uremia begins. Nevertheless, there is a poor awareness of CKD. In the end, CKD-related morbidity and mortality can be postponed more successfully by early detection and care. So, the researchers did this study to evaluate the effect of educational guidelines on the early detection of chronic kidney failure among diabetic patients

Aim of the study:

To evaluate the effect of educational guidelines on early detection of chronic kidney failure among diabetic patients through:

- Assess patient's knowledge regarding early detection of chronic kidney failure pre and post-educational guidelines implementation among diabetic patients.

- Assess patients' reported practice regarding early detection of chronic kidney failure pre and post-educational guidelines implementation among diabetic patients.

- Design the educational guidelines for diabetic patients regarding early detection of chronic kidney failure based on patients' needs.

- Implementation the educational guidelines for diabetic patients regarding early detection of chronic kidney failure based on patients' needs.

-Determine the effect of educational guidelines on diabetic patients' knowledge and reported practice regarding early detection of chronic kidney failure pre and post-implementation.

Research Hypothesis:

Educational guidelines will have a positive effect on improving diabetic patients' knowledge and practice regarding early detection of chronic kidney failure.

Subjects and Method

Design:

This study employed a quasi-experimental research design. One kind of experimental design that is very similar to a true experimental design but lacks one of the criteria—control, manipulation, or randomization—is called a quasi-experimental

design (**Creswell, 2012**).

Setting:

The current study was conducted in the General Medical Departments and diabetic out-patients clinic at Sohag University Hospital. These settings were selected because of the high prevalence of patients in the selected settings and also, serve the biggest region of the population.

Subjects:

A convenient sample technique of a total of 200 elderly diabetic patients was recruited in the study within six months.

Tools of data collection:

Three tools were used for data collection in this study as follows:

Tool (1): Patients' demographic data; such as age, gender, education, and residence.

Tool (2): Patients' knowledge about chronic kidney failure **(pre/post)**: **(Kidney Disease Improving Global Outcomes, 2021; Shlipak et al., (2021; Delgado et al., 2021; Centers for Disease Control and Prevention, 2020; & McCullough et al., 2018**); it included questions used to assess patients' knowledge about chronic kidney failure among diabetic patients. It included 10 questions (multiple choice questions) about the definition, risk factors, causes, signs and symptoms, types, complications, treatment, and nursing care of chronic kidney failure.

Scoring system:

The formula for calculating the patients' level of knowledge of chronic renal failure was (2) for the "correct" answer and (0) for the "incorrect" one. The entire score might be between 0 and 20. The total score for knowledge was divided into two categories: satisfactory for scores above 60% and unsatisfactory for those below 60%. The mean score for the area was calculated by adding the scores of each item in each section and dividing the total by several elements. The mean and standard deviations were calculated after converting these scores into a percent score.

A % score was generated from these scores.

Tool (3): Patients' reported practice about early detection of chronic kidney failure **(pre/post); (Shlipak et al., (2021; Delgado et al., 2021; Centers for Disease Control and Prevention, 2020; & McCullough et al., 2018);** It included items used to assess patients' reported practices about chronic kidney failure among diabetic patients. It included 15 items (multiple choice questions) about screening/stratifying at-risk individuals for CKD using blood pressure, GFR estimation (eGFR) based on serum creatinine and other variables, urine albumin-to-creatinine ratio, and examination of the urine sediment for red. **Signs of Kidney Disease** such as feeling more tired, having less energy or having trouble concentrating, having trouble sleeping, dry and itchy skin, the need to urinate more often, blood in your urine, urine foamy, persistent puffiness around your eyes

Scoring system:

The patients' practices were rated as done or not done, with one being assigned for a job well done and zero for a practice that was not done. These values were then transformed into a percentage score. If the percent score for the patients' reported practice was 60% or more, it was deemed adequate; if it was less than 60%, it was deemed inadequate. The items' scores were added together for each section, and the total was divided by several items to determine the area's mean score. A percentage score was created from these scores.

Tool Validity and Reliability:

Five expert professors, two in medical-surgical nursing, one in community health nursing, one in gerontological nursing, and one in medical-surgical medicine, evaluated the tools' content validity as well as their clarity, comprehensiveness, appropriateness, and relevance. As per the panel's ruling, no changes were made.

By providing the participants with the same tool multiple times in the same conditions, test-retest reliability was utilized to evaluate the internal consistency of the instruments.

According to Cronbach's alpha, the correlation coefficients for knowledge and practice were 0.89 and 0.85, respectively.

Procedure:

The actual study included three phases:

A-Preparatory phase:

To create the instruments for gathering data and creating the instructional guidelines, the researchers looked through both recent and older material that was accessible as textbooks, papers, periodicals, and online searches. The brochure was created in Arabic, produced with the sample size in mind, and distributed following the application of the instructional guidelines.

Pilot study:

The previously described tools were used in pilot research to assess the applicability, clarity, and estimated time for each instrument on 10% of the elderly diabetic patients (20 old diabetic patients) from the chosen units. The primary research participants were the elderly diabetic patients who took part in the pilot trial.

Ethical consideration:

According to the Faculty of Nursing Ethical Research Committee, Official permission was obtained through an issued letter from the Dean of the Faculty of Nursing, Sohag University to conduct this study. After outlining the purpose of the study, the directors of the aforementioned setting were asked for their written approval. Before beginning the study, the researchers obtained an informed consent form from the elderly diabetic patients and gave a brief explanation of its goals. They also informed the participants that participation in the study was voluntary that they could withdraw from it at any time, for any reason, and that they would remain anonymous and confidential.

Implementation phase:

The director of Sohag University Hospital was given formal approval by the dean of the nursing faculty. Data collection took place over six months, from July 1, 2023, to December 30, 2023; all subsequent phases were completed.

Before conducting interviews with nurses, the researchers briefed the senior diabetic patients about the purpose, design, and anticipated results of the study.

All of the information was acquired to assess how educational guidelines affected diabetic patients' ability to identify chronic kidney failure early on. The tool was used twice: once during pre-educational guidelines to gauge patients' awareness of and experience with early detection of chronic kidney failure, and again during follow-up one month later to gauge the impact of the educational guidelines.

Regarding the early detection of chronic kidney failure in diabetic patients, the educational guidelines provided patients with basic and understandable information. Compiling instructional resources including images, videos, and PowerPoint presentations was also part of it. The researchers created an Arabic brochure, which they presented to the patients after each session. It included instructional advice about the early detection of kidney failure.

During this phase, instructional guidelines on the early diagnosis of chronic renal failure were implemented for twelve weeks. Three sessions, each lasting 40–50 minutes, have been scheduled to cover the subject matter: two for theoretical content and one for practice. Each of the seven groups of patients who took part in the trial received around two hours of total time. Seven or eight patients were in each group.

Contents of sessions

Session 1:

Before discussing the session's learning objectives, each researcher gave an overview of the session's contents. The researchers conducted the session in the Arabic language adequate for the participant's level of understanding of chronic renal disease failure. The researchers discussed the significance of diabetes patients' early identification of chronic renal failure. Researchers begin by evaluating patients' habits and knowledge of chronic kidney failure (pretest).

Session 2:

Knowledge of chronic kidney failure, including its definition, causes, symptoms, kinds, complications, treatments, and nursing care, was covered in the theoretical section. Patients took about 40 to 50 minutes on average to complete the data-collecting tools. PowerPoint presentations, images, films, and posters were used to implement it.

The educational guidelines included knowledge regarding chronic kidney disease as follows:
- Definition of chronic kidney failure
- Risk factors of chronic kidney failure
- Causes of chronic kidney failure
- Signs and symptoms of chronic kidney failure
- Types of chronic kidney failure
- Complications of chronic kidney failure
- Treatment of chronic kidney failure
- Nursing care of patients with chronic kidney failure

Session 3:

The practical part contained information about current patients' reported practice about early detection of chronic kidney failure. It was implemented through lectures, posters, and educational films about chronic kidney disease.

The educational guidelines included reported practices regarding the early detection of chronic kidney failure as follows: screening/stratifying at-risk individuals for CKD using blood pressure, GFR estimation (eGFR) based on serum creatinine and other variables, urine albumin-to-creatinine ratio, examination of the urine sediment for red**,** education about diet, physical activity, smoking cessation, glycemic control, and medications.

The Evaluation phase:

The research sample's knowledge and practice were assessed one month after the educational guidelines for chronic kidney failure were put into action. The same set of tools (tools II and III) that were used in the pre-test were utilized to assess the impact of the educational guidelines.

Statistical analysis:

Statistical analysis and data entry were carried out with SPSS for Windows, version 20. Descriptive statistics were used to present the data; for qualitative variables, this took the form of frequencies and percentages, and for quantitative variables, mean and SDs. The t-test, which compares differences between two means, was applied. At a P-value < 0.05, statistical significance was deemed to have occurred.

Results:

As shown in Table 1. the studied elderly diabetic patients average age were $65.23 + 4.02$ years old and 56% of them were female. More than two-thirds of the studied elderly patients (70%) were illiterate. concerning occupation among the studied elderly patients (46%) of them were retired. As regards residence, it was observed that 70% of them live in rural areas.

Figure (1) shows that the majority (80%) of the studied diabetic patients didn't attend training courses regarding early detection of chronic kidney failure.
Figure (2): Shows that three-fifths (60%) of the studied diabetic patients, their main source of information regarding chronic kidney failure was doctors.

Table (2): Illustrates that there were highly statistically significant differences found between diabetic patients' knowledge regarding chronic kidney failure among diabetic patients pre/post-educational guidelines (P<0.001).

Figure (3): Demonstrates that 15% of the studied diabetic patients had a satisfactory knowledge level regarding chronic kidney failure pre-educational guidelines which improved post-intervention and 87% of them had satisfactory knowledge.
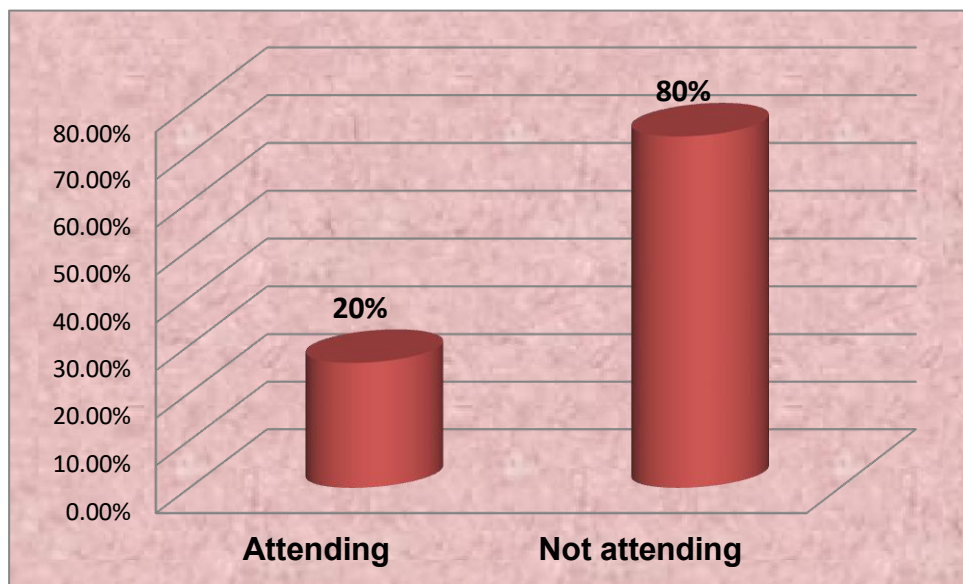
In the comparison of the studied diabetic patients' practice regarding early detection of chronic kidney failure table (3) illustrated that there were highly statistically significant differences between diabetic patients' reported practice at pre and post-educational guidelines(p<0.001) Regarding all aspects of early detection of chronic kidney failure.

Figure: Portrays the diabetic patients' total practice level regarding early detection of chronic kidney failure pre and post-educational guidelines, and indicates that 10% of the studied diabetic patients' had an adequate level of practice pre-educational guidelines, but post-educational guidelines 80% of them had an inadequate level of practice.

Table (4) reveals a correlation between the total knowledge score and total practice score of the studied diabetic patients pre and post-educational guidelines implementation. There is a statistically significant positive correlation between studied diabetic patients 'total knowledge scores and total practice scores at the post-educational guidelines implementation (p<0.001**).

Table (1): Percentage distribution of the studied diabetic patients regarding their demographic data

Demographic data	(n=200)	(%)
Age(in years):		
(60-65)	120	60.0
(60-70)	80	40.0
Mean±SD=65.23 + 4.02		
Sex:		
Female	112	56.0
Male	88	44.0
Education		
Illiterate	136	68.0
Read &write	44	22.0
University education	20	10.0
Occupation		
Housewives	80	40.0
Working	28	14.0
Retired	92	46.0
Residence :		
Rural	140	70.0
Urban	60	30.0

Figure (1): Percentage distribution of the studied diabetic patients according to their attendance to training courses regarding early detection of chronic kidney failure (n=200).
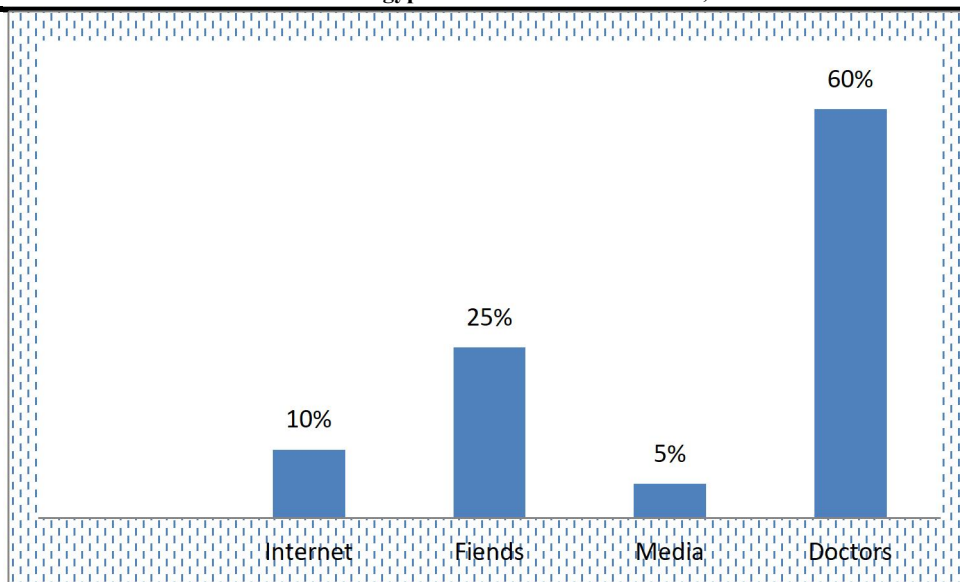
Figure (2): Percentage distribution of the studied diabetic **patients about their source of information regarding chronic kidney failure**

Table (2) Comparison of diabetic patients' Knowledge scores regarding chronic kidney failure patients pre and post-educational guidelines (n-200)

Knowledge items	Pre- the educational guidelines		Post- the educational guidelines		X²	P-value
	No	%	N No	%		
- Definition of chronic kidney failure	56	28	200	100	126.22	<0.001**
- Risk factors of chronic kidney failure	28	14	180	90	134.33	<0.001**
- Causes of chronic kidney failure	32	16	184	92	125.44	<0.001**
- Signs and symptoms of chronic kidney failure	56	28	168	84	145.55	<0.001**
- Types of chronic kidney failure	28	14	172	86	126.56	<0.001**
- Complications of chronic kidney failure	52	26	148	74	119.76	<0.001**
- Treatment of chronic kidney failure	34	17	178	89	128.89	<0.001**
- Nursing care of patients with chronic kidney failure	32	16	156	78	127.11	<0.001**

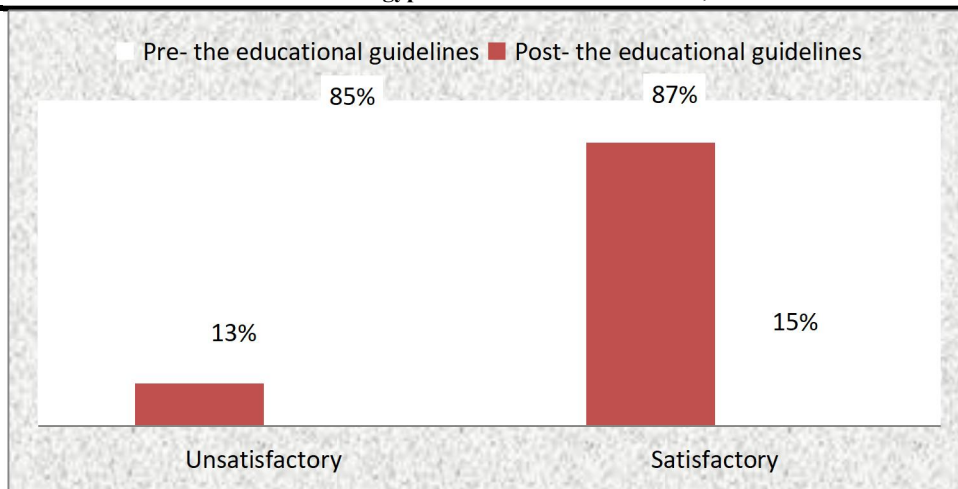**; Highly significant at p-value < 0.001

Figure (3): Percentage distribution of the studied diabetic patients' total knowledge regarding chronic kidney failure pre and post-educational guidelines (n-200)

Table (3): Comparison of diabetic patients' practice regarding chronic kidney failure pre and post-educational guidelines

Practices items	Studied diabetic patients (n=200)				X^2	P-value
	Pre- the educational guidelines		Post- the educational guidelines			
	N	%	N	%		
Screening/stratifying at-risk individuals for CKD using blood pressure					76.07	<0.001**
• Done	52	26.0	200	100		
• Not done	148	74.0	0	0.0		
GFR estimation (eGFR) based on serum creatinine					110.03	<0.001**
• Done	60	30.0	180	90.0		
• Not done	140	70.0	20	10.0		
Urine albumin-to-creatinine ratio					87.24	<0.001**
• Done	68	34.0	184	92.0		
• Not done	132	66.0	16	8.0		
Examination of the urine sediment for red					97.44	<0.001**
• Done	56	28.0	192	96.0		
• Not done	144	72.0	8	4.0		
Diet					77.26	<0.001**
• Done	40	20.0	120	60.0		
Not done	160	80.0	80	40.0		
Physical activity					87.47	<0.001**
• Done	48	24.0	128	64.0		
• Not done	152	76.0	72	36.0		
Smoking cessation					67.25	<0.001**
• Done	60	30.0	108	54.0		
• Not done	140	70.0	92	46.0		
Glycemic control and medications					67.33	<0.001**
• Done	70	35.0	132	66.0		
• Not done	130	65.0	88	44.0		

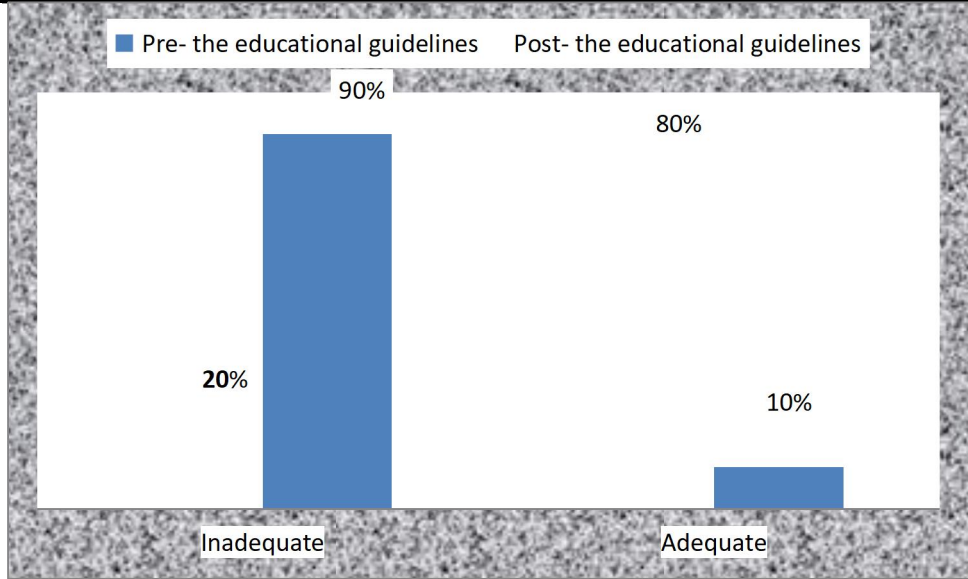**; Highly significant at p-value < 0.001

Figure (4) Differences between diabetic patients' total practice level pre and post-educational guidelines regarding early detection of chronic kidney failure (n=200)

Table (4): Correlation between total knowledge score and total practice score of the studied diabetic patients' pre and post-educational guidelines (n=200).

Variables	Pearson correlation coefficient			
	Total knowledge score			
	Pre- educational guidelines		Post educational guidelines	
	r	P	R	P
Total practice score	.473	.000**	.645	.000**

** Correlation is significant at the 0.01 level

Discussion:

A major global public health hazard, diabetes mellitus affects 537 million adults (**American Diabetes Association, 2022**). The prevalence of obesity is on the rise, largely due to population aging, poor nutrition, and physical inactivity. Although the burden of diabetes is rising globally, it is growing more quickly in low- and middle-income countries (LMICs) than in high-income countries (HICs). Diabetic nephropathy, often known as diabetic kidney disease, is a frequent microvascular consequence brought on by unchecked chronic hyperglycemia (**Diabetic Federation, 2020**).

According to the current study's findings, the average age of elderly diabetic patients was 65.23 + 4.02 years; almost two-thirds of the patients were illiterate, and most of them lived in rural areas. According to the researchers, it was linked to a poor ability to detect it at an early stage because of age and place of residence. This could be because persons living in rural regions have a higher chance of coming into contact with contaminated water and salty food, which can lead to greater renal symptoms and damage to the urinary tract. Their access to healthcare is further restricted by the fact that they struggle to lead healthy lives and do not have access to institutions that offer good prevention, early detection, and treatment. They were considered the primary risk factors for the development of CKD (**Kidney Disease: Improving Global Outcomes, 2022**).

The majority of the elderly diabetes patients in the current study did not attend training sessions about the early detection of chronic kidney failure, according to the study's findings.

From the perspective of the researchers, it demonstrated the necessity for the elderly diabetic patients under study to follow instructional guidelines. According to the current study's results, doctors were the primary source of information for three-fifths of the elderly diabetic patients who were studied. It proved that patients seek out the appropriate services, according to the researchers **(Hsu et al., 2021).**

The current study's findings showed that both before and after educational guidelines were implemented, there were highly statistically significant variations in the knowledge of diabetes patients about chronic kidney failure. According to the researchers, it shows how well-implemented educational guidelines have affected patients with diabetes's understanding of chronic kidney failure, meeting their demands and supplying them with adequate information. These results are consistent with research that found that raising awareness can help prevent the negative effects of CKD and can significantly reduce the number of diabetics who develop kidney failure **(Inker et al., 2021 & Chen et al., 2019)**.

Primary and secondary therapies aimed at disease management can prevent a significant percentage of CKD linked with diabetes. The pace of GFR decline can be slowed down in diabetics by making early referrals to nephrology services. To prevent diabetes-associated CKD in LMICs, efforts should also be focused on preventing upstream risk factors, such as tobacco use, unhealthy diets, food insecurity (which is known to be a risk factor for developing diabetes and poor blood glucose control; Tait et al., 2018), socioeconomic factors, and sedentary lifestyles. To promote diabetic treatment and, in turn, the prevention and management of CKD, significant investments are necessary throughout the health system (**Ameh et al., 2020**).

About the pre-educational guidelines for chronic kidney failure, which improved after intervention, fewer than one-fifth of the patients in the study had adequate information. The significance and efficacy of instructional guidelines, according to the researchers, are linked to the investigated patients' increased

knowledge and comprehension of chronic kidney failure. The results of a study by **Stempniewicz et al. (2021**) on "Chronic kidney disease testing among primary care patients with type 2 diabetes" corroborate these findings. The study found that structured education enhances self-management, collaborative decision-making, and primary and secondary prevention of diabetes-related complications, such as CKD.

According to the current study's findings, diabetic patients' stated practices before and after receiving educational guidelines about every facet of early chronic kidney failure diagnosis differed markedly statistically. According to the researchers, it demonstrated how the instructional instructions had a favorable effect on patients' practices. These attested to the successful adjustments in patients' practices that demonstrated the accomplishment of the primary objectives of the guidelines' implementation.

These results are consistent with research conducted in low- and middle-income nations by **George et al., (2022)** on "The need for screening, early diagnosis, and prediction of chronic kidney disease in people with diabetes " and Thierry **Hannedouche et al., (2022)** about " Early diagnosis of chronic kidney disease in patients with diabetes " and they reported the same results

These results are in line with those of **Shlipak et al., (2021**) "Early identification and intervention of chronic kidney disease: conclusions from a Kidney Disease," which found that patient education is linked to better patient outcomes and endorsed by international guidelines and organizations. However, several obstacles stand in the way of the widespread adoption of comprehensive education for individuals with progressive kidney disease. These results are consistent with research by **George et al. (2022)** regarding "The necessity of chronic kidney disease screening, early diagnosis, and prediction in individuals with diabetes in

The results of this study showed that the total knowledge and total practice scores of the diabetes patients under study, both before and

after the adoption of educational recommendations, correlated positively. This demonstrated how crucial it is to raise patients' levels of understanding and behavior to support their acquisition and application of sound knowledge. This correlation is explained by the fact that when patients possess adequate knowledge, it enables them to practice effectively, which is reflected in their treatment. **George et al., (2022**) "The need for screening, early diagnosis, and prediction of chronic kidney disease in people with diabetes in low- and middle-income countries," corroborate these findings.

The current study's results validated the improvement in the patient's knowledge and practices while also supporting the study's goal and premise. The success of implementing educational principles and their beneficial consequences are seen by the researchers as evidence of this. shows the value and efficacy of providing patients with guidance on the early detection of chronic kidney failure in diabetic patients, which is linked to better practice.

Globally, kidney transplantation or dialysis due to renal failure is most frequently caused by diabetes. Of the five persons with diabetes, one does not know they have the disease. The prevalence of CKD is considerably lower, with 2 out of 5 people with severe CKD and 9 out of 10 people not knowing they had underlying CKD (**Centres for Disease Control and Prevention, 2020**). Furthermore, older persons and racial and ethnic minorities are disproportionately affected by diabetes and chronic kidney disease (CKD). This result is consistent with **Chu et al.'s (2020**) study, "CKD awareness among US adults by future risk of kidney failure," which discovered that efforts to implement treatment and improve outcomes are hampered by inadequate screening, diagnosis, and awareness, which also exacerbates racial, socioeconomic, and ethnic disparities.

Diabetes's Significance for CKD in Their Early Stages There is an increase in type 2 diabetes. Therefore, diabetes consequences including chronic kidney disease (CKD) pose a serious risk to public health (**Delgado et al., 2021**). There is a comparable association between type 2 diabetes mellitus and early-stage CKD in many studies (**McCullough et al., 2018**). Thus, routinely checking urine albumin excretion in T2D patients is crucial for both tracking the disease's course and identifying the onset of CKD (**Kidney Disease Improving Global Outcomes, 2021**).

Furthermore, CKD is underdiagnosed in T2D patients. It is advised to screen for CKD early, and if the condition is found, follow-up testing needs to be done at least twice a year. Measuring the UACR in a spot urine sample (first-morning void) and predicting the GFR from serum creatinine values provide the best screening results for CKD. The urine albumin measurement standardization program can be used to address the current problems related to the lack of standardization in UACR testing. Regular eGFR and UACR screening could lead to better patient outcomes by raising awareness of the incidence of CKD in the T2D population. Following CKD diagnosis, guidelines-recommended therapy and suitable intervention can be started and should be optimized for individualized patient targets for glycemic and blood pressure control, with specialist referral as necessary (**Elena et al., 2021).**

Conclusion:

It was determined, based on the current study's aim and hypotheses, that most diabetic patients had insufficient knowledge and practices regarding the early detection of chronic kidney failure before the implementation of educational guidelines, but that these improved after the guidelines were put into place. The knowledge and reported practices of patients for the early detection of chronic kidney failure were positively impacted by educational recommendations.

Recommendations:

The present study's conclusions led to the following recommendations being made: -

- Patients with diabetes should be given educational programs regarding the significance of early detection of chronic kidney failure.

- Patients with diabetes should have access to a simplified illustrated handbook about the early detection of chronic kidney failure.

- It is advised to repeat the current study using a bigger probability sample to obtain generalizable conclusions.

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