

Relationship among Knowledge, Self-efficacy and Foot Care Behavior for Patients with Type II Diabetes Mellitus

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Abstract

Background: Preventive foot care is a critical step in protecting the feet of individuals with type II diabetes. Knowledge and self-efficacy play a vital role in enabling successful adherence to proper foot care practices. **Aim:** to investigate relationship among knowledge, self-efficacy and foot care behavior for patients with type II diabetes mellitus. **Research design:** Correlational design of research was used. **Setting:** Internal medicine department and diabetes and endocrinology center at Assuit university main hospital. **Sample:** Purposive sample of 322 patients. **Tools:** **Tool (I):** Patient Interview Questionnaire: **Tool (II):** Foot Care Knowledge Questionnaire. **Tool (III):** Diabetes Self efficacy scale. **Tool (IV):** Nottingham Assessment of Functional Foot Care. **Results:** The majority of the patients **82.6%** had poor knowledge. More than two third **65.22%** had moderate self-efficacy, and the majority of them **97.83%** had poor foot care behavior and that there was significant positive correlation between knowledge, self-efficacy and foot care behavior with p-value **<0.01**. **Conclusion:** The findings conclude that there was significant positive correlation between knowledge, self-efficacy and foot care behavior. **Recommendation:** Application of educational program and workshops for diabetic patients to enhance their knowledge and self-efficacy regarding foot care behavior.

Keywords: Foot care behavior, Knowledge, Self-efficacy & Type II diabetes.

Introduction

Diabetes mellitus (DM) develops when the body is unable to use insulin properly or When the pancreas fails to produce sufficient insulin. Insulin is a critical hormone responsible for maintaining normal blood glucose levels, type 2 diabetes mellitus is mainly driven by insulin resistance, which over time results in a gradual reduction in the pancreas's ability to secrete insulin from β -cells. Various factors contribute to this condition, including lifestyle choices, inconsistent eating habits, genetic susceptibility, and other underlying metabolic disorders (Tanamas et al., 2025).

Diabetes has emerged as a major global health issue. In 2021, approximately 537 million adults aged 20–79 worldwide were living with diabetes, representing a global prevalence of 10.5%. This number is projected to rise to 643 million by 2030 (11.3% prevalence) and further increase to 783 million by 2045. Additionally, an estimated 541 million people had impaired glucose tolerance in 2021. The high prevalence of diabetes places a substantial burden on societies, as it ranks as the eighth leading cause of death globally and incurred \$413 billion in costs in the United States alone in 2022—covering both direct medical expenses and losses in productivity (Fang, 2024).

In Egypt, DM is a rapidly growing public health concern. According to the International Diabetes Federation (IDF), Egypt ranks 9th globally in terms of DM prevalence, with 15.2% of Egyptian adults affected. However, this figure may be an underestimate, as studies suggest that around 43% of individuals with diabetes and the majority of those with prediabetes in Egypt remain undiagnosed. Alarming, the number of people living with DM in the country has increased sharply in a relatively short time—rising from approximately 4.4 million in 2007 to 7.5 million by 2013. It is expected this number will jump up to 13.1 million by 2035. Therefore, DM should be thoroughly explored in terms of its risk factors, prevention, treatment, and consequences (Okasha et al., 2024).

Knowledge refers to an individual's understanding of a specific subject and significantly influences their behavior. In the context of DM, having adequate knowledge serves as a crucial support for patients in managing their treatment. When patients have a clearer understanding of how to maintain stable blood glucose levels, they are more likely to adopt positive behavioral changes. This, in turn, can lead to better control of their condition and an improved quality of life (Rhayem et al., 2025).

Self-efficacy refers to an individual's confidence in their ability to perform specific tasks or behaviors, such as engaging in regular physical activity. It has a major impact in influencing how people approach challenges and take action in managing health conditions. In individuals with type 2 DM, higher self-efficacy can enhance disease management, improve adherence to treatment plans, and contribute to better health outcomes. A strong belief in one's ability to control blood glucose levels is particularly effective in supporting successful treatment and prolonged glycemic control in type 2 DM (Demirdağ & Tosun, 2025).

Foot care behavior is one of the critical components in T2DM self-management. To avoid and postpone possible complications, it is imperative to practice foot care on a regular basis. Diabetic foot issues, which frequently result in amputation are among the most common complications and the one that patients with type 2 diabetes are most afraid of. People with type 2 diabetes may have pain and discomfort from amputation, which can impair their physical function and lower their quality of life. As a result, it is essential to put into practice a suitable preventative plan, namely foot care. However, diabetics continue to have inadequate foot care practices, which can result in serious issues (Cheng et al., 2023).

Knowledge refers to an individual's understanding of a specific subject and significantly influences their behavior. Self-efficacy refers to an individual's confidence in their ability to perform specific tasks or behaviors, such as engaging in regular physical activity. Foot care behavior is one of the critical components in T2DM self-management. Foot care behavior is essential to be carried out regularly to prevent and delay potential complications (Hidayat et al., 2024).

Nurses are frequently the main point of contact for individuals with T2DM and play a vital role in managing their care. They support patients by promoting self-care, shifting from being direct caregivers to acting as facilitators, educators, and advocates. In this role, nurses help patients develop the necessary skills and knowledge to effectively manage their own health. A key responsibility includes educating patients about the importance of foot self-care and offering continuous support to reduce the risk of complications (De Sousa et al., 2024).

Nurses play a crucial role in educating individuals with DM by applying evidence-based nursing interventions that emphasize key aspects such as blood glucose control, healthy eating habits, regular physical activity, proper foot care, and adherence to prescribed medications. These

guidelines can be effectively communicated through structured educational programs, enabling patients with type 2 diabetes to get more involved in their condition's management and practicing self-care. The primary goal of these nursing strategies is to boost patients' confidence in managing their health, enhance self-efficacy, and promote better adherence to treatment plans, ultimately improving overall health outcomes (Metwaly & Bayomi, 2025).

Operational definition:

Self-efficacy: Refers to an individual's perception or belief in his ability to perform specific actions.

Foot Care Behavior: Refers to the practices and routines individuals undertake to maintain the health and hygiene of their feet. This includes activities such as washing, drying, moisturizing, inspecting for cuts or sores, trimming nails, wearing appropriate footwear, and seeking medical attention when necessary.

Significance of the study:

According to the records of patients at Assiut university hospital in internal medicine department and diabetes and endocrinology center, it has been found that there were about 2000 patients with type 2 diabetes mellitus (Assiut University Hospital records., 2023).

In the Middle East and North Africa, which are primarily Muslim nations, the prevalence of diabetic foot varies from 5.0% to 20.0%. One of the most preventable consequences of type 2 diabetes is diabetic foot ulcers, which are linked to risk factors, a lack of knowledge, noncompliance with treatment, and low self-efficacy. Controlling the possible complications of type 2 diabetes requires an understanding of the knowledge levels of those who have the disease.

(Akca Doğan et al., 2024)

Based on the researcher's clinical experience over a span of two years at Assiut University Hospital, a notable observation has emerged as patients with diabetes mellitus have lack of knowledge about foot care and low self-efficacy, so it's imperative to study the relation of knowledge, self-efficacy and foot care behavior.

Aim of the study

This study aimed to assess relationship among knowledge, self-efficacy and foot Care behavior for patients with type 2 diabetes mellitus.

Research question:

Is there a relation between knowledge, self- efficacy and foot care behavior among patients with type 2 diabetes mellitus?

Patients and Methods:

Research design:

Correlational research design was utilized for this study. It is a type of non-experimental research design that examine the relationships between or among two or more variables in a single group, which can occur at several levels (Devi et al., 2022).

Setting:

The study was conducted at main hospital in internal medicine department and diabetes and endocrinology center at Assuit university hospital. The internal medicine department at Assuit University Main Hospital consists of two floor; the eighth floor and the ninth floor, each floor consists of patient's room as regarding 8th it had 4 patients room and 2 for ninth floor in addition each floor had nursing station, changing room for female staff and a medical staff lounge. The diabetes and endocrinology Center at Clinics building encompasses six clinics, diabetes clinic, thyroid clinic, obesity clinic, diabetic foot clinic, Podiatry Clinic and health education Clinic.

Sample:

A purposive sample of 322 male and female patients with type 2 diabetes mellitus attended previously mentioned setting who met the following inclusion criteria:

- Adult (20- ≥65 years old).
- Who could communicate.
- Willing to participate in the study.

Exclusion criteria:

Patients with T₁DM, pregnant women (gestational diabetes), diabetic foot ulcer, psychiatric patients, refusal to participate in the study and who had peripheral vascular disease was excluded from the study.

Sample size and calculation:

(Steven K. Thompson's equation, 2012) was used to calculate sample size which includes:

$$n = \frac{N \times p(1-p)}{\left[\left[N - 1 \times \left(d^2 \div z^2 \right) \right] + p(1-p) \right]}$$

N = total number of populations = (2000) through 2023

(Assuit Heart University Hospital record, 2023).

Z = confidence level is 0.95.

D = the error ratio is =0.05.

P = the property availability ratio and neutral =0.05.

Tools for data collection:

To accomplish the goal of the study, data collection four tools were utilized.

Tool (I): Patient Interview Questionnaire:

The researcher created this instrument after reviewing both national and international review of literature (Phan et al., 2025) to assess personal and medical data which include two parts:

Part (1): Patients' personal data:

This part was developed by the researcher to assess patients' personal data such as age, gender, marital status, residence, occupation, educational level, personal habits such as smoking and alcohol intake, weight, height and body mass index (BMI).

Part (2): Medical data:

This part was used to assess the patient condition (past and present health history, duration of diabetes, presence of comorbid diseases and Hemoglobin A1c (HbA1c).

Tool (II): Foot Care Knowledge Questionnaire.

This tool adopted from (Hasnain & Sheikh., 2009) this tool aimed to assess foot care knowledge. It was composed of 15-item answerable as: -

- 1) Correct knowledge = 1
- 2) Wrong knowledge or I do not know = 0

Scoring System of Knowledge:

- Good knowledge if the score ≥75%, (11-15).
- Fair knowledge if the score 50<75%, (8-10).
- Poor knowledge if the score < 50%, (<8).

Tool (III): Diabetes Management Self Efficacy Scale(DMSES).

This tool adopted from (Bijl et al., 1999) to assess the confidence of diabetes patients in their ability to manage their diet, blood sugar, and physical exercise. This tool was primarily utilized to assess self-efficacy. It composed of 20 items designed to investigate behavior in term of four factors as follows:

Specific nutrition and weight: with a subscale of five items (6, 13, 14, 15, 16) designed to determine the adherence of patient and adjustment of diet when away from home, maintain diet on vacation and party and weight control.

General nutrition and medical treatment: with a subscale of nine items (4, 5, 7, 9, 10, 17, 18, 19, 20) designed to determine the choose and variation in nutrition, maintain diet most of the time, adjust diet when ill and stress, check feet, consult physician for diabetes control and use of medication.

Physical exercise: with a subscale of three items (8, 11, 12) designed to determine the extra and take care of training on physician's advice.

Blood sugar: with a subscale of three items (1, 2, 3) designed to determine the management of blood glucose when it was too low or too high and control blood glucose in illness.

Scoring System:

For the DMSES instrument all items are measured on a five-point scale, it is a Likert-type scale scoring between 1 and 5, total score 20-100.

(Never-1, Rarely-2, Sometimes-3, Often-4, Always-5). The global average of the scale is used to get the score; that is, the sum of the scores for each item is divided by the total number of elements. A higher

sense of self-efficacy is indicated by higher averages. Good self-efficacy if the score $\geq 80\%$. Moderate self-efficacy if the score $60 < 80\%$. Poor self-efficacy if the score $< 60\%$. adopted from (Morrison & Weston, 2013)

Tool (IV): Nottingham Assessment of Functional Foot Care (NAFF).

This tool adopted from (Li & Xing, 2015) to assess foot care behavior. It comprised of 25 item, including the content of foot examination (item 1), foot cleaning and protection (items 2–7, 14, 17–21), shoe and sock selection (items 8–13, 15, 16), and medical help seeking (items 22–24–25). The items were rating using the 4-point Scale (0–3) answerable with “Never”, “Rarely”, “Sometimes”, or “About once a week”. The sum of each item's scores, which ranged from 0 to 75 with a standard value, was the overall score.

Scoring System:

- 1) > 80 indicating high behavior.
- 2) 60–80 indicating moderate behavior.
- 3) < 60 indicate poor behavior.

Procedures:

To fulfill the study's goal, it passed through the following phases:

Preparatory phase:

Tools development

Tools for Data collection methods were created by examining relevant literature from the past, present, and local, national, and worldwide (Phan et al., 2025) in various aspects.

validity and reliability Content

- The content validity of the tool was done by (3) expertise in medical surgical nursing and (2) assistant professor of endocrinology and diabetes at faculty of medicine to investigate the tool's validity, content, completeness, and query clarity. Every suggestion and comment was taken into account, and some statements were reworded and rearranged appropriately.
- The reliability of the adopted tools was done using Cronbach's coefficient alpha test. The reliability of tool II (0,85), tool III (0,89), tool four IV (0,81).

Administrative approval

Official permission to carry out the study was obtained from the dean of faculty of nursing directed to the responsible head of the Internal Medicine Department and Diabetic and Endocrinology Center at Assiut Main University Hospital to conduct the study.

Pilot study:

To assess the applicability and clarity of the developed tools, a pilot study was carried out on 10% (32 patients) of the sample. The pilot study gave the researcher experience dealing with the included subjects and the data collection tools, and based on

the findings, the data collection instruments were refined without any modifications. As a result, those patients were included in the full sample.

Ethical considerations:

- The research proposal was approved by the Ethical Committee in the Faculty of Nursing. The Institutional Review Board (IRB) number is: 1120240890 on 24-9-2024.
- There was no risk for study subject during application of the research.
- The study was follow common ethical principles in clinical research
- Written consent was taken from participated woman or guidance that was willing to participate in the study, and oral consent was taken from illiterate women.
- Confidentiality and anonymity was assured.
- Participated woman had the right to refuse to participate and /or to withdraw from the study without any rational any time.
- When collecting data, patient privacy was taken into consideration.

Implementation phase

- The researcher attended the mentioned setting four days per week at morning and afternoon shifts to collect relevant data from studied patients.
- The researcher greeted patients, introduced self, the purpose of study was explained to studied patients prior to any data collection and obtained verbal consent to be involved in the study.
- The data collection tools were filled in through patients' interviewing by researcher.
- Assessment of personal characteristics and medical data of studied patients was done by using tool I (part 1 and part 2)
- Assessment of knowledge of foot care behavior of studied patients was done by using tool II.
- Assessment of self-efficacy of studied patients was done by using tool III.
- Assessment of foot care behavior of studied patients was done by using tool IV.
- After finishing assessment, the researcher clarified to all patients any wrong or missing information about diabetes mellitus and foot care behavior and how to reduce its complications. Also emphasized the importance of follow up as scheduled.
- Data was gathered between October 2024 and May 2025, a total of eight months.

Statistical analysis:

Following data collection, the obtained data were organized, tabulated, and statistically analyzed using IBM SPSS software version 22. Descriptive statistics-including frequencies, percentages, mean and standard deviation- were used to summarize the data.

Qualitative variables were analyzed using the Chi-square test while Pearson's correlation coefficient was applied to examine relationship between study variables. Additionally, the results were visually

represented using bar charts and pie charts, a p-value of ≤ 0.05 was considered statistically significant while a p-value of ≤ 0.001 indicated a highly statistically significant

Results:

Table (1): Distribution of personal data among studied patients (n=322)

Personal data and health habits	N	%
Mean $\pm$ SD of age	48.75 $\pm$ 9.89	
Gender		
Male	119	37.0
Female	203	63.0
Marital status:		
Single	24	7.5
Married	256	79.5
Widowed-Widower	40	12.4
Divorced	2	0.6
Residence		
Rural	233	72.4
Urban	89	27.6
Educational Level:		
Illiterate	143	44.4
Read and write	22	6.8
Primary school	48	14.9
Preparatory school	28	8.7
Secondary school	53	16.5
University and Higher education	28	8.7
Occupational Status		
Working	126	39.1
Non-Working	196	60.9
Personal habits:		
-Smoking		
Yes	52	16.2
No	270	83.8
BMI :		
1-Standard level of weight (18.5 - 24.9 Kg).	102	31.7
2-Over weight (24.9 - 29.9 Kg).	119	37.0
3- Obese grade1(30- 34.9 Kg).	74	23.0
4-Obese grade 2 (35 -39.9 Kg)	27	8.3

Table (2): Total levels of patients knowledge regarding foot care (n=322).

Levels of knowledge	N	Percentage
Poor knowledge	266	82.6%
Fair knowledge	55	17.1%
Good knowledge	1	0.3%

Table (3): Distribution of sample regarding total mean of self-efficacy scale, n=322.

Self-efficacy scale	Minimum	Maximum	Mean	Std. Deviation
Specific nutrition and weight:	5.00	25.00	13.1988	5.40603
General nutrition and medical treatment	9.00	45.00	30.1526	6.68943
Physical exercises	3.00	15.00	9.4783	3.20064
Blood sugar	3.00	15.00	10.5280	3.44979
Total of self-efficacy scale	20.00	100.00	63.3271	16.03733

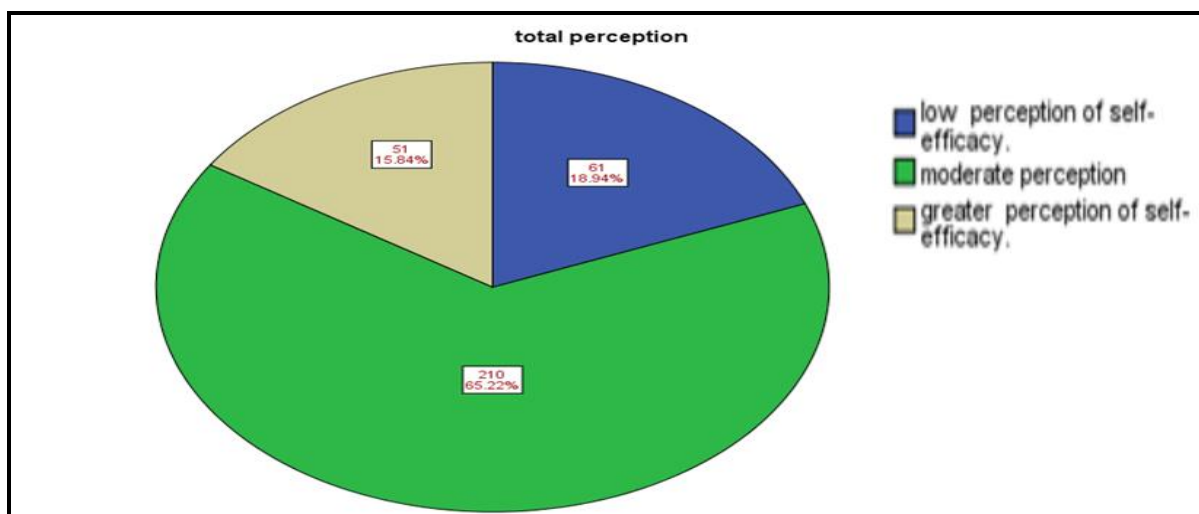


Figure (1): Distribution of sample regarding total level of diabetes self-efficacy scale (n=322)

Table (4): Distribution of sample regarding total score of Nottingham assessment of functional foot care scale (n=322)

Foot care behavior scale	N	%
Poor behavior .	315	97.8
Moderate behavior .	7	2.2
Good behavior	0	0

Table (5): Correlation between knowledge, diabetes self-efficacy and foot care behavior among studied patients.

Variables		knowledge	Diabetes Self efficacy	Foot care behavior
Total knowledge	Pearson Correlation		.368**	.322**
	Sig. (2-tailed)		.000	.000
Diabetes Self efficacy scale	Pearson Correlation	.368**		.347**
	Sig. (2-tailed)	.000		.000
Foot care behavior	Pearson Correlation	.322**	.347**	
	Sig. (2-tailed)	.000	.000	

**. Correlation is significant at the 0.01 level (2-tailed). Pearson correlation test was used

Table (1): Reveals that patients undergoing study were 48.75 ± 9.89 years old on mean. Regarding gender, the current study reveals that nearly two thirds **63,0%** were females. Slightly more than three fourth of patients **79,5%** were married. About three fifth of patients **60,9%** were not working. Nearly three fourth **72,4%** from rural areas. As regarding educational level, the highest percentage **44.4%** were illiterates. As regarding personal habits, the majority of patients **83,8%** were not smoking. Finally, as regarding BMI more than one third **37%** were overweight.

Table (2): Illustrates that **82.6%** of studied patients had poor knowledge and **17.1%** of investigated patients had fair knowledge and **0.3%** of patients had good knowledge.

Table (3): Demonstrates that mean of self-efficacy regarding specific nutrition and weight was **13.28%**, mean of general nutrition and medical treatment was **30.16%**, while mean of physical exercises was **9.48%**, also mean of blood sugar was **3.45%**. And total mean of self-efficacy was **63.33**.

Figure (1): Clarifies that more than two third **65,22%** of the studied patient had moderate perception of self-efficacy and **18,94%** had low self-efficacy and **15,84%** had greater self-efficacy.

Table (4): Demonstrate that the majority of the patients **97,83%** had poor foot care behavior and **2,17%** had moderate foot care behavior.

Table (5): Presents that there was a highly statistically significant positive correlation between the studied patient's knowledge, self-efficacy and foot care behavior with p-value **<0.01**.

Discussion:

Diabetes mellitus constitutes a chronic pathological state delineated by sustained hyperglycemia and compromised glucose metabolism, which stems from the pancreas's inadequate insulin synthesis or the body's incapacity to effectively utilize the synthesized insulin. T2DM represents a multifaceted, multisystem metabolic disorder typified by elevated blood glucose concentrations, which arise from an advancing deficiency in insulin secretion or tissue resistance to insulin. T2DM is a prevalent and heterogeneous condition characterized by diverse extents of beta-cell dysfunction and insulin resistance (**Mlynarska et al., 2025**).

When it comes to preventing foot wounds, proper education, self-efficacy, and foot care practices are essential. According to the statement, a multidisciplinary team approach and proper foot care education can decrease diabetic foot wounds and amputations (**Yildirim et al., 2022**).

The current study was conducted to investigate relation of knowledge, self-efficacy and foot care behavior among patients with type 2 diabetes mellitus.

Regarding personal and medical data: This study investigated a sample of three hundred and twenty-two patients. The current study finding revealed that patients mean of age was forty-eight years old. These finding similar with the finding of a study conducted by **Wong et al., (2025)** who reported that mean age of patients around to forty-nine years old. Also the same study findings align with the findings of a study conducted by **Alasfory et al., (2024)** who mentioned that mean patients' age was forty-four years old.

According to researchers' assumptions, when a person reaches the age of forty, their physiological state will drastically deteriorate. As a person ages, they will undoubtedly experience physiological and metabolic changes, such as a reduction in the pancreatic β cells' ability to produce insulin due to a decrease in the body's metabolic activities. The body's capacity and function deteriorates with age, which impacts the production of insulin by the pancreatic β cells. Therefore, the chance of getting type 2 diabetes mellitus rises with age, especially after the age of forty.

Regarding gender, the current study finding revealed that nearly two thirds of the studied patients were female so these finding was similar with the finding of a study conducted by **Setiawati & Astuti, (2024)** who conducted their study to identify the knowledge and foot care behavior of patients with diabetes mellitus and reported that sixty percent of the studied patients were female. Also the same finding was similar with **Alasfory et al., (2024)** & **Rizana et al.,**

(2023) who stated that about two thirds of the investigated patients were female.

In disagreement with the present study findings **Madran et al., (2022)** who clarified that more than two thirds of the studied patients were male.

According to researchers' assumptions, female are at higher risk of developing diabetes due to factors like obesity, family history of diabetes, follow unhealthy diet and hormonal changes which may increase risk for type 2 diabetes.

Regarding residence, the current study finding clarified that more than two thirds of the studied patients living in rural areas. Regarding health habits more than three fourth of them were non-smokers. These findings align with **Alshaikhi et al., (2025)** who reported that more than three fourth of the studied patients living in rural areas and more than three fourth of them were non-smokers.

From researchers' assumptions, most of the sample were non-smokers because the majority of them were female, and in our Eastern society, women typically do not smoke. And the majority of patients come from rural areas due to the limited number of diabetes centers in these regions, as well as the lack of adequate medical care and health insurance hospitals are not available in rural areas to dispense monthly medications.

Regarding occupational status, the current study finding revealed that around sixty percent of the studied patients were non workers. These finding consistent with the findings of a study conducted by **Ang et al., (2024)** who conducted their study in Singapore and mentioned that around sixty-five of the studied patients were non workers.

For body mass index (BMI) the present study revealed that more than one thirds were overweight, this study finding was consistent with **Fereidooni et al., (2024)** who conducted their study in Rasht, Iran to examine the relationship between Self-Care, Self-Efficacy, and Health Deviation Self-Care Requisites in patients with type 2 diabetes based on Orem's Self-Care Theory and reported that more than one thirds of patients were overweight.

Concerning foot care knowledge for patients with type 2 diabetes mellitus, the current study illustrated that the majority of the patients had poor knowledge about foot care. This finding was consistent with **sivan et al., (2021)** who mentioned that nearly two thirds of the patients had limited knowledge regarding foot care.

In disagreement with the current study findings (**Yeh et al., 2025**) who examine the relationship between foot care knowledge and self-management behavior in patients with diabetes in Taiwan and reported that most of those involved in the study had good knowledge. This disagreement could be attributed to

higher educational levels in study population (more than half above junior high school) and increased general health awareness in contemporary society.

Also the finding of the present study was inconsistent with **Alsaleh et al., (2021)** who performed their study in primary healthcare centers in Kuwait and to identify those at risk for developing diabetic peripheral neuropathy to evaluate the knowledge and practice of foot care among patients with diabetes mellitus, they demonstrated that more than three fourth had good knowledge about foot care. The difference in outcomes may stem from the higher educational level of patients in Kuwait, most of whom were college graduates, likely contributing to greater knowledge and awareness. In contrast, nearly three fourth of the current sample came from rural areas and demonstrated significantly lower levels of knowledge, which may have influenced their behaviors or responses.

Concerning diabetes self-efficacy for patients with type 2 diabetes mellitus, the current study revealed that self-efficacy could predict foot care behavior with mean score of the studied patients was sixty-three this align with **Dağcı et al., (2025)** who conducted their study in Türkiye to investigate self-efficacy and factors influencing foot care behavior in patients with type 2 diabetes mellitus and concluded that mean score of self-efficacy was sixty-nine. Also the same study finding agree with **Küççük & Tosun, 2022** who stated that mean score of self-efficacy was sixty-two.

The present study clarified that nearly two thirds of the studied patients had moderate perception of self-efficacy this agree with **Madran et al., (2022)** & **(Calli & Kartal, 2021)** who mentioned that studied patients was at moderate degree of belief in their capacity to take effective action.

According to researchers' assumptions, moderate level of self-efficacy may be due to barriers that patients face in managing their diabetes, which might be: Insufficient knowledge and misconceptions about the condition, limited access to resources, existing health complications, emotional distress, and absence of adequate support.

Concerning foot care behavior for patients with type 2 diabetes mellitus, the current study revealed that mean score of the studied patients was forty-seven which indicate poor foot care behavior which similar with **Putri et al., (2023)** who stated that Most patients demonstrated inadequate practices in caring for their feet. Also the present study aligns with **Sari et al., (2020)** who concluded that mean of foot care behavior was forty-seven which indicate inadequate foot care practice.

The result of the present study was inconsistent with **Ang et al., (2024)** who carried out their study in various hospitals and polyclinics across Singapore to assess foot care behaviors among patients with type two diabetes and to identify the factors associated with the practice of diabetic foot care and reported that nearly three fourth of the studied patients had adequate foot care practice.

This differences may be due to the study's setting in Singapore, a nation with both a high diabetes burden and a well-developed healthcare infrastructure. This suggests that sustained public health initiatives, consistent clinical guidance, and accessible educational resources have been effective for many patients. Additionally, the longer patients live with diabetes, the more likely they are to benefit from repeated, cumulative exposure to foot care education throughout their disease journey.

According relation between patient's knowledge and foot care behavior; the current study stated that there was a highly statistically significant positive correlation between the studied patient's knowledge and foot care behavior. This finding similar with **Xu et al., (2024)** who conducted their study in china to evaluate diabetic foot care knowledge, determinants of self-care practices and the efficacy of health education and concluded that there was significant positive correlation between knowledge of foot care and foot care behavior.

Also the previous finding was consistent with **Putri et al., (2023)** who concluded that there was significant positive correlation between the level of knowledge and foot care behavior in diabetes mellitus patients.

According to researchers' assumptions, being well-informed helps patients recognize the severe consequences of poor foot care, such as neuropathy, foot ulcers, infections, and the potential need for amputation, thereby encouraging them to take proactive steps in managing their foot health. So patients who have sufficient knowledge about diabetes-related complications, especially those affecting the feet, are more likely to practice preventive foot care, this includes behaviors such as daily foot inspection, maintaining proper foot hygiene, wearing suitable footwear, and avoiding foot injuries.

As regarding relation between patient's self-efficacy and foot care behavior; the current study stated that there was a highly statistically significant positive correlation between the studied patient's self-efficacy and foot care behavior. This finding agree with **Dağcı et al., (2025)** & **Rizana et al., (2023)** who mentioned

that there was strong positive correlation between the studied patient's self-efficacy and foot care behavior. Also the same finding was aligning with **Huda et al., (2019)** who reported that there was statistical significant relation between how confident patients felt in their ability to manage their health and their actual practices regarding foot care.

According to researchers' assumptions, self-efficacy plays a crucial role in the effective management of diabetes mellitus. Individuals with higher self-efficacy are more motivated to adhere to healthy behaviors, including proper foot care, as they believe in their ability to successfully manage their condition. Consequently, there is a positive correlation between self-efficacy and foot care practices: as self-efficacy increases, so does the likelihood of engaging in consistent and thorough foot care; conversely, lower levels of self-efficacy are associated with poorer adherence to foot care routines.

The present study was inconsistent with (**Wendling & Beadle, 2015**) who conducted their study to Examine the connection between diabetes patients' self-efficacy and their foot care practices and concluded that there was no significant correlation was identified between the level of self-efficacy and foot care behaviors.

This discrepancy may be attributable to the absence of a significant correlation, as the patient population exhibiting elevated scores in both self-efficacy and foot care practices. The association may become more pronounced within higher-risk cohorts, particularly among individuals with a history of ulcers or amputations. The uniformity and high functionality of the sample constrained the capacity to identify substantive patterns.

As regarding relation between patient's knowledge and self-efficacy; the current study stated that there was a highly statistically significant positive correlation between the studied patient's knowledge and self-efficacy. The same opinion was reported by **Jiang et al., (2025)** who conducted their study in in Wenzhou city, China to investigate the relationship between diabetes knowledge, self-efficacy, and eating behaviors among patients with Type 2 diabetes with poor glycemic control and show a significant association between diabetes knowledge and self-efficacy.

Also the same findings align with the findings of a study conducted by **Bezerra et al., (2023)** who stated that there was significant correlation between diabetes knowledge and self-efficacy.

From researcher opinion this may be attributed to limited knowledge can impair patients' understanding of the importance of effective diabetes management, which may subsequently

undermine their confidence in managing their condition. Individuals with insufficient knowledge may lack assurance when making key self-care decisions related to diet, exercise, blood glucose monitoring, and medication adherence.

Conclusion:

Based on the results of current study, it can be concluding that more than one third of the studied patients were illiterate, living in rural areas, had poor knowledge, moderate self-efficacy and poor foot care behavior.

Furthermore, there is a significant positive relationship between knowledge, self-efficacy and foot care behavior, among patients with T₂ DM.

Recommendation:

Based on the study findings, the following recommendations are proposed to enhance the knowledge, self-efficacy and foot care behavior for patients with type 2 diabetes.

- Application of educational program and workshops for diabetic patients to enhance their knowledge and self-efficacy regarding foot care behavior
- Develop multimedia educational tools (videos, leaflets, mobile apps) in languages people speak every day to simplify information about knowledge, self-efficacy to improve foot care behavior.
- Equip nurses in internal medicine and diabetes clinics with standardized foot care education protocols and communication skills to consistently assess, educate, and motivate patients during every encounter.
- Prioritize patients from rural areas and those with low educational levels for intensive foot care education, as they are at greater risk of poor knowledge and complications.
- Make foot inspection and foot care behavior evaluation a mandatory component of every diabetes clinic visit, using validated tools like the Nottingham Assessment of Functional Foot Care (NAFF).

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