



RESEARCH ARTICLE

KNOWLEDGE, ATTITUDE, AND PRACTICE REGARDING DIABETIC FOOT CARE AMONG DIABETIC PATIENTS AT DAMMAM DIABETES AND ENDOCRINE CENTER, SAUDI ARABIA 2026

Walaa Abdulrazzaq Alduhileb¹ and Mona Ahmed Alyusuf²

1. Saudi Board of Family Medicine, Family Medicine Consultant.
2. Family Medicine and Diabetes Management Consultant.

Manuscript Info

Manuscript History

Received: 18 June 2026
Final Accepted: 20 July 2026
Published: August 2026

Abstract

Background:-Diabetes mellitus is an escalating global health problem. Early identification and management of diabetic patients are essential to prevent complications. Diabetic foot care reduces the risk of foot-related complications, lessens the economic burden, and enhances overall quality of life. This study aims to assess the level of knowledge, attitude, and practice regarding diabetic foot care among diabetic patients.

Methods:-An analytical cross-sectional study was conducted among 401 diabetic patients attending the Diabetes and Endocrine Center at Dammam Medical Complex, Eastern Health Cluster, Saudi Arabia during the period from February to April 2026. A self-administered questionnaire was distributed to the diabetic patients and included questions related to knowledge, attitude, and practice regarding diabetic foot care.

Results:-A total of 401 diabetic patients responded to the study. Approximately 60 % of the participants had good knowledge, the majority of respondents (81%) had positive attitudes, while 86.8% demonstrated poor practices related to diabetic foot care. Multinomial logistic regression identified marital status, educational level, diabetic treatment, sensation problem in foot and receiving advice as significant predictors of knowledge ($p \leq 0.05$). It also showed that illiterate participants ($OR=0.80$, $p=0.027$) and those with foot complaints ($OR=0.46$, $p=0.022$) were less likely to have positive attitudes. Participants who didn't receive advice on foot care ($OR=9.45$, $p=0.033$), and those with poor knowledge ($OR=3.04$, $p=0.02$) and poor attitudes ($OR=9.47$, $p=0.034$) were more likely to have poor practices.

"© 2026 by the Author(s). Published by IJAR under CC BY 4.0. Unrestricted use allowed with credit to the author."

Conclusion:-This study demonstrated adequate knowledge and favorable attitudes towards diabetic foot. However, poor practices related to diabetic foot care were still observed. These findings highlight the gap between knowledge,

attitudes, and practices, and emphasize the urgent need to establish effective interventions to enhance patients' self-care of foot.

Introduction:-

Introduction and Literature Review:-

Diabetes mellitus (DM) is a chronic progressive metabolic condition marked by hyperglycemia which occurs due to either absolute or relative insulin deficiency. According to new data published in The Lancet on World Diabetes Day, the global number of adults living with diabetes has surpassed 800 million, more than a fourfold increase since 1990. Additionally, the study revealed that the global prevalence of diabetes among adults has doubled, rising from 7% to 14% between 1990 and 2022⁽¹⁾. Saudi Arabia is considered one of the countries with the highest diabetes prevalence as it ranked the second in the Middle East and the seventh worldwide⁽²⁾. According to the International Diabetes Federation (IDF), the prevalence of diabetes in the country in 2021 stands at 17.7%, with a total of 4,274,100 adult cases⁽³⁾.

Therefore, early identification and management of diabetic patients is essential to prevent complications, with foot-related issues being among the most significant of these complications. In Saudi Arabia, a study was conducted to identify the most common foot complications among diabetic patients. The findings revealed that foot ulcers accounted for the majority of these complications (81%), followed by foot amputation and gangrene, which made up 31% and 29%, respectively⁽⁴⁾. Physiologically, the primary pathological factors contributing to diabetic foot complications are ischaemia, neuropathy, and infection, which are often occurring together. Neuropathy and ischaemia typically act as the initiating factors, frequently in the form of neuroischaemia, while infection is usually a subsequent result⁽⁵⁾. Several risk factors contribute to the development of diabetic foot-related issues, including poor glycemic control, vascular disease, inadequate foot care, neuropathy resulting in the loss of protective sensation, foot deformities, trauma, diabetes-related immune dysfunction, and infections⁽⁶⁾. The consequences of diabetic foot can include a decline in functional status, infection, hospitalization, amputation, gangrene, and even death⁽⁴⁾. A retrospective study conducted at a tertiary care center in Jeddah between 2013 and 2020 found that 84.9% of patients underwent amputation. Among these, 38.2% had minor amputations, 40.1% had severe amputations, and 21.7% experienced both types of amputations. Infection was the leading cause of amputation, affecting 50.3% of patients. The study also recorded 75 deaths, resulting in a 20% mortality rate over a seven-year period⁽⁷⁾.

The onset of these complications is often linked to poor knowledge, attitudes, and practices related to foot care among diabetic patients⁽⁸⁻¹⁰⁾. Therefore, understanding the knowledge, attitude, and practice (KAP) of diabetic individuals toward foot care is necessary for developing effective interventions to reduce the risk of foot-related complications.

Research has shown that individuals with diabetes are often unaware of the importance of regular foot inspections, proper footwear, and timely medical consultations. Moreover, their attitudes toward foot care, influenced by cultural, social, and educational factors, can significantly impact their daily practices and adherence to recommended foot care routines. Unfortunately, many diabetic patients neglect essential foot care practices, increasing their vulnerability to ulcers and infections that could lead to amputations.

This research aims to assess the knowledge, attitudes, and practices related to diabetic foot care among diabetic patients attending diabetes clinics at Dammam Diabetes and Endocrine Center.

By identifying gaps in understanding, misconceptions, and barriers to proper foot care, this study seeks to provide insights into how health education and targeted interventions can improve foot care practices and reduce the incidence of foot complications in this population. Ultimately, improving awareness and practice in diabetic patients is essential to enhancing overall health outcomes and quality of life⁽¹¹⁾.

During reviewing of the literature, the researcher found many studies concerning diabetic foot care among patients with diabetes.

These studies can be categorized as:-

- 1) National studies,
- 2) and international studies

National studies:-

Alkalash and Alnashri carried out a cross-sectional study at the Al-Qunfudah Diabetes Center between October 2022 and March 2023. The objective was to evaluate the knowledge, attitudes, and practices related to diabetic foot care among adult patients with diabetes. The results revealed that participants demonstrated lower-than-expected knowledge, held negative attitudes, and exhibited inadequate practices regarding diabetic foot care. These outcomes highlight the urgent need for educational initiatives aimed at improving diabetic foot care ⁽⁸⁾. Similar results and recommendations were reported in studies conducted in Makkah and Aseer region ^(9,12).

Another survey revealed that 26% of diabetic patients attending the diabetes clinic at King Fahad Hospital of the University of Dammam had developed diabetic foot ulcers. While participants generally demonstrated a good level of knowledge and a positive attitude toward diabetic foot care, the study emphasized the need for additional awareness programs to further improve patients' understanding and approach to managing diabetic foot health ⁽¹³⁾.

A recently published study designed to assess the knowledge, attitudes, and practices regarding risk factors for diabetic foot ulcers among diabetic patients attending the International Diabetes Center in Jeddah. The findings revealed that most patients had an excellent level of knowledge, with significantly higher scores among married individuals. However, a negative attitude toward diabetic foot care was noted. The study also reported that approximately one-third of the participants had received foot care education from physicians and nurses ⁽¹⁴⁾. Similar findings were reported in a study by Alshammari et al., which was conducted among diabetic patients in Riyadh ⁽¹⁵⁾.

Another study carried out at the Military Hospital in Al-Kharj found that over half of the participants experienced issues with foot sensation. While their knowledge of foot care was deemed acceptable and their attitude toward managing foot complications was generally positive, their actual practices in managing these complications remained insufficient despite the high levels of awareness and favorable attitudes ⁽¹⁶⁾.

Several studies conducted across various regions in Saudi Arabia have reported similar outcomes. These studies indicated a good level of knowledge and a positive attitude toward diabetes and its related complications ⁽¹⁷⁻²⁰⁾. Higher knowledge levels were often linked to younger age, higher educational attainment, and having a family member with diabetes ⁽¹⁷⁾. Furthermore, Alharbi et al. highlighted the importance of implementing annual foot examinations as a crucial preventive measure ⁽¹⁸⁾.

A study conducted in Najran revealed moderate levels of awareness and attitudes toward foot self-care among diabetic patients. It emphasized the vital roles both patients and physicians play in the prevention of diabetic foot syndrome. The study also identified neuropathy as the most commonly recognized risk factor of diabetes mellitus (DM), followed by retinopathy. Additionally, factors such as glycemic control, duration of diabetes, and educational level were found to be associated with complications including neuropathy, retinopathy, vasculopathy, and foot deformities ⁽²¹⁾.

International studies:-

A survey was conducted in Kuwait aimed to assess the knowledge and practices related to foot self-care among adult diabetic patients attending specialized primary health care centers (PHCCs). The results showed that 79.3% of participants had a good level of knowledge about foot care, while only 30.8% demonstrated satisfactory foot care practices. The prevalence of Diabetic Peripheral Neuropathy (DPN) among the participants was 17.4%. Notably, a higher level of knowledge was significantly associated with a longer duration of diabetes and the absence of comorbidities. Based on these findings, the study recommended that healthcare providers offer additional support and training on foot care to improve patient outcomes ⁽²²⁾.

Another study with similar objectives was conducted in Egypt among diabetic patients at Alexandria Main University Hospital. The findings revealed that both foot care knowledge and practices were below expectations. While knowledge tended to increase in the presence of microvascular complications, participants still demonstrated poor foot care practices. The study recommended implementing effective educational programs to raise awareness among both patients and healthcare providers ⁽²³⁾.

In Palestine, a cross-sectional study was conducted by Awwad et al. aimed to assess the knowledge, attitude, and practices of diabetic patients regarding the prevention and management of diabetic foot ulcers (DFUs). The results revealed satisfactory levels in all three areas among participants. However, higher knowledge scores were observed

among unmarried individuals. Additionally, patients with secondary or university-level education were more likely to exhibit positive attitudes and practices toward DFU prevention⁽²⁴⁾.

In Malaysia, a survey was conducted among diabetic patients attending government clinics in Penang, using a self-administered questionnaire. The study found that 53.1% of participants achieved good scores in foot care knowledge, while approximately 63% demonstrated good foot care practices. Formal education on foot care emerged as a significant predictor of knowledge levels ($p < 0.05$, 95% CI -1.102 to -0.098). Moreover, there was a strong positive correlation between foot care knowledge and self-care practices ($p < 0.001$, 95% CI 0.548 to 0.727). The study concluded that enhancing foot care knowledge may lead to improved self-care practices among diabetic patients⁽²⁵⁾. Similar conclusion was reported in a study conducted in China by Jia et al.⁽²⁶⁾.

A retrospective case-control study was conducted to identify factors associated with diabetic foot and amputation (DFA) among diabetic patients attending the two main hospitals in St. Kitts and Nevis, Taiwan. The prevalence of DFA among participants was 42.4%. Participants' responses reflected a solid understanding, positive attitudes, and appropriate practices regarding foot care. The study found that foot care knowledge, attitudes, and practices were not significant predictors of diabetic foot and/or amputation (DFA). However, male gender, employment status, and a longer duration of diabetes were identified as associated factors and potential predictors of DFA. The study recommended that patient education for DFA prevention should emphasize maintaining proper blood circulation in the lower limbs and the importance of daily foot washing⁽²⁷⁾.

A qualitative study was conducted in Tobago, an island located off the northern coast of the South American mainland. The study revealed that while most participants had limited knowledge about diabetic foot ulcers (DFUs), they demonstrated awareness of key foot care practices—such as proper foot cleaning and inspection, preventing irritation after washing, wearing appropriate footwear, and avoiding walking barefoot. Despite their poor understanding of DFUs, participants generally showed positive attitudes and good foot care practices. However, many reported receiving insufficient education on DFUs and foot care from healthcare providers. As a result, the study recommended the implementation of structured educational programs to enhance patients' overall awareness and self-care practices⁽²⁸⁾.

In Denmark, a study conducted by Simonsen et al. explored the relationship between health literacy, cognitive function, and foot self-care among patients with diabetic foot ulcers. The findings indicated that individuals with diabetic foot ulcers display diverse self-care behaviors, shaped by personal factors such as their level of health literacy, cognitive abilities, and their knowledge, attitudes, and practices. The study emphasized the need for personalized education and intervention strategies, highlighting that a one-size-fits-all approach may not be effective in managing or preventing diabetic foot complications⁽²⁹⁾.

In Gambia, poor level of knowledge (52.5%) and practice (68.7%) were reported among patients attending diabetic clinic in two public hospitals. Patients' educational level was found to be significantly associated with their knowledge of diabetic foot self-care ($p = 0.02$). Additionally, a history of diabetic foot ulcers ($p < 0.001$), prior hospitalization due to diabetes ($p = 0.01$), and having received diabetic foot care education ($p < 0.001$) were all significantly associated with foot self-care practices. The overall low levels of diabetic foot self-care knowledge and practice among respondents highlight the urgent need to implement structured diabetic health education programs within these clinical settings⁽³⁰⁾.

A qualitative study was conducted to explore the barriers to proper diabetic foot care among patients attending a safety-net hospital in Atlanta, Georgia. While participants demonstrated an acceptable level of knowledge, their self-care practices varied. The majority reported positive habits, with 77.5% checking their feet daily and 80% washing them daily. Only 17.5% of participants admitted to ever walking barefoot. However, several personal barriers to effective foot care were identified, including lack of motivation, high costs, limited insurance coverage for necessary supplies, and challenges in reducing activity for adequate offloading⁽³¹⁾.

Research Question:-

What is the level of knowledge, attitude, and practice regarding diabetic foot care among diabetic patients attending a diabetic clinic in Dammam Diabetes and Endocrine Center, Saudi Arabia?

Research Aim:-

To assess the level of knowledge, attitude, and practice regarding diabetic foot care among diabetic patients attending a diabetic clinic in Dammam Diabetes and Endocrine Center, Saudi Arabia.

Research Objectives:-

1. To assess the level of knowledge regarding diabetic foot care among diabetic patients attending a diabetic clinic in Dammam Diabetes and Endocrine Center, Saudi Arabia.
2. To measure the attitude regarding diabetic foot care among diabetic patients attending a diabetic clinic in Dammam Diabetes and Endocrine Center, Saudi Arabia.
3. To determine the practice regarding diabetic foot care among diabetic patients attending a diabetic clinic in Dammam Diabetes and Endocrine Center, Saudi Arabia.
4. To measure the associated factors with diabetic foot care knowledge, attitude and practice.

Methodology:-**Study design:-**

Analytical cross-sectional study was conducted.

Study setting and time:-

The study was carried out at the Diabetes and Endocrine Center at Dammam Medical Complex (DMC), Eastern Health Cluster, Saudi Arabia during the period from February to April 2026.

Study population:-**Inclusion criteria:-**

All patients aged more than 14 years with type 1 or type 2 diabetes who were registered and attending diabetic clinic at Diabetes and Endocrine Center at Dammam Medical Complex (DMC) were included in the study.

Exclusion criteria:-

Any patient who was unable to understand or provide the requested information such as elderly patients or patients with cognitive impairment, or who didn't complete the questionnaire, was excluded from the study.

Sample size:-

The target population for the current study was determined with the assistance of the quality team leader at the Diabetes and Endocrine Center, Dammam Medical Complex, by analyzing the statistics of diabetic patients who attended the diabetes and endocrine clinics during the year 2024 which was found to be 5,766 patients. The minimum recommended sample size calculated using the Raosoft sample size calculator [www.raosoft.com/samplesize] based on a 95% confidence level, a 5% margin of error, and for a target population of 5,766 patients was 361.

Sample technique:-

Patients were selected from the clinic's waiting lists using a systematic random sampling technique to ensure unbiased selection.

Data collection tool and method:-

The data were collected using a validated questionnaire adapted from previous studies^(8,16). Some modifications were made by the current researcher. The questionnaire was translated to Arabic and compared with the original form. It was available in both electronic and paper formats. It was distributed among diabetic patients attending follow-up visits with their physicians at Dammam Diabetes and Endocrine Center. The questionnaire consists of four main parts as follows:

Part I: is demographic characteristics and diabetes-related clinical characteristics which contain 14 questions asking about age, gender, nationality, marital status, level of education, smoking, duration of diabetes, HbA1C, diabetes treatment, foot complaints, sensation problem in the foot, chronic diseases and complications, received advice on foot care and source of advice if any.

Part II: contains 12 questions to assess the patients' knowledge regarding diabetic foot care.

Part III: contains 5 questions to measure the attitude toward diabetic foot care and participant's willingness to adopt preventive measures.

Part IV: which is the last part and has 12 questions designed to determine the diabetic foot care practice among the participants.

Study variables:-**Independent variables:-**

Patients' characteristics and diabetes-related clinical characteristics

Dependent variables:-

Knowledge, attitude and practice of diabetic foot care among diabetic patients

Validity and reliability:-**Construct validity:-**

The researcher used two validated questionnaires^(8,16). The questionnaires were merged and modified to answer the current research questions. The modification was done after an extensive literature review as part of the construct validity.

Content validity:-

The questionnaire items were reviewed by seven physicians who are experts on diabetes to ensure the importance of each question as part of content validity.

Pilot study:-

A pilot study was conducted on 30 patients attending the primary health care centers to ensure the clarity, understandability of the questions, and suitability of the language used in the questionnaire. The results of the pilot were excluded from the final research results. The reliability was checked by calculating Alpha-Cronbach for knowledge, attitude and practice parts (0.829, 0.778 and 0.764 respectively).

Data analysis:

Data were entered through a Personalized Computer (PC) and analysis was done using Statistical Package for the Social Sciences (SPSS) version 26. Data were presented in tables and figures.

- All categorical data were analyzed using frequency and percentage.
- Each response regarding the knowledge, attitude and practice was assigned as a score (0-2) as the following:
 - Correct knowledge was scored 1, incorrect knowledge or no knowledge was scored 0
 - Positive attitude was scored 1 while negative attitude was score 0
 - Full practice was scored 2, partial or incomplete practice was score 1 while score 0 was given to those who has no practice.
 - The level of patients' knowledge regarding diabetic foot care was evaluated by using 80% as a cutoff point; patients were considered to have good knowledge if the score was at 80% or higher, while those below 80% were categorized as having inadequate knowledge, and the same was applied for attitude and practice scores.
- Chi-square and Fisher's exact tests were used to measure the association whenever appropriate. Multinomial logistic regression analysis was done to identify predictors of knowledge, attitude and practice. A p-value equal to or less than 0.05 was considered significant.

Results:-

In the current study, a total of 401 diabetic patients completed the questionnaire, and most of them were Saudi (92.3%). More than half of the participants were female, aged above 50 years, married and had a university education (53.1%, 53.6%, 56.1% and 52.9%, respectively). Around 26% of the respondents were smokers. The duration of diabetes was less than 10 years among 46.4% of the sample. Approximately 61% of the participants had uncontrolled HbA1C levels. About 32.7% of respondents were using oral hypoglycemic agents only. Almost 20% of patients had foot complaints, while 66% had sensory problems in the foot. The majority (65.1%) had chronic diseases. Most of the participants (80.3%) had received advice on foot care, and physicians were the main source of advice, as reported by 77.8% of the studied sample (Table 1). Knowledge regarding diabetic foot care is presented in Table 2. The highest percentages of the participants demonstrated correct knowledge that foot gangrene is one of the complications of diabetic foot (91.5%), diabetic patients are likely to develop reduced sensation in their feet (88%), it is important to examine the inside of footwear for any object or tear (87.8%) and it is important to inspect the feet (87%). In contrast, the lowest percentages of patients had correct knowledge that poor circulation in the feet may result from smoking (62.6%) and that it is important to take care of the feet because they are more prone to be flat foot (58.4%). Regarding attitudes toward diabetic foot care, most participants (92%) agreed or strongly agreed that

wearing footwear indoors, as advised by foot-care specialist, is important. However, 22.4% disagreed or strongly disagreed that wearing special footwear is important, as shown in Table 3.

Concerning practices related to diabetic foot care, Table 4 shows that the majority of participants did not walk barefoot outside and trim/cut their toenails regularly (85.3% and 63.6% respectively). Meanwhile, more than half of respondents (57.4%) did not examine their shoes before wearing them. Figure 1 displayed that 60 % of the participants had good knowledge, and the majority (81%) had positive attitudes toward diabetic foot care, while 86.8% demonstrated poor practices related to diabetic foot care. There was a statistically significant difference between the level of knowledge and age, marital status, educational level, HbA1c control level, diabetes treatment, sensation problems in the feet and receiving advice ($p \leq 0.05$). Multinomial logistic regression analysis shows that single participants and those with secondary education were more likely to have good knowledge ($OR=2.49$, $OR=4.41$, respectively, $p \leq 0.05$), while illiterate participants were less likely to have good knowledge ($OR=0.35$, $p=0.014$).

Participants receiving oral agents and insulin treatment ($OR=4.7$, $p=0.019$), patients with sensation problem in the foot ($OR=1.78$, $p=0.047$) and those who had received advice ($OR=2.29$, $p=0.012$) were also more likely to have good knowledge (Table 5). The level of attitude was significantly associated with marital status, educational level, smoking, duration of diabetes, HbA1c control level, foot complaints and sensation problems in the feet. Multinomial logistic regression analysis shows that illiterate participants ($OR=0.80$, $p=0.027$) and those with foot complaints ($OR=0.46$, $p=0.022$) were less likely to have positive attitudes (Table, 6). Chi square test shows a statistically significant association between practice and gender, marital status, educational level, smoking, HbA1c control level, diabetes treatment, chronic diseases, receiving advice, level of knowledge, and attitude ($p \leq 0.05$). After performing multinomial logistic regression analysis, participants who didn't receive advice on foot care were more likely to have poor practice ($OR=9.45$, $p=0.033$), and respondents who had poor knowledge and attitude were more likely to have poor practice ($OR=3.04$, 9.47 respectively, $p \leq 0.05$) (Table 7).

Table (1): Demographic Characteristics and Diabetes-Related Clinical Characteristics Among Diabetics at Dammam Diabetes and Endocrine Center

Demographic Variables	Frequency N=401	Percentage (%)
Age group (years)		
• ≤ 30	74	18.5
• 31-40	48	12.0
• 41-50	64	16.0
• 51-60	100	24.9
• >60	115	28.7
Gender		
• Female	213	53.1
• Male	188	46.9
Nationality		
• Saudi	370	92.3
• Non-Saudi	31	7.7
Marital status		
• Single	117	29.2
• Married	225	56.1
• Divorced or widowed	59	14.7

Level of education • Illiterate • Primary • Intermediate • Secondary • University	21 24 38 106 212	5.2 6.0 9.5 26.4 52.9
Smoking • No • Yes	296 105	73.8 26.2
Duration of Diabetes • ≤ 10 years • 11-20 years • 21-30 years • >30 years	186 129 63 23	46.4 32.2 15.7 5.7
HbA1C • Controlled < 7.0% • Uncontrolled 7.0-8.5% • Highly uncontrolled ≥ 8.6% • Unknown	135 125 119 22	33.7 31.2 29.7 5.5
Diabetes treatment • Diet only • Oral agents • Insulin • Insulin and oral agents • Injectable medications and oral agents	28 131 108 79 55	7.0 32.7 26.9 19.7 13.7
Foot complains • History of healed ulcer • Current foot ulcer • Flat foot • None	37 15 26 323	9.2 3.7 6.5 80.5
Sensation problem in foot • Numbness • Foot pain during walking • Foot pain at rest (especially at night) • Tingling or pricking • Multiple problems • None	239 175 127 199 145 136	59.6 43.6 31.7 49.6 36.2 33.9

Chronic diseases and complications - Hypertension - Dyslipidemia - Amputation - Heart diseases - Retinopathy - Renal diseases - Neuropathy - None	179 198 22 81 75 68 43 140	44.6 49.4 5.5 20.2 18.7 17.0 10.7 34.9
Received advice on foot care - No - Yes	79 322	19.7 80.3
Source of advice - Physicians - Media - Relative - Multiple sources	312 82 63 95	77.8 20.4 15.7 23.7

Table (2): Knowledge Regarding Diabetic Foot Care

	Yes F (%)	No F (%)	I don't know F (%)
Foot gangrene is one of the diabetic foot complications	367 (91.5)	9 (2.2)	25 (6.2)
Diabetics are likely to develop reduced sensation in their feet	353 (88.0)	11 (2.7)	37 (9.2)
It is important to examine the inside of footwear for any object or tear	352 (87.8)	18 (4.5)	31 (7.7)
It is important to inspect the feet, as wounds and infections may not heal quickly	349 (87.0)	18 (4.5)	34 (8.5)
It is important to look at the soles because diabetics have reduced sensations	347 (86.5)	15 (3.7)	39 (9.7)
Diabetics are likely to develop foot ulcers	344 (85.8)	16 (4.0)	41 (10.2)
Diabetics are likely to develop reduced blood flow in their feet	326 (81.3)	20 (5.0)	55 (13.7)
Taking medication regularly will reduce diabetes complication	307 (76.6)	68 (17.0)	26 (6.5)
Doing exercise will help me prevent diabetic foot	287 (71.6)	55 (13.7)	59 (14.7)

Uncontrolled diabetes can lead to foot deformity	254 (63.3)	44 (11.0)	103 (25.7)
Poor circulation in feet may result from smoking	251 (62.6)	54 (13.5)	96 (23.9)
It is important to look after the feet because they are more prone to be flat foot	234 (58.4)	56 (14.0)	111 (27.7)

Table (3):Attitude Regarding Diabetic Foot Care

	Strongly agree F (%)	Agree F (%)	Disagree F (%)	Strongly disagree F (%)
I think that regular exercise and change my foot habits can prevent further diabetic complications	177 (44.1)	175 (43.6)	46 (11.5)	3 (0.7)
It is my responsibility to do daily examination of my feet and footwear, as well as regular foot-care specialist consultation	195 (48.6)	169 (42.1)	31 (7.7)	6 (1.5)
Wearing special footwear as advised by the foot-care specialist is important	146 (36.4)	165 (41.1)	77 (19.2)	13 (3.2)
Wearing footwear indoors as advised by my foot-care specialist is important	186 (46.4)	183 (45.6)	27 (6.7)	5 (1.2)
I can live a normal life with appropriate measures for diabetes	162 (40.4)	159 (39.7)	66 (16.5)	14 (3.5)

Table (4):Practice Regarding Diabetic Foot Care

	Yes F (%)	Sometimes F (%)	No F (%)
I don't walk barefoot, outside	342 (85.3)	53 (13.2)	6 (1.5)
I trim/cut my toenails regularly	255 (63.6)	118 (29.4)	28 (7.0)
I use comfortable, closed, and soft footwear	224 (55.9)	117 (29.2)	60 (15.0)
I change my socks daily	206 (51.4)	104 (25.9)	91 (22.7)
I wash my feet with warm water daily	174 (43.4)	122 (30.4)	105 (26.2)
I regularly change footwear, even without damage	173 (43.4)	102 (25.6)	124 (31.1)

I continuously wear cotton socks	154 (38.4)	154 (38.4)	93 (23.2)
I dry the cleft between toes carefully after washing	151 (37.7)	81 (20.2)	169 (42.1)
I regularly visit a physician for foot check-ups	139 (34.7)	144 (35.9)	118 (29.4)
I examine my shoes before wearing them	77 (19.2)	94 (23.4)	230 (57.4)
I examine my feet daily	76 (19.0)	146 (36.4)	179 (44.6)
I apply moisturizer daily on my feet	59 (14.7)	153 (38.2)	189 (47.1)

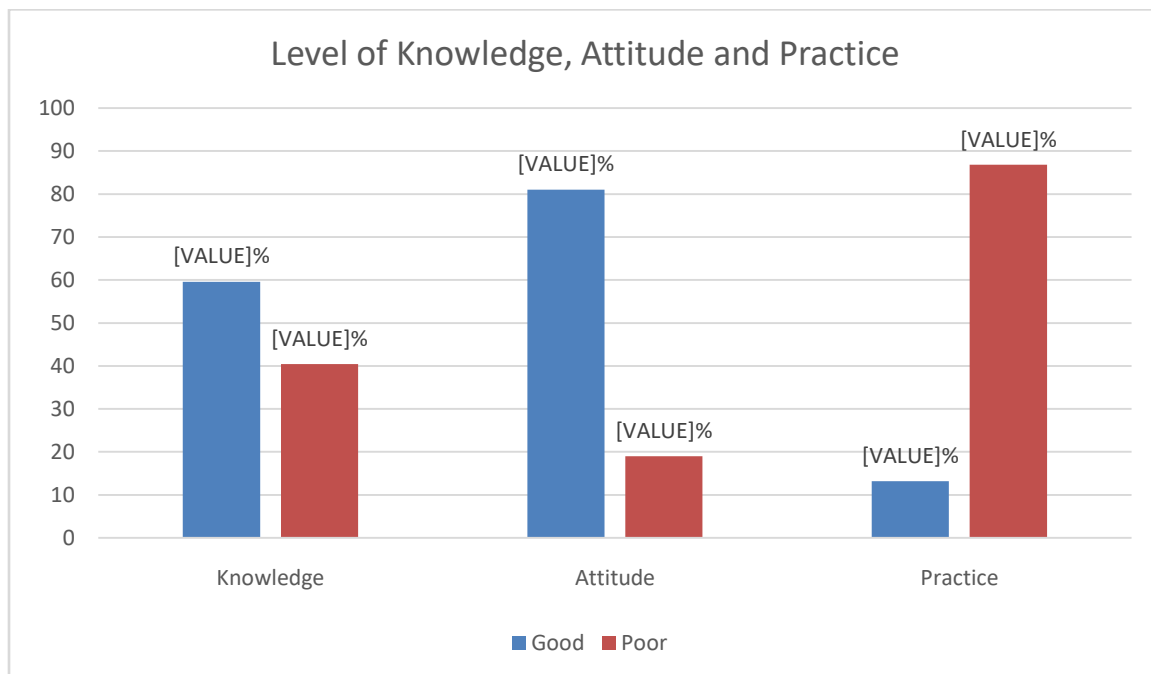


Figure (1): Level of Knowledge Attitude and Practice Regarding DiabeticFoot Care Among Diabetic Patients

Table (5): Association between Level of Knowledge and Sample Characteristics

Demographic Variables	Poor knowledge F (%)	Good knowledge F (%)	P value	OR (95% confidence interval)	P value
Age group (years)					
• ≤ 30	34 (45.9)	40 (54.1)	0.030*	1.77 (0.53-5.97)	0.357
• 31-40	17 (35.4)	31 (64.6)		1.63 (0.58-4.62)	0.357
• 41-50	15 (23.4)	49 (76.6)		0.94 (0.39-2.22)	0.880
• 51-60	45 (45.0)	55 (55.0)		2.09 (1.06-4.09)	0.033
• >60	51 (44.3)	64 (55.7)			
Gender					
• Female	86 (40.4)	127 (59.6)	0.992		
• Male	76 (40.4)	112 (59.6)			
Nationality					
• Saudi	149 (40.3)	221 (59.7)	0.856		
• Non-Saudi	13 (41.9)	18 (58.1)			
Marital status					
• Divorced or widowed	37 (62.7)	22 (37.3)	0.000*	1.94 (0.95-3.97)	0.069
• Single	54 (46.2)	63 (53.8)		2.49 (1.12-5.53)	0.025*
• Married	71 (31.6)	154 (86.4)			
Level of education					
• Illiterate	18 (85.7)	3 (14.3)	0.000*	0.35 (0.15-0.81)	0.014*
• Primary	17 (70.8)	7 (29.2)		2.21 (0.68-7.19)	0.186
• Intermediate	21 (55.3)	17 (44.7)		0.88 (0.38-2.04)	0.771
• Secondary	55 (51.9)	51 (48.1)		4.41(1.02-19.01)	0.046*
• University	51 (24.1)	161 (75.9)			
Smoking					
• No	117 (39.5)	179 (60.5)	0.550		
• Yes	45 (42.9)	60 (57.1)			
Duration of Diabetes					
• ≤ 10 years			0.357		
• 11-20 years	70 (37.6)	116 (62.4)			
• 21-30 years	52 (40.3)	77 (59.7)			
• 31-40 years	27 (42.9)	36 (57.1)			
• >30 years	13 (56.5)	10 (43.5)			
HbA1C					
• Controlled < 7.0%	34 (25.2)	101 (74.8)	0.000*	1.50 (0.81-2.79)	0.200
• Uncontrolled 7.0-8.5%	54 (43.2)	71 (56.8)		1.10 (0.56-2.17)	0.785
• Highly uncontrolled ≥ 8.6%	61 (51.3)	58 (48.7)		1.88 (0.61-5.74)	0.271
• Unknown	13 (59.1)	9 (40.9)			

Diabetes treatment - Diet only - Oral agents - Insulin - Insulin and oral agents - Injectable medications and oral agents	7 (25.0) 42 (32.1) 46 (42.6) 51 (64.6) 16 (29.1)	21 (75.0) 89 (67.9) 62 (57.4) 28 (35.4) 39 (70.9)	0.000*	1.80 (0.57-5.66) 2.14 (0.59-7.67) 1.31 (0.37-4.57) 4.70 (1.29-17.16)	0.314 0.243 0.675 0.019*
Foot complains - No - Yes	127 (39.3) 35 (44.9)	196 (60.7) 43 (55.1)	0.370		
Sensation problem in foot - No - Yes	122 (46.0) 40 (29.4)	143 (54.0) 96 (70.6)	0.001*	1.78 (1.01-3.16)	0.047*
Chronic diseases and complications - No - Yes	107 (41.0) 55 (39.3)	154 (59.0) 85 (60.7)	0.739		
Received advice on foot care - No - Yes	40 (50.6) 122 (37.9)	39 (49.4) 200 (62.1)	0.039*	2.29 (1.19-4.41)	0.012*

*p≤0.05 is statistically significant, OR Adjusted Odds Ratio

Table (6): Association between Level of Attitude and Sample Characteristics

Demographic Variables	Negative attitude F (%)	Positive attitude F (%)	P value	OR (95% confidence interval)	P value
Age group (years) ≤ 30 31-40 41-50 51-60 >60	14 (18.9) 12 (25.0) 13 (20.3) 16 (16.0) 21 (18.3)	60 (81.1) 36 (75.0) 51 (79.7) 84 (84.0) 94 (81.7)	0.768		
Gender - Female - Male	40 (18.8) 36 (19.1)	173 (81.2) 152 (80.9)	0.925		
Nationality - Saudi - Non-Saudi	72 (19.5) 4 (12.9)	298 (80.5) 27 (87.1)	0.371		
Marital status - Divorced or widowed - Single	15 (25.4) 29 (24.8)	44 (74.6) 88 (75.2)	0.024*	1.99 (0.87-4.61) 1.86 (0.98-3.54)	0.105 0.057

Married	32 (14.2)	193 (85.8)			
Level of education - Illiterate - Primary - Intermediate - Secondary - University	1 (4.8) 5 (20.8) 14 (36.8) 23 (21.7) 33 (15.6)	20 (95.2) 19 (79.2) 24 (63.2) 83 (78.3) 179 (84.4)	0.012*	0.08 (0.01-0.75) 0.45 (0.13-1.61) 0.43 (0.17-1.07) 0.38 (0.16-0.93)	0.027* 0.220 0.069 0.033*
Smoking - No - Yes	48 (16.2) 28 (26.7)	248 (83.8) 77 (73.3)	0.019*	0.72 (0.39-1.33)	0.297
Duration of Diabetes ≤ 10 years 11-20 years 21-30 years >30 years	25 (13.4) 31 (24.0) 18 (28.6) 2 (8.7)	161 (86.6) 98 (76.0) 45 (71.4) 21 (91.3)	0.011*	1.59 (0.31-8.16) 3.07 (0.61-17.15) 3.26 (0.62-17.15)	0.581 0.176 0.163
HbA1C - Controlled < 7.0% - Uncontrolled 7.0-8.5% - Highly uncontrolled ≥ 8.6% - Unknown	14 (10.4) 26 (20.8) 28 (23.5) 8 (36.4)	121 (89.6) 99 (79.2) 91 (76.5) 14 (63.6)	0.005*	1.69 (0.78-3.71) 1.53 (0.69-3.42) 3.04 (0.93-9.99)	0.184 0.299 0.0067
Diabetes treatment - Diet only - Oral agents - Insulin - Insulin and oral agents - Injectable medications and oral agents	7 (25.0) 16 (12.2) 22 (20.4) 22 (27.8) 9 (16.4)	21 (75.0) 115 (87.8) 86 (79.6) 57 (72.2) 46 (83.6)	0.061		
Foot complains - No - Yes	50 (15.5) 26 (33.3)	273 (84.5) 52 (66.7)	0.000*	0.46 (0.24-0.89)	0.022*
Sensation problem in foot - No - Yes	58 (21.9) 18 (13.2)	207 (78.1) 118 (86.8)	0.036*	1.29 (0.66-2.53)	0.462
Chronic diseases and complications - No - Yes	54 (20.7) 22 (15.7)	207 (79.3) 118 (84.3)	0.226		

Received advice on foot care					
- No - Yes	17 (21.5) 59 (18.3)	62 (78.5) 263 (81.7)	0.516		

*p≤0.05 is statistically significant, OR Adjusted Odds Ratio

Table (7): Association between Level of Practice and Sample Characteristics

Demographic Variables	Poor practice F (%)	Good practice F (%)	P value	OR (95% confidence interval)	P value
Age group (years) ≤ 30 31-40 41-50 51-60 >60	71 (95.9) 42 (87.5) 53 (82.8) 87 (87.0) 95 (82.6)	3 (4.1) 6 (12.5) 11 (17.2) 13 (13.0) 20 (17.4)	0.089		
Gender - Female - Male	194 (91.1) 154 (81.9)	19 (8.9) 34 (18.1)	0.007*	1.648 (0.73-3.72) Reference	0.230
Nationality - Saudi - Non-Saudi	318 (85.9) 30 (96.8)	52 (14.1) 1 (3.2)	0.087		
Marital status - Divorced or widowed - Single - Married	51 (86.4) 112 (95.7) 185 (82.2)	8 (13.6) 5 (4.3) 40 (17.8)	0.002*	0.467 (0.16-1.35) 3.23 (0.98-10.98)	0.160 0.054
Level of education - Illiterate - Primary - Intermediate - Secondary - University	19 (90.5) 23 (95.8) 37 (97.4) 95 (89.6) 174 (82.1)	2 (9.5) 1 (4.2) 1 (2.6) 11 (10.4) 38 (17.9)	0.033*	0.48 (0.03-6.83) 1.11 (0.06-22.54) 0.61 (0.07-5.59) 0.59 (0.07-5.31) Reference	0.585 0.946 0.661 0.643
Smoking - No - Yes	263 (88.9) 85 (81.0)	33 (11.1) 20 (19.0)	0.040*	2.14 (0.92-4.94)	0.076
Duration of Diabetes ≤ 10 years 11-20 years 21-30 years >30 years	163 (87.6) 113 (87.6) 52 (82.5) 20 (87.0)	23 (12.4) 16 (12.4) 11 (17.5) 3 (13.0)	0.760		

HbA1C					
• Controlled < 7.0%	111 (82.2)	24 (17.8)	0.001*	0.96 (0.43-2.14)	0.916
• Uncontrolled 7.0-8.5%	102 (81.6)	23 (18.4)		2.16 (0.69-6.79)	0.189
• Highly uncontrolled ≥ 8.6%	113 (95.0)	6 (5.0)		Reference	
• Unknown	22 (100.0)	0			
Diabetes treatment					
• Diet only	27 (96.4)	1 (3.6)	0.000*	0.27 (0.03-2.47)	0.246
• Oral agents	106 (80.9)	25 (19.1)		0.22 (0.02-2.090)	0.187
• Insulin	101 (93.5)	7 (6.5)		0.32 (0.03-3.58)	0.355
• Insulin and oral agents	74 (93.7)	5 (6.3)		0.86 (0.07-10.16)	0.905
• Injectable medications and oral agents	40 (72.7)	15 (27.3)		Reference	
Foot complains					
• No	278 (86.1)	45 (13.9)	0.460		
• Yes	70 (98.7)	8 (10.3)			
Sensation problem in foot					
• No	233 (87.9)	32 (12.1)	0.346		
• Yes	115 (84.6)	21 (15.4)			
Chronic diseases and complications					
• No	220 (84.3)	41 (15.7)	0.044*	0.75 (0.33-1.73)	0.497
• Yes	128 (91.4)	12 (8.6)			
Received advice on foot care					
• No	78 (98.7)	1 (1.3)	0.001*	8.45 (1.19-74.71)	0.033*
• Yes	270 (83.9)	52 (16.1)		Reference	
Level of knowledge					
• Good	154 (95.1)	8 (4.9)	0.000*	Reference	0.020*
• Poor	194 (81.2)	45 (18.8)		3.04 (1.19-7.73)	
Level of attitude					
• Positive	75 (98.7)	1 (1.3)	0.001*	Reference	0.034*
• Negative	273 (84.0)	52 (16.0)		9.47 (1.19-75.33)	

*p≤0.05 is statistically significant, OR Adjusted Odds Ratio

Discussion:-

Diabetic foot care is crucial for preventing late complications, reducing the economic burden and improving quality of life. This study aims to assess the level of knowledge, attitude, and practice regarding diabetic foot care among diabetic patients attending a diabetic clinic in Dammam Diabetes and Endocrine Center. The present study found that most of respondents had good knowledge and positive attitudes toward diabetic foot care, while high proportion had poor practice related to diabetic foot care. Regarding the level of knowledge toward diabetic foot care, our findings are similar to a national study conducted by Alsareii, 2025⁽²¹⁾, who reported a satisfactory level of awareness (60.0%). Similarly, Alharbi and Sulaiman, 2022⁽¹⁸⁾ found that 56.5% of participants had adequate knowledge. Many

national studies reported higher level of knowledge as Metwally et al., 2023 (79.9%)⁽¹⁹⁾, Alshammari et al., 2019 (76.6%)⁽¹⁵⁾ and Badahdah et al., 2024 (72.4%)⁽¹⁴⁾. Also, some international studies reported higher results as Alsaleh et al., 2021 (79.3%)⁽²²⁾, Awwad and Abu-khader, 2022 (68.7%)⁽²⁴⁾. In contrast poor level of knowledge was reported by Wazqaret al., 2021 (72.4%)⁽¹²⁾, Alkalashet al., 2024 (50.4%)⁽⁸⁾, Omotosho et al., 2024 (52.5%)⁽³⁰⁾, and Kassab et al., 2022 (75%)⁽²³⁾.

These variations in the results may be attributed to differences in study samples and assessment tools used. Additionally, variations in healthcare systems across countries may also explain these differences. Most participants in this study knew well about diabetic foot care mainly diabetic foot complications, importance for examining the inside of footwear and inspection of the feet. This was in line with Adeyemi et al., 2021⁽²⁸⁾ who reported good knowledge of foot care, particularly regarding foot cleaning and inspection, but inconsistent with Alsaleh et al., 2021⁽²²⁾ who found that the least recognized preventive measures among patients were the importance of daily foot inspection (42.9%) and checking the inside of footwear for any problems (50.1%). Moreover, Al Amri et al., 2021⁽¹⁷⁾ Published lower scores regarding knowledge items.

The adequate level of knowledge in the current study could be related to good health education programs applied in the health institutions also the advice received by the physicians regarding foot care play a significant role in raising knowledge level. The significant association between knowledge and level of education in this study could explain the high level of knowledge, since more than half of participant had university education. Knowledge about importance of taking medication regularly to reduce diabetes complication was less scored by respondents in this study. This was different than Ong et al., 2022⁽²⁵⁾ where all participants agreed, Alsaleh et al., 2021⁽²²⁾ where 99.4% agreed, Al-Hariri et al., 2017 where 97.3% agreed⁽¹³⁾ and Kassab et al., 2022⁽²³⁾ 97% agreed.

Lower percentage of participants in this study knew that smoking may result in poor circulation in feet. This varies from a study conducted by Wazqar et al., 2021⁽¹²⁾ where most patients were aware that individuals with diabetes should avoid smoking, as it impairs circulation and adversely affects the feet. Smoking was not a significant predictor for knowledge in the present study, in contrary to Jia et al., 2022⁽²⁶⁾ who reported that current smokers demonstrated significant lower levels of knowledge toward diabetic foot prevention compared with non-smokers. The main source of advice in the current study was physicians this was consistent with Shaqran et al., 2023⁽²⁰⁾ and Alharbi and Sulaiman, 2022⁽¹⁸⁾. Therefore, Shamim et al., 2021⁽¹⁶⁾ reported not receiving adequate advice from physicians regarding diabetic foot management. Receiving advice in this study was a significant predictor of knowledge similar to Al Amri et al., 2021⁽¹⁷⁾.

In this study, education is a significant predictor of knowledge. This is in agreement with Alkalash et al., 2024⁽⁸⁾, Alshammari, 2019⁽¹⁵⁾, Metwally et al., 2023⁽¹⁹⁾, Alsareii, 2025⁽²¹⁾, Al Amri et al., 2021⁽¹⁷⁾. Moreover, Omotosho et al., 2024⁽³⁰⁾ found that higher level of education was less likely to have poor knowledge of diabetic foot self-care. Educated patients understand health information about the disease better than illiterate and they read more about complications and preventive measures. They also communicate better with health care providers and understand them clearly. In addition, marital status is a significant predictor of knowledge in this study which is similar to Alshammari, 2019⁽¹⁵⁾, Metwally et al., 2023⁽¹⁹⁾ and Badahdah et al., 2024⁽¹⁴⁾. Awwad and Abu-khader, 2022⁽²⁴⁾ found that unmarried participants are more likely to have higher knowledge by 1.7 times compared with those who were married. While, Alsareii, 2025⁽²¹⁾ detects no significant association between marital status and awareness. Unmarried patients may have increased self-reliance, independent personality that actively seeking health information and medical advice which could explain the significant relationship with knowledge.

The current study demonstrates that the attitudes toward diabetic foot care were positive as reported by the majority. This is in agreement with Shamim et al., 2021 (80%)⁽¹⁶⁾ and Jia et al., 2022 (63.9%)⁽²⁶⁾. Shaqran et al., 2023⁽²⁰⁾ also demonstrated positive attitudes toward inspecting their feet and footwear. However, Alkalash et al., 2024 (53.6%)⁽⁸⁾ showed much lower scores for attitude. Also, Awwad and Abu-Khader, 2022⁽²⁴⁾ reported unfavorable attitude (61.7%) and Badahdah et al., 2024⁽¹⁴⁾ found that only 3.8% had positive attitude. Level of education is a significant predictor of attitude in the present study. This is consistent with Alkalash et al., 2024⁽⁸⁾, Alsareii, 2025⁽²¹⁾, Awwad and Abu-khader, 2022⁽²⁴⁾ and reflects that good education affects attitudes positively. Concerning the practice related to diabetic foot care, the majority in this study had poor practice, similar to Alkalash et al., 2024⁽⁸⁾, Wazqar et al., 2021⁽¹²⁾ and Badahdah et al., 2024⁽¹⁴⁾ where 77.7%, 63.3% and 54.8% respectively reported a poor level of practice. Moreover, Kassab et al., 2022 (76%)⁽²³⁾, Alsaleh et al., 2021 (69.2%)⁽²²⁾ and Awwad and Abu-khader, 2022 (68.2%)⁽²⁴⁾ all showed low level of practice. On the other hand, high level of practice was reported by Metwally et al., 2023

(81.8%)⁽¹⁹⁾, Alharbi and Sulaiman, 2022 (56.9%)⁽¹⁸⁾ and Ong et al., 2022 (63%)⁽²⁵⁾. This variation could be related to difference in sample characteristics, using different assessment tools and cut-off values.

In the present study, most of participants did not walk barefoot and trimmed their toenails, which is consistent with Badahdah et al., 2024⁽¹⁴⁾ who found that 83.8 % and 81.9% respectively did not walk barefoot and trimmed their toenails. On the other hand, there was a poor level of other daily foot care practices demonstrated in the current study. This was in line with Wazqar et al., 2021⁽¹²⁾. In addition, Jia et al., 2022⁽²⁶⁾ observed that some patients believed that feet without symptoms did not require daily examination and, consequently, did not consider daily inspection of their feet and footwear before use to be important. In contrary, Alharbi and Sulaiman, 2022⁽¹⁸⁾, Badahdah et al., 2024⁽¹⁴⁾ and Al Amri et al., 2021⁽¹⁷⁾ displays different results where 100%, 94.8% and more than 80% of participants respectively washed their feet daily. In addition, Alsaleh et al., 2021⁽²²⁾ reported that 62.4% of respondents do inspect their feet daily and 67.5% wash their feet more than once a day. Also, most participants used a moisturizer and applied it between toes. Ong et al., 2022⁽²⁵⁾ shows that 97.7% of studied sample washed their feet regularly and 93.6% seeking doctor's consultation. This indicates that participants have health seeking behavior on the contrary in this study.

An important result regarding regular visiting a physician for foot check-ups, this study matches Abdulghani et al., 2018⁽³⁴⁾ who demonstrated that 34.2% perform regular examination by specialist and higher than Alharbi and Sulaiman, 2022⁽¹⁸⁾ where only 22.3% of participants have done examination. Metwally et al., 2023⁽¹⁹⁾ said that 65.8% of participants reported they would consult a doctor if needed. Early medical consultation and regular follow-up for diabetic foot problems is very important and can help prevent further complications at an early stage. The poor level of practice in the current study could be attributed to insufficient motivation among patients to care for their feet properly. Performing daily repetitive practices on foot may be boring for patients and make them less committed when there are no immediate benefits are noticeable.⁽²⁶⁾ Also, there might be other personal, social or cultural factors that contribute to this poor practice which necessitate further studies to address these root causes.

The poor diabetic foot care practices noticed in this study is worrying and may increase the risk of diabetic foot ulcers and other complications. Effective interventions aiming patient education and the promotion of self-management skills is essential to prevent complications and enhance their overall quality of life.⁽³⁰⁾ This study demonstrates that receiving advice on foot care is a significant predictor for good practice, similar to Omosho et al., 2024⁽³⁰⁾. This emphasizes the significant role of health education programs for these patients. Our results shows that knowledge and attitudes are significant predictors of practice. This was in agreement with Badahdah et al., 2024⁽¹⁴⁾, Kassab et al., 2022⁽²³⁾, Ong et al., 2022⁽²⁵⁾ and Jia et al., 2022⁽²⁶⁾ who identifies positive significant correlation between knowledge and practice. Therefore, empowering patients with accurate knowledge about foot care will improve their practice.

However, in this study there was a gap between knowledge, attitude and practice, where good knowledge and favorable outcome of the participants didn't raise the level of practice. This gap is comparable to Shamim et al., 2021⁽¹⁶⁾, Jia et al., 2022⁽²⁶⁾, Kurup et al., 2019⁽³²⁾ and Pourkazemi et al., 2020⁽³³⁾. This study found that education is not a significant predictor of practice which is in line with Kassab et al., 2022⁽²³⁾ but inconsistent with Alkalash et al., 2024⁽⁸⁾ who found a significant relationship between higher education and good practice. As regard to diabetes related factors in this study, participants with insulin and oral agents and those with sensation problems in foot are more likely to have good knowledge. Foot complaints is a significant predictor of attitude. Those patients may have more frequent visits to clinics and receive more health education about disease complications and prevention. Similarly, Alsareii, 2025⁽²¹⁾ shows that participants receiving insulin only demonstrated lower awareness and attitude compared with those receiving both insulin and oral antiglycemic medications. Alkalash et al., 2024⁽⁸⁾ found that taking oral hypoglycemic medications is a significant predictor for good knowledge. There were no significant predictors of practice and diabetes related factors in the current study. This was in line with Wazqar et al., 2021⁽¹²⁾ and Badahdah et al., 2024⁽¹⁴⁾. In contrary, Alshammari, 2019⁽¹⁵⁾ displayed a significant relationship between practice and duration of diabetes and Alsareii, 2025⁽²¹⁾ shows that less duration of diabetes and controlled HbA1c level both had better awareness and attitude.

Study limitations:-

An analytical cross-sectional study was used in this research. This type of study has some limitations in evaluating temporality and causality of observed relationships with no follow-up of the sequence of events. Also, this study was conducted only at one place; Dammam Medical Complex; which hinder the generalization of the results. The practice

was measured relying on patients' answers on questions related to practice not through observation which could be inaccurate.

Conclusion:-

This study concluded adequate knowledge and favorable attitudes towards diabetic foot. However, poor practices related to diabetic foot care were observed. Marital status, educational level, diabetes treatment, sensation problems in the feet and receiving advice were significant predictors of knowledge. Educational level and foot complaints were significant predictors of attitude, whereas receiving advice, level of knowledge, and attitude were significant predictors of practice.

Recommendations:-

The findings of this study highlight the urgent need for interventions and training programs to improve patients' knowledge and practices. To develop effective patient education and management programs, it is recommended to implement training programs targeting nurses and all health care providers as well. These programs should focus on improving knowledge and practical competencies of health care workers about diabetic foot care. Health education programs for patients are essential to improve knowledge, particularly regarding the importance of regular medication adherence to prevent complications, the benefits of exercise, and proper foot care, as diabetic patients are more prone to foot problems. These programs should also emphasize that smoking may lead to poor circulation. In addition, they should focus on improving patients' self-care skills through using educational materials, infographics and leaflets on foot care.

Education should mainly focus on the importance of daily foot examination, washing the feet with warm water, applying moisturizer daily, and inspecting shoes before wearing them. Moreover, regular physician visits for foot check-ups are highly important. Health education programs targeting caregivers, families of diabetic patients, and the community are also essential to increase awareness of diabetic foot care and to provide support and guidance to patients at home within the community. Patients' characteristics and their interactions with the environment should be taken into consideration when developing health education programs. Assessing patients' willingness to learn foot care skills is necessary to improve practices. ⁽²⁶⁾ Further studies are recommended, mainly on diabetic foot care practices, to investigate the root causes of poor practice.

Ethical considerations:-

IRB and administrative approval were obtained from Dammam Medical Complex, Eastern Health Cluster. Informed consent was obtained from all participants. All data were kept confidential and anonymous. All authors declare no conflict of interest.

Budget:-

All expenses were self-sponsored by the research team member.

Acknowledgment:-

The authors would like to express their sincere gratitude to all participants who took part in this study. Their valuable time, cooperation, and willingness to share their experiences made this research possible. We deeply appreciate their contribution, which was essential to the successful completion of this work. Special thanks to Dr. Maha Eltwansy for her assistance with data analysis, as well as for her valuable guidance and constructive feedback.

References:-

1. Urgent action needed as global diabetes cases increase four-fold over past decades [Internet]. Who.int. [cited 2025 Mar 17]. Available from: <https://www.who.int/news/item/13-11-2024-urgent-action-needed-as-global-diabetes-cases-increase-four-fold-over-past-decades>
2. Almottowa H, Aldurayhim A, Alsaeri A, Mnayan M, Alghamdi F, Alghamdi T, et al. Rates of Amputations Among Diabetics in Saudi Arabia. *Journal of Healthcare Sciences*. 2022;2(04):52-7.
3. Saudi Arabia [Internet]. International Diabetes Federation. 2023 [cited 2025 Mar 17]. Available from: <https://idf.org/our-network/regions-and-members/middle-east-and-north-africa/members/saudi-arabia/>

4. Zaki SM, El Karsh DS, Faden TM, Almghamsi LT, Fathaldin JO, Alhazmi OA. Diabetic foot complications in Saudi Arabia: A retrospective study. *Cureus* [Internet]. 2024;16(2):e53531. Available from: <http://dx.doi.org/10.7759/cureus.53531>
5. Lepäntalo M, Apelqvist J, Setacci C, Ricco JB, De Donato G, Becker F, Robert-Ebadi H, Cao P, Eckstein HH, De Rango P, Diehm N. Chapter V: diabetic foot. *European Journal of Vascular and Endovascular Surgery*. 2011 Dec 1;42:S60-74. Available from: [http://dx.doi.org/10.1016/S1078-5884\(11\)60012-9](http://dx.doi.org/10.1016/S1078-5884(11)60012-9)
6. Stancu B, Ilyés T, Farcas M, Coman HF, Chiş BA, Andercou OA. Diabetic Foot Complications: A Retrospective Cohort Study. *International Journal of Environmental Research and Public Health*. 2023; 20(1):187. <https://doi.org/10.3390/ijerph20010187>
7. Almohammadi AA, Alnashri MM, Harun RAT, Alsamiri SM, Alkhatieb MT. Pattern and type of amputation and mortality rate associated with diabetic foot in Jeddah, Saudi Arabia: A retrospective Cohort Study. *Ann Med Surg (Lond)* [Internet]. 2022;73. Available from: <http://dx.doi.org/10.1016/j.amsu.2021.103174>
8. Alkalash SH, Alnashri FH, Alnashri AI, Alghubayshi KA, Alsumaydi MA, Alzubaidi WS, et al. Knowledge, attitude, and practice of adult diabetics regarding diabetic foot ulcers: A cross-sectional study in Saudi Arabia. *Cureus* [Internet]. 2024; Available from: <http://dx.doi.org/10.7759/cureus.53356>
9. Alshaikh AA, Alqarni HM, Hassan Assiri HA, Shlwan MA, AlJebrael MA, Almuaddi AS, et al. Knowledge, attitude, and practice of diabetic foot ulcer care in Asser region: A cross-sectional study. *Cureus* [Internet]. 2023; Available from: <http://dx.doi.org/10.7759/cureus.42807>
10. Kassab HS, Ismaeel MT, Elfattah TA, Elaaty A. Diabetic foot care knowledge and practice in type 2 diabetes and relation to microvascular complications in Alexandria (Egypt). *Endocr Regul* [Internet]. 2022;56(2):95–103. Available from: <http://dx.doi.org/10.2478/enr-2022-0011>
11. Yıldırım Ayaz E, Dincer B, Oğuz A. The effect of foot care education for patients with diabetes on knowledge, self-efficacy and behavior: Systematic review and meta-analysis. *Int J Low Extrem Wounds* [Internet]. 2022;21(3):234–53. Available from: <http://dx.doi.org/10.1177/15347346221109047>
12. Wazqar AA, Baatya MM, Lodhi FS, Khan AA. Assessment of knowledge and foot self-care practices among diabetes mellitus patients in a tertiary care centre in Makkah, Saudi Arabia: a cross-sectional analytical study. *Pan Afr Med J* [Internet]. 2021;40:123. Available from: <http://dx.doi.org/10.11604/pamj.2021.40.123.30113>
13. Al-Hariri MT, Al-Enazi AS, Alshammari DM, Bahamdan AS, Al-Khtani SM, Al-Abdulwahab AA. Descriptive study on the knowledge, attitudes and practices regarding the diabetic foot. *J Taibah Univ Med Sci* [Internet]. 2017;12(6):492–6. Available from: <http://dx.doi.org/10.1016/j.jtumed.2017.02.001>
14. Badahdah HM, Alshammari SF, Jassomah OM, Alharbi AJ, Alsiwed DT, Althagafi AA, et al. Knowledge, attitude, and practice of foot care and the risk of foot ulcers in diabetic patients in Jeddah, Saudi Arabia: A cross-sectional study. *Cureus* [Internet]. 2024;16(3):e55826. Available from: <http://dx.doi.org/10.7759/cureus.55826>
15. Alshammari ZJ, Alsaid LA, Parameaswari PJ, Alzahrani AA. Attitude and knowledge about foot care among diabetic patients in Riyadh, Saudi Arabia. *J Family Med Prim Care* [Internet]. 2019;8(6):2089–94. Available from: http://dx.doi.org/10.4103/jfmpe.jfmpe_248_19
16. Shamim M, Alhakbani MSA, Alqahtani MSB, Alharthi OSO, Alhaqbani YJN. Knowledge, attitude, and practice regarding diabetic foot care among Saudi and non-Saudi diabetic patients in Alkharij. *J Family Med Prim Care* [Internet]. 2021;10(2):859–64. Available from: http://dx.doi.org/10.4103/jfmpe.jfmpe_1681_20
17. Al Amri AM, Shahrani IM, Almaker YA, Alshehri DM, Argabi MA, Alghamidi FA, et al. Knowledge, attitude and practice regarding risk of diabetic foot among diabetic patients in aseer region, Saudi Arabia. *Cureus* [Internet]. 2021;13(10):e18791. Available from: <http://dx.doi.org/10.7759/cureus.18791>
18. Alharbi MO, Sulaiman AA. Foot care knowledge, attitude and practices of diabetic patients: A survey in Diabetes health care facility: A survey in Diabetes health care facility. *J Family Med Prim Care* [Internet]. 2022;11(7):3816–23. Available from: http://dx.doi.org/10.4103/jfmpe.jfmpe_183_21
19. Metwally AS, Aljohani ZA, Maashi MI, Alrehaili AA, Alhejaili BM, Aljabri AM, et al. Knowledge, attitude, and practice regarding the risk of diabetic feet among diabetic patients in the Madinah region, Saudi Arabia. *Cureus* [Internet]. 2023;15(12):e49933. Available from: <http://dx.doi.org/10.7759/cureus.49933>
20. Shaqran TM, Alqahtani SN, Alhalafi AF, Alsabeelah NM, Algethmi RA, Azhari AS, et al. Knowledge, attitude, and practices related to foot care among diabetic patients in Tabuk City, Saudi Arabia. *Cureus* [Internet]. 2023;15(11):e48473. Available from: <http://dx.doi.org/10.7759/cureus.48473>
21. Alsareii SA. Evaluation of knowledge, attitude, and practices of foot self-care among diabetic patients attending different diabetic clinics in Najran, Saudi Arabia. *King Khalid University Journal of Health Sciences* [Internet]. 2023 [cited 2025 Apr 10];8(1):37–47. Available from: https://journals.lww.com/kkuj/fulltext/2023/0810/evaluation_of_knowledge,_attitude,_and_practices.7.aspx

22. Alsaleh FM, AlBassam KS, Alsairafi ZK, Naser AY. Knowledge and practice of foot self-care among patients with diabetes attending primary healthcare centres in Kuwait: A cross-sectional study. *Saudi Pharm J* [Internet]. 2021;29(6):506–15. Available from: <http://dx.doi.org/10.1016/j.jsps.2021.04.006>
23. Kassab HS, Ismaeel MT, Elfattah TA, Elaaty A. Diabetic foot care knowledge and practice in type 2 diabetes and relation to microvascular complications in Alexandria (Egypt). *Endocr Regul* [Internet]. 2022;56(2):95–103. Available from: <http://dx.doi.org/10.2478/enr-2022-001>
24. Awwad KA, Abu-Khader IR. Cross-sectional study concerning the knowledge, attitude, and practice of people with diabetes regarding the prevention of foot ulcers in a community. *Clin Diabetes* [Internet]. 2022 Summer;40(3):298–304. Available from: <http://dx.doi.org/10.2337/cd21-0099>
25. Ong JJ, Azmil SS, Kang CS, Lim SF, Ooi GC, Patel A, et al. Foot care knowledge and self-care practices among diabetic patients in Penang: A primary care study. *Med J Malaysia*. 2022;77(2):224–31.
26. Jia H, Wang X, Cheng J. Knowledge, attitudes, and practices associated with diabetic foot prevention among rural adults with diabetes in North China. *Front Public Health* [Internet]. 2022;10:876105. Available from: <http://dx.doi.org/10.3389/fpubh.2022.876105>
27. Hanley G, Chiou P-Y, Liu C-Y, Chen H-M, Pfeiffer S. Foot care knowledge, attitudes and practices among patients with diabetic foot and amputation in St. Kitts and Nevis. *Int Wound J* [Internet]. 2020;17(5):1142–52. Available from: <http://dx.doi.org/10.1111/iwj.13446>
28. Adeyemi TM, Olatunji TL, Adetunji AE, Rehal S. Knowledge, practice and attitude towards foot ulcers and foot care among adults living with diabetes in Tobago: A qualitative study. *Int J Environ Res Public Health* [Internet]. 2021;18(15):8021. Available from: <http://dx.doi.org/10.3390/ijerph18158021>
29. Simonsen MB, Christiansen SL, Pedersen MK, Røikjer J, Croosu SS, Leutscher PDC, et al. Health literacy and cognitive function in people with diabetic foot ulcer with focus on knowledge, attitude, and practice in relation to foot self-care. *SAGE Open Med* [Internet]. 2024;12:20503121241258841. Available from: <http://dx.doi.org/10.1177/20503121241258841>
30. Omotosho TOA, Sanyang Y, Senghore T. Diabetic foot self-care knowledge and practice among patients with diabetes attending diabetic clinic in the Gambia. *Int Wound J* [Internet]. 2024;21(7):e14963. Available from: <http://dx.doi.org/10.1111/iwj.14963>
31. Fayfman M, Schechter MC, Amobi CN, Williams RN, Hillman JL, Alam MM, et al. Barriers to diabetic foot care in a disadvantaged population: A qualitative assessment. *J Diabetes Complications* [Internet]. 2020;34(12):107688. Available from: <http://dx.doi.org/10.1016/j.jdiacomp.2020.107688>
32. Kurup R, Ansari A, Singh J, Raja A. Wound care knowledge, attitudes and practice among people with and without diabetes presenting with foot ulcers in Guyana. *Diabet. Foot J*. 2019;(22): 24–31.
33. Pourkazemi A, Ghanbari A, Khojamli M, Baloh H, Hemmati H, Jafaryparvar Z, et al. Diabetic foot care: knowledge and practice. *BMC Endocr Disord*. 2020; 20:40. doi: 10.1186/s12902-020-0512-y
34. Abdulghani HM, AlRajeh AS, AlSalman BH, AlTurki LS, AlNajashi NS, Irshad M, et al. Prevalence of diabetic comorbidities and knowledge and practices of foot care among diabetic patients: A cross-sectional study. *Diabetes Metab Syndr Obes* 2018;11:417-25.