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Review Article

**DIABETIC FOOT CARE AWARENESS AND KNOWLEDGE IN
KSA: A SYSTEMATIC REVIEW**

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Abstract:

Objective: A growing number of research on diabetic foot care knowledge and awareness have been undertaken; nevertheless, there is no clear consensus on the diabetic foot care knowledge and awareness. The goal of this systematic review was to consolidate current data on diabetic foot care knowledge and awareness.

Methods: Authors began with recognizing the important examination proof that spots light on diabetic foot care knowledge and awareness in KSA. Authors led electronic writing look in the accompanying data sets: Ovid Medline (2016 to present), Ovid Medline Daily Update, Ovid Medline in process and other non-filed references, Ovid Embase (2016 to present), The Cochrane Library (latest issue) and Web of Science. Just examinations in English language will be incorporated. The precise selection was acted in close collaboration with a clinical examination curator.

Results: A total of 72 studies were identified in the search, all of them were assessed for eligibility, and 7 articles were included in this review. All included articles targeted diabetic patients and assessed their knowledge and awareness regarding diabetic foot care. Studies were conducted in different regions of KSA as presented in table 1. It is noticed from the table that all studies were cross sectional and data was analyzed using SPSS. Different regions were included and were Riyadh, Alkharj, Aseer, Jazan and Dammam. All studies targeted both type 1 and 2 diabetes except two studies which targeted only type 2 diabetes. Most of included studies reported poor knowledge and practice except for that showed good knowledge and poor attitude.

Conclusion: Study results showed that some studies indicated good knowledge, good practice and poor attitude among participants. On the other hand, other studies reported low knowledge and practice. Furthermore, other authors concluded sufficient knowledge, positive attitude, and lag practice.

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INTRODUCTION:

More than 400 million individuals were diagnosed with diabetes in 2014, with the disease disproportionately affecting those over the age of 65. This number is expected to rise by 7.7% by 2030 [1] and 642 million by 2040[2-3]. Sedentary behavior, urbanization, and becoming older are all thought to contribute to this complex condition [4,5]. Diabetes foot is the leading cause of non-traumatic lower limb amputations, affecting half of all diabetic patients [6-8]. Mechanical stress, neuropathy, and angiopathy are key contributors to the development of foot deformities in people with diabetes.

Reduced feeling from sensory neuropathy increases the risk of foot damage, which may cause skin breakdown and foot ulcers [9]. Between 8 and 17 percent of people with diabetes develop foot ulcers every year [10]. Diabetic foot is defined as a foot affected by neurologic abnormalities and varying degrees of peripheral vascular disease due to foot ulceration, infection, or destruction [11]. According to a recent meta-analysis, the prevalence of diabetic foot ulcer (DFU) is highest in men with type 2 diabetes, and the worldwide burden of DFU is estimated to be 6.3% [12]. Native North Americans are said to have the greatest incidence rate in the world. Oceania had a prevalence rate of 3%, Africa 7.2%, Europe 5.1%, Australia 1.5%, and Asia 5.5%. Some nations, notably Canada and Belgium, have a higher reported frequency of [7]. There was 11.6% of DFU in Asia, all of which came from India [7].

According to previous research, the prevalence of DFU in Saudi Arabia ranges from 26% to 61.8%, making it the second most populous nation in the Middle East [13] in terms of diabetic patients [14-15]. It is believed that 5 percent of all fatalities in Saudi Arabia are caused by this complex illness [16]. A majority of diabetes patients with foot issues in Saudi Arabia have foot ulcers, according to data gathered from a registry [17]. It is very uncommon for foot ulcers to be followed by further health issues that make daily living miserable. Furthermore, it raises

healthcare costs since almost 35% of all hospital admissions are due to diabetes-related complications in clinics that specialize in treating the disease [18].

Studies of the cost of treating diabetic foot ulcers (DFUs) in the United States and Europe (including nations like France and Belgium) have shown very high direct and indirect costs associated with DFU care [19-22]. Costs associated with treating DFUs in India were estimated to be \$1960 USD in a recent research. The United Arab Emirates (UAE) is experiencing a similar treatment expense burden as other countries and regions due to the rapid increase in the incidence of diabetes mellitus (DM), as shown in [23]. However, with the right prophylactic treatment and preventative measures, diabetic foot problems may be reduced or even eliminated [13]. American Orthopedic Foot and Ankle Society's Diabetes Committee has formulated recommendations for preventative foot care, which include screening, patient education, and treatment [24]. Patients' knowledge and education on early detection and self-management have been shown to be lacking. Concerning, Saudi Arabia has the second-highest rate of DM in the Middle East and the seventh-highest rate in the world. With so little previously published on the Middle East, further study is clearly needed in the region.

METHODS:**Review Question**

This review seeks to evaluate and point out knowledge and awareness of diabetic foot care among diabetic patients in KSA. The specific review questions to be addressed are:

- (1) What is level of diabetic foot care awareness among diabetic patients in KSA?
- (2) What is the knowledge level of diabetic foot care among diabetic patients in KSA?

Searches

We began with recognizing the important examination proof that spots light on t knowledge and awareness of diabetic foot care among diabetic patients in KSA. We

led electronic writing look in the accompanying data sets: Ovid Medline (2016 to present), Ovid Medline Daily Update, Ovid Medline in process and other non-filed references, Ovid Embase (2016 to present), The Cochrane Library (latest issue) and Web of Science. Just examinations in English language will be incorporated. The precise selection was acted in close collaboration with a clinical examination curator. Also, the bibliographies of any qualified articles recognized was checked for extra references and reference look were done for all included references utilizing ISI Web of Science.

We considered “published” articles to be compositions that showed up in peer-reviewed journals. Articles present in grey literature were excluded from our review.

Types of studies to be included

We included articles covering how to coordinate different review plans in orderly review of knowledge and awareness of diabetic foot care among diabetic patients in KSA. We did exclude articles only depicting the knowledge and awareness of diabetic foot care among diabetic patients in KSA.

We concentrated on the knowledge and awareness of diabetic foot care among diabetic patients in KSA. We included articles depicting sample sizes and articles that planned to sum up their outcomes to the populace which test was drawn from. Case series and case reports were excluded from our search. Only studies from KSA were considered.

Participants

The systematic review included examinations with tests of diabetic patients.

Searching key words

For every data set, looking through was led by utilizing a mix of the accompanying keywords: (diabetes OR diabetic foot OR diabetes complication OR angiopathy OR neuropathy OR knowledge OR awareness OR foot care OR Kingdom of Saudi Arabia OR systematic review).

We included examinations enrolling members in everyone as well as clinical settings. Studies were incorporated assuming they revealed pr knowledge and awareness of diabetic foot care among diabetic patients in KSA. No comparator or control test size is required in the review to be incorporated.

Studies selection process

All list items were brought into an EndNote record. Two analysts evaluated titles and abstracts for their likely pertinence.

One reviewer freely screened titles and abstracts from the search and any articles that report knowledge and awareness of diabetic foot care among diabetic patients in KSA. We gained the full text of articles that possibly meet the eligibility criteria.

Outcomes

Primary outcome

To determine knowledge and awareness of diabetic foot care among diabetic patients in KSA.

Information extraction¹, (choice and coding)

Information was extracted from the included articles utilizing an electronic information extraction structure on Microsoft Access programming. Two reviewers freely extracted information, utilizing a standard information extraction structure which was created by the survey creators with the end goal of the review. The extraction structure incorporated the accompanying data:

- 1- Publication subtleties: title, authors, journal name and year and city, of distribution, country in which the review was led, sort of distribution, and wellspring of financing.
- 2- Study subtleties: concentrate on plan (cross-sectional, cohort, case-control), settings (clinical or population based), concentrate on transience (planned or review), patients' enlistment techniques (successive or non-continuous), the geographical area, year of information assortment and reaction rate, qualification (consideration and avoidance rules), name of appraisal tool(s), approval of evaluation tool(s).
- 3- Study members' subtleties: number of people reviewed/examined, population qualities including mean age (SD), and gender distribution, relationship status, demographic data.

Data management

A descriptive statistic is employed and relevant data are extracted from eligible studies and presented in tables. We then presented a narrative synthesis of the summary of knowledge and awareness of diabetic foot care among diabetic patients in KSA.

RESULTS:

A total of 72 studies were identified in the search, all of them were assessed for eligibility, and 7 articles were included in this review (Figure 1).

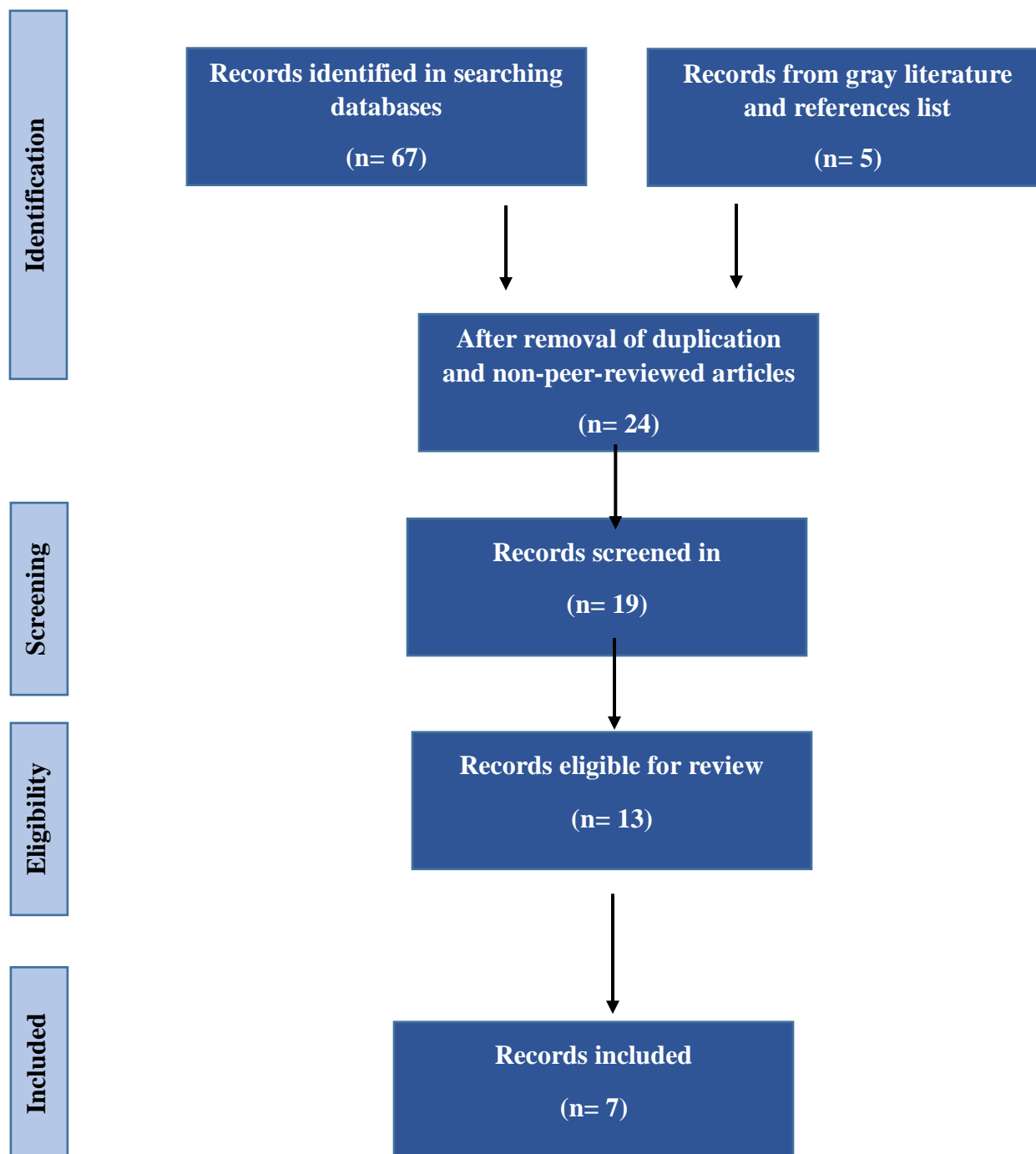


Figure 1: Flow chart of selection process

All included articles targeted diabetic patients and assessed their knowledge and awareness regarding diabetic foot care. Studies were conducted in different regions of KSA as presented in table 1. It is noticed from the table that all studies were cross sectional and data was analyzed using SPSS. Different regions were included; Riyadh [25-26, 29], Alkharj [27], Aseer [28], Jazan [30] and Dammam [31]. All studies targeted both type 1 and 2 diabetes except two studies [29-30] which targeted only type 2 diabetes.

Table 1: Methodological characteristics of included studies

Study	Year	Region	Design	Sample size	Sampling	Setting	Diabetes	Analysis	Data collection	Questionnaire
Alshammari [25]	2019	Riyadh	Cross-sectional	368	Random	Diabetic clinic of tertiary care hospital	Type 1 and 2	SPSS 23.0	By investigator	Demographic profile, knowledge (6 items), attitude (7 items), practice (8 items)
AlOwais [26]	2022	Riyadh	Cross-sectional	350	Consecutive	Primary Care Center in Security Forces Hospital	Type 1 and 2	SPSS 22.0	Self-administered	Demographic, knowledge, practice
Shamim [27]	2021	Alkharj	Cross-sectional	224	Convenience	Diabetic clinic, Military Hospital	Type 1 and 2	SPSS 24.0	Face-to-face, Electronic	Demographic, knowledge, attitude, practice
AlJarallah [28]	2020	Aseer	Cross-sectional	351	Convenience	Aseer Central Hospital	Type 1 and 2	SPSS 22.0	Self-administered	Demographic, knowledge, practice
AlOdhayani [29]	2017	Riyadh	Cross-sectional	350	Convenience	Multi-center	Type 2	SPSS 18.0	Self-administered	Demographic, knowledge, awareness, practice
Solan [30]	2016	Jazan	Cross-sectional	250	Random	Jazan Diabetes Center	Type 2	SPSS	Face-to-face	Socioeconomic, information about DM, diabetic foot pattern, knowledge, practice
AlHariri [31]	2017	Dammam	Cross-sectional	229	Random	King Fahd Hospital	Type 1 and 2	SPSS	Self-administered	Demographic, knowledge (16 items), attitude (3 items), practice (10 items)

Most of included studies reported poor knowledge and practice [26-30] except for [25] that showed good knowledge and poor attitude. However, AlHariri [31] reported good knowledge, favorable attitude and good practice. Summary of significant results are presented in table 2.

Table 2: Main results and conclusion of included studies

Study	Male	Female	Knowledge	Attitude	Practice	Factors affecting knowledge, attitude and practice	Conclusion
Alshammari [25]	111	257	76.6%	47.6%	59.8%	Married, Secondary and university education, Employed	Good knowledge, good practice, poor attitude
AlOwais [26]	185	165	65%	-	28%	Gender	Low knowledge and practice
Shamim [27]	131	93	69.2%	70.5%	26.8%	-	Sufficient knowledge, positive attitude, lag practice
AlJarallah [28]	218	133	22.4%	-	29.17%	Female gender, previous education	Low knowledge and practice
AlOdhayani [29]	225	125	Not numerically presented			-	Lack of knowledge, unaware of DM complications, poor practice
Solan [30]	112	138	53.6%	-	68.4%	-	Knowledge and practice are not adequate
AlHariri [31]	134	95	76%	92%	72%	-	Good knowledge, favorable attitude, good practice

There were some factors that affected level of knowledge, attitude and practice either positively or negatively. Figure 2 shows a forest plot of these factors among the total population included in this systematic review.

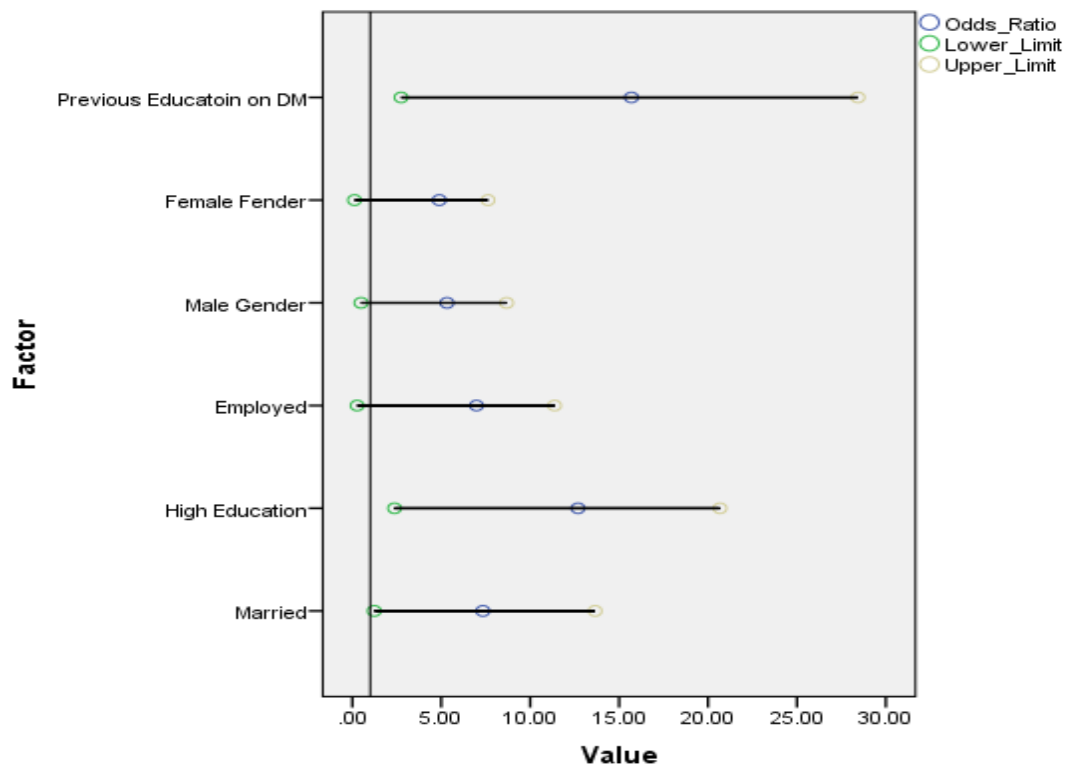


Figure 2: Forest plot of factors affecting participants knowledge, attitude and practice regarding diabetic foot

DISCUSSION:

From 4.7% in 1980 [32] to 8.4% in 2017 [33], the worldwide adult prevalence of diabetes has grown dramatically. The development of diabetic foot ulcers is a serious consequence of the disease (DFU). Disabling foot ulcers (DFU) are a leading cause of death and hospitalization [34]. DFU occurs in 15%-25% of people with diabetes during the course of their lifetimes [35, 36], and re-ulceration rates are predicted to reach 65% after 5 years. The therapy of DFU may be further complicated by poor wound healing and re-ulceration due to coexisting peripheral artery disease, infection, and neuropathy [36].

Amputation may be necessary if an ulcer does not heal or becomes infected. When combined with diabetes, chronic kidney disease increases the risk of death from amputation to over 70% after seven years [37]. This is true even for those with diabetes who do not have chronic renal disease. In addition, those who lose limbs to DFU have a worse quality of life [38] and are more likely to experience psychological anguish [39]. In addition to having negative effects on the patients themselves, DFUs have been demonstrated to have a negative effect on the quality of life of the carers [40]. Cost estimates range from \$9 to \$13 billion in the United States [41] to £580 million for the National Health Service in the United Kingdom [42]. These figures highlight the enormous clinical and financial challenges caused by DFU. Thus, it is crucial to implement measures to avoid ulcers, and teaching people how to take care of their feet might be one of these measures. The International Working Group on the Diabetic Foot (IWGDF) recommendations state that "education targeted at enhancing foot care knowledge and behavior and encouraging the patient to adhere to this foot care guidance" [43] should be provided to people with diabetes who are at risk of foot ulcers.

Effective foot care education for people with diabetes should provide them with critical, understandable information about their illness, allowing for patients to be active participants in their own treatment and promoting comprehension of how to attain personal health objectives (i.e. self efficacy). If people have faith in their own abilities to take care of their health, they are more likely to take an active role in their own healthcare [44], and this is especially true in the case of diabetes, where self-efficacy is crucial for enhancing self-care behavior [45]. One way to measure a person's self-efficacy is to ask them how confident they are in their ability to engage in the various forms of self-care that have been identified as beneficial for people with diabetes [46].

Patient education alone has not been shown in previous evaluations [47, 48] of clinical outcomes such as ulceration incidence or amputation rates to be an effective strategy of lowering the occurrence of diabetic foot ulceration and amputation. In particular, this paper seeks to evaluate the research in order to comprehend the effect of patient foot care education on diabetics' foot care knowledge, foot self-care behavior, and self-efficacy.

CONCLUSION:

Study results showed that some studies indicated good knowledge, good practice and poor attitude among participants. On the other hand, other studies reported low knowledge and practice. Furthermore, other authors concluded sufficient knowledge, positive attitude, and lag practice.

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