E-B Environment - Behaviour Proceedings Journal

AicE-Bs2026Sokcho

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https://www.amerabra.org/index.php/aice-bs2026sokcho-04-06-jun-2026/

14th Asia-Pacific International Conference on Environment-Behaviour Studies

Kyungdong University Global (KDU Global),Sokcho (Goseong), South Korea, 04-06 Jun 2026

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# Effect of Educational Programs on Foot Care Knowledge and Practices among Diabetes Patients in Asia: A systematic review

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**Abstract**

Diabetic foot complications are a public concern, a leading cause of morbidity, disability, and reduced quality of life. Promoting effective foot care through education for enhancing functional independence, well-being, and quality of life. This review, guided by the PRISMA 2020 guidelines, included studies from January 2015 to March 2025, comprising three randomized controlled trials and 13 quasi-experimental studies conducted in Asian countries. The results revealed that interventions varied, including face-to-face education, printed and multimedia materials, mobile health applications, and community-based programs. Findings indicate improvements in knowledge and foot care practices, and that educational interventions are effective in strengthening these.

Keywords: Diabetes Mellitus, diabetes foot care, educational intervention, foot care practice

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## 1.0 Introduction

Diabetes is a major global public health concern, with an estimated 537 million adults living with Diabetes (Sun et al., 2022). This number is predicted to rise to 643 million by 2030 and 783 million by 2045 (Magliano et al., 2021). In Asia, there were more than 230 million Asian people with diabetes, about 55% of the global diabetes population, and this will jump to 355 million by 2040 (Hossain et al., 2024; Yang et al., 2019). The International Diabetes Federation (IDF) (2021) predicted that Indonesia's national diabetes prevalence would be 6.2% in 2019 and increase to 10.8% in 2021, placing it among the top 10 countries with the highest diabetes prevalence. In Indonesia, 44.8% of the population in rural areas had prediabetes, with a minimum age of 30 years. (Dany et al., 2020). In 2018, 10.9% of

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Indonesia's population aged more than 15 years old had Diabetes, and most of the patients had micro or macro complications (Indonesia KKR, 2018).

Malaysia is a multi-ethnic country with diverse cultures. National Health Morbidity Survey (NHMS) (2023) reported that 15.6% of Malaysian adults have diabetes, with 5.9% undiagnosed. A study by Tee and Yap (2017) reported that Indians are the highest ethnic group diagnosed with diabetes, followed by Malays and Chinese. However, the National Diabetes Registry Report (NDR) (2023) reported that almost 2 million Malaysian adults have diabetes, led by the Selangor and Malay ethnic groups. The high prevalence of diabetes increases the risk of complications. Among various associated diabetes complications, diabetic foot disease (DFD) remains one of the most devastating and costly, leading to ulceration, infection, and lower limb amputation.

DFD primarily results from peripheral neuropathy, peripheral arterial disease, and poor foot care practices (Lazzarini et al., 2028). It is estimated that about 15% of patients with diabetes will develop a foot ulcer, and a significant proportion of these cases progress to amputation if not treated (Raja et al., 2023). In Malaysia, approximately 2.2% to 5.9% of individuals with diabetes develop foot ulcers annually, with higher prevalence among the elderly and those with poor glycemic control (Abdul Hadi et al.,2019). The impact of DFD extends beyond physical disability, affecting the psychological well-being and quality of patients' lives, while placing a considerable economic burden on the healthcare system. An effective educational intervention is crucial in reducing the risk of DFD.

Therefore, this systematic review aims to evaluate the effectiveness of educational interventions implemented in Asian countries between 2015 and 2025 in improving foot care practices among adults with diabetes. The objectives of this study are to evaluate the effect of an educational intervention on improving foot care knowledge and practices among Asian individuals with diabetes.

## 2.0 Literature review

Diabetes has emerged as a significant global public health concern with a rapidly increasing prevalence across all regions. The IDF estimated that about 589 million adults had diabetes in 2024, with projections indicating a rise to 853 million by 2050 (International Diabetes Federation, 2024). Similarly, the Global Burden of Disease (GBD) study highlighted that diabetes prevalence has doubled over the past three decades, disproportionately affecting low- and middle-income countries, where minimal access to quality care (GBD Diabetes Collaborators, 2023; World Health Organisation, 2023). These figures underscore the magnitude of the disease and its growing clinical and economic impact.

The rising prevalence of diabetes has direct implications for foot health. Diabetic foot complications, such as ulcers, infections, and lower limb amputations, are among the most serious and costly consequences of poorly managed diabetes. Peripheral neuropathy and peripheral arterial disease, both of which are common in long-standing diabetes, significantly increase the risk of foot ulcers (Armstrong et al., 2020). Globally, it is estimated that up to 25% of patients with diabetes will develop a foot ulcer in their lifetime, with Asia and low-resource settings experiencing a higher risk due to delayed detection and limited access to specialized care (Lazzarini et al., 2024). In Malaysia, the increasing prevalence of diabetes is expected to contribute to a parallel rise in foot-related complications, which already represent a significant cause of hospitalization and healthcare costs (Ministry of Health Malaysia, 2018).

Thus, the growing global, regional, and national prevalence of diabetes underscores the urgent need for preventive measures and effective management strategies, with foot care education and practice being central components. Early screening, patient education on self-care practices, and timely clinical intervention can significantly reduce the risk of diabetic foot ulcers and amputations. Strengthening foot care services in Malaysia and across Asia is therefore essential to mitigating the projected rise in diabetes-related morbidity and mortality.

## 3.0 Methodology

### *3.1 Source*

This systematic review followed a rigorous, transparent, and structured approach based on the Preferred Reporting Items for Systematic Reviews and Meta-Analyses(PRISMA) 2020 guidelines (Page et al., 2021; Reeves et al., 2019). The process consisted of four key stages: identification, screening, eligibility assessment, and inclusion, all carried out independently by the reviewer to minimize selection bias and ensure consistency.

### *3.2 Formulation of the Research Question*

The PICO model (Population, Intervention, Comparison, Outcome) is a widely used framework for formulating focused research questions and guiding evidence synthesis in systematic reviews. In this review, the PICO framework was applied to identify and evaluate studies assessing the impact of educational interventions on foot care practices among patients with diabetes in Asia. The population(P) for this study is Type 1 or Type 2 Asian diabetes patients, intervention (I) under review is any educational program used to improve foot care knowledge and practices, comparison (C) including a comparison group allows for evaluating whether educational interventions produce measurable improvements in foot care practices compared with what patients would receive under typical clinical care or in the absence of intervention, and outcome (O) is improvement in foot care knowledge and practices.

### *3.3 Information Source*

A comprehensive, systematic search was conducted to identify relevant literature for this review and to meet the inclusion criteria for diabetes mellitus, diabetes foot care, educational interventions, and foot care practices. The primary databases used during the search for relevant studies are PubMed/MEDLINE, Scopus, CINAHL (Cumulative Index to Nursing and Allied Health Literature), Cochrane Library, Wiley, ScienceDirect, SpringerLink, and Google Scholar

*3.4 Search Strategy*

The search strategy used terms such as "Diabetes", "Diabetes Mellitus", "Foot", "Foot Care", "Foot Ulcer", "Foot Problem", "Foot Complication", "Foot care behaviour", "Foot Education", "Educational intervention", "Self-care behaviour", "Asian Country", and limited to English Language, full-text research articles. Articles were retrieved from online databases, with a focus on inclusion and exclusion criteria, published from 2015 to 2025, and emphasizing intervention studies.

*3.5 Selection Process*

The selection process for this systematic review is illustrated in Figure 1. Through database and register searches, 516 records were identified. After removing the 34 duplicates, 482 titles and abstracts were screened. Of these, 50 full-text articles were retrieved and assessed for eligibility. However, only 16 studies met the inclusion criteria, comprising three randomized controlled trials and 13 quasi-experimental studies that focused on educational interventions to improve foot care practices among patients with diabetes in Asia.

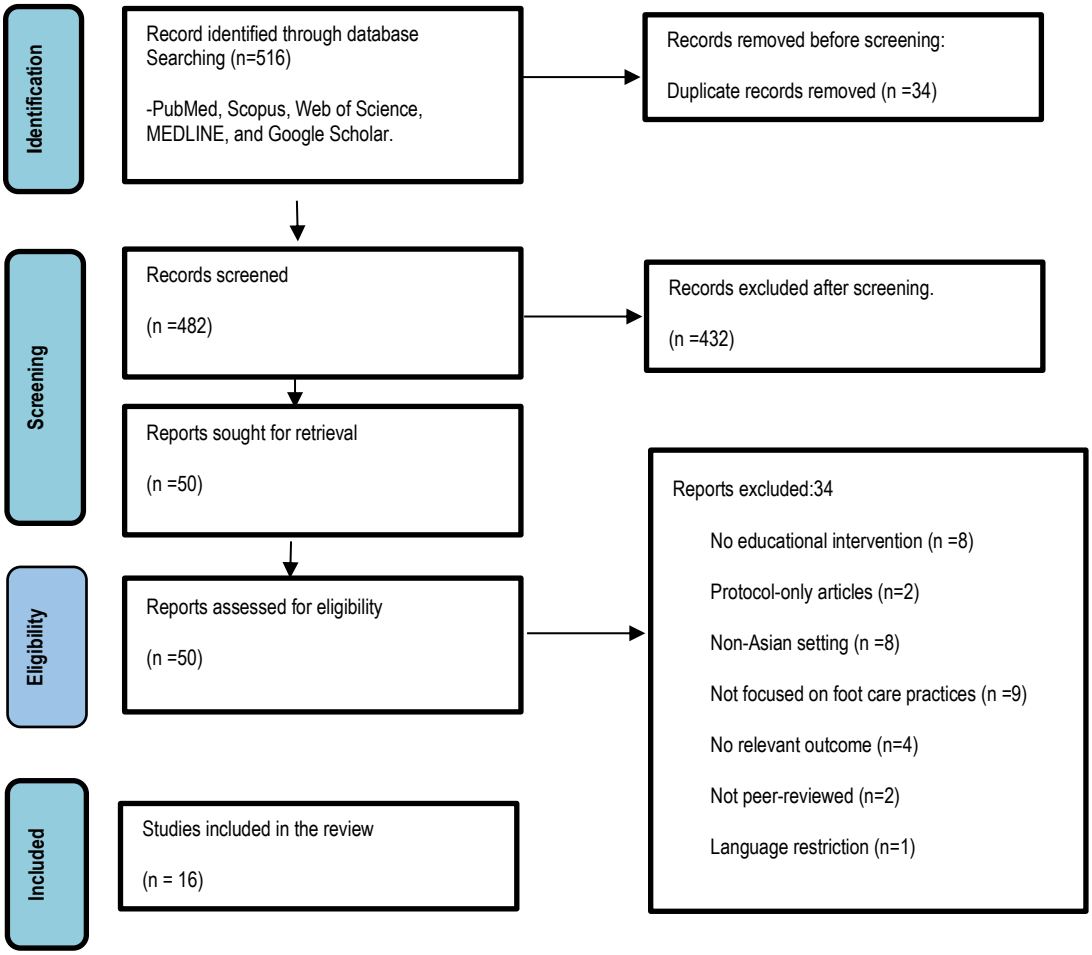


*Figure 1* PRISMA 2020 Flow Diagram for the process of study selection

*3.6 Quality Appraisal*

The selection criteria for this study were: articles published in English, focused on adult patients with diabetes in Asia, involving structured education interventions, and using quantitative methods. 16 studies that met the criteria were evaluated. A comprehensive evaluation of the methodological design features was then conducted for all 16 studies included in this review using the Non-Randomized Studies Methods Group (NRSMG) of The Cochrane Collaboration (Reeves et al., 2019). According to the headings, the appraisal focused on four critical aspects: the presence of a comparison group, participant allocation methods, the prospective nature of the study, and the assessment of baseline comparability between study groups (Table 1). For randomized controlled trials, a comparison group, a prospective design, and baseline comparability were included; however, participant allocation varied across studies (Beiranvand et al., 2015; Rahaman et al., 2018; Ahmad Sharoni et al. (2018). Six quasi-experimental studies had no comparison group and no baseline comparability, with a prospective design (Nguyen et al., 2019; Frisca,2021; Mahdalena and Ningsih, 2016; Hadi Sulistyo et al., 2018; Sharoni et al.,2017). These elements were systematically examined to provide further context regarding the internal validity and interpretability of each study's findings.

Table 1: Quality Appraisal

| Author (Year) | Study design | Comparison Group | Participant Allocation | Prospective Design | Baseline Comparability |
|---|---|---|---|---|---|
| Nguyen et al. (2019) | Quasi-experimental | No | Convenience | Yes | N/A |
| Frisca (2021) | Quasi-experimental | No | Convenience | Yes | N/A |
| Tekir et al. (2023) | Quasi-experimental | Yes | Randomized | Yes | Yes |
| Venkatesh et al. (2022) | Quasi-experimental | Yes | Purposive | Yes | Yes |
| Toygar et al. (2022) | Quasi-experimental | Yes | Non-randomized | Yes | Partially |
| Devi et al. (2016) | Quasi-experimental | Yes | Unclear | Yes | Partially |
| Mahdalena and Ningsih (2016) | Quasi-experimental | No | Purposive | Yes | N/A |
| Beiranvand et al. (2015) | RCTs | Yes | Randomized | Yes | Yes |
| Rahaman et al. (2018) | RCTs | Yes | Randomized | Yes | Yes |
| Fajriyah et al. (2020) | Quasi-experimental | Yes | Purposive | Yes | Yes |
| Hadi Sulistyo et al. (2018) | Quasi-experimental | No | Convenience | Yes | N/A |
| Savari et al. (2023) | Quasi-experimental | Yes | Randomized | Yes | Yes |
| Hijazi et al. (2025) | Quasi-experimental | Yes | Stratified random | Yes | Yes |
| Abdullah et al. (2021) | Quasi experimental | No | Convenience | Yes | N/A |
| Sharoni et al. (2017) | Quasi-experimental | No | No random allocation | Yes | N/A |
| Ahmad Sharoni et al. (2018) | RCTs | Yes | Cluster randomization | Yes | Yes |

Note: RCTs, Randomized Controlled Trials, N/A, non-applicable

## 4.0 Findings

*4.1 Types of Education Programs*

The educational programs implemented across the 16 included studies demonstrated a broad spectrum of structured strategies to enhance foot care knowledge and practices among people with diabetes. These interventions were typically delivered through a combination of verbal instruction, printed booklets, audiovisual materials, and hands-on demonstrations, often led by trained healthcare professionals such as nurses, diabetes educators, or community health workers.

A significant proportion of studies incorporated behavioural theories to structure their programs. The Health Belief Model (HBM) was employed in studies by Savari et al. (2023) and Hijazi et al. (2025) examined key constructs, perceived risk, benefits of preventive action, barriers, and self-efficacy in the context of foot care. Similarly, Bandura's Social Cognitive Theory guided interventions, such as Nguyen et al.'s (2019) 3STEPFUN program and Toygar et al.'s (2022), emphasizing role modelling, reinforcement, and self-regulation. The Theory of Planned Behaviour (TPB) underpinned the design of educational content in Beiranvand et al. (2015), focusing on intention and perceived behavioural control.

Several programs were tailored to local contexts, particularly in resource-limited settings. For example, Devi et al. (2016) developed a self-learning module, while Sulistyo et al. (2018) organized a foot care camp to reach underserved populations. In Malaysia, a single session of structured diabetic foot care education titled 'Diabetes Footcare' was delivered to patients, with a pamphlet as a reinforcement (Abdullah et al., 2021). Hijazi et al. (2025) introduced a multi-arm intervention that included family-based support and digital reminders, showcasing the growing integration of technology and social support into diabetes education.

While most interventions were group-based, fostering peer learning and motivation, or individual counselling sessions. Program durations varied, with single-session programs used in Toygar et al. (2022). Multi-session models were common in studies such as Tekir et al. (2023), Fajriyah et al. (2020), Sharoni et al. (2017), Ahmad Sharoni et al. (2018), and Frisca (2021). Programs that included repetition, theory-based content, and interactive components (e.g., discussions, skill demonstrations) consistently showed greater efficacy in sustaining improvements in foot care behaviour. These findings highlight the importance of integrating educational theory with practical, culturally responsive delivery methods.

*4.2 Study setting and sample size*

The 16 studies included in this systematic review were conducted in various clinical and community health settings across several Asian countries, reflecting the diverse healthcare contexts in which foot care educational interventions were implemented. Most studies were conducted in outpatient diabetes clinics, primary health centres, community health posts, tertiary hospitals, and long-term care facilities. For instance, Nguyen et al. (2019) conducted their study in a Vietnamese outpatient diabetes clinic. Similarly, Frisca (2021) and Mahdalena and Ningsih (2016) carried out their interventions in community-based health settings in Indonesia. Devi et al. (2016) and Rahaman et al. (2018) utilized tertiary hospital settings in India to implement their respective educational programs. Notably, Sulistyo et al. (2018) implemented their intervention in a rural community setting through a foot care camp model. Abdullah et al. (2021) conducted their study in the orthopaedic ward and the Outpatient Medical Clinic of a University Hospital in the Klang Valley. Meanwhile, Ahmad Sharoni et al. (2018) conducted their study in an elderly care facility.

Sample sizes across studies varied significantly, ranging from as few as 20 participants (e.g., Venkatesh et al., 2022) to as many as 340 participants (Devi et al., 2016). Most studies involved moderate sample sizes of 60 to 150 participants, consistent with typical quasi-experimental designs in educational interventions. These sample sizes provided sufficient power for within-group and between-group comparisons, particularly in studies with control groups, such as those by Hijazi et al. (2025) and Beiranvand et al. (2015).

*4.3 Duration, follow-up, and evaluation*.

There were variations in duration, follow-up periods, and evaluation methods. Approximately eight studies implemented short-duration interventions, typically consisting of a single education session lasting 30-90 minutes. Examples of these include the works of Toygar et al. (2022) in Turkey, Devi et al. (2016) in East Delhi, India, and Abdullah et al. (2021) in Malaysia. These programs often focused on delivering concise, structured education sessions through lectures or pamphlets and were generally effective in enhancing knowledge and short-term self-care behaviours. A larger subset of studies (n = 10) employed moderate-length programs, typically spanning 2 to 8 weeks with recurring sessions. These programs, such as those by Frisca (2021) and Tekir et al. (2023), allowed for gradual learning, repeated reinforcement, and interaction through group discussions and practice-based activities. The remaining three studies implemented extended programs lasting between three and six months, often incorporating booster sessions and serial foot assessments. Notable examples include Nguyen et al. (2019), who used a 3-step structured program with monthly follow-up to evaluate participants over 6 months and assess sustained behaviour change and clinical outcomes.

The follow-up period varied significantly among the included studies. About 5/8 of the studies conducted short-term follow-up assessments within 1 to 2 weeks after the intervention. This timeframe was mainly used to capture immediate post-education gains in knowledge and intended behavioural changes (e.g., Devi et al., 2016; Abdullah et al., 2021). A larger number of studies (n = 6) conducted intermediate follow-up assessments, generally between 4 and 8 weeks post-intervention, including those by Hijazi et al. (2025) in Jordan and Savari et al. (2023) in Iran. Nguyen et al. (2019) reported the longer-term follow-up (more than three months).

The effectiveness of the interventions was assessed using a variety of evaluation tools, comprising both self-reported and objective measures. All studies (n = 16) utilized pre- and post-intervention questionnaires to assess changes in foot care knowledge, self-care behaviour, and self-efficacy. Tools such as the Diabetes Foot Self-Care Behaviour Scale (DFSBS), the Nottingham Assessment of Functional Foot Care (NAFF), Diabetes Quality of Life (DQoL) Brief Clinical Inventory, and researcher-developed foot care checklists were frequently employed. In addition to subjective self-reports, clinical foot assessments were incorporated in two studies, which involved visual inspections by trained nurses or diabetes educators to evaluate skin and nail conditions and the presence of ulcers, calluses, or infections, and the use of clinical tools, such as the Ipswich Touch Test or the Ankle-Brachial Index (ABI), to detect neuropathy or peripheral arterial disease (e.g., Fajriyah et al., 2020; Togyar et al., 2022).

*4.4Outcome measure*

The studies included in this review used a range of outcome measures to assess the effectiveness of educational interventions on foot care among individuals with diabetes. These outcomes can be broadly categorized into behavioural outcomes, knowledge-related outcomes, self-efficacy, improvements in quality of life, and clinical indicators of foot health or ulcer risk.

The most frequently reported outcome was improvement in foot self-care practices, observed in all studies. These behaviours included daily foot inspection, hygiene (washing and drying), appropriate footwear usage, nail care, moisturizing, avoiding barefoot walking, and proper management of minor foot injuries. Standardized tools, such as the Diabetes Foot Self-Care Behaviour Scale (DFSBS) and the Nottingham Assessment of Functional Footcare (NAFF), were commonly employed (e.g., Tekir et al., 2023; Nguyen et al., 2019; Savari et al., 2023; Abdullah et al., 2021). Most studies observed a statistically significant increase in the frequency and quality of foot care practices after the educational interventions ($p < 0.05$ to $p < 0.001$).

Knowledge improvement was reported as a secondary or co-primary outcome in at least five studies, often assessed using pre-post questionnaires developed or adapted for the local context. For instance, Devi et al. (2016) demonstrated significant increases in post-intervention knowledge scores following the distribution of self-learning modules and structured education sessions, respectively. Knowledge gains were often linked to improved practices and greater confidence in identifying risk factors for foot complications.

Five studies evaluated self-efficacy using standardized or adapted scales. Studies based on the Health Belief Model or Social Cognitive Theory (e.g., Savari et al., 2023; Hijazi et al., 2025; Mahdalena & Ningsih, 2016) specifically targeted self-efficacy as an intermediary outcome influencing behavioural change. Significant improvements in self-efficacy scores were consistently reported in these studies, reinforcing the role of cognitive beliefs in promoting sustained foot care behaviours. Plus, a subset reported quality-of-life elements where relevant (Abdullah et al., 2021).

Several studies extended beyond behavioral and perceptual outcomes to include clinical evaluations. These evaluations included foot inspection and risk grading (Nguyen et al., 2019), assessment of calluses, wounds, or infections (Frisca, 2021), the Ankle-Brachial Index (ABI), and the Ipswich Touch Test to assess peripheral neuropathy and blood flow (Fajriyah et al., 2020). Nguyen et al. (2019) reported significant reductions in foot risk scores at 6-month follow-up, while Frisca (2021) documented a 7.4% improvement in foot conditions.

Table 2: List of Literature Review of Health Education Programs

| No | Tittle | Author / Country | Education Program | Sample size (n)/ Follow up | Outcome |
|---|---|---|---|---|---|
| 1 | Effectiveness of a theory-based foot care education program (3STEPFUN) in improving foot self-care behaviours and foot risk factors for ulceration in people with type 2 diabetes. | Nguyen et al. (2019)<br><br>Vietnam | 3-step education with reinforcement | n= 119<br><br>Follow up: 6 months | Improved foot care behaviour.<br><br>Reduce the risk of foot complications. |

| | | | | | |
|---|---|---|---|---|---|
| 2 | Assessing the effectiveness of targeted education interventions on enhancing self-efficacy and foot care practices among women in Jordan. | Hijazi et al. (2025) Jordan | Group and digital education/ family support | n=76<br>Follow up: 8 weeks | Improved foot care behaviours.<br>Increase confidence in foot care practice |
| 3 | Effectiveness of self-learning module on the knowledge and practices regarding foot care among type II diabetes patients in East Delhi, India | Devi et al. (2016)<br>India | Self-learning module. | n=340<br>Follow up: 1 week | Improved foot care knowledge and practices. |
| 4 | Effectiveness of Diabetes Self-Management Education (DSME) to Foot Care Behaviour and Foot Condition in Diabetes Mellitus Patients | Frisca (2021)<br>Indonesia | Weekly education program | n=112<br>Follow up: 2 months | Improve adherence to foot care practice.<br>Increase the frequency of foot care practice. |
| 5 | The Effects of Educational Intervention Based on the Health Belief Model on Improving Foot Self-Care Behaviors in Older Adults | Savari et al. (2023)<br>Iran | 4-session Health Belief Model Intervention | n= 120<br>Follow up: 4 weeks | Improved foot care practices<br>Increased perceived benefits of foot care practices. |
| 6 | Effect of an Educational Intervention Based on Bandura's Theory on Foot Care Self-Efficacy in Diabetes: A Prospective Quasi-Experimental Study. | Toygar et al. (2022)<br>Turkey | An education session and foot assessment. | n= 33<br>Follow up: 4 weeks | Improve foot care self-efficacy. |
| 7 | Effectivity of Foot Care Education Program in Improving Knowledge, Self-Efficacy and Foot Care Behavior among Diabetes Mellitus Patients in Banjarbaru, Indonesia. | Mahdalena and Ningsih (2016)<br>Indonesia | 3 structured education sessions | n=48<br>Follow up: 3 weeks | Improved foot care practices<br>Improved foot efficacy. |
| 8 | Assess the Effectiveness of Foot Care Nursing Intervention on Knowledge and Practice of Foot Care in Patients with Diabetes Mellitus in Rural Tamil Nadu. | Venkatesh et al. (2022)<br>India | Foot care nursing intervention. | n=20<br>follow up:15 days | improved foot care knowledge and practice. |
| 9 | Paket Edukasi Dan Deteksi Dini Meningkatkan Perilaku Perawatan Kaki Diabetisi Di Puskesmas Kabupaten Pekalongan | Fajriyah et al. (2020)<br>Indonesia | Weekly education session | n=143<br>follow up:8 weeks | Increase foot care practices.<br>Reduce the risk of foot complications |
| 10 | Efficacy of an Intervention Based on the Theory of Planned Behavior on Foot Care Performance in Type II Diabetic Patients | Hadi Sulistyo et al. (2018)<br>Indonesia | 2-day Foot care camp: an educational session, video, discussion session, and counselling. | n=72<br>follow up:5 weeks | Improved foot care knowledge and practice score. |
| 11 | The Effects of Education on Foot Care Behaviors and Self-Efficacy in Type 2 Diabetes Patients | Tekir et al. (2023)<br>Turkey | Single-session education using educational materials. | n= 94<br>follow up:3 months | Improved foot care behaviours and self-efficacy.<br>Enhance foot care practice after intervention. |
| 12 | Effectiveness of a Patient Education Module on Diabetic Foot Care in Outpatient Setting: An Open-label Randomized Controlled Study | Rahaman et al. (2018)<br>India | Short audiovisual display and pamphlet on foot care. | n= 127<br>follow up:3 months | Significant improvement in foot care knowledge and practices. |
| 13 | The Effects of Diabetic Footcare Programme Towards Quality of Life Among Type II Diabetes Mellitus Patients in UKM Medical Centre (UKMMC) | Abdullah et al. (2021)<br>Malaysia | Structured footcare education titled 'Diabetes Footcare' with a supporting pamphlet. | n=37<br>follow up:One month after baseline education. | Improved in foor care practice and quality of life. |
| 14 | The effects of a self-efficacy education programme on foot self-care behaviour among older adults with diabetes in a public long-term care institution. | Sharoni et al. (2017)<br>Malaysia | Group seminar plus one-to-one reinforcement visits; skills practice, | n= 31<br>follow up:Week 4 (One-to-one discussion). | Improve in foot self-care behaviour, Self-efficacy, knowledge, and quality of life. |

| | | | | | |
|---|---|---|---|---|---|
| | | | goal-setting, problem-solving | Then, biweekly visits of the respondent (week 5-12). | |
| 15 | A self-efficacy education programme on foot self-care behaviour among older adults with Diabetes: Cluster randomized controlled trial. | Ahmad Sharoni et al. (2018).<br><br>Malaysia | Standardized self-efficacy curriculum delivered at the facility level with structured reinforcement. | n=76 (38 each Group)<br><br>Follow up: Week 0: intervention given<br><br>Week 4 and 12: assessment on foot care behaviour, self-efficacy, foot outcomes, and | Intervention improved Foot self-care behaviour, Self-efficacy, knowledge, quality of life |
| 16 | Efficacy of an Intervention Based on the Theory of Planned Behavior on Foot Care Performance in Type II Diabetic Patients | Beiranvand et al. (2015)<br><br>Iran | 4-week education program based on the Theory of Planned Behaviour. | n= 72<br><br>Follow up: 4 weeks | Foot care behaviour improvement and belief enhancement. |

## 5.0 Discussion

This systematic review provides robust evidence that educational interventions play a pivotal role in enhancing foot care knowledge, self-efficacy, and preventive practices among individuals with diabetes across Asian settings. The consistent improvement observed in practice, such as daily foot inspection, appropriate hygiene, and footwear selection, underscores the critical role of structured education in mitigating modifiable risk factors associated with diabetic foot complications. These findings are consistent with prior evidence highlighting education as a cornerstone strategy in reducing the incidence and progression of diabetic foot conditions (Alshammari et al., 2023).

A key strength of the included studies is the use of behavioural theories to guide intervention design; for example, the Health Belief Model and self-efficacy theory appear particularly effective in promoting sustained behavioural change. For example, theory-based interventions have demonstrated significant improvements in patients' perceived susceptibility, benefits, and confidence, leading to better adherence to foot care practices (Savari et al., 2023; Toygar et al., 2020). This theoretical underpinning strengthens both the design and effectiveness of educational interventions by addressing not only knowledge deficits but also motivational and behavioural determinants.

Moreover, the diversity of intervention delivery methods, including face-to-face education, printed materials, multimedia tools, and mobile health (mHealth) applications, reflects an evolving, adaptive approach to patient education. Multimodal strategies may enhance engagement and reinforce learning, particularly when combined with ongoing support. Emerging evidence suggests that digital health interventions can improve accessibility and continuity of care, thereby supporting long-term behavioural adherence (Liew et al., 2023).

However, several methodological limitations should be acknowledged. The predominance of quasi-experimental designs introduces potential risks of bias, limiting the strength of causal inferences. In addition, heterogeneity in intervention characteristics and outcome measures reduces comparability across studies. Notably, most studies focused on short-term outcomes, with limited evidence on long-term clinical endpoints such as ulcer incidence or amputation rates. This highlights the need for more rigorous and longitudinal research.

Contextual and cultural factors also influence the effectiveness of educational interventions. Variations in health literacy, beliefs, and healthcare access across Asian populations necessitate culturally sensitive, tailored approaches that align with recommendations from the health promotion literature, which emphasize the importance of context-specific strategies to optimize patient engagement and outcomes (Chao et al., 2018).

In conclusion, educational interventions are effective in improving foot care knowledge and practices among individuals with Diabetes. Nevertheless, future research should prioritize high-quality randomized controlled trials, standardized outcome measures, and long-term follow-up to strengthen the evidence base and inform sustainable, culturally appropriate intervention strategies.

## 6.0 Conclusion and Recommendations

This systematic review provides an updated synthesis of evidence on educational interventions for diabetic foot self-care across Asian populations. The findings consistently indicate that structured, skill-based educational programmes improve foot care behaviours and enhance patient knowledge and self-efficacy. These behavioural gains are clinically meaningful, given the largely preventable nature of diabetic foot complications and their substantial burden on individuals and the health care system.

However, the current evidence base remains methodologically constrained. The predominance of quasi-experimental designs, heterogeneity in intervention components and outcome measures, and limited follow-up durations restrict definitive conclusions regarding long-term clinical effectiveness. The absence of standardized reporting further impedes cross-study comparability and quantitative synthesis.

Notwithstanding these limitations, the review underscores the critical role of structured and culturally responsive education as a cornerstone of diabetic foot prevention strategies in Asia. Moving forward, rigorously designed randomized controlled trials with standardized outcomes and extended follow-up are essential to establish sustained clinical impact. Strngthening the methodological

quality and theoretical grounding of future interventions will be pivotal in translating behavioural improvements into measurable reductions in ulceration and amputation rates, thereby informing policy, practice, and regional diabetes prevention frameworks.

## Ackowledgemenent

The authors extend their appreciation to Universiti Teknologi MARA for the assistance in this systematic review

## .Paper Contribution to the Related Field of Study

This systematic review provides a proper understanding of foot care knowledge and practices across Asian countries. It highlights multiple effective educational interventions that can improve foot care practices and reduce the risk of foot complications.

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