

Systematic Review: Effectiveness of Self-Efficacy and Audiovisual Education on Diabetic Foot Care

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Article Info	Abstract
Article History Submitted, 2026-05-13 Accepted, 2026-06-24 Published, 2026-06-30	Type 2 Diabetes Mellitus (T2DM) is a chronic metabolic disorder with increasing global prevalence and represents a major public health burden. One of its most serious complications is Diabetic Foot Ulcer (DFU), which significantly contributes to morbidity, reduced quality of life, and lower limb amputation. Poor foot care behavior among patients is commonly associated with insufficient knowledge and low self-efficacy. In recent years, self-efficacy-based education and audiovisual interventions have been introduced as innovative strategies to improve diabetes self-management, particularly foot care practices. This systematic review aims to evaluate the effectiveness of self-efficacy-based and audiovisual educational interventions in improving knowledge, self-efficacy, adherence, and foot care behavior among patients with Type 2 Diabetes Mellitus. This study employed a systematic review design following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. Literature searches were conducted in Google Scholar, PubMed, and ScienceDirect databases for studies published between 2015 and 2025. Study quality was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for quasi-experimental studies. A total of 120 articles were initially identified, 25 duplicates were removed, and after screening and eligibility assessment, 10 studies met the inclusion criteria and were included in the final analysis. Data were synthesized using a narrative approach due to heterogeneity in study designs and measurement tools. Result of this study was all included studies demonstrated statistically significant improvements in at least one outcome variable ($p < 0.05$). Self-efficacy-based interventions consistently improved patients' confidence and motivation in performing foot care practices. Audiovisual and digital-based education showed stronger effects in improving knowledge retention, adherence, and behavioral change compared to conventional education methods such as leaflets. Interventions combining education, demonstration, and audiovisual media produced the most comprehensive improvements in knowledge, self-efficacy, and foot care behavior. Variations in effectiveness were influenced by intervention duration, educational methods, and participant characteristics. Conclusion of this study was Self-efficacy-based and audiovisual educational interventions are effective in improving foot care behavior among patients with Type 2 Diabetes Mellitus. These interventions enhance cognitive, psychological, and behavioral outcomes and have the potential to prevent Diabetic Foot Ulcer. Integration of audiovisual and digital health education into routine diabetes care is strongly recommended.
Keywords: Type 2 diabetes mellitus, self-efficacy, audiovisual, foot care, diabetic foot ulcer	

Introduction

Type 2 Diabetes Mellitus (T2DM) is one of the most prevalent chronic diseases worldwide and has become a major challenge in public health. This disease not only affects patients' quality of life but also contributes to various acute and chronic complications. One of the most common chronic complications is Diabetic Foot Ulcer (DFU), which may lead to severe infection and even amputation if not managed properly (Marliana et al., 2025).

Globally, the prevalence of diabetes mellitus continues to increase significantly. According to the International Diabetes Federation (2021), the number of individuals aged 20–79 years living with diabetes reached 536.6 million (10.5%) and is projected to rise to 783.2 million (12.2%) by 2045. In Indonesia, the prevalence of diabetes increased from 6.9% in 2013 to 8.5% in 2018, with an estimated 19.5 million cases (Risksedas, 2018). This increase highlights the urgency of comprehensive prevention and management strategies for diabetes complications.

Foot Ulcer is a complication caused by a combination of peripheral neuropathy, vascular impairment (ischemia), and unmanaged infection (Marliana et al., 2025). This condition results in reduced sensation in the feet, causing patients to be unaware of injuries that may later develop into ulcers. Furthermore, chronic hyperglycemia creates an environment favorable for microbial growth, thereby increasing the risk of infection (Cahyaningtyas & Werdiningsih, 2022). DFU is one of the leading causes of morbidity and mortality among diabetic patients and requires substantial healthcare costs (Akkus & Sert, 2022).

The prevention of DFU largely depends on proper foot care practices, including regular foot examination, maintaining foot hygiene, appropriate footwear use, and early wound management (Schaper et al., 2024). However, numerous studies indicate that many diabetic patients still have limited knowledge and awareness regarding foot care (Widodo et al., 2024). Although patients often receive education related to blood glucose control and dietary management, foot care practices are frequently not performed optimally (Wulandari et al., 2019).

One important factor influencing foot care behavior is self-efficacy, defined as an individual's belief in their ability to perform specific actions (Bahri & Hidayat, 2023). In the context of diabetes management, self-efficacy plays a crucial role in motivating patients to perform consistent and independent self-care behaviors. Patients with higher levels of self-efficacy tend to adhere more effectively to health recommendations and manage their disease more appropriately (Purnamasari, 2019).

Self-efficacy-based educational approaches have been shown to effectively improve health knowledge and behavior. Educational interventions that focus not only on delivering information but also on strengthening confidence and practical skills can produce more sustainable behavioral changes (Fitriadi et al., 2021). Additionally, the use of engaging educational media such as audiovisual tools can enhance comprehension and information retention because they involve multiple sensory modalities (Oktaviani et al., 2021).

Along with technological advancements, digital health education has become an innovative alternative for improving intervention effectiveness. Audiovisual media, such as educational videos integrated into applications, allow patients to access information flexibly, interactively, and repeatedly according to their needs. However, most currently available applications remain limited to text-based information delivery and do not comprehensively integrate self-efficacy approaches.

Based on these issues, innovative educational interventions integrating self-efficacy approaches with audiovisual media are needed to improve foot care behaviors among patients with Type 2 Diabetes Mellitus. Therefore, this study aimed to analyze the effectiveness of self-efficacy-based and audiovisual educational interventions in improving foot care practices as an effort to prevent Diabetic Foot Ulcer. The introduction to a community service project should contain factual and actual partner problems or community needs related to the activity's target.

Methods

This study employed a systematic review method using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) approach to ensure transparency and completeness in reporting. The initial identification process yielded 120 relevant articles from predetermined electronic databases. Duplicate screening identified 25 duplicate articles, which were removed before proceeding to the screening stage. Consequently, 95 unique articles remained for further evaluation based on the established criteria.

During the screening stage, titles and abstracts of the 95 articles were assessed. The results showed that 50 articles did not meet the inclusion criteria due to topic or research focus mismatch and were therefore excluded. The remaining 45 articles underwent eligibility assessment through full-text review. The eligibility assessment was conducted comprehensively on the 45 full-text articles to ensure alignment with the study objectives. Based on the full-text evaluation, 25 additional articles were excluded because they did not fulfill the strict eligibility criteria. Ultimately, 10 articles met all inclusion criteria and were included in this systematic review analysis.

The study selection process followed four stages: identification, screening, eligibility, and inclusion. A total of 120 articles were identified from electronic databases, including Google Scholar, PubMed, and ScienceDirect. After removing 25 duplicate records, 95 unique articles remained for title and abstract screening. At the screening stage, 50 articles were excluded due to irrelevance to the study topic, leaving 45 full-text articles for eligibility assessment. During full-text review, 25 articles were excluded for not meeting the inclusion criteria, resulting in 10 studies that met all criteria and were included in the final systematic review.

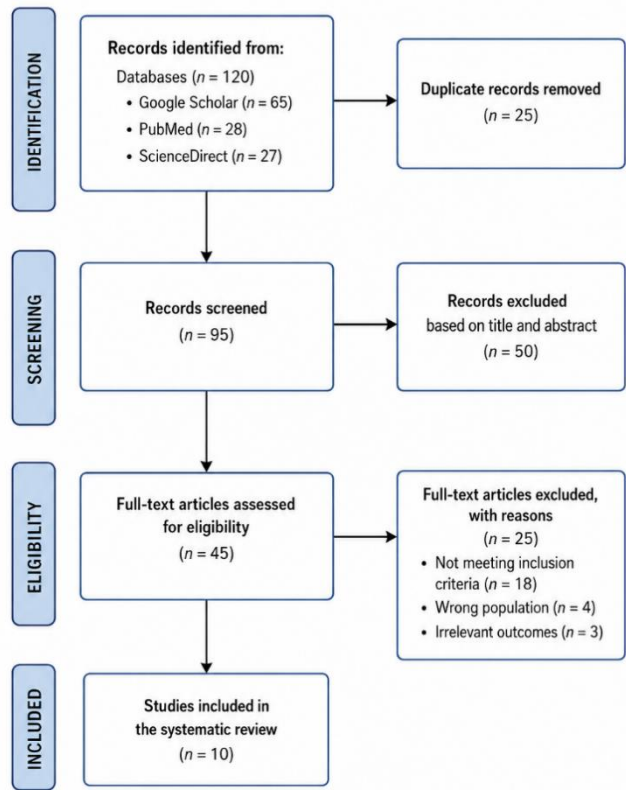


Figure 1. PRISMA Flow Diagram

Literature Search Strategy

Articles were systematically searched through several electronic databases, including Google Scholar, PubMed, and ScienceDirect. The search process was conducted from January to March 2026, covering publication years from 2015 to 2025. Keywords were developed using Boolean operators (AND, OR), including: “Type 2 Diabetes Mellitus” OR “T2DM”, “Diabetic Foot Care” OR “Foot Care Behavior”, “Self-efficacy”, “Audiovisual education” OR “Health education”, “Diabetic Foot Ulcer”.

Inclusion and Exclusion Criteria

Inclusion criteria: Quantitative research articles (RCT or quasi-experimental studies), participants diagnosed with Type 2 Diabetes Mellitus, interventions involving self-efficacy–based education, audiovisual education, or a combination of both, outcomes related to knowledge, self-efficacy, or foot care behavior, articles published in Indonesian or English. Exclusion Criteria: Review articles, meta-analyses, or qualitative studies, studies without comparison groups, articles with incomplete data, duplicate publications.

Article Selection Process

The article selection process consisted of several stages: Identification: 120 articles were identified from all databases, Screening: Duplicate removal resulted in 95 articles; title and abstract screening resulted in 45 articles, Eligibility: Full-text review resulted in 20 eligible articles. Included a total of 10 articles fulfilled all criteria and were included in the final analysis.

Data Extraction

Data from selected articles were extracted using a standardized table including: Author and publication year, Research design, Sample size, Type of intervention, Research instruments, Main findings (p-values and score improvements). The extraction process was conducted systematically to ensure data consistency.

Quality Assessment

Study quality was assessed using the Joanna Briggs Institute (JBI) Critical Appraisal Checklist for quasi-experimental studies. The assessment included: Group equivalence, Clarity

of intervention, Instrument validity, Statistical analysis. Each study was categorized as: High quality, Moderate quality and Low quality

Data Analysis

Data were analyzed using descriptive narrative synthesis through the following steps: Grouping studies based on intervention type, comparing findings across studies, identifying patterns of intervention effectiveness. Due to heterogeneity in study designs and instruments, meta-analysis was not conducted. Therefore, findings were presented narratively and in tables.

Results and Discussion

Based on the PRISMA selection process, 10 articles met the inclusion criteria and were analyzed in this systematic review. The selected studies consisted of quasi-experimental and randomized controlled trial (RCT) designs focusing on self-efficacy-based and/or audiovisual educational interventions among patients with Type 2 Diabetes Mellitus.

Table 1. Characteristics of Included Studies

Author (Year)	Country	Study Design	Sample Size	Intervention	Instrument	Outcome
Nabilah et al. (2020)	Indonesia	Quasi-experimental	40	Self-efficacy education	Questionnaire	Knowledge
Basri et al. (2021)	Indonesia	Experimental	50	Self-efficacy motivation	Scale	Self-efficacy
Laowo & Batubara (2021)	Indonesia	Quasi-experimental	30	Hands-on practice	Observation	Behavior
Garcia et al. (2019)	USA	Experimental	60	Self-efficacy education	Scale	Adherence
Indradewi et al. (2019)	Indonesia	Quasi-experimental	35	Intensive education	Questionnaire	Behavior
Fitriadi et al. (2021)	Indonesia	Experimental	45	Self-efficacy training	Scale	Self-efficacy
Rahmawati et al. (2020)	Indonesia	Quasi-experimental	38	Health education	Questionnaire	Knowledge
Oktaviani et al. (2021)	Indonesia	Experimental	50	Digital education	Scale	Adherence
Ernawati et al. (2025)	Indonesia	Quasi-experimental	36	Video-based education	Questionnaire	Self-care
Marliana et al. (2025)	Indonesia	Experimental	36	SAFE-FOOT application	NAFF	Foot care

Table 1 presents the characteristics of the 10 articles analyzed in this systematic review, which were selected using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. In general, the studies varied in terms of research design, sample size, intervention type, and instruments used; however, all studies focused on improving foot care among patients with Type 2 Diabetes Mellitus.

Based on the research design, most studies employed a quasi-experimental approach, while several others used an experimental design, specifically randomized controlled trials (RCTs). This indicates that the majority of studies in this field are still at the stage of testing interventions with limited control, although they remain sufficiently robust in evaluating the effectiveness of educational programs.

In terms of sample size, each study involved between 30 and 60 respondents, with a total of approximately 420 participants across all studies. Variations in sample size may influence the statistical power of each study; however, overall, these sample sizes are considered adequate for small- to medium-scale intervention studies. Regarding study location, most studies were conducted in Indonesia, while several others originated from international settings. This finding indicates that research related to foot care education among patients with Diabetes Mellitus has been well developed within the local context while still maintaining global relevance. The types of interventions used in the studies were highly diverse; however, they could generally be classified into three main categories, namely: Self-efficacy based education, hands on practice based education, audiovisual or digital based education.

Self-efficacy-based interventions generally focused on enhancing patients' confidence in performing foot care practices, whereas hands-on practice-based interventions emphasized the development of technical skills. Meanwhile, audiovisual-based interventions utilized media such as videos and digital applications to improve patients' understanding in a more interactive manner. The instruments used across the studies also varied, including knowledge questionnaires, self-efficacy scales, observation sheets, and standardized instruments such as the Nottingham Assessment of Functional Footcare (NAFF). This variation in instruments

indicates that outcome measurements were conducted multidimensionally, encompassing cognitive, affective, and behavioral aspects. The outcomes assessed in these studies included improvements in knowledge, self-efficacy, adherence, and foot care behavior. This demonstrates that the interventions focused not only on increasing patients’ understanding but also on promoting behavioral changes, which constitute the primary objective in preventing diabetic foot complications.

Overall, the study characteristics presented in Table 1 indicate that research on foot care education among patients with Type 2 Diabetes Mellitus has been conducted using various intervention approaches and evaluation methods. These variations provide a comprehensive overview of the effectiveness of different educational strategies while simultaneously strengthening the analytical foundation of this systematic review.

Main Findings of Intervention

Table 2. Synthesis of Study Finding			
Author (Year)	Intervention	Outcome	Significance
Nabilah et al.	Self-efficacy education	Increased knowledge	p < 0.05
Basri et al.	Self-efficacy motivation	Increased self-efficacy	p < 0.05
Laowo & Batubara	Hands-on practice	Improved behavior	p < 0.05
Garcia et al.	Self-efficacy education	Improved adherence	p < 0.05
Indradewi et al.	Intensive education	Increased behavior (6.6%)	p < 0.05
Fitriadi et al.	Self-efficacy training	Increased self-efficacy	p < 0.05
Rahmawati et al.	Health education	Increased awareness	p < 0.05
Oktaviani et al.	Digital education	Improved adherence	p < 0.05
Ernawati et al.	Video-based education	Improved self-care	p < 0.05
Marliana et al.	SAFE-FOOT application	Significant improvement	p = 0.000

Table 2 presents a synthesis of findings from the 10 studies analyzed in this systematic review based on the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines. The table focuses on the types of interventions administered and their effects on the main variables, namely knowledge, self-efficacy, and foot care behavior among patients with Type 2 Diabetes Mellitus. Overall, all studies demonstrated a consistent trend of positive outcomes following the interventions. This was indicated by statistically significant findings in nearly all studies ($p < 0.05$), suggesting that the interventions had a meaningful effect on changes in patients’ health behaviors.

When reviewed according to the type of intervention, self-efficacy-based education consistently demonstrated improvements in patients’ confidence in performing foot care. Studies utilizing this approach reported that patients became more confident in carrying out self-care activities independently, which ultimately contributed to greater adherence and behavioral consistency. These findings reinforce the role of self-efficacy as a key psychological factor in health behavior change. Meanwhile, hands-on practice interventions demonstrated a more substantial impact on behavioral change compared to merely increasing knowledge. Patients who participated in direct training or demonstrations were more capable of applying foot care skills in their daily lives. This was reflected in improvements in behavioral indicators such as routine foot examinations, foot hygiene practices, and the use of appropriate footwear.

Audiovisual and digital-based interventions, such as educational videos and applications (e.g., SAFE-FOOT), demonstrated the most prominent results in improving multiple aspects simultaneously, including knowledge, self-efficacy, and behavior. The advantage of these media lies in their ability to deliver information through both visual and auditory channels simultaneously, thereby enhancing comprehension and information retention. Furthermore, flexible access enables patients to review the educational materials repeatedly according to their needs, thereby reinforcing the learning process.

Several studies also reported improvements in the form of percentage changes, such as a 6.6% increase in behavior. This indicates that although the numerical changes may appear relatively small, they remain statistically and clinically significant. This finding is important because health behavior changes generally occur gradually and require time to develop.

Interestingly, although all studies demonstrated significant results, variations in the magnitude of intervention effects were observed. These variations were likely influenced by several factors, including intervention duration, delivery methods, participant characteristics, and the types of instruments used. Studies involving more intensive and combined interventions (e.g., self-efficacy + audiovisual + hands-on practice) tended to produce greater improvements compared to single-component interventions.

Overall, Table 2 demonstrates that self-efficacy-based and audiovisual educational interventions have high and consistent effectiveness in improving foot care behavior among patients with Type 2 Diabetes Mellitus. The combination of increased knowledge, enhanced

confidence, and improved practical skills appears to be the primary factor supporting the success of these interventions in preventing complications such as Diabetic Foot Ulcer.

This systematic review demonstrated that self-efficacy-based and audiovisual educational interventions consistently improved knowledge, self-efficacy, and foot care behavior among patients with Type 2 Diabetes Mellitus. These findings align with Bandura's Social Cognitive Theory, which emphasizes self-efficacy as a major determinant of health behavior change (Bandura, 1997).

The Effect of Education on Knowledge

The increase in knowledge observed across nearly all studies indicates that health education remains fundamental in preventing diabetes complications. Audiovisual education was found to be more effective than conventional methods such as leaflets because it engages multiple senses, thereby improving comprehension and retention (Oktaviani et al., 2021).

According to Notoatmodjo (2018), knowledge is an essential domain in shaping health behavior. Individuals with adequate knowledge are more likely to adopt healthy behaviors, including diabetic foot care practices.

The Role of Self Efficacy in Behavioral Change

The review findings indicated that self-efficacy-based interventions significantly improved patients' confidence in performing foot care. Self-efficacy acts as a key determinant of behavioral change because it influences motivation and persistence in carrying out health-related actions (Bahri & Hidayat, 2023). Patients with higher self-efficacy levels tend to adhere more consistently to independent foot care practices. This finding is consistent with Fitriadi et al. (2021), who reported that increased self-efficacy enhances patients' ability to perform consistent self-care behaviors.

Changes in Foot Care Behavior

Behavioral change is the most important outcome in preventing Diabetic Foot Ulcer. Patients receiving educational interventions were more consistent in conducting foot examinations, maintaining foot hygiene, and using proper footwear. According to Wulandari et al. (2019), although diabetic patients may possess adequate knowledge about their disease, foot care practices are often still suboptimal. This suggests that knowledge alone is insufficient without strong self-efficacy support.

Effectiveness of Audiovisual Media and Digital Technology

Audiovisual and digital-based interventions showed superior outcomes compared to conventional educational methods. Audiovisual media can simultaneously present visual and auditory information, enhancing patient understanding and engagement (Oktaviani et al., 2021). Moreover, digital health applications allow patients to repeatedly and flexibly access educational materials, supporting independent learning processes that are particularly beneficial in chronic disease management. Marlina et al. (2025) reported that the video-based SAFE-FOOT application significantly improved foot care behavior because it provided interactive and easily accessible learning experiences.

Variability Among Studies

Despite the positive findings across all studies, variations in intervention effects were observed. These differences may be associated with: Duration of intervention, educational methods, participants' educational background, duration of diabetes diagnosis. Notoatmodjo (2018) emphasized that educational level and personal experience strongly influence individuals' ability to receive and process health information, ultimately affecting behavioral change.

Practical Implications

The findings of this review have important implications for nursing practice and health education: Foot care education should integrate self-efficacy components, Audiovisual media should be utilized as primary educational tools, Healthcare professionals should provide practical training sessions, The development of digital health applications should be continuously enhanced. According to Rahmawati et al. (2020), effective education can improve patients' awareness regarding the importance of foot care and prevent DFU complications.

Study Limitations

This systematic review has several limitations: The number of included studies was limited, Quantitative meta-analysis was not conducted, High variability in research instruments across studies. Most studies originated from developing countries, limiting global generalizability.

Conclusion and Recommendations

Overall, this systematic review demonstrates that self-efficacy-based and audiovisual educational interventions are effective approaches for improving knowledge, self-efficacy, and foot care behavior among patients with Type 2 Diabetes Mellitus. These interventions not only enhance cognitive aspects but also strengthen psychological readiness and practical skills, which are essential in preventing Diabetic Foot Ulcer complications. Based on the findings of this systematic review, several recommendations can be proposed for future research and practical development. Future studies are recommended to conduct meta-analysis with larger and more diverse datasets to generate stronger statistical evidence regarding the effectiveness of self-efficacy-based and audiovisual interventions. In addition, randomized controlled trials (RCTs) with larger sample sizes are needed to improve the validity and generalizability of findings. Further research should also consider diverse demographic characteristics, including different age groups, educational levels, socioeconomic backgrounds, and varying durations of diabetes, to better understand how these factors influence intervention outcomes. Moreover, future studies are encouraged to use standardized and validated measurement instruments for foot care behavior, self-efficacy, and knowledge to reduce heterogeneity across studies. From a methodological perspective, longitudinal studies with long-term follow-up periods are recommended to assess the sustainability of behavioral changes after interventions. In addition, future research may explore the development and evaluation of integrated digital health interventions, such as mobile applications combining audiovisual education and self-efficacy enhancement modules, to support continuous self-management in patients with Type 2 Diabetes Mellitus.

Overall, this systematic review demonstrates that self-efficacy-based and audiovisual educational interventions are effective approaches for improving knowledge, self-efficacy, and foot care behavior among patients with Type 2 Diabetes Mellitus. These interventions not only enhance cognitive aspects but also strengthen psychological readiness and practical skills, which are essential in preventing Diabetic Foot Ulcer complications.

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