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Analysis Of Home Foot Temperature Monitoring Intervention in Diabetic Foot Ulcer Patients: Literature Review

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Abstract*.Introduction: High blood sugar can cause neuropathy and peripheral artery disease, reducing sensation in the limbs and leading to diabetic foot ulcers (DFU), about 30% of diabetics develop DFU. The purpose of this study was to analyze the intervention of home foot temperature monitoring in patients with diabetic foot ulcers (DFU). Methods: using the PICO formulation to conduct a literature search collection of materials from databases such as PubMed, Google Scholar, and science direct. The search was conducted using relevant keywords,and focused on articles published between 2021 and 2024 according to the inclusion and exclusion criteria. Results: Low compliance in reducing activities after detecting hotspots hinders ulcer prevention, especially in those with high self-care scores. Home foot temperature monitoring is ineffective without activity reduction, requiring behavioral changes and a comprehensive approach. Sensor-based smart footwear better prevents ulcers by reducing plantar pressure, while telehealth and interactive dashboards enhance patient monitoring and communication for more efficient care. Conclusion: The articles stress combining behavior change and technology to prevent diabetic foot ulcers. Low activity reduction limits effectiveness, but smart footwear aids prevention, while telehealth improves monitoring and communication, highlighting integrated solutions.*

Keywords: *Foot temperature monitoring,Diabetic foot ulcer (DFU), Intervention, Literature review*

Abstrak Pendahuluan: Gula darah tinggi dapat menyebabkan neuropati dan penyakit arteri perifer, mengurangi sensasi pada anggota badan dan menyebabkan ulkus kaki diabetik (DFU), sekitar 30% penderita diabetes mengalami DFU. Tujuan penelitian ini adalah menganalisis intervensi pemantauan suhu kaki di rumah pada pasien ulkus kaki diabetik (DFU). Metode: menggunakan formulasi PICO untuk melakukan pencarian literatur kumpulan materi dari database seperti PubMed, Google Scholar, dan science direct. Pencarian dilakukan dengan menggunakan kata kunci yang relevan, dan difokuskan pada artikel yang diterbitkan antara tahun 2021 hingga 2024 sesuai kriteria inklusi dan eksklusi. Hasil: Rendahnya kepatuhan dalam mengurangi aktivitas setelah mendeteksi titik api menghambat pencegahan maag, terutama pada mereka yang memiliki skor perawatan diri tinggi. Pemantauan suhu kaki di rumah tidak akan efektif tanpa pengurangan aktivitas, sehingga memerlukan perubahan perilaku dan pendekatan komprehensif. Alas kaki pintar berbasis sensor mencegah tukak dengan lebih baik dengan mengurangi tekanan plantar, sementara telehealth dan dasbor interaktif meningkatkan pemantauan dan komunikasi pasien untuk perawatan yang lebih efisien. Kesimpulan: Artikel-artikel tersebut menekankan penggabungan perubahan perilaku dan teknologi untuk mencegah ulkus kaki diabetik. Pengurangan aktivitas yang rendah membatasi efektivitas, namun alas kaki pintar membantu pencegahan, sementara telehealth meningkatkan pemantauan dan komunikasi, menyoroti solusi terintegrasi.

Kata Kunci: Pemantauan suhu kaki, Ulkus kaki diabetik (DFU), Intervensi, Tinjauan Pustaka

1. INTRODUCTION

Diabetes Mellitus (DM) is a metabolic and pathophysiological group manifested by high blood glucose levels due to the inability of pancreatic beta cells to secrete sufficient insulin or insulin insensitivity to receptors to oxidize blood glucose, diabetes mellitus is one of the earliest identified diseases and its complications have been well understood by humans, when patients fail to maintain insulin levels it can trigger *other metabolic* disorders such as

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(hypertension, cardiovascular disease, obesity), pathological conditions and insulin deficiency/resistance (Mariadoss, 2022). High blood glucose levels can cause neuropathy, complications of diabetes can be caused by increased blood sugar levels, which can cause peripheral arterial disease reducing sensation in the hands and feet, leading to diabetic foot ulcers (DFU) after untreated trauma. Approximately 30% of diabetic patients experience DFU during their lifetime (Boulton, 2019). Standard treatments for DFU are debridement, decontamination (removing bacteria from the body), and antibacterial treatment. Debridement removes contaminated, deteriorating, or infected areas. The best way to invest is through total control, where a custom cast is distributed to each foot, reducing waste and increasing productivity. The application process has been simplified and can now be completed in a short time thanks to the connectivity of the cast system. However, the total cast account is not accessible, making daily maintenance impossible (Chang & Nguyen, 2021). The hallmark of DFU is an increase in the temperature of the patient's foot caused by inflammation and enzymatic tissue autolysis due to imbalance of pressure activity, repetitive stress, neuropathic sensory loss and biomechanical anomalies (Okoduwaet al., 2024). This high foot ulcer makes Pressure can be reduced by removing footwear. In addition, the presence of high plantar fasciitis Pressure can be identified by regularly monitoring foot temperature as a warning sign of impending ulceration (Alahakoon et al., 2020). Approximately 85% of all amputations performed in extreme conditions due to diabetes are performed on the foot, this is due to poor diabetes self-management. Good self-management includes, among others, lifestyle modification, rehabilitation, exercise, dietary changes, smoking, and self-glucose maintenance. Diabetes management is primarily concerned with preventing diabetic ketoacidosis. Effective diabetes care management can reduce the risk of diabetes complications by 50% to 60%. People with Diabetes Mellitus have the main responsibility in preventing diabetic foot ulcers, including by obtaining or seeking good information and being active in practicing independent foot care (Obilor et al., 2020). Warning signs of trauma to the sole of the foot can be identified through increased skin temperature on one foot compared to the contralateral foot, also known as a hot spot. The hot spot map identifies areas of injury caused by trauma and predicts future growth in that area. After identifying hotspots, identifying relevant areas through roadside activities and/or plant modifications may help reduce ulcer growth (Golledge et al., 2022). Therefore, further research is needed to explore this topic in more depth. The aim of this study was to analyze the intervention of home foot temperature monitoring in diabetic foot ulcer (DFU) patients.

2. LITERATURE REVIEW

Literature review is part and parcel of scholarly research. Though many literature review guides are available, they remain limited because they do not adequately account for the different types of literature review. Noteworthily, literature reviews can manifest as part of conceptual or empirical studies, or as independent studies, in which the latter may be curated in various ways. Moreover, despite its importance and popularity, literature reviews, particularly as independent studies, continue to attract unfair criticism and remain scarce in service research. To address the aforementioned gaps, this article endeavors to provide an overview and guidelines for writing literature reviews. Specifically, this article explains (1) what a literature review is and is not, (2) why literature reviews are valuable, and (3) how to conduct a literature review, as well as (4) the areas of service research and (5) the innovative ways in which literature reviews can be curated in the future (Lim et al., 2022). Literature reviews as standalone pieces of work may allow researchers to enhance their understanding of prior work in their field, enabling them to more easily identify gaps in the body of literature and potential avenues for future research. More importantly, review articles may challenge established assumptions and norms of a given field or topic, recognize critical problems and factual errors, and stimulate future scientific conversations around that topic (Kraus et al., 2022).

3. METHODS

Emphasis is placed on the framework of intervention strategies for monitoring foot temperature in patients with diabetic foot ulcers, before conducting a literature search, the researchers formulated the PICO framework to guide the literature review:

- Population: patients with diabetic foot ulcers
- Intervention: Foot temperature monitoring at home

Comparison : -

Outcome) : -.

Based on the PICO formulation above, the author formulated a research question, namely, how is the intervention for monitoring foot temperature at home in diabetic foot ulcer (DFU) patients?. In the process of compiling this literature review, the researchers carried out several stages. The initial stage involved collecting material from academic databases such as PubMed, Google Scholar, and science direct. The search was conducted using relevant keywords, including "foot temperature monitoring" "foot monitoring interventions in patients

with diabetic foot ulcers". This study focused on articles published between 2021 and 2024, with the requirement that the article must be available in full-text format and in English or Indonesian. The search results were then analyzed to assess their suitability with the inclusion criteria, which included relevance to the research topic and the availability of articles in full-text format. Furthermore, articles that met the inclusion criteria were included for further review in the literature analysis, namely:

Inclusions:

1. Articles published between 2021-2024.
2. Articles written in Indonesian or English.
3. Articles that discusshome foot temperature monitoring in DFU patients
4. Article available in full text form, open access and research articles

Exclusions:

1. Articles published before 2021.
2. Articles that are not written in Indonesian or English.
3. Articles that do not focus onhome foot temperature monitoring in DFU patients
4. Articles that are not available in full text form, open access and research articles

Table 1. Summary Description of Articles

Biography journal	**Population**	**Research result**
Adherence to at-Home Monitoring of Foot Temperatures in People with Diabetes at High Risk of Ulceration Author: Rovers et al., 2022	There were 151 participants in the enhanced therapy arm of the DIATEMP trial (all at high risk of diabetes-related foot ulcers) aimed to conduct and record daily foot temperature for 18 months or until ulceration occurs.	The results showed that ninety-four participants (62.3%) were compliant in measuring foot temperature. This figure was higher in months 1-3. compared to months 4-18: 118 (78.1%) versus 78 (57.4%; P < .001). Of the 83 participants with hotspots, 24 (28.9%) reduced indoor activity. reduced outdoor activity. Increasing age (P = .021, OR = 1.045) and better self-care (P = .007, OR = 1.513) were positively associated with foot temperature adherence
Effectiveness of at-home skin temperature monitoring in reducing the incidence of foot ulcer recurrence in people with diabetes: a multicenter randomized controlled trial (DIATEMP) Author: Bus et al., 2021	In this parallel group multicenter randomized controlled trial by outcome assessors randomly assigned to the center (7 hospitals, 4 podiatry practices), we randomly assigned people with diabetes, neuropathy, history of foot ulcers (<4 years, n = 295), or Charcot neuro-arthropathy (n = 9) for usual care regular care (i.e., podiatric care, education, and therapy) footwear)	Results Based on intention to treat, 44 of 151 (29.1%) participants in enhanced therapy and 57 of 153 (37.3%) in usual care experienced ulcer recurrence at the primary outcome site (RR: 0.782 (95%CI 0.566 to 1.080), p=0.133). Of the 83 participants in enhanced therapy who measured hotspots, 24 who subsequently reduced their outpatient activity had

	or usual care plus skin temperature measurements at 6-8 plantar sites per foot daily (enhanced therapy)	ulcer recurrence was significantly less (n=3) compared to those on usual care (RR: 0.336 (95% CI 0.114 to 0.986), p=0.017). Increased enhanced therapy is more effective than usual care for ulcer recurrence in any leg (RR: 0.760 (95% CI 0.579 to 0.997), p=0.046).
Therapeutic smart-footwear approach for management of neuropathic diabetic foot ulcers: Current challenges and focus for future perspective Author: Okoduwa et al., 2024	There were 90 patients with a history of DFU enrolled in the trial and they were randomly assigned to a control group (CG) or intervention group (IG). While the CG group did not receive answer, the IG group was given a functioning smart watch that signaling when consistent pressure is felt. The study findings showed a 71% reduction in wound recurrence.	The results of the research are the concept of footwear therapeutically important for the treatment of DFU and shows how new sensor technology makes this possible. People with neuropathic DFU can manage their foot problems with therapeutic footwear without any limitations in daily activities. Interventions in maintaining these DFUs must be discrete, energy efficient, accurate, and easy to use to offer a reliable and acceptable way for effective health monitoring. The device can be inserted into a person's shoe from the plantar aspect of the foot to gather more information about their health. The findings suggest that load-bearing activities and offloading sensor devices can be used as an effective offloading therapy to cure DFU. This article discusses a sensor system based on DFU technology. therapeutic footwear, which tracks many elements that help in tracking foot ulcers, available treatments, and potential future research areas
Telemedical Monitoring of Plantar Temperature in Diabetic Patients at Risk of Foot Ulcers Author: Ming et al., 2024	Patients with diabetes and peripheral neuropathy (DFU) risk group 2/3) are monitored for plantar abnormalities with telemedicine system consisting of a single insert with a temperature sensor temperature sensors and photo documentation. An open and prospective trial, randomized controlled trials were conducted to determine whether This system prevents DFU. Intervention group and control group were also trained in ulcer prevention and observed during follow-up in 6 month interval for 24 months	A total of 283 patients were recruited. In 85,137 days of observation, DFU occurred in five patients in the control group (n = 143) and none in the patients in the intervention group (n = 140). Main results The main factor is the hazard ratio, which is calculated to be 0.015. (95% confidence interval [0; 19.717]; p = 0.25) after adjusting for age, gender, severity of neuropathy, and risk class. There were 239 alarm and 75 instructions to reduce heavy loads on the feet. Subjects performed telemedicine. telemedicine applications on approximately 70% of observation days. Quality of life improved in both groups

4. RESULTS

After careful keyword search and application of inclusion and exclusion criteria, the number of relevant literature sources is summarized in Table 1, namely:

Table 1. Synthesis of article reviews

	Database	Article	Article filtering	Articles found
1.	Pubmed	5	5	1
2.	Google Scholar	17,600	8	2
3.	Science Direct	311	3	1
		17,916	16	4

Based on the online database search conducted, a total of 17,916 articles were identified across three databases: PubMed, Google Scholar, and Science Direct. The initial screening process involved reviewing 16 articles for relevance. Ultimately, 4 articles met the inclusion criteria after thorough screening and assessment of content and focus on the topic of interest. Specifically, PubMed generated 1 relevant article out of 5 screened articles, Google Scholar contributed 2 relevant articles out of 8 screened articles, and Science Direct provided 1 relevant article out of 3 screened articles. These selected articles will serve as the basis for further analysis and review in the literature review.

Results of the study in article 1 The main finding of our study was the low level of compliance of participants in reducing outpatient activities after detecting a hotspot. This behavioral change after hotspot identification is the most important element of the intervention as it serves to reduce the risk of ulcers by reducing the mechanical load on the foot; foot temperature measurement only serves as a tool to identify potential risks. Surprisingly, our analysis showed that participants with lower self-care scores tended to be more compliant in reducing outpatient activities. This is contrary to the relationship between self-care scores and adherence to temperature monitoring and also does not fit with clinical logic. One possible hypothesis is that individuals with higher self-care scores tend to incorporate foot temperature measurement into their daily routine without understanding the importance of behavioral changes after detecting a hotspot. As a result, they are more likely to detect a hotspot but fail to take necessary action. However, this analysis was conducted in a smaller subgroup (n = 83) with a mean difference of only 0.6 on a scale of 0–7 between the compliant and non-compliant groups, so the clinical significance of this finding may be limited. Furthermore, because no other factors were clearly associated with poor adherence to reducing outpatient activities, we have not been able to identify the appropriate group to improve this aspect of the intervention.

Further research is needed to develop more effective strategies to improve adherence to this behavioral change (Rovers et al., 2022).

Results of study article 2 Daily home foot temperature monitoring, in addition to usual care, did not significantly reduce the incidence of recurrent foot ulcers at or around the measurement site compared with usual care alone in people with diabetes, peripheral neuropathy, and a history of foot ulcers or Charcot foot. Adherence to foot temperature monitoring did not change this effect, but when participants reduced their activity after a hotspot was identified, the intervention was effective compared with usual care. Furthermore, when only ulcers at the previous ulcer site or ulcers at any foot site (including sites not measured) were considered, the intervention was effective compared with usual care. Thus, the effect of home foot temperature monitoring on preventing ulcer recurrence is not as simple as previously found and may be limited to those who are compliant in changing their behavior based on temperature measurements, to specific foot sites that need to be targeted, or as a method to increase awareness of foot health. While this intervention has potential, the findings suggest that it is not a stand-alone solution. A multimodal treatment approach is needed to substantially and sustainably reduce the risk of ulcer recurrence in people with diabetes (Bus et al., 2021).

Research Results Article 3 This review article describes an investigation into the effectiveness of smart footwear in the treatment of diabetic neuropathic foot ulcers. The shortcomings of current approaches to the treatment of diabetic foot ulcers (DFUs) can be overcome, and adherence to integrated foot care best practices can be improved with the use of sensor-based patient monitoring footwear. These medical devices can not only impact foot health but also the course of diabetes and patient life expectancy. Compared with conventional footwear, therapeutic footwear for diabetics was more effective and resulted in a significant reduction in peak plantar pressure in both static and dynamic analyses. In high-risk individuals, this may help prevent foot ulcers and diabetic foot-related injuries. Better conversion efficiency, high power output, and large volume area are some of the device applications found in sensor-based footwear. For diabetics, special insoles with sensors and a cushioned heel cushion are excellent tools for reducing pressure. These insoles can also help rebalance plantar pressure, thereby reducing the risk of developing foot ulcers (Okoduwa et al., 2024).

Research results article 4 The advantage of the telehealth approach is the implementation of a surveillance strategy that allows information to be collected without organizational barriers (e.g., consultation hours, on-site physician visits, travel). During the study, the learning curve in patient care via telehealth was accompanied by the expansion of

the dashboard functionality, which allowed physicians to interact with participants via messages, short notifications, standardized questionnaires, and foot photos. In addition, the availability of temperature recordings from before (Ming et al., 2024).

5. DISCUSSION

Article 1 of the intervention step carried out by Rovers et al (2022), namely participants measured their temperature at six to eight predetermined locations on the plantar surface of both feet. To remind participants, standard text messages were sent twice weekly to non-compliant participants, and once every 4 weeks to compliant participants. Participants were asked to measure their foot temperature daily, preferably in the morning immediately after waking up. If the skin temperature measured in a region was >2.2 °C higher than in the corresponding region on the contralateral foot for two consecutive days, this was called a "hotspot". At that time, participants were instructed to reduce their ambulatory activity by approximately 50% until the foot temperature returned to normal (temperature difference ≤ 2.2 °C) Lower Extremity Wounds and to contact their podiatrist. Participants who recorded a hotspot were instructed to mark the hotspot in the logbook and record their next action (i.e. reduce ambulatory activity by 50% and contact their podiatrist). All of the above instructions were also stated in the logbook, to help remind participants to take the necessary actions. The results showed that in people at high risk for developing diabetes-related foot ulcers, adherence to measuring foot temperature was quite high in the first months after the study began, but decreased over time. Adherence to reducing outpatient activity when a hot spot was found was low throughout the study period (Rovers et al., 2022).

Article 2 intervention steps taken by respondents from Bus et al (2021),Enhanced therapy consisted of usual care plus home-based plantar foot skin temperature measurements, per instructions once daily in the morning immediately upon awakening. Participants used an infrared thermometer (TempTouch, Diabetica Solutions, San Antonio, Texas, United States) to measure skin temperature at six predetermined points on the plantar surfaces of both feet where they most commonly occur:21 the hallux, the second and third toes, and the first, third, and fifth metatarsal heads. A maximum of two additional plantar foot sites were measured if a previous ulcer or preulcerative lesion (i.e., multiple calluses, hemorrhages, or blisters) was or was present at a site other than the predetermined site. This selection of measurement sites differed from previous trials, in which only six predetermined sites (four on the forefoot, one midfoot, and one heel) were used. Participants recorded each temperature value and its difference between the corresponding sites on both feet on a customized form. These forms

were returned to the investigators after 2 weeks at baseline and every 4 weeks thereafter. If the temperature difference at the corresponding location was 2.2°C for two consecutive days, it was defined as a “hotspot”. Participants were instructed verbally and in writing on their forms to then substantially reduce their ambulatory activity, i.e., by at least 50% as subjectively assessed, until the temperature difference normalized to <2.2°C, and to contact their podiatrist for further and, if necessary, treatment. Participants recorded these actions on their forms, when the foot temperature difference exceeded 4°C or did not return to normal within 2 days. Within 2 days, participants were instructed to immediately contact and see their podiatrist. Participants received mobile phone text reminders twice a week for the first 6 weeks and every 2 weeks for the remainder of the follow-up, to encourage them to measure their foot temperature and to reduce ambulatory activity and contact their podiatrist if a hotspot was found. The results showed that home foot temperature monitoring did not significantly reduce the incidence of diabetic foot ulcer recurrence at or adjacent to the measurement site compared to usual care, unless participants reduced outpatient activity when a hot spot was detected, or when aiming to prevent ulcers at any foot location (Bus et al., 2021).

Article 3 shows that this research focuses on technologies that may facilitate the prevention of DFU and re-ulceration for individuals at high risk for DFU, research challenges, and potential emerging explanations that may advance future off-the-shelf treatments. The sensor-enabled insole contains four TRIPS sensors, positioned at the heel: the 5th metatarsal head (5 MH), the 1st metatarsal head (1 MH), and the hallux. These locations were chosen because they represent the most common sites for DFU occurrence and allow important gait events to be detected. Placing a temperature device within the insole can facilitate the assessment of ambient temperature to ensure proper operation and can also track the temperature of foot regions associated with specific disorders. The temperature sensor locations are where people with diabetes have previously experienced foot ulcers. Temperature anomalies detected by a device placed at one or more of these locations may be a sign that a diabetic foot ulcer is likely to develop. The use of smart devices to monitor and alert for continuous plantar pressure (greater than 30-50 mmHg and lasting more than 15 minutes) during an individual’s daily routine is one of the accessible digital health interventions to expedite home plantar pressure and gait monitoring. The current review article outlines the investigation of the efficacy of smart footwear for the treatment of diabetic neuropathic foot ulcers. The shortcomings of current DFU treatment approaches can be addressed, and improved adherence to integrative foot care best practices can be encouraged with the use of sensor-based patient monitoring footwear. This medical device not only impacts foot health but also the

course of diabetes and patient longevity. Compared to conventional footwear, therapeutic footwear for diabetics was more successful and resulted in a significant reduction in peak plantar pressure in both static and dynamic analyses. In high-risk individuals, this may help avoid foot ulcers and diabetic foot-related injuries. Better conversion efficiency, high power output, and large volume area are some of the device applications found in sensor-based footwear. For people with diabetes, specially designed insoles with sensors and a soft heel pad are excellent loading and unloading devices. They can also help rebalance plantar pressure, thereby reducing the risk of developing foot ulcers (Okoduwa et al., 2024).

Article 4 shows that Plantar temperature recordings were "normalized" by subtracting ambient temperature recordings from the same insole from the additional sensor integrated in the Bluetooth device. A pre-defined algorithm calculated the asymmetry of temperatures recorded by the sensors of both insoles and was shown on the dashboard when the alarm level was ≥ 3. The physicians conducting the study assessed the likelihood of this finding based on all available information. In 75 verified alarm cases, a 5-day foot unloading intervention was initiated by the physician. In cases that could not be classified due to technical defects (missing or damaged sensor data), no contact between the plantar foot and the hallux sensor, or a decrease in temperature (possibly due to intermittent leg ischemia), the alarm level was reset. The overall compliance rate was defined as the days of measurement divided by the days of observation. This rate was calculated as 70%. The number of AEs and SAEs recorded in the study did not differ between the two groups, the QOL of both groups improved during the study period. After 24 months, QOL was slightly better in patients using the telehealth application (Ming et al., 2024). The advantage of the telehealth approach is the implementation of a surveillance strategy that allows information to be collected without organizational barriers (e.g., consultation hours, on-site physician visits, travel). During the study, the learning curve in patient care via telehealth was accompanied by the expansion of the dashboard functionality, allowing physicians to interact with participants through messages, short notifications, standardized questionnaires, and foot photos. In addition, the availability of temperature recordings from before (Ming et al., 2024).

Several studies have stated that foot temperature monitoring interventions significantly reduce the incidence of diabetic foot ulcers (DFU), removing footwear is effective in reducing the incidence of DFU and monitoring foot temperature at home reduces the incidence of foot ulcers but these results are not completely strong there are several things that need to be considered such as having to be balanced with routine care and changes in patient behavior for the better (Alahakoon et al., 2020).

The results should include findings of the study, including, if appropriate, results of statistical analysis, which must be included either in the text or as tables and figures. This section should discuss the implications of the findings in the context of existing research and highlight the limitations of the study.

6. CONCLUSION

Based on the literature review conducted, it can be concluded that 4 articles stated that there was an effect of home foot temperature monitoring intervention in diabetic foot ulcer (DFU) patients but the results were not entirely strong. Poor compliance in reducing outpatient activities after participants identified hot spots or performed foot temperature monitoring. This could occur when only ulcers at the previous ulcer site or ulcers at any foot site (including unmeasured sites) were taken into account, this intervention was effective. Some of these findings also indicate that this is not a stand-alone solution. A multimodal treatment approach is needed to substantially and sustainably reduce the risk of ulcer recurrence in people with diabetes.

LIMITATION

The limitation in this research is that the search engine used can be more so that the data obtained becomes more varied. Not all studies discussed had a robust methodological design, such as randomised clinical trials, which may affect the validity of the findings.

REFERENCES

Alahakoon, C., Fernando, M., Galappaththy, C., Matthews, E.O., Lazzarini, P., Moxon, J.V., & Golledge, J. (2020). Meta-analysis of randomized controlled trials reporting the effect of home foot temperature monitoring, patient education, or offloading footwear on the incidence of diabetes-related foot ulcers. Diabetic Medicine, 37(8), 1266-1279. https://doi.org/10.1111/dme.14281

Boulton, A. J. (2019). The diabetic foot. Medicine, 47, 100–105. https://doi.org/10.1016/j.mpmed.2018.10.001

Bus, S. A., Wouter, B., van Baal, J. G., Busch-Westbroek, T. E., Nollet, F., & van Netten, J. J. (2021). Effectiveness of at-home skin temperature monitoring in reducing the incidence of foot ulcer recurrence in people with diabetes: A multicenter randomized controlled trial (DIATEMP). BMJ Open Diabetes Research and Care, 9(1), e002392. https://doi.org/10.1136/bmjdrc-2021-002392

Chang, M., & Nguyen, T. T. (2021). Strategy for treatment of infected diabetic foot ulcers. Accounts of Chemical Research, 54(5), 1080-1093. https://doi.org/10.1021/acs.accounts.1c00025

Golledge, J., Fernando, M. E., Alahakoon, C., Lazzarini, P. A., Aan de Stegge, W. B., van Netten, J. J., & Bus, S. A. (2022). Efficacy of at-home monitoring of foot temperature for risk reduction of diabetes-related foot ulcers: A meta-analysis. Diabetes/Metabolism Research and Reviews, 38(6), e3549. https://doi.org/10.1002/dmrr.3549

Kraus, S., Breier, M., Lim, W. M., Dabić, M., Kumar, S., Kanbach, D., ... & Ferreira, J. J. (2022). Literature reviews as independent studies: Guidelines for academic practice. Review of Managerial Science, 16(8), 2577-2595. https://doi.org/10.1007/s11846-022-00519-6

Lim, W. M., Kumar, S., & Ali, F. (2022). Advancing knowledge through literature reviews: 'What', 'Why', and 'How to contribute'. The Service Industries Journal, 42(7-8), 481-513. https://doi.org/10.1080/02642069.2021.1908534

Ming, A., Alhajjar, A., Walter, I., Piehler, C., Hoetzsch, J., Leuckert, M., ... & Mertens, P. R. (2024). Telemedical monitoring of plantar temperature in diabetic patients at risk of foot ulcers: The randomized Smart Prevent Diabetic Feet trial. Deutsches Ärzteblatt International, 121(1), 9. https://doi.org/10.3238/arztebl.m2024.0003

Obilor, H. N., Achore, M., & Woo, K. (2022). Use of information communication technology tools in diabetic foot ulcer prevention programs: A scoping review. Canadian Journal of Diabetes, 46(5), 535-548. https://doi.org/10.1016/j.jcjd.2022.07.002

Okoduwa, S. I., Igiri, B. E., Tagang, J. I., Okoduwa, U. J., & Adeyi, A. O. (2024). Therapeutic smart-footwear approach for management of neuropathic diabetic foot ulcers: Current challenges and focus for future perspective. Medicine in Novel Technology and Devices, 100311. https://doi.org/10.1016/j.mntd.2024.100311

Rovers, F. J., Van Netten, J. J., Busch-Westbroek, T. E., Aan de Stegge, W. B., & Bus, S. A. (2022). Adherence to at-home monitoring of foot temperatures in people with diabetes at high risk of ulceration. The International Journal of Lower Extremity Wounds. https://doi.org/10.1177/15347346221114565