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Nurses' Digital Health Literacy and Their Utilization of Wearable Technologies for Diabetic Foot Ulcer Monitoring

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ABSTRACT

This study in centered on the nurses' digital health literacy and their utilization of wearable technologies in caring for diebetic patient with foot ulcer. The researcher made use of the descriptive0omparative correlation1r086srch design employing the 131 nurse08pondenie of the study who were chos0n using the purposive sampling technique

The study revealed that majority of the nurse respondents are 31-36 years old, female, and have 3-5 years of work experience. Nurse respondents viewed themselves as generally informed and competent across all domains of digital health literacy. Nurses reported consistent and confident use of wearable technologies diabetic foot ulcer care, particularly in clinical application, decision-making and team communication. Significant differences in nurses self-digital health literacy were only observed in information searching skills, influenced by age and sex,while other components remained consistent acr098 age groups,sexes,and years of6xperience,indicating a generally uniform level of digital literacy among nurse respondents. Significant differences in the utilization of wearable technologies among nurses were observed only in accuracy in data interpretation by sex and understanding device limitations by years of experience,while other components. While overall digital health literacy was not a significant predictor of wearable technology utilization, specific competencies such as data privacy awareness and technology adaptability supported greater use,whereas high ethical caution and limited integration of skills like EHR proficiency posed potential barriers—underscoring the need for balanced, targetrd digital training for nurses

Develop training modules that focus on aligning digital health competencies with practical clinical applications—especially in the use and interpretation of wearable technologies. Emphasize improving skills in device operation, data trend analysis, and integration of wearable data into care planning. Provide workshops or seminars on digital ethics that help nurses balance caution with confidence when using wearable technologies. Case-based discussions and real-life scenarios can help bridge ethical awareness with practical application. Encourage teamwork between IT specialist, clinic educators, and nurses to ensure that both technical and ethical aspects of wearable technology use are addressed. Promote open dialogue on device limitations, alert fatigue and best practices in patient communication. Utilize the strengths of nurses aged 31-35 and those with 3-5 years of experience—who showed higher competence in several areas—as peer mentors or facilitators in digital health workshops,to promote peer learning and motivation.Conduct refresher sessions particularly for older nurses(aged 41 and above)to strengthen confidence in information searching, source verification, and navigating digital databases. Address the gap between nurses' confidence in digital patient education and their device-handling skills by pairing educational training with hands-on simulations involving calibration, maintenance, and troubleshooting of wearable devices. Bridge the disconnect between EHR proficiency and care plan integration by offering structured training on translating digital and wearable data into actionable nursing interventions. Establish regular self-assessment tools and peer evaluations to monitor digital health literacy and wearable technology use.Use findings to tailor individualized or group-based upskilling initiatives.

Keynote: Nurses' Digital Health Literacy; Utilization of Wearable Technologies; Care for Diabetic Patients; Foot Ulcer

INTRODUCTION

The integration of wearable technologies into diabetic foot ulcer (D FU) management has revolutionized patient care, offering real -time monitoring and early detection of complications. Nurses, being at the forefront of patient care, play a pivotal role in leveraging these technologies effectively. Digital health literacy among nurses is crucial for the optimal utilization of wearable devices, ensuring accurate data interpretation and timely interventions. Studies have highlighted the significance of enhancing nurses' digital competencies to improve D FU outcomes (Kim et al. , 2024; Wu et al. , 2024) .

Digital health literacy encompasses the ability to seek, understand, and apply digital health information effectively. In the context of D FU management, nurses with high digital literacy are better equipped to interpret data from wearable devices, leading to improved patient outcomes. A study conducted emphasized the need for structured training programs to enhance nurses' digital competencies, thereby facilitating the integration of wearable technologies into clinical practice (Ki m et al. , 2024) . Similarly , research highlighted the positive impact of digital literacy on nurses' confidence and efficiency in utilizing mobile health applications for DFU monitoring (Liew et al. , 2023) . These findings underscore the importance of investing in digital health education for nursing professionals.

Wearable technologies, such as smart insoles and socks , have emerged as effective tools for continuous D FU monitoring. These devices provide real-time data on foot pressure and temperature, enabling early detection of ulcer formation. A study demonstrated the efficacy of smart insoles in reducing D FU recurrence rates, with nurses playing a critical role in interpreting the data and adjusting care plans accordingly (Schneider et al. , 2023) . The implementation of a cloud-based plantar pressure monitoring system empowered patients and nurses to collaborate more effectively in D FU management (Wu et al. , 2024) . The successful adoption of these technologies hinge s on nurses' proficiency in digital health tools.

Nurses with high digital health literacy are instrumental in educating patients about the use of wearable technologies, fostering greater engagement in self-care practices. A study revealed that nurse-led education programs significantly improved patients' adherence to smart sock usage, leading to better DFU outcomes (Verhoeven & van den Berg, 2023) . Nurse-guided digital coaching programs enhanced patients' motivation and understanding of foot care, emphasizing the role of nurses in bridging the gap between technology and patient comprehension (Kuro kawa et al. , 2021) .

These initiatives highlight the dual role of nurses as caregivers and educators in the digital health landscape. Despite the benefits, several challenges impede the effective utilization of wearable technologies in D FU monitoring. Barriers such as limited access to training, technological complexities, and resistance to change can hinder nurses' adoption of digital tools. A WHO study identified the need for tailored educational programs and real-time technical support to overcome these obstacles (WHO, 2023) . Research indicated that institutional support and continuous professional development are vital in addressing t he challenges associated with digital health integration (Dumas et al. , 2022) . Addressing these barriers is essential for maximizing the potential of wearable technologies in D FU care.

Effective D FU management requires seamless collaboration among healthcare professionals. Nurses with robust digital health literacy can facilitate better communication and data sharing within interdisciplinary teams. A study highlighted how digitally profi cient nurses enhanced team-based decision-making by accurately interpreting and conveying data from wearable devices (Lee et al. , 2023) . Such collaboration ensures comprehensive care, with timely interventions based on real-time data, ultimately improving patient outcomes.

The use of wearable technologies raises ethical and privacy concerns, necessitating nurses to be well-versed in data security protocols. Research emphasized the importance of nurses' awareness of cybersecurity risks and adherence to privacy regulations when handling sensitive patient data (Weber & Fuchs, 2022) . Ensuring patient confidentiality and informed consent is paramount, and nurses play a critical role in upholding these ethical standards in the digital health domain .

Continuous training and institutional support are pivotal in enhancing nurses' digital health literacy. The development of the "Well Feet" mobile application involved nurse training programs to ensure effective implementation and patient education (Liew et al. , 2023) . Similarly, structured digital literacy courses led to increased confidence among nurses in utilizing wearable technologies for D FU monitoring (Dumas et al. , 2022) . These examples underscore the necessity of organizational commitment to ongoing professional development in digital health competencies.

Looking ahead, integrating digital health literacy into nursing curricula and professional development programs is essential. Collaborative efforts between educational institutions and healthcare organizations can foster a workforce adept at leveraging wea rable technologies for chronic disease management. Further research is needed to evaluate the long-term impact of digital health literacy on D FU outcomes and to develop standardized training modules tailored to nurses' needs. Embracing these strategies will ensure that nurses remain at the forefront of technological advancements in patient care .

Nurses' digital health literacy significantly influences the effective utilization of wearable technologies in diabetic foot ulcer monitoring. Enhancing digital competencies among nurses leads to improved patient education, engagement, and outcomes. Addressing challenges through targeted training and institutional support is crucial for integrating these technologies into clinical practice. As healthcare continues to evolve, empowering nurses with digital skills will be instrumental in advancing patient-centered care and optimizing chronic disease management.

Background of the Study

The increasing prevalence of diabetes mellitus globally has led to a surge in complications such as diabetic foot ulcers (DF Us), which pose significant challenges to healthcare systems in Hainan General Hospital at No 19 Xiu hua road, Xiuying District, Haikou city, South China's Hainan Province . Wearable technologies have emerged as innovative tools for monitoring and managing DF Us, offering real-time data and continuous assessment of patients' conditions. Nurses, being at the forefront of patient care, play a pivotal role in utilizing these tec hnologies effectively. However, the successful integration of wearable devices into clinical practice is contingent upon nurses' digital health literacy—their ability to seek, understand, and apply digital health information.

Digital health literacy is defined as the capacity to obtain, process, and comprehend basic health information and services needed to make appropriate health decisions in a digital context. In East Asia, studies have highlighted varying levels of digital h ealth literacy among nursing professionals. For instance, a study revealed that nursing students possessed moderate levels of digital health literacy, indicating a need for enhanced educational interventions to bolster these competencies (BMC Medical Education, 2024) . Similarly, research indicated that nurses' e Health literacy was associated with their confidence in providing health education regarding online health information (PubMed, 2023) .

The digital health divide remains a pressing concern. A re port by the World Health Organization highlighted that only half of the countries have policies to improve digital health literacy, leaving millions behind (WHO Europe, 2023) . This gap underscores t he necessity for comprehensive strategies to enhance digital competencies among healthcare professionals, including nurses.

The adoption of wearable technologies for D FU monitoring offers promising avenues for improving patient outcomes. A novel cloud-based plantar pressure monitoring system was developed to empower diabetic foot ulcer prevention. This system integrates a wearable device with a pressure-sensitive insole, enabling precise, real-time monitoring of plantar pressure, thereby facilitating early detection of potential issues (Wu et al. , 2024) .

Despite the potential benefits, the effective utilization of such technologies by nurses is contingent upon their digital health literacy . Inadequate digital skills can hinder the adoption and integration of wearable devices into clinical practice. Therefo re, enhancing digital health literacy among nurses is imperative to fully leverage the advantages of wearable technologies in D FU management.

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Educational initiatives play a pivotal role in bridging this gap . The Sustainable Healthcare with Digital Health Data Competence (Susa) project, launched by a consortium of European universities, aims to enhance the digital skills of health professionals t hrough comprehensive educational programs (Financial Times, 2025) . Such initiatives are crucial in equipping nurses with the necessary competencies to navigate the evolving digital healthcare landscape. Moreover, the integration of digital health literacy into nursing curricula is essential. A study emphasized the importance of incorporating digital health education into nursing programs to prepare students for the demands of a digitally-driven healthcare environment (Zhao, 2024) . This approach ensures that future nurses are well-equipped to utilize wearable technologies effectively in clinical settings .

In the context of DFU management, wearable technologies offer real-time monitoring and data collection, enabling timely interventions. However, the successful implementation of these devices relies on nurses' ability to interpret and act upon the data generated. This necessitates a high level of digital health literacy to ensure optimal patient care.

Furthermore, the COVID -19 pandemic has accelerated the adoption of digital health solutions, highlighting the need for healthcare professionals to adapt to new technologies rapidly. This shift underscores the urgency of enhancing digital health literacy among nurses to ensure they can effectively utilize wearable technologies in managing chronic conditions like D F Us.

The intersection of digital health literacy and the utilization of wearable technologies is critical in the effective management of diabetic foot ulcers. Enhancing nurses' digital competencies through targeted educational initiatives and curriculum integration is essential to fully realize the benefits of these technologies in clinical practice .

Managing Diabetic Foot Complications

Diabetes mellitus (DM) is becoming more widely acknowledged as a leading cause of death and has become a major global public health concern. Over 10% of individuals worldwide are presently affected by it (Sun et al. , 2022), and for the past 20 years, the number of cases has dramatically increased in China, which has the highest population of diabetics worldwide. Chronic high b lood suga r is a hallmark of diabetes mellitus (DM), a long-term metabolic disease that is usually brought on by either insulin resistance, insufficient insulin secretion, or both (Ala m et al. , 2024) . Type 1 diabetes (T1DM), which is caused by an autoimmune attack on the β-cells in the pancreas that produce insulin (Katsa rou et al. , 2023), and type 2 diabetes (T2DM), which is frequently associated with obesity, sedentary lifestyles, and poor eating habits (Ohlson et al. , 2024), are the two main forms of the disease. T2DM is becoming increasingly common in China, especially in cities where lifestyle risk factors are more prevalent.

Diabetes mellitus (DM) is linked to a number of severe health issues, such as microvascular disorders including diabetic kidney disease, nerve damage, and eyesight loss, as well as cardiovascular illnesses like coronary artery disease and stroke (Viigi maa et al. , 2025; Fowler, 2024) . Of these, diabetic foot problems are especially concerning since they afflict 15% of diabetic patients and, if left untreated, often result in lower limb amputations (Brocco et al. , 2024; Markakis et al. , 2022) . Foot-related problems, which frequently result from infection, tissue necrosis, or persistent ulcers, are a major cause of diabetes-related hospital admissions in China (Bandyk, 2024) . The development of diabetic foot ulcers (DF Us), which are a crucial stage of the illness, is impacted by bacterial infection, decreased blood flow, and nerve loss (Brocco e t al. , 2024) .

Wound cleansing, infection management, blood flow restoration, surgical de bride ment, and, in extreme situations, amputation are standard therapies for D F Us (Bekele & Chelkeba, 2025) . However, because to high medical expenditures and a lack of trained healthcare practitioners, access to such procedures is still restricted in many parts of China, especially in rural or underserved areas. Consequently, there has been an increase in interest in plant-based medicines and traditional medicine. This change is consistent with the long-standing clinical and community healthcare usage of herbal treatments in China.

The therapeutic potential of medicinal plants in treating diabetic foot issues was recently brought to light by study. Aloe vera, Curcuma longa, Centella asiatica, and Punica granatum are among the plants that contain compounds that have anti-inflammatory, antibacterial, and wound-healing qualities (Ahmadian et al., 2025; Ansari et al., 2022). Bioactive substances including quercetin, apigenin, and catechins, which are abundant in these plants, help heal damaged tissue and control blood sugar levels. They work by increasing insulin sensitivity, decreasing hepatic glucose production, promoting insulin secretion, and blocking enzymes involved in the digestion and glycation of carbohydrates (Ahmadian et al., 2025; Ansari et al., 2022). Incorporating plant-based treatments might provide a culturally relevant and economical supplement to traditional diabetic foot care in China, given the combined advantages of glucose control and wound healing.

Scientific interest in traditional herbal medicine has grown due to the abundance of bioactive substances found in different plants, especially in relation to the separation and evaluation of phytochemicals for possible use in the treatment of diabetic wou nds (Ahmadian et al., 2025). Research into how traditional remedies and plant-based ingredients could help manage diabetic foot syndrome and contribute to the development of novel antidiabetic medicines is accelerating in China, where herbal medicine has long been included into health practices.

By 2045, there will be 783 million people worldwide with diabetes mellitus, up from the present 537 million (Sun et al., 2022). Diabetic foot is still the leading cause of non-traumatic lower limb amputations in China, and its incidence has increased dramatically due to the country's rising diabetes prevalence (Markakis et al., 2026). In China, like in other countries, the rising prevalence of diabetic foot problems has emerged as a major public health and economic issue. Skin, soft tissue, and bone are all affected by diabetic foot ulcers (DF Us), which frequently get infected and might result in amputation. Research indicates that 5 -24% of ulcers result in limb loss, 10-15% become chronic, and 60-80% finally heal (Markakis et al., 2022). Patients with type 2 diabetes had a slightly greater incidence of DFUs (6.4%) compared to those with type 1 diabetes (5.5%). However, the paucity of extensive epidemiological studies on D FUs in China and around the world indicates that more research is necessary to inform prevention, early intervention, and treatment plans, which could lower medical expenses and enhance patient outcomes (Bekele & Chelkeba, 2025).

A history of ulcers, chronic hyperglycemia, aberrant pressure points, inadequate footwear, unintentional trauma, and dry or cracked skin are some of the underlying causes of DF Us. Peripheral artery disease and diabetic neuropathy can exacerbate these prob lems, delaying the identification of ulcers and hastening their progression to grave consequences, such as amputation (Oliver & Mutluog lu, 2025; Perez-Favila et al., 2025). Due to nerve loss that affects their ability to feel pressure and discomfort, many patients first ignore these ulcers (Boulton, 2023; Alav i et al., 2024).

Diabetic peripheral neuropathy (DP N), which damages motor, sensory, and autonomic nerves, is one of the most crippling long - term effects of diabetes. DP N often causes dry skin, joint deformities, tissue disintegration, muscular weakness, diminished sensitivity, and poor temperature and pain perception in Chinese diabetes patients (Forsythe et al., 2025). People are more susceptible to unconscious stress when their protective feeling wanes. Structural foot deformities like hammer toe or inflexible hallux are caused by bone anomalies that are exacerbated by motor neuropathy. Additionally, autonomic dysfunction decreases sweating, which results in dry, cracked skin and raises the risk of infection and ulceration (Rosy id, 2023).

According to data, foot ulcers that progress to gangrene or infections occur prior to over 85% of diabetes-related amputations (Perez-Favila et al., 2025). Diabetic foot is thought to impact 6.4% of people worldwide, with ulcer or necrosis rates ranging from 2 to 5% per year (Laing, 2024). According to studies, between 19 and 34 percent of diabetics will have diabetic foot issues at some point in their lives (Fry kberg, 2022). DF Us are also more prevalent in males (4.5%) than in women (3.5%), and they are more common in people with type 2 diabetes (6.4%) than in people with type 1 diabetes (5.5%), according to a meta-analysis. Research on the epidemiological picture of diabetic foot is still lacking in

China, despite the condition's rising incidence . This vacuum must be filled immediately with thorough research that will assist guide national public health initiatives and lower the disease burden among diabetics by improving long-term care, prevention, and treatment (Rosyid, 2023) .

Increased oxidative stress and the development of atherosclerosis are the main causes of hyperglycemia-induced peripheral arterial disease. The accumulation of glucose in the circulation causes arterial blockage, weakness, and constriction in people with diabetes mellitus. Oxidative stress aggravates this illness by maintaining microcirculation inflammation and impairing capillary flexibility, both of which lead to ischemia (Alav i et al. , 2024) . Diabetic foot ulcers (DF Us) are twice as common in diabetic individuals as in non-diabetics, and atherosclerosis affecting arteries like the femoral artery and knee greatly increases the chance of developing these ulcers in China and other nations (Rosyid, 2023) . Studies show that type 2 diabetics are almost 20 ti mes more likely than non-diabetics to have atherosclerosis in their lower limbs, indicating a higher risk of DF Us (Laing, 2024) . About 90% of D FU cases are caused by neuropathy, with the other 10% being caused by ischemia and other causes (Forsythe et al. , 2025) .

Diabetic peripheral neuropathy, peripheral vascular disease, and chronic hyperglycemia are conceptually linked to the development of diabetic foot ulcers. By resulting in aberrant collagen crosslinking, compromising cellular defenses, reducing inflammatory responses, and interfering with the development of new blood vessels, chronically elevated blood sugar impairs wound healing. Deformities of the foot, dry skin, fissures, infections, and loss of protective sensibility are all consequences of peripheral neuropathy, which affects sensory, motor, and autonomic neurons. Atherosclerosis and oxidative stress are the causes of peripheral artery disease, which is exacerbated by ischemia, microvascular inflammation, and elevated plantar pressure.

According to recent studies, the following are important risk factors for the development of D FU: smoking, prior amputations, history of foot ulcers, elevated glycated hemoglobin (HbA1c), male gender, advanced age (around 65 years), long-term hyperglycemia (more than 10 years), elevated plantar pressure, infections, and inadequate foot care (Shahbaz ian, Yazdanpanah, & Latifi, 2023; Iraj et al. , 2023; Waaij man et al. , 2024; Monteiro-Soares et al. , 2022; McEwen et al. , 2023) .

Numerous physiological problems, such as impaired collagen crosslinking, weakened immune responses, fungal infections like tinea and onychomycosis, matrix metalloproteinase dysfunction, diminished cellular defense mechanisms, chronic inflammation, and aberrant angiogenesis, impair wound healing in diabetics. The development and chronicity of DF Us are mostly caused by persistent hyperglycemia, which inhibits acute inflammation and new blood vessel creation, two essential processes for wound healing (Tellechea, Leal, Veves, & Carvalho, 2025) .

A variety of infections, ranging from mild cellulitis to severe necrotizing fasciitis, may exacerbate D F Us. Immune failure brought on by hyperglycemia makes people more susceptible to infections from germs like Staphylococcus aureus and Escherichia coli. When resistant bacterial strains or systemic infection are implicated, these infections have the potential to progress to sepsis, which significantly raises the risk of lower limb amputation (McEwen et al. , 2023) . As a result, DF Us are complex, dangerous illnesses that are mostly caused by inadequate glycemic management.

Tissue loss, wound dimensions, perfusion status, infection severity, depth, wound area, and sensory impairment are the clinical criteria used to categorize diabetic foot ulcers (Scha per, 2024) . Age, sex, medical history, and concurrent conditions—particularly peripheral arterial disease (PAD) and loss of protective sensation (LOPS)—all affect these clinical features. According to Jeffcoate et al. (2022), these elements are essential for classifying ulcers and directing therapeutic approaches.

Diabetic foot ulcers (DF Us) are commonly categorized using the Wagner-Meggitt classification system into six different severity - based grades:

Skin that is intact but may have abnormalities or patches of thicker skin (hyperkeratosis) is represented by grade 0.

In grade 1, superficial ulcers that do not impact deeper tissues may be necrotic.

Although grade 2 ulcers can not develop an abscess or osteo myelitis, they do pierce deeper tissues including bone, tendon, ligament, o r fascia.

Grade 3 ulcers are worsened by osteo myelitis, deep abscesses, or tendinitis, and they are frequently accompanied by inflammatory symptoms including warmth, redness, and swelling.

Grade 4 denotes localized gangrene, usually in the forefoot or toes, which often requires partial foot amputation because of inadequate blood supply.

Amputation below the knee is typically necessary for grade 5 gangrene, which affects the whole foot (Wagner, 2021; Abid & Hosseinzadeh, 2025) .

Brodsky expanded on this concept by suggesting an improved categorization that highlights the function of ischemia and improves grades 4 and 5. His system has additional ischemia subgroups in addition to grades 0-3:

Grade 0 denotes a foot that is at high risk but does not have an ulcer .

A superficial ulcer with no visible bone is referred to be grade 1. A deeper ulcer with potential bone involvement is seen in grade 2.

Severe infections including abscesses or osteo myelitis without gangrene are covered under grade 3.

The following are the ischemia subcategories:

No ischemia or gangrene is indicated by grade A .

Ischemia without gangrene is a feature of grade B .

Ischemia with partial gangrene is denoted by grade C .

Ischemia with full gangrene is indicated by grade D (Robinson, Pasapula, & Brodsky, 2025) .

For diabetic foot ulcers to be effectively treated and managed, accurate staging is crucial. Current strategies go beyond glyce mic management to promote wound healing, stop the development of infections, relieve pressure, and improve blood circulation (Pe rez - Favila et al. , 2025) . Drugs like ta pentadol, pregaba lin, tramadol, duloxetine, acetaminophen, and opioids like oxycodone are frequently used to treat the neuro path ic pain brought on by diabetic peripheral neuropathy. Long-term usage of these analgesics might result in adverse effects such as nausea, diarrhea, sleepiness, and disorientation, despite the fact that they relieve mild to moderate pain (Perez-Favila et al. , 2025) .

Despite the lack of prospective comparative studies, a variety of antibiotics, such as nafcill in, flu cloxa cill in, dic loxac ill in, ceftazidime, cefazo lin, ceftriaxone, dalbavancin, o ritavancin, telavanc in, doxycycline, sulfamethoxazole, and trimethop rim, have been successfully used to treat diabetic foot infections (Rosy id, 2023) . However, the development of antimicrobial resistance is influenced by a number of variables, including the patient's immunological condition, wound chronic ity, poly microbial infections, cleanliness, and previous use of antibiotics (Forsythe et al. , 2025) . The high cost of these advised antibiotics is a majo r problem in China and many other developing nations, frequently leading to treatment delays and the development of severe, challenging-to-treat diabetic foot ulcers in healthcare settings with limited resources (Rosy id, 2023; Forsythe et al. , 2025) .

Debridement is the main and most important treatment for diabetic foot ulcers (DF Us) in order to promote healing and avoid amputations. This process entails clearing the wound site of infectious particles, foreign objects, and necrotic, dead, or senescent tissue. By lowering the bacterial load, promoting

the synthesis of local growth factors, releasing pressure on the wound, and promoting drainage, de bride ment is essential (Frykberg, 2022) . Outperforming mechanical, enzymatic, biological, or auto lytic debridement approaches, surgical de bridement is thought to be the most successful treatment because it transforms chronic ulcers into acute wounds that are more receptive to healing (Frykberg, 2022) .

Comprehensive diabetic foot management also includes other therapeutic measures like pressure offloading, laser therapy, surgical interventions, revascularization procedures to address ischemia, and appropriate wound dressings (Perez-Favila et al. , 2025; Frykberg, 2022; Rosyid, 2023) . However, more research is needed to determine which patient groups benefit the most from these treatments and to assess their cost-effectiveness.

As the frequency of diabetes mellitus has climbed over the past few decades, so too has the prevalence of diabetic foot ulcers worldwide. Almost one-third of the total expenses associated with diabetes care are attributed to the treatment of DF Us (Pandey et al. , 2021) . The danger of lower limb amputations and this financial load have a negative impact on patients' quality of life and may even fuel societal stigma. Alternative medicines, which offer less side effects and maybe extra health advantages, have drawn attention as adjuncts to address this dilemma (Kumar et al. , 2025) .

Although synthetic medications, which are frequently used in conjunction with insulin, continue to be the cornerstone of managing diabetes and diabetic foot complications, their efficacy can be restricted, and adverse effects are frequent. This has led to a rise in interest in natural alternative medicines, especially those made from medicinal plants and animals (Ahmed et al. , 2025) . A number of modern antidiabetic medications have their roots in medicinal herbs, which have long been known to have antidiabetic effects (Li et al. , 2021) . Plant-based therapies have demonstrated potential in the treatment of diabetic foot problems, both as stand-alone treatments and in conjunction with traditional medications. The active ingredients of these plants and their underlying processes are still being investigated (Li et al . , 2021) .

In the therapy of D FU, delayed wound healing continues to be a major obstacle (Kumar et al. , 2025; Zhang et al. , 2021) . Utilized in both conventional and contemporary medical systems, medicinal plants are prized for their many therapeutic benefits, which include the ability to decrease blood sugar, heal wounds, and have antibacterial, anti-inflammatory, and antioxidant effects. While some natural therapies are used orally, the majority are given topically as wound dressings (Dinesh et al. , 2021; Zhang et al. , 2021) . Diabetes wound care has benefited greatly from the use of traditional medical systems including Ayurveda, Unani, and Traditional Chinese Medicine (TCM) . These systems, which include herbal medicines, acupuncture, dietary changes, massage, and therapeutic exercise, are becoming more and more accepted as complementary and alternative medicine in Western nations (Chou et al. , 2025) . To encourage the healing of chronic D FU wounds, TCM, in particular, commonly uses herbal formulae either by itself or in conjunction with traditional treatments (Guo et al. , 2021) .

According to certain research, integrating insulin therapy with Ayurvedic medicine increases patients' overall quality of life in addition to treatment satisfaction (Raja n et al. , 2021) .

By promoting fi broblast activity, increasing growth factor expression, scavenging free radicals, inhibiting microbial growth, promoting collagen synthesis, improving blood circulation, lowering cellular damage, promoting DNA synthesis, and facilitating wou nd contraction and epithelial ization, the various phytochemicals present in medicinal herbs aid in wound healing (Dinesh et al. , 2021; Khanna et al. , 2021; Lopez & Rivera, 2021; Wibowo et al. , 2021) . These positive outcomes add to the increasing interest in herbal remedies as potential antidiabetic therapies as well as therapeutic agents for diabetic foot problems (Ahmed et al. , 2025) . Many of the phytomedicines on the market are made from plants that have long been used in traditional medicine (Ahmed et a l. , 2025) . Both single - and multi-herb formulations are possible for these items. Dia beta (Lopez & Rivera, 2021), Ang ipars (Mendoza & Torres, 2021), WinVivo (Nguyen & Salazar, 2021), Jathyadi Thailam, and Jatyadi Gh ritam (Sarma et al. , 2021) are commercial

poly-herbal medicines used to treat diabetic foot ulcers. In order to promote better patient results, these herbal medicines are sometimes combined with food and lifestyle suggestions (Lopez & Rivera, 2021) .

Digital Health Technologies in Managing Diabetic Foot Syndrome

Diabetic foot ulcers (DF Us) and lower limb problems continue to be among the most incapacitating and costly effects of diabetes worldwide, including in China, where the prevalence of the disease is rapidly increasing. Zhang et al. (2025) estimate that 131 million people are at risk of developing DF Us because of untreated contributing factors, and 18.6 million people globally presently have active DF Us. About one-third of all diabetes-associated healthcare costs in countries like the US a re connected to diabetic foot care, with a significant amount of that money going toward inpatient treatment (Barshes et al. , 2023; Sk rep nek, Mills, & Armstrong, 2025) . For instance, diabetes-related expenses amounted to USD 245 billion in 2012, a 41% rise from 2007 levels (NCD -RisC, 2022) . From 2006 to 2010, Sk rep ne k et al. (2025) reported that over a million ED visits in the United States were connected to D FU . They estimated that the yearly national expenses for emergency care and inpatient treatment alone were USD 1.9 billion and USD 8.78 billion, respectively.

Lower limb amputation (LEA) and other problems connected to DFU are becoming more and more of a worry in China, which has the biggest diabetic population in the world. Around 10% of DF Us result in amputations worldwide, affecting an estimated 6.8 million amputees, 4.3 million of whom do not currently have access to prosthetic devices (Zhang et al. , 2025) . Because people from lower-income backgrounds—including underprivileged rural Chinese communities—face far higher risks of amputation and have less access to preventative care and cutting-edge therapies, socioeconomic gaps make the problem worse.

DF Us increase the risk of falls, fractures, decreased mobility, early-onset frailty, and death, posing significant risks to patient health and quality of life in addition to amputation (Allen et al. , 2023; Najaf i et al. , 202 3; Toosi zade h et al. , 2025) . Diabetes-related amputations have a 5 -year death rate of over 70%, which is higher than the survival rates for several prevalent malignancies, including prostate and breast cancer (Lavery et al. , 2 025) . Furthermore, even effective DFU therapy can lead to significant lower limb muscle loss , particularly when offloading techniques limit mobility for prolonged periods of time. This can lead to long-term impairment and a reduction in independence (Najaf i et al. , 2023) .

There is an urgent need for D FU prevention techniques in China due to the country' s high incidence of diabetes and growing aging population. According to research, early intervention and appropriate care might prevent up to 70% of diabetes-related amputations (Rogers et al. , 2025) . According to systematic reviews and randomized controlled trials, D FU can be avoided by addressing modifiable risk factors , such as wearing appropriate footwear , checking feet frequently, keeping an e ye on body temperature, and receiving regular medical care (Gol ledge et a l. , 2025; van Nette n et al. , 2025; Lazzarini et al. , 2025; Najafi, Reeves, & Armstrong, 2025) . Accessible and efficient technologies are still desperately needed in the Chinese healthcare system, nevertheless, i n order to facilitate daily risk monitoring, promote patient self-management, and improve team communication. This gap may be filled by newly developed digital health technologies, which would allow for prompt intervention and more effective incorporation of evidence-based preventative techniques into standard clinical practice for the management of DFU .

For podiatric evaluations, people with diabetes in China who are at a higher risk of developing diabetic foot ulcers (DF Us) frequently visit outpatient clinics once a week or every two weeks (Golledge et al. , 2025) . However, an already overburdened healthcare system may be further taxed by this frequent need for care. Given that foot ulcer recurrence rates are still quite high, even cutting-edge diabetic treatment facilities with highly qualified staff and first-rate resources frequently fail to adequately address the problem (Armstrong, Boulton, & Bus, 2023) . In order to enable timely preventative intervention before ulceration starts, it is crucial to identify and refer high-risk patients as soon as possible.

Localized inflammation is frequently brought on by repeated pressure-related injuries to the foot soles, especially in high-load locations. Elevated skin temperature at the site of an upcoming injury is one

way to identify this (Najafi et al. , 2023; Armstrong & Lavery, 2023) . According to research, a temperature difference between symmetrical areas on both feet that is more than 2 .22°C (4.0°F) and lasts for two days in a row is a good predictor of ulcer development (Armstrong & Lavery, 2023; Lavery et al. , 2025; Najaf i et al. , 2023) . Therefore, regular temperature monitoring of the plantar surface, which has been shown to be successful in lowering ulcer recurrence among high-risk groups, might be included into D FU preventive efforts in China (Isaac et al. , 2025) .

There are still few thorough studies of plantar temperature monitoring at home, despite the fact that some clinical recommendations suggest it as a component of foot ulcer prevention measures (Bus et al. , 2022; Fry kberg et al. , 2022; Lavery et al. , 2022) . When compared to usual treatment, three important investigations by the same research team with 427 participants used infrared thermometers to monitor 12 particular location s of t he foot and showed significant reductions in the incidence of D FU (Armstrong et al. , 2023; Laver y et al. , 2024, 202 3) . However, due to a limited sample size and an unequal distribution of patients with recurrent ulcer histories, a smaller independent trial with 41 patients did not discover statistically significant results (Skafj eld et al. , 2025; Isaac et al . , 2025) .

Patients typically take their foot temperatures using portable infrared thermometers. This approach, however, might be time - consuming and unfeasible for everyday use, which lowers self-care adherence. It has been suggested that temperature tracking be automated to increase uniformity and convenience. The Podimetrics Mat, a wireless gadget created by Frykberg and associates in 2017, takes thermal pictures of both feet in 20 seconds and sends the information to a safe remote platform for examination (Najafi et al. , 2023) . With a specificity rate of 57% and an average advance warning time of 37 days, this technique identified 97% of future ulcerations and detected temperature variations higher than 2.2°C at paired plantar locations in a research including 12 9 people. Adding to this, Lavery et al. (2025) developed an automated unilateral monitoring system that enables early risk identification even in patients who have partial lower limb amputations or just one functioning foot—situations that make bilateral temperature comparison challenging.

In addition to other technical advancements, Najafi and associates (2023) unveiled "Smart Socks," a sophisticated wearable that uses optical fiber sensors sewn into fabric to continually monitor plantar temperature, pressure distribution, and toe motion th roughout daily activities. This gadget has the advantage of concurrently recording many biomechanical markers pertinent to diabetic foot problems, even if it demonstrated a reasonable correlation ($r = 0.58$) with traditional infrared thermographic imaging (Najafi et al. , 2023) . Nevertheless, the predictive accuracy of the instrument in predicting the onset of diabetic foot ulcers (DF Us) has not yet been thoroughly verified. Although early research suggests that continuous, dual - mode monitoring (temperature and pressure) may be useful in identifying novel digital biomarkers related to shear stress, vascular function, and early pathological changes, such as those observed in acute Charcot neuroarthropathy, there is ongoing debate regarding whether continuous monitoring offers superior clinical value over single-point assessments (W robe l et al. , 2024; Ra he mi et al. , 2023; Najafi et al. , 2022; Reyzelman et al. , 2024) .

Emerging digital health technologies are now making it possible to detect early signs of D FU remotely through the use of highly sensitive digital biomarkers, providing clinicians with the ability to prioritize patients based on risk (Gol ledge et a l. , 2025) . Most diabetic foot ulcers are attributed to repeated microtrauma concentrated at high-pressure plantar regions over a period of days. If not addressed early, this leads to an increase in plantar t issue stress (PTS) in these zones (Najafi et al. , 2025; La zzarini et al. , 2025) . The concept of PTS encompasses several biomechanical variables, including plantar pressure, shear forces, and prolonged exposure due to insufficient footwear adherence. Sustained elevations in these factors can provoke inflammation in subcutaneous tissues, setting the stage for ulceration (Najafi et al. , 2025) . Furthermore, a meta -analysis found that people with diabetic peripheral neuropathy (DP N) with a history of DF Us have noticeably higher plantar pressures when walking than people with DP N alone (Fernando et al. , 2024) .

Pressure mapping with static pressure plates or wearable insoles with sensors is the conventional method for evaluating PTS in clinical or research settings (Hesse rt et al. , 2025) . However, the fact that these instruments only offer brief readings restricts their use for prevention in real time. Sensor-integrated smart insoles have been created to address this issue by providing real-time alert systems that notify users when crucial thresholds are surpassed, in addition to continuous plantar pressure monitoring (Najafi, Swerd low, & Armstrong, 2021; Miller, Najafi, & Armstrong, 2025; Shu et al. , 2025) . A pressure-sensitive insole that converts mechanical stress into electrical impulses and a communication device that sends out alerts via sound, visual cues, or vibrations are often the two main components of these systems (Crea et al. , 2024) . To guarantee thorough coverage of frequent pressure points, sensors are usually placed beneath important anatomical locations including the metatarsal heads, lateral foot borders, heel, big toe, and smaller toes.

In addition to s mart insoles, a variety of digital health tools have surfaced to facilitate plantar pressure and gait dynamics monitoring at home. For instance, Orpyx (Calgary, Canada) created the SurroSense Rx system, which uses a wristwatch to detect prolonged plantar pressure (between 30 and 50 mmHg sustained for more than 15 minutes) during daily movement. The wristwatch device provided real-time pressure alerts to 90 patients with a history of diabetic foot ulcers (D FU) during the course of an 18 - month randomized controlled study (Abbott et al. , 2025) . Despite drawbacks including high attrition (about 35%), short study size, and few D FU instances, the technology's preventative potential was demonstrated by the 71% decrease in ulcer recurrence seen by the intervention group as compared to controls.

Orpyx also unveiled the Orpyx Log R platform, which allows for remote in-shoe plantar pressure monitoring using smartphones and cloud-based dashboards, in addition to the smartwatch-based solution . Although the clinical validation of this system is still b eing assessed, it provides 8 to 12 hours of autonomous usage per day (Najafi et al . , 2021) .

From simple communication devices to sophisticated, multipurpose platforms that enable apps like GPS navigation, video communication, internet access, and mobile gaming, mobile phones have seen substantial evolution over the last ten years. This change has prompted the creation of smartphone applications for managing chronic diseases and remote wound monitoring (Wang et al. , 2025) . Wang and colleagues (2025), for example, created a mobile system that analyzes wound photos, defines wound edges, and assesses healing progress for D FU patients. In a similar vein, Mammas et al. (2024) conducted a simulation-based research in which 10 experts used a te lemedicine program to remotely evaluate D FU patients. Their results showed that expert satisfaction varied from 89% to 100% and that distant wound categorization was accomplished with an average accuracy of 89% .

The precision of smartphone photos for remote wound assessment is still debatable, though. Images captured using mobile devices showed poor validity and reliability, according to Van Netten et al. (2023), who advised doctors to add more clinical data to image-based evaluations in order to inform treatment choices. Despite the enormous potential of smartphone-enabled care platforms, further research is necessary to enhance image quality, automate the detection of wound characteristics, and simplify the incorporation of these tools into electronic health record systems (Van Nette n et al. , 2023) .

Experts recommend the use of risk-stratified foot assessments to improve care for patients who are at high risk of foot problems. These evaluations are particularly crucial in preventative measures (Hayward et al. , 2024) and have been demonstrated to cut the incidence of lower extremity amputations (LEAs) by as much as 70% in D FU patients (Lavery et al. , 2025) . However, it is still difficult to incorporate these tools into regular practice, particularly for non - specialist clinicians. The transfer of intricate risk models, which are usually created at specialized, well-funded academic institutions, to community-based clinics—which frequently lack funding and serve underprivileged populations—is one major problem. Patients are sent to centralized diabetic foot care facilities under the outdated referral paradigm, however this approach has not worked well. Due to deficiencies in early diagnosis and preventative management of DF Us, these centers frequently experience overcrowding from severe cases, which results in delays in care, an increase in ED visits, hospitalizations, and avoidable LEAs.

Affordable and scalable technology advancements that enable efficient risk classification without depending on costly infrastructure or specialist staff are desperately needed to bridge the current gaps in diabetic foot care. The Wound, Ischemia, and Foot Infection (WIfI) categorization system, which was presented by Mills et al.

(2024), is one example of such a development. In order to determine the risk of lower extremity amputation (LEA) and direct treatment plans, this approach assesses three key clin ical parameters: the extent of the wound, the degree of ischemia, and the presence of infection. The Society for Vascular Surgery has formally embraced the WIfI framework, which is now integrated into the publicly available "SVS i PG" mobile application. This app contains clinical care suggestions and referral criteria for vascu lar experts in addition to educational information regarding different types of wounds. The application's risk calculator is a crucial component that helps doctors make decisions on possible revascularization treatments by estimating WIfI scores using eas ily accessible clinical markers (Mills et al . , 2024) .

Models of home-based care delivery were starting to attract attention as promising substitutes for treating patients with complex medical requirements even before the COVID -19 epidemic created disruptions (Leff et al. , 2025; The Future of Home Health Care, 2025) . The limits of traditional healthcare paradigms, especially those focused on facility-based management of chronic disorders like diabetic foot ulcers (DF Us), were further highlighted by the pandemic. Established methods for DFU care and prevention were unintentionally hampered during the health crisis since people with diabetic foot problems were classified as high-risk and aggressively encouraged to avoid needless hospital visits (Najafi, 2025) .

Health systems have started to rethink service delivery frameworks by advocating for the "care in place" paradigm in response to these issues. As part of a larger initiative to decentralize healthcare services and provide more equal access for populations in rural or socioeconomically disadvantaged locations, this strategy has gained traction (Ivanova et al. , 2022) . A purposeful move away from hospital-centric paradigms and toward proactive, community-based treatments is highlighted in recent guidelines on the management of foot diseases. A shift in policy and research goals to promote integrated preventive initiatives at the local level is reflected in this decentralization (Bu s et al. , 2025) . Policymakers, healthcare professionals, and patients—all parties involved in enhancing the delivery of chronic care—are finding these changes to be more and more pertinent.

Digital connection has made it possible for a number of technical advancements to surface that have the potential to improve clinical results and lessen the strain on the healthcare system . These technologies are now positioned as strategic assets that might support public health systems' financial sustainability in addition to serving as clinical faci litators .

Telemedicine has emerged as one of the most successful methods for providing care remotely among the new developments in chronic wound care. According to W robe l et al. (2024), it is the delivery of clinical services remotely, enabling medical professional s to assess, track, and care for patients without needing to be in close physical contact. Tele medicine's main goal is to improve accessibility and safety by moving some components of care from hospital settings into patients' homes. Telemedicine has become one of the most cost-effective and patient-centered follow-up treatment methods for managing diabetic foot ulcers (DF Us) because to developments in communication technology (Tchero et al. , 2023) . Tele medicine's incorporation into standard clinical practice was greatly hastened by the COVID-19 pandemic, which also increased institutional adoption and patient acceptability (Najafi et al. , 2025) .

Visual wound evaluation using transmitted pictures is now the main focus of telemedicine's application in D FU treatment (Wrobel et al. , 2024) . Three basic categories may be used to group the material currently available on tele medicine for D F Us: diagnosti c reliability, economic efficiency, and clinical effectiveness. Rasmussen et al. (2025) compared the results of patients receiving tele medical monitoring with those getting conventional in -person treatment in a crucial randomized controlled study. Up to a year, or until a main goal like healing, amputation, or death was achieved, 401 patients in all were monitored. While the control group (n = 181) adhered to a regular schedule of three in-clinic visits per cycle,

the intervention group (n = 193) was handled using a combination of remote consultations and one in-person visit per cycle. There were no statistically significant variations in the two groups' healing or amputation results, indicating that tele medicine is a good substitute for traditional medical treatment. Though the underlying causes are yet unknown, a greater death rate was noted in the telemedicine group.

Numerous previous research on telemedicine for D FUs had methodological flaws, such as limited sample numbers, diverse ulcer types, and inconsistent technical techniques, despite encouraging results (Fasterholdt et al. , 2024; Bowling et al. , 2021) . Wil brig ht et al. , for instance, conducted interactive real-time teleconsultations with 20 D FU patients and discovered results that were similar to those of 120 patients receiving treatment in a typical diabetic foot clinic (Bowling et al. , 2021) . The growth of tele medicine has also been impacted by past strains on the healthcare system. Kobza et al. (2025) used video-based consultations after more than 2,700 home health companies were shut down in 1997 because of funding problems. This approach resulted in bette r healing results and lower hospitalization rates than the baseline home care model (Fasterholdt et al . , 2024) .

Summerhayes et al. (2022) used a te lemedicine platform that enabled image-based communication between primary and secondary care clinicians in order to address the cost issues associated with treating lower leg ulcers. When compared to conventional treatment paths, the economic evaluation, which was carried out in a semi-rural healthcare practice, showed a significant reduction in healing time—from 105 days to 70 days—and an 11.9% drop in overall care expenses. The proposal for increased telemedicine usage in general practice settings was bolstered by these findings . Fasterholdt et al. (2024) found no statistically significant change in amputation rates, however they did find a 41% cost decrease for telemonitoring when compared to routine care.

Bowling et al. (2021) compared assessments based on three - dimensional wound pictures with in-person clinical evaluations to determine the reliability of remote wound assessments. In cases that required debridement, where the image-based approach found it difficult to capture important but subtle wound parameters like moisture levels, discrepancies were particularly noticeable.

Modern wearable technology has been created to get over these diagnostic restrictions. Smart wound dressings with sensors that track several physiological and biochemical markers are among them. For example, instruments have been designed to measure wound pH (Sharp, 2023), stress-related biomarkers, which are known to affect wound healing (Razjouyan et al. , 2023), bacterial activity (Farrow et al. , 2022), temperature variations, sub-bandage pressure, and moisture (Mehmood et al. , 2025) . Notably, Mehmood et al.

(2025) presented a wireless, low-energy device that can transfer data in real time from inside a wound dressing. This allows for more accurate therapeutic interventions and continuous monitoring of vital wound-site parameters.

Theoretical Framework

This study is grounded in Norman and Skinner’s e Health Literacy Model (2006), which defines e Health literacy as the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem. This model is particularly relevant for exploring nurses’ digital health literacy and their utilization of wearable technologies in managing diabetic foot ulcers, a chronic condition that requires continuous monitoring and timely i ntervention. The model comprises six core literac ies: traditional literacy, health literacy, information literacy, scientific literacy, media literacy, and computer literacy, all of which intersect to influence effective use of digital health tools (Ishigami & Fujioka, 2023; Kwon & Matsuda, 2022) .

Digital health literacy empowers nurses to competently operate wearable devices and interpret the data generated, thus enhancing patient care outcomes (Tang & Aoki, 2021) . Nurses with high digital health literacy can more confidently engage with innovative technologies, such as sensors and smart insoles, which continuously monitor diabetic foot conditions for early signs of ulceration (Liu & Ohtani, 2024) . This competency not only supports clinical decision - making but also promotes patient education and

adherence to treatment plans (Nguyen & Tanaka, 2022). Conversely, a lack of proficiency in digital health literacy may hinder nurses' acceptance and utilization of wearable technologies, leading to suboptimal patient monitoring (Han & Yamaguchi, 2021).

The six domains of e Health literacy facilitate a comprehensive understanding of nurses' capabilities to integrate wearable technology into clinical workflows. For instance, traditional literacy is essential for understanding device manuals and clinical guidelines, while computer literacy underpins the practical operation of software and apps associated with wearable devices (Seo & Min, 2023). Health literacy enables nurses to contextualize the clinical data in relation to diabetic foot ulcer pathology, while information literacy supports efficient retrieval of relevant medical literature and best practice protocols (Zhang & Kato, 2021). Scientific literacy helps in understanding the technological principles behind sensors, and media literacy aids in critically assessing the reliability of health apps and digital platforms (Cheng & Okabe, 2025).

Wearable technologies generate large volumes of real-time patient data, necessitating advanced digital health literacy for effective data management and interpretation (Mori & Ishida, 2024). Nurses must not only operate these devices but also analyze trends to anticipate complications and tailor individualized care plans (Saito & Kimura, 2023). The model's emphasis on appraisal and application aligns with the requirement for nurses to critically evaluate the accuracy of data and translate findings into clinical action (Ueda & Park, 2022). Thus, digital health literacy directly influences the extent to which nurses can utilize wearable technology effectively for diabetic foot ulcer monitoring.

Furthermore, the integration of wearable technology in nursing practice is influenced by organizational and environmental factors, which the e Health Literacy Model indirectly addresses through its focus on systemic understanding and resource availability (Fujimoto & Cheng, 2021). Training programs that enhance nurses' literacy across the model's six domains have demonstrated increased confidence and technology adoption in clinical settings (Yamamoto & Suzuki, 2023). This theoretical grounding supports the investigation of how nurses' digital health literacy impacts their actual utilization behaviors regarding wearable devices.

In summary, Norman and Skinner's e Health Literacy Model offers a comprehensive framework to examine the multifaceted competencies required for nurses to effectively employ wearable technologies in diabetic foot ulcer monitoring. By focusing on the six interconnected literacies, this model guides the exploration of the relationships between digital health literacy and technology utilization, providing a basis for strategies aimed at improving both nursing practice and patient outcomes.

Conceptual Framework

Figure 1 shows the research paradigm assessing the relationship between the nurse respondents' digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring in Hainan General Hospital at No 19 Xiuhua road, Xiuying District, Hai kou city, South China's Hainan Province. It will likewise present the correlation between the nurse respondents' digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring.

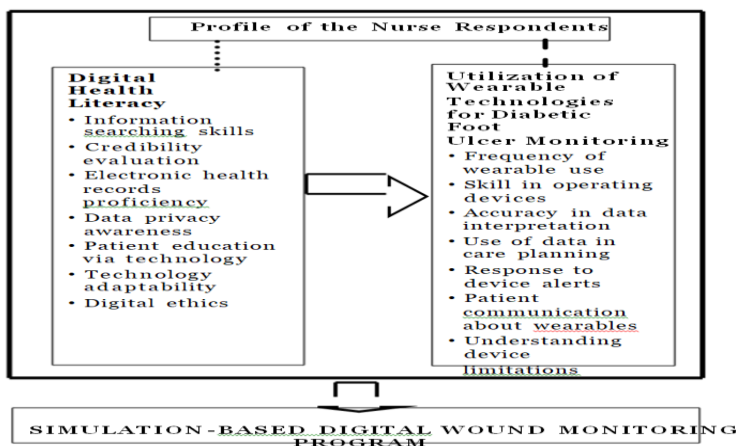

Figure 1. Research Paradigm

Figure 1 indicates the research paradigm of the study. It presents the intervening variables, specifically the nurse respondents' demographic data. It also presents the nurse respondents' self-assessment of their digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring.

It shows the expected output of the study, which is the simulation-based digital wound monitoring program.

Statement of the Problem

This study will determine the nursing respondents' digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring at Hainan General Hospital in No 19 Xiuhua road, Xiuying District, Hai kou city, South China's Hainan Province .

The results of the study will be used as a basis for a simulation - based digital wound monitoring program.

Specifically, the study will answer the following questions:

1. What is the demographic profile of the nurse respondents in terms of:

1.1. sex;

1.2. age; and

1.3. number of years as a nurse?

2. What is the self-assessment of the nurse respondents of their digital health literacy in terms of:

2.1. information searching skills;

2.2. credibility evaluation;

2.3. electronic health records proficiency;

2.4. data privacy awareness;

2.5. patient education via technology;

2.6. technology adaptability; and

2.7. digital ethics awareness?

3. Is there a significant difference in the self-assessment of the nurse respondents of their digital health literacy when they are grouped according to their profile?

4. What is the self-assessment of the nurse respondents of their utilization of wearable technologies for diabetic foot ulcer monitoring in terms of:

4.1. frequency of wearable use;

4.2. skill in operating devices;

4.3. accuracy in data interpretation;

4.4. use of data in care planning;

4.5. response to device alerts;

4.6. patient communication about wearables; and

4.7. understanding device limitations?

5. Is there a significant difference in the self-assessment of the nurse respondents of their utilization of wearable technologies for diabetic foot ulcer monitoring when they are grouped according to their profile?

6. Is there is significant relationship between the nurse respondents' digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring?

7. Based on the results of the study, what simulation -based digital wound monitoring program can be proposed?

Hypothesis

The following hypotheses will be tested:

1. There is no significant difference in the self-assessment of the nurse respondents of their digital health literacy when they are grouped according to their profile.

2. There is no significant difference in the self-assessment of the nurse respondents of their utilization of wearable technologies for diabetic foot ulcer monitoring when they are grouped according to their profile .

3. There is no significant relationship between the nurse respondents' digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring.

Significance of the Study

The outcomes of this study can be valuable for the following:

Nurses – This study will enhance nurses' understanding of digital health literacy and its critical role in effectively utilizing wearable technologies for monitoring diabetic foot ulcers. Improved literacy will em power nurses to confidently incorporate these technologies into patient care, leading to better monitoring, early detection of complications, and timely interventions.

Patients – This study will indirectly benefit patients by promoting more accurate and consistent monitoring of diabetic foot ulcers through nurses' proficient use of wearable technologies. Enhanced monitoring can lead to earlier identification of ulcer progression or infection, reducing complications and improving patient outcomes and quality of life.

Hospital Management and Administration – This study will provide hospital leaders with insights into the importance of supporting digital health literacy initiatives among nursing staff. This knowledge will assist in resource allocation and technology adoption strategies that optimize patient care efficiency and the integration of innovative health technologies in clinical settings.

Nursing Board – This study will inform the Nursing Board about the emerging need to incorporate digital health literacy and wearable technology competencies into nursing education and licensure requirements. Such integration can ensure that nurses remain current with technological advancements relevant to chronic disease management and patient monitoring.

Professional Development Providers – This study will guide professional development providers in designing focused training programs that enhance nurses' digital health skills and their ability to effectively use wearable devices. This will improve nurses' readiness to adopt new technologies and apply them confidently in clinical practice .

Future Researchers – This study will provide a valuable foundation for future research exploring the intersection of digital health literacy, technology adoption, and patient care outcomes. It will encourage further investigation into best practices for training nurses in digital health tools and their impact on chronic disease management.

Scope and Delimitation of the Study

The study will be carried out in Hainan General Hospital at No 19 Xiu hua road, Xiuying District, Haikou city, South China's Hainan Province.

The scope of the study will cover the assessment of the nurse respondents' digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring by nurses from Hainan General Hospital at No 19 Xiu hua road, Xiuying District, Haikou city, South China's Hainan Province.

The study will evolve around the selected profile variables of the nurse respondents such as sex, age, and number of years as a nurse.

To be specific, the nurse respondents' self-assessment of their digital health literacy will be based on the following: information searching skills, credibility evaluation, electronic health records proficiency, data privacy awareness, patient education via technology, technology adaptability, and digital ethics awareness . This variable will be correlated with the self-assessment of the nurse respondents of their utilization of wearable technologies for diabetic foot ulcer monitoring in terms of frequency of wearable use, skill in operating devices, accuracy in data interpretation, use of data in care planning, response to device alerts, patient communication about wearables, and understanding device limitations.

In data gathering and utilizing more complex statistical treatment, the study included descriptive statistics and correlational analysis with one-way ANOVA and post hoc analysis to interpret further and investigate the nurse respondents' demographic data a nd the significant relationship between the nurse respondents' digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring.

Definition of Terms

Accuracy in Data Interpretation – The competence to correctly analyze and draw clinical conclusions from data provided by wearable sensors.

Behavioral Monitoring – Tracking patient adherence and lifestyle factors through wearable sensors relevant to diabetic foot ulcer care .

Clinical Decision Support Systems (CDSS) – Software tools that assist nurses by analyzing wearable data to provide evidence - based care recommendations.

Credibility Evaluation – Nurses' capacity to assess the reliability and trustworthiness of digital sources and wearable device data.

Data Privacy Awareness – Understanding of policies, practices, and ethical considerations regarding the confidentiality of patient health information collected via digital means.

Data Synchronization – The process by which data from wearable devices is transmitted and updated in electronic health systems.

Data Visualization – Presentation of wearable data in charts, graphs, or dashboards to enhance understanding and clinical decision-making.

Digital Ethics Awareness - Recognition of ethical issues related to digital health technologies, including patient consent, data security, and equitable access.

Digital Health Literacy - The overall ability of nurses to obtain, process, and understand digital health information to make appropriate health decisions.

Electronic Health Records Proficiency - Competence in navigating and updating patient electronic health records (EH Rs) to integrate data from wearable devices.

Frequency of Wearable Use - How often nurses utilize wearable technologies in their routine care for diabetic foot ulcer patients .

Health Outcomes Tracking - Using wearable data to monitor progress, complications, or improvements in diabetic foot ulcer healing .

Information Searching Skills - The ability of nurses to effectively locate and retrieve relevant digital health information related to diabetic foot ulcer monitoring.

Interoperability - The capability of wearable devices to effectively communicate and share data across different digital health platforms.

Patient Communication about Wearables – Nurses' effectiveness in explaining the purpose, use, and findings of wearable technology to patients.

Patient Data Security – Measures and protocols ensuring that wearable-derived patient data is protected from unauthorized access.

Patient Education via Technology – The use of digital tools and wearable data to inform and instruct patients about managing their diabetic foot ulcers .

Patient Engagement with Technology – The degree to which patients actively use and comply with wearable monitoring protocols.

Remote Patient Monitoring (RPM) – Using wearable devices to continuously track diabetic foot ulcer patients' health status from a distance.

Response to Device Alerts – Timely and appropriate actions taken by nurses when wearable devices signal abnormal readings or potential complications.

Skill in Operating Devices – Practical ability to manage, troubleshoot, and maintain wearable monitoring devices.

Technical Troubleshooting – Nurses' ability to identify and resolve issues with wearable device functionality.

Technology Acceptance Model (TAM) – Framework assessing nurses' willingness to adopt wearable technologies based on perceived ease of use and usefulness.

Technology Adaptability – Nurses' ability to learn, adopt, and effectively use new wearable technologies and associated software.

Training and Competency Development – Formal and informal education aimed at improving nurses' skills in digital health and wearable technologies.

Understanding Device Limitations – Awareness of thetechnical, operational, and clinical constraints of wearable technologies used in monitoring.

Use of Data in Care Planning – Integration of wearable device information into individualized patient care strategies and treatment plans.

User Interface Usability – The ease with which nurses can navigate and operate wearable device software and applications.

Wearable Device Calibration – Procedures to ensure wearable sensors provide accurate and reliable measurements.

Wearable Technology Integration – The seamless incorporation of wearable device data into healthcare workflows and documentation.

METHODOLOGY

Research Design

This research employs a descriptive-comparative-correlational methodology, characterized by clearly defined variables, systematic data collection, rigorous analysis, and a comprehensive understanding of contextual relationships. As highlighted by Dubois and Lefèvre (2023), descriptive research aims to systematically observe and document phenomena in their natural settings, allowing for detailed identification of key characteristics, behavioral trends, and environmental patterns. This approach provides a solid empirical foundation for subsequent investigations and theoretical development.

Building upon this foundation, descriptive research is pivotal in social sciences and psychology, as it facilitates the collection of objective and nuanced data regarding individuals' attitudes, experiences, and behaviors. According to Müller and van den Berg (2024), such research aids in uncovering underlying patterns and variations within populations, enriching interpretations of complex social and psychological dynamics.

Moreover, Schneider and Laurent (2022) emphasize the role of comparative research methods in detecting significant variables that differentiate groups or settings, while correlational analysis reveals the strength and direction of relationships between these variables. This analytical combination enhances the explanatory capacity of studies by identifying potential links that inform theory and practice. In this study, correlational techniques will be ut ilized to examine associations between demographic factors and relevant behavioral o r attitudinal variables, contributing to a deeper theoretical understanding and guiding practical interventions.

By integrating descriptive accuracy, comparative insight, and correlational analysis, this research framework synthesizes the perspectives of Dubois and Lefèvre (2023), Müller and van den Berg (2024), and Schneider and Laurent (2022) . This comprehensive approach bolsters the validity, depth, and applicability of the findings, offering a robust platform for future scholarly inquiry and real -world implementation.

This study aims to investigate the nurse respondents' digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring.

This research approach allows the researcher to numerically analyze, compare, and correlate the relationships amongst the dependent variables included in the study.

By utilizing this approach, the researcher will be able to find any significant difference or relationship between the nurse respondents' self-assessment of their digital health literacy and their demographic data such as age, sex, and number of years as a nurse. Also, the researcher will be able to find any significant difference or relationship in the nurse respondents' self-assessment of their utilization of wearable technologies for diabetic foot ulcer monitoring and their demographic data such as age, sex, and number of years as a nurse. The nurse respondents' self-assessment of their digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitor will then be correlated.

All the above discussions on the descriptive research method will suit the nature of research that this present study would do; hence this method will be adopted.

Research Locale

The study will transpire at Hainan General Hospital at No 19 Xiu hua road, Xiuying District, Hai kou city, South China's Hainan Province.

Hainan General Hospital also known as the Hainan Clinical Medicine Research Institution, was established by an American priest in 1881 as the Hai kou Gospel Hospital. In 1927, the gospel hospital teamed up with Hainan Hospital and changed its name to Hainan General Hospital in 198 8, thus becoming the youngest people's hospital, yet with the longest history. Currently, the hospital covers an area of nearly 400 mu (26.7 hectares), of which 340,000 square meters are for healthcare service or medical research. It employs 4,313 staff members, including 3,561 medical professionals, who collectively have performed over 60,000 operations annually. Offering over 3,000 beds, the hospital receives about 1.8 million inpatients and 85,000 outpatients every year.

Hainan General Hospital has developed a comprehensive system of healthcare facilities. It is home to 15 medical centers, 74 clinical medical departments, and 23 research laboratories. Its outstanding experts include 739 senior technicians, 701 doctors with master's degrees, and 29 certified experts who have made outstanding contributions to society. Adhering to the principle of "people-oriented, patient-centered," the hospital is the provincial center for medical treatment, first-aid service, further education, scientific research, and disease prevention.

The hospital has incubated many featured specialties, including he patobiliary diseases, medical imaging, urography, cardiovascular and cerebrovascular intervention, minimally invasive surgery and rehabilitation medicine. Adhering to a strategy of overall development, the hospital has expanded eight key disciplines of Hainan province - neurosurgery, general surgery, cardiology, pediatrics, intensive care, neurology, emergency medicine and hematology.

Hainan General Hospital has made substantial progress in the development of high-tech diagnosis and treatment of complicated diseases or disorders, especially in la parosco pic surgery, minimally invasive techniques, liver transplantation, kidney transplantation, organ resuscitation, pre-hospital treatment of acute and critical illness, tumor intervention, vascular intervention, and more. The hospital's substantial investment in cutting-edge medical devices has played an important role in that progress. With a cost of 700 million yuan ($103 million), the hospital has equipped itself with PET -CT, 3.0T magnetic resonance inspectors, 1.5T magnetic resonance inspectors, 256-row CT, 64-row CT, SPECT, DSA 3, linear accelerators, gamma knife, X -knife, cell knife and other state-of-the - art clinical technologies .

The hospital is also a training base for junior medical professionals in Hainan province. As a non-directly-affiliated hospital of Nanhua University and Hainan College of Medicine, it undertakes the integrated teaching programs of their undergraduate stude nts. There are currently two doctoral tutors, 22 master tutors, about 800 graduates, and nearly 100 postgraduates studying and interning in different departments and laboratories. In the past four years, the hospital has undertaken 24 national-level scientific research projects and 83 provincial-level scientific research projects

Sampling Technique

The respondents of the study will be the nurses from Hainan General Hospital at No 19 Xiu hua road, Xiuying District, Haikou City, South China's Hainan Province. In selecting the nurse respondents, purposive sampling technique will be used among the nurse respondents.

Research Instrument

In gathering the needed data, the researcher will make researcher-made questionnaires on the nurse respondents' self - assessment of their digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitor.

The researcher will use face to face or onsite in administering this questionnaire .

The questionnaire will be composed of the following parts.

Part 1 - This section determines the demographic profile of the nurse respondents.

Part 2 - This section determines the nurse respondents' digital health literacy .

Part 3 - This section identifies the nurse respondents' utilization of wearable technologies for diabetic foot ulcer monitoring.

Digital Health Literacy

Scale **Verbal Interpretation**

3.51 - 4.00 **Very Informed**

If the statements are very true of them, 76%-100% level of being informed.

2.51 -3.50 **Informed**

If the statements are very true of them, 51%-75% level of being informed.

1.51 -2.50 **Slightly Informed**

If the statements are very true of them, 26%-50% level of being informed.

1.00-1.50 **Not Informed**

If the statements are very true of them, 1%-25% level of being informed.

Utilization of Wearable Technologies for Diabetic Foot Ulcer

Monitoring

Scale **Verbal Interpretation**

3.51 - 4.00 **Very Consistent Utilization**

If the statements are very true of them, 76%-100% level of utilization consistency.

2.51 -3.50 **Consistent Utilization**

If the statements are very true of them, 51%-75% level of utilization consistency.

1.51 -2.50 **Slightly Consistent Utilization**

If the statements are very true of them, 26%-50% level of utilization consistency.

1.00-1.50 **Inconsistent Utilization**

If the statements are very true of them, 1%-25% level of utilization consistency.

The adapted questionnaire and the researcher-made questionnaire will be subjected to content validation of the experts who are knowledgeable in the field of research. The suggestions of the experts will be made integral in the instrument.

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The same instrument will be submitted for face validation with at least five experts. The questionnaires will be pilot tested to measure reliability. The pilot testing will be computed using Cronbach's Alpha through the Statistical Package of Social Science (SPSS) . The researcher welcomes the suggestions of the experts and will make necessary revisions to construct the said instrume nts valid.

Data Gathering Procedure

The researcher will get permission from the office of the hospital of Hainan General Hospital at No 19 Xiuhua road, Xiuying District, Hai kou city, South China's Hainan Province.

When permission is approved, the researcher will ask permission from the nurses by distributing a letter of consent form to the nurses, which will be signed by them and will be returned to the researcher.

After, the purpose of the study and instructions on how the items on the survey should be answered will be explained to the nurse respondents. Then, the survey will be administered using face to face and they will be given enough time to answer the survey.

After completing the survey, the researcher will collect the questionnaires from the nurse respondents.

The data will be gathered, tallied, and processed with Statistical Package for Social Science (SPSS) The processed data will be interpreted and analyzed, and the results will be used to propose a simulation-based digital wound monitoring program.

Finally, the interpretation and analysis of data will be done. Summary of findings, conclusions, and recommendations will be formulated.

Statistical Treatment of the Data

The responses to the survey questionnaire will be tallied using the S PSS, and then they will be tabulated and organized accordingly. The data will be presented, analyzed, and interpreted using frequency, percentage, mean, standard deviation, independent samples t-test, one-way ANOVA, and Pearson's r correlation .

1. For research question no. 1, descriptive statistics such as frequency counts and percentages will be used to treat responses in the demographic profile of the nurse respondents.

2. For research question nos. 2 and 4, weighted means will be utilized to treat the self-assessment of the nurse respondents of their digital health literacy in terms of information searching skills, credibility evaluation, electronic health records proficiency, data privacy awareness, patient education via technology, technology adaptability, and digital ethics awareness.

Weighted means will also be used to compute for the self-assessment of the nurse respondents of their utilization of wearable technologies for diabetic foot ulcer monitoring in terms of frequency of wearable use, skill in operating devices, accuracy in data interpretation, use of data in care planning, response to device alerts, patient communication about wearables, and understanding device limitations.

The following will be used to interpret the WM of the nurse respondents' responses:

Mean Range	Verbal Description
3.51 - 4.00	Very True of Me
2.51 - 3.50	True of Me
1.51 - 2.50	Slightly True of Me
1.00 - 1.50	Not True of Me

3. For research question nos. 3 and 5, one way ANOVA with post-hoc analysis (Scheffe) will be used to find out the significant difference in the self-assessment of the nurse respondents' digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring.

4. For research question no. 6, Pearson's r correlation analysis will be utilized to determine the significant relationship between the nurse respondents' digital health literacy and their utilization of wearable technologies for diabetic foot ulcer monitoring.

Ethical Considerations

The researcher will constructively consider and carefully follow the ethical considerations that must be met to protect the rights of all the respondents. The following are the ethical considerations:

1. Conflict of Interest

The researcher of this study ensured that there would be no conflict of interest . The researcher needed to elaborate and clearly state the purpose of this research and study to the chosen respondents. It is also a must that the researcher must stick to the purpose of gathering personal information and data. All gathered data must not be used for any form of exploitation against the respondents. The researcher must stick to the objective of the research and its purpose.

2. Privacy and Confidentiality

Before conducting this research, the respondents will be assured that whatever information would be gathered would be confidential, and the survey results cannot be given to anyone aside from the researcher himself and the person who answered the survey – questionnaire. The researcher must not mention the respondents, names in presenting the data gathered to protect their privacy. The identity of the respondents would remain anonymous or free from any clues and suggestions that would lead others to connect or relate with the respondents.

3. Informed Consent Process

Before conducting the survey questionnaire, the researcher will secure a consent form that gives confirmation and consent from the respondents that they understand the purpose and objective of this study and agreed that the data gathered would strengthen the researcher's study. The researcher will make sure that she explains thoroughly and clearly everything to the respondents without any deception. The process and the possible risks in participating in this study will also be discussed.

4. Recruitment

The respondents of this study will be the physical education teachers. The respondents will be free to exercise their rights to disagree and agree in participating in this study. The respondents will not be forced to participate and will be given the freedom to refuse at any point in time.

5. Risk

The researcher of this study will ensure that there would be no risk in participating in this study. The respondents will ensure that whatever data and information would be gathered would not harm respondents' life and name. The respondents had all the rights to freely stop the conduct of questions at any given time if they felt harassed, questions were too personal and or violated.

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APPENDIX A

Nurses' Digital Health Literacy And Their Utilization Of Wearable Technologies For Diabetic Foot Ulcer Monitoring

Nurses' Questionnaire

Part l. Profile of the nurse respondents in terms of:

1.1 Name ____

1.2 Sex: ( ) Male ( ) Female

1.3. Age: ( ) less than 25 yrs . old ( ) 36-45 yrs. old

( ) 25-30 yrs. old ( ) 46-50 yrs. old

( ) 31 -35 yrs. old ( ) more than 50 yrs. old

1.4 Number of Years as a Nurse: ( ) Less than 5 Years

( ) 5 -

10 Years

( )

More than 10 Years

Part II. Digital Health Literacy

Direction: For each statement below, please assess your digital health literacy in the following areas by indicating the extent to which each statement is true of you. Rate your digital health literacy on a scale from 1 to 4, where:

Rate	**Verbal Interpretation**
4	Very True of Me
3	True of Me
2	Slightly True of Me
1	Not True of Me

Indicators (4) (3) (2) (1)

A. Information Searching Skills

1. I am confident in using online databases to find health information.
2. I can efficiently locate digital resources relevant to patient care.
3. I know how to use search engines effectively for medical information.
4. I am skilled at using filters and keywords to narrow down search results .
5. I can distinguish between different types of digital health resources (e.g. , journals, websites) .
6. I frequently update my knowledge by searching for new digital health information .

B. Credibility Evaluation

7. I critically evaluate the reliability of online health information.
8. I check the source and author credentials before trusting health information .
9. I can identify biased or misleading digital health content .
10. I assess the date and relevance of health information before use.
11. I am cautious about using unverified online medical advice.
12. I use reputable websites and databases for clinical decision-making .

C. Electronic Health Records Proficiency

13. I am comfortable navigating electronic health record (E HR) systems.
14. I can accurately input patient data into digital records .
15. I retrieve patient information quickly from electronic systems.
16. I understand how to use clinical decision support tools within EH Rs.
17. I ensure completeness and accuracy when documenting electronically.
18. I regularly update patient records using digital tools .

D. Data Privacy Awareness

19. I understand the importance of protecting patient data confidentiality.
20. I follow protocols to safeguard electronic patient information .
21. I recognize potential risks to data privacy in digital health tools .
22. I am aware of legal regulations regarding patient information security.
23. I use secure passwords and authentication measures for health systems.
24. I avoid sharing patient data through unsecured channels.

E. Patient Education via Technology

25. I use digital tools to educate patients about their health conditions.
26. I feel confident explaining health apps and devices to patients.
27. I can create or share digital resources to support patient learning.
28. I encourage patients to use online health information responsibly.
29. I adapt educational content based on patients' digital literacy levels .
30. I use tele health platforms effectively to communicate with patients.

F. Technology Adaptability

31. I easily learn to use new digital health technologies.
32. I adapt quickly when healthcare technology systems change.
33. I troubleshoot minor technical issues independently.
34. I seek help proactively when facing digital health challenges.
35. I remain open to integrating new digital tools into my practice .
36. I keep up with advancements in healthcare technology.

G. Digital Ethics Awareness

37. I understand ethical issues related to digital health technology.
38. I respect patient autonomy when using digital health tools .
39. I maintain professionalism in digital communications with patients.
40. I am aware of the ethical implications of data sharing in healthcare .
41. I promote equitable access to digital health resources.
42. I consider cultural sensitivity when using digital health technologies.

Part III. Utilization of Wearable Technologies for Diabetic Foot Ulcer Monitoring

Direction: For each statement below, please assess your utilization of wearable technologies for diabetic foot ulcer monitoring in the following areas by indicating the extent to which each statement is true of you. Rate your utilization of wearable technologies for diabetic foot ulcer monitoring on a scale from 1 to 4, where:

Rate	**Verbal Interpretation**
4	Very True of Me
3	True of Me
2	Slightly True of Me

1 Not True of Me

Indicators (4) (3) (2) (1)

A. Frequency of Wearable Use

1. I regularly use wearable devices when monitoring patients with diabetic foot ulcers .
2. I incorporate wearable technology into my routine patient assessments.
3. I use wearable data consistently to track foot ulcer progress.
4. I encourage patients to wear devices as part of their daily care .
5. I frequently check wearable device readings during patient visits.
6. I make use of wearables for all eligible patients under my care.

B. Skill in Operating Devices

7. I am confident in setting up wearable devices for patients.
8. I can troubleshoot common technical issues with the wearables.
9. I understand how to navigate device interfaces effectively.
10. I can calibrate and maintain wearables to ensure proper functioning.
11. I teach patients how to use wearable technology properly.
12. I stay updated on new features or updates of the wearables.

C. Accuracy in Data Interpretation

13. I accurately interpret the data provided by wearable devices.
14. I can identify meaningful trends from wearable data.
15. I differentiate between normal variations and signs of deterioration in data.
16. I use wearable data to detect early signs of diabetic foot ulcer complications.
17. I verify wearable data with clinical observations and other assessments.
18. I trust the data provided by the wearables to inform clinical decisions.

D. Use of Data in Care Planning

19. I incorporate wearable data into individualized care plans.
20. I adjust treatment strategies based on data trends from wearables.
21. I use wearable data to prioritize interventions .
22. I communicate care plans to the healthcare team based on wearable insights .
23. I document wearable data findings in patient records.

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24. I use wearable data to support patient progress evaluations.

E. Response to Device Alerts

25. I respond promptly to alerts generated by wearable devices.
26. I investigate abnormalities flagged by the wearables immediately.
27. I take appropriate clinical action when device alerts indicate risk.
28. I keep patients informed about alerts related to their condition .
29. I escalate care when wearable alerts suggest urgent intervention.
30. I review alert history regularly to track patient status.

F. Patient Communication About Wearables

31. I explain the purpose of wearable devices clearly to patients.
32. I discuss how wearables help in monitoring diabetic foot ulcers.
33. I address patients' concerns about wearable use effectively.
34. I encourage patients to be active participants in using wearables.
35. I provide guidance on interpreting wearable feedback for patients.
36. I promote adherence to wearable usage through patient education.

G. Understanding Device Limitations

37. I am aware of the technical limitations of wearable devices.
38. I understand situations where wearable data may be inaccurate.
39. I consider environmental factors that affect wearable performance.
40. I recognize when wearable data should be supplemented with other assessments.
41. I communicate device limitations to patients honestly.
42. I remain cautious about over-relying on wearable technology.