Analysis of High-Risk Factors for Diabetic Foot and Current Status of Nursing Interventions: Postprint

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Abstract

Diabetic foot (DF) is one of the serious complications of diabetic patients and one of the main causes of disability and mortality among this population. This study reviews the literature to summarize the current high-risk factors, key prevention points, and status of nursing interventions for DF, aiming to provide references for DF prevention and improving the quality of life of diabetic patients.

Full Text

Analysis of High-Risk Factors for Diabetic Foot and Current Status of Nursing Interventions

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Abstract

Diabetic foot (DF) represents one of the most severe complications in patients with diabetes mellitus and constitutes a major cause of disability and mortality. Through literature review, this paper systematically summarizes the current high-risk factors, key prevention strategies, and nursing intervention protocols for DF, aiming to provide evidence-based references for DF prevention and quality-of-life improvement in diabetic patients.

Keywords: diabetic foot; blood glucose; health education; community; peripheral neuropathy; foot ulcer

1. Risk Factors for Diabetic Foot

Epidemiological studies demonstrate that high-risk groups for DF ulceration experience substantially elevated morbidity compared to low-risk populations, with similarly increased amputation rates. Clinical screening of diabetic patients using standardized DF care protocols reveals that common risk factors include abnormal foot sensation (pain, numbness, itching), ill-fitting footwear or socks, and nail abnormalities (thickening, overgrowth, ingrown nails, onychomycosis). Retrospective analyses further identify poor glycemic control, prolonged disease duration, advanced age, and pathogenic infection as significant contributors, particularly among patients over 60 years old.

Comprehensive risk assessment encompasses vascular status evaluation (palpation of dorsalis pedis and posterior tibial pulses), skin examination (temperature, color, swelling, callus formation, pre-ulcerative lesions), and joint inspection (deformities such as hammer toe or claw toe, abnormal joint limitation, bony prominences). Patients should be examined in both standing and supine positions. Even when patients report intact foot sensation, reassessment for loss of protective sensation (LOPS) remains essential, utilizing 10g monofilament testing, 128Hz tuning fork vibration perception, or light touch assessment at the toe pad. LOPS typically results from diabetic polyneuropathy, necessitating further investigation into underlying causes and prognosis when detected.

The primary risk factors for DF can be summarized as: history of foot ulceration, peripheral neuropathy, prior amputation, foot deformities, diabetic nephropathy (especially in dialysis patients), lower extremity vascular disease, poor glycemic control, abnormal glycated hemoglobin, visual impairment, smoking, living alone, and inadequate foot self-care.

2. Preventive Measures

Regular Risk Assessment and Screening

Diabetic patients with peripheral artery disease (PAD) and LOPS require comprehensive evaluation including: medical history (prior ulceration/amputation, foot care knowledge, social support, economic status, healthcare access), footwear assessment (fit and insole condition), foot hygiene practices, and self-care limitations (e.g., visual impairment, obesity).

Following assessment, patients should be stratified using the 2019 IWGDF Risk Classification System , which guides screening frequency and management protocols. Evidence indicates that patient education deficits increase amputation risk by 3.2-fold, while nurse training in diabetes care significantly improves DF knowledge and management capacity.

Appropriate Footwear and Socks

Shoes should feature breathable uppers, thick soles, adequate internal space, and soft materials to ensure proper pressure distribution. Socks should have loose cuffs, good ventilation, and be light-colored cotton, changed daily. Prophylactic

diabetic shoes, insoles, and specialized orthotic devices (e.g., heel pads, hammer toe pads, gel metatarsal pads) may be prescribed based on individual patient needs.

3. Current Status of Nursing Interventions

Targeted education for male, elderly, and less-educated diabetic patients has proven effective in improving DF awareness. All diabetic patients should receive comprehensive, effective education to ensure adequate disease understanding and self-management skills.

Routine Foot Inspection
Regular foot examinations facilitate early risk detection and inform treatment decisions. Assessment includes skin temperature, color, nail abnormalities, lesions, blisters, abrasions, dryness, fissures, corns, calluses, and sensory changes.

Foot Moisturization
Daily warm water foot baths (temperature $ $37°C, duration <10 minutes) using elbow or thermometer verification should be followed by thorough drying, especially between toes. Moisturizing lotion should be applied to dry skin (excluding interdigital spaces) with gentle massage. Proper nail trimming—avoiding excessive length or shortness—and edge filing are essential. Patients with visual impairment should seek assistance, avoiding chemical callus treatments or unsupervised nail care. Fungal infections require prompt treatment.

Trauma Prevention
Diabetic patients with peripheral neuropathy exhibit reduced sensation and must avoid external foot injuries. Heating devices (hot water bottles, electric blankets) are contraindicated due to burn risk. Patients should never walk barefoot and must inspect shoes for foreign objects. Any foot injury requires immediate medical attention.

Glycemic Control
Glycated hemoglobin correlates positively with DF ulcer severity and represents an independent amputation risk factor. Effective glycemic control forms the cornerstone of DF prevention and treatment.

Appropriate Footwear
Ill-fitting shoes constitute a primary cause of foot injury in diabetic patients. Proper footwear selection is critical for prevention.

Clinical studies demonstrate that intensive DF assessment and education can prevent up to 85% of amputations. Advanced nursing models applied to high-risk patients significantly reduce ulcer incidence and improve quality of life. Combined simplified assessment and advanced nursing protocols enhance risk evaluation rates and patient self-care behaviors. Whole-course nursing interventions show superior control of DF risk factors compared to conventional care. Community-based interventions improve self-management and glycemic control, effectively preventing DF development.

4. Conclusion

With population aging and increasing health demands, China faces severe challenges as the nation with the world's largest diabetic population. DF represents a chronic, severe complication resulting from long-term hyperglycemia-induced peripheral arterial ulcerative changes and constitutes a leading cause of lower extremity amputation and disability. Effective glycemic control improves patient prognosis.

The International Diabetes Center proposed in 1993 that early diagnosis and active management could prevent 50% of DF ulcers. Gavin's weighted risk factor scoring system effectively stratifies non-diabetic, low-risk, medium-risk, and high-risk populations. As the aging trend intensifies, Chinese healthcare institutions have shifted from reactive to proactive DF management, implementing diversified nursing interventions with positive outcomes.

Prevention should focus on low-risk patients while prioritizing medium- and high-risk populations. Guiding patients in glycemic control and daily foot care represents the key to effective ulcer prevention. Professional healthcare teams providing purposeful, planned, and individualized nursing interventions for low-risk patients enhance self-management and risk awareness, thereby reducing DF ulcer incidence and improving quality of life. Early prevention and management, combined with professional team guidance on glycemic control and foot care, are essential for effective DF prevention.

Conflict of Interest Statement: The author declares no conflicts of interest.

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Note: Figure translations are in progress. See original paper for figures.