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Review Article

Reliability and credibility analysis of Inlow's 60 second diabetic foot screening tool for diabetic foot risk stratification and its feasibility in India: a systematic review

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ABSTRACT

Diabetes is the common cause for amputation of lower limb. Foot ulcers and associated complications are important causes of mortality and morbidity in patients with diabetes. Hence, it is important to predict diabetic foot ulcer in its early stages to eliminate the risks of foot amputation. Inlow's 60 second diabetic foot ulcer screening tool is gaining immense attention over the years which is associated with its simplicity to use, rapid detection of high risk diabetic feet, and provides referral for patients necessitating treatment. A systematic review is conducted to assess the reliability and credibility of using Inlow's 60 second diabetic foot screening tool for diabetic foot risk stratification and to examine its feasibility in the Indian context. Eight studies suited the inclusion criteria which were analysed systematically. The findings of the paper reveal that the sixty second tool acts as a better tool for diabetic foot ulcer risk stratification; however, modifications are necessary for its application in the Indian context.

Keywords: Credibility, Diabetic foot ulcer, Inlow's 60 second tool, Reliability

INTRODUCTION

Diabetes is a global concern; there is an increase in the number of diabetic patients all over the world and diabetes related complications are increasing such as the non-traumatic lower extremity amputations.[1] Mostly, diabetic foot complications which lead to the amputation of foot are associated with the formation of skin ulcers in diabetic patients.[2] It is hence of crucial importance to detect Diabetic Foot Ulcers (DFU) in its early stages to prevent amputations of the lower limb in diabetic patients.

There is an increase in the prevalence of DFUs all over the world wherein the most specific countries that are affected to the core belong to Africa, Asia and South America.[3] The nature of DFUs is generally neuropathic and hence is simple to prevent and treat during its initial stages.[3-6] A quarter of people with diabetes is estimated to develop foot ulcer wherein reports reveal a lower limb is amputated every 30 seconds as a result of DFU complication.[7,8] In the diabetic population, amputations frequently occur at 15-40 times than in normal population. Hence, it is of vital importance to define and utilize a standardized approach for the efficient prevention of foot ulceration which ultimately reduces the risks of amputation. The first step is hence the correct identification of foot ulceration and the degree of risks in patients.[9]

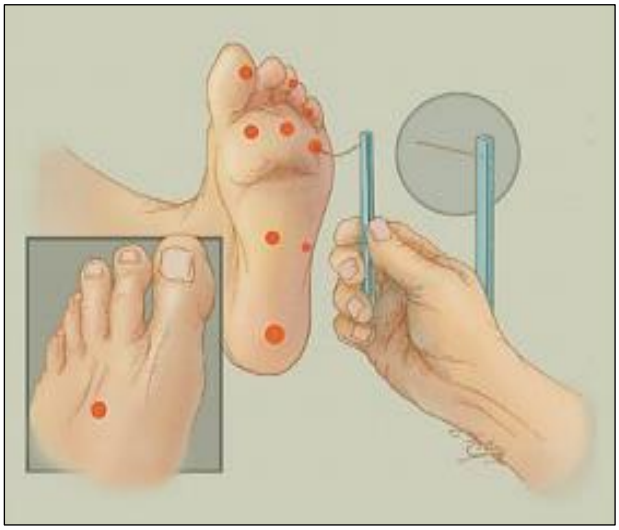
Presently, there are several diabetes foot risk stratification systems which utilise different methods.[10] Diabetic foot risk stratification identifies the various clinical features of patients with diabetes that predict the risks of foot ulceration in the future. Several clinical indicators include both the peripheral and systemic symptoms and signs.

Systemic signs include age, gender, body-mass index (BMI), height, weight, diabetes duration, diabetes type, regimes of insulin, fasting glucose, history of myocardial infarct, serum creatinine, kidney diseases, alcohol consumption, smoking and so on. Peripheral features include deformity of the foot, abnormal plantar foot pressure, peripheral neuropathy, prior foot amputation or ulceration, absence of tendon reflexes, transcutaneous oxygen tension, tineapedis, onychomycosis, fissured skin and lower leg oedema.[11] In addition, social factors also contribute to the clinical indicators which include occupation, education, religion, marital status, ethnicity, and so on.[11,12]

Several diabetic foot ulcer risk stratification tools have been developed over the years wherein a systematic review by Monteiro-Soares et al, reveals the following: International Working Group on Diabetic Foot (IWGDF), University of Texas Foot Risk Stratification (UTFRS), Scottish Intercollegiate Guideline Network (SIGN), American Diabetes Association (ADA) and a tool developed by Boyko et al.[12,13]

Of all these tools, only Boyko et al, examined predictive validity through an external system wherein HbA1c is considered as a predictive variable.[12,13] However, predictive validity is highly examined in the tool developed by Inlow, wherein various researches examined the reliability and validity of the tool.[15-19] Hence, the Inlow's sixty second tool is found to be highly reliable for risk stratification of diabetic foot ulcers.

The 60-second diabetic foot risk stratification criteria is prepared by Inlow which aids primary care clinicians to identify the risks of diabetic foot (Figure 1).[15]



Source: Adopted from Sibbald[21]

Figure 1: Sensory foot examination.

This tool, also known as the 'Inlow's 60-Second Screen' was implemented into the bedside tool comprising of 12 items with a scoring system and an overall score that ranges from 0 to 23. The tool is also validated in several settings of the healthcare sector wherein in some cases, the modified Inlow's tool is also used to suit different healthcare settings.[20] It is further stated in validation studies that the Inlow's 60-second screen possesses high inter and intra rate reliability in the long term settings.[16] Hence, such a tool could be used as a diabetic foot ulcer risk stratification tool and could reduce the risks of amputation in low and middle income nations such as India where the rate of foot amputation is high in the diabetic population (Table 1) (Figure 1).

There are only few studies which examined the reliability and credibility of the 60 second diabetic foot stratification tool and hence the credibility and reliability of the tool are least examined. Hence, a systematic review is conducted in the present paper which elaborates on the validity and credibility of the 60 second diabetic foot stratification tool. Furthermore, studies conducted on the risk stratification of foot ulcer among the Indian population are scarce.[23] Hence, the paper also examines the feasibility of using the 60 second diabetic foot stratification tool in the Indian context since there is no research to reveal the applicability of the tool in Indian diabetic patients.

METHODS

Search strategy and study selection

The search for studies was performed electronically wherein various medical databases are searched such as EBSCO, MEDLINE (PubMed), NCBI, EMBASE, ISI and SCOPUS databases published up to December 2016. The use of Medical Subject Heading (MeSH) and keywords enabled the search for data for the systematic review. Following are the keywords that are included during the search: 'Diabetic foot ulcer (DFU); DFU risk stratification; 60 second DFU risk stratification tool, Inlow's 60 second risk stratification tool'. For the search of literature relevant to the aims of the paper, MeSH heading and keywords are used either in combination or independently.

For the collection of research articles with the aim to eliminate duplicate articles, language restriction and so on, the research focused on the PICO (Population, Intervention, Comparison and Outcome) methodology to elaborate on the inclusion parameters for the selection of appropriate researches in the review. Table 1 is the PICO table for the paper and table 2 is the criteria set for the selection of studies. (Table 2 and 3)

The 'Assessment of methodological quality' is referred to as the appraisal of research articles critically which is the commonly used context in any systematic review. The examination of quality of articles removes bias wherein it is evident that only articles that are of high standards are considered for a systematic review.The use of Critical Appraisal Skills Programme (CASP) tool enables the

assessment of the papers selected based on their qualities and check whether the selected studies could be included for the review. For both qualitative and quantitative studies, the CASP tool could be applied.

Table 1: Original inlow's 60-second diabetic foot screen.

Patient name:			**Clinician signature:**
ID number:			Date:
Look-20 seconds	Left foot	Right foot	Care recommendations
1. Skin 0 = intact and healthy 1 = dry with fungus or light callus 2 = heavy callus build up 3 = open ulceration or history of previous ulcer			
2. Nails 0 = well-kept 1 = unkempt and ragged 2 = thick, damaged, or infected			
3. Deformity 0 = no deformity 2 = mild deformity 4 = major deformity			
4. Footwear 0 = appropriate 1 = inappropriate 2 = causing trauma			
Touch - 10 seconds	Left foot	Right foot	Care recommendations
5. Temperature - cold 0 = foot warm 1 = foot is cold			
6. Temperature - hot 0 = foot is warm 1 = foot is hot			
7. Range of motion 0 = full range to hallux 1 = hallux limitus 2 = hallux rigidus 3 = hallux amputation			
Assess - 30 seconds	Left foot	Right foot	Care recommendations
8. Sensation - monofilament testing 0 = 10 sites detected 2 = 7 to 9 sites detected 4 = 0 to 6 sites detected			
9. Sensation - ask 4 questions: i. Are your feet ever numb? ii. Do they ever tingle? iii. Do they ever burn? iv. Do they ever feel like insects are crawling on them? 0 = no to all questions 2 = yes to any of the questions			
10. Pedal pulses 0 = present 1 = absent			
11. Dependent rubor 0 = no 1 = yes			
12. Erythema 0 = no 1 = yes			
Score totals =			
Screening for foot ulcers and/or limb-threatening complications. Use the highest score from left or right foot. Score = 0 to 6 → recommend screening yearly Score = 7 to 12 → recommend screening every 6 months =Score = 13 to 19 → recommend screening every 3 months Score = 20 to 25 → recommend screening every 1 to 3 months			
Comments:			

Source: Adopted from Inlow[21]

Table 2: PICOS methodology.

PICOS methodology	
Population or patient	Patients with Diabetes
Intervention	The use of 60 second Diabetic foot risk stratification tool
Comparison	-
Outcome	60 second Diabetic foot risk stratification tool as an effective structured protocol for the assessment of diabetic foot ulcers

Table 3: Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
Research articles which checked the validity and reliability of original and modified Inlow's 60 second risk stratification tool	Research articles that considered risk stratification tools other than 60 second risk stratification tool
Research articles published in English	Research articles which lack data; incomplete information
Research articles published in the period of 2012-2016	Studies which only had abstracts
Research articles from both developed and developing nations	Research articles published in languages other than English

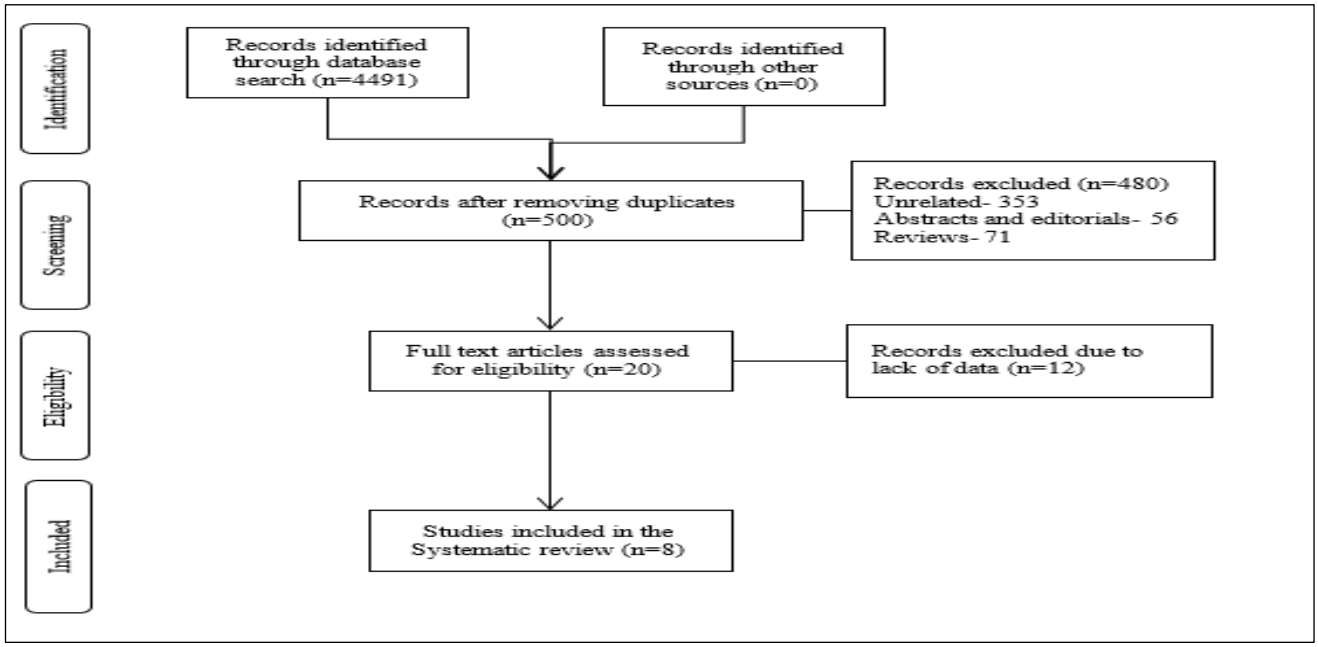


Figure 2: Article selection process.

RESULTS

Description of the studies

Our initial search for articles with respect to diabetic foot ulceration retrieved 4491 studies. With the application of the inclusion and exclusion criteria specified in Table 2, only 20 articles had relevance to the topic. Further screening the articles based on availability of ample data led to only 8 studies which are selected for the systematic review. The selection of studies is given in the prisma flow diagram (Figure 2).

Characteristics of included studies

Table 4 directly below the present section is the main characteristics of the studies included in the systematic review (Table 4).

Table 4: Data extraction table.

Author; year	Title	Region of study	Study objective	Data collection period	Description of the research	Outcomes (reliability and validity)	results	Conclusion
Woodbury et al.[16]	Tool for rapid and easy identification of high risk diabetic foot: validation and clinical pilot of the simplified 60 second diabetic foot screening tool	Guyana, South America	To determine the applicability, clinical performance and inter-rater reliability of the 'Simplified 60 Second Diabetic Foot Screening tool' as a routine diabetic foot ulcer screening method	2008-2010	A simplified 60 second tool is developed on the grounds of the Inlow's sixty second tool	A minimum Cronbach's alpha value of 0.60 is acceptable. monofilament test- 0.98; active ulcer- 0.97; previous amputation- 0.97; previous ulcer- 0.97; fixed ankle- 0.91; deformity- 0.87; callus- 0.87; absent pulses- 0.87; fixed toe- 0.80; blisters- 0.77; ingrown nail- 0.72; and fissures- 0.55	The high inter-reliability of the components reveals the potential ability of the tool to be used for DFU risk stratification	Simplified 60-Second Diabetic Screening Tool can be used as a reliable tool for the identification of diabetic skin ulceration in any income setting
Mwandri[24]	The outcome of using the 60-second diabetic foot screen to identify the diabetic foot at risk in Tanzania	Tanzania	To examine the risk pattern for the development of diabetic foot complications	June 201(Novembe 2011	The 60-second tool is used in Tanzanian setting to facilitate the assessment of foot ulceration related with diabetes in the region	-	- Male: female- 60:40 in 50 patients - Prevalent risk factors include the following- Fissures (37 per cent), calluses (27 per cent), fungal lesions in the toe-web spaces (27 per cent), the presence of an active plantar ulcer (8 per cent), blisters (4 per cent) and ingrowing toenails (6 per cent)	60-second diabetic foot screen has simplified the assessment of diabetic foot ulcer in Tanzania.
Carreau et al.[17]	A prospective, descriptive study to assess the reliability and usability c a rapid foot screen for patients with diabetes mellitus in a	Canada	To explore the time for completion of the assessment, the content, ease of utilisation and the reliability of the 60	Not specifie d	Inlow's 60-second Diabetic foot screen is used as such to examine various factors such as deformities, skin nails, temperature, footwear, motior	- The reliability and validity of the 60 second tool are assessed in long-term and acute care settings. - Inter-rater	- 39 per cent of assessments took a maximum of 7 minutes. However, the inter-reliability of the tool is	Revisions in the sixty second tool are necessary for improving the ease of use of the tool and the reliability

	complex continuing car setting		second Diabetic Foot Screen		range, pulses, erythema sensation, and dependent rubor	reliability was low with ICC 0.608 (95% confidence interval 0.349-0.781)	relatively low	and validity of the tool
Murphy et al.[18]	Reliability and Predictive Validity of Inlow's 60-Second Diabetic Foot screen tool	Canada	To assess and ascertain risk recognition consistency of the Inlow's 60-Second Diabetic Foot Screen Tool for practice setting	Novem ber 2009 - April 2010	The research aimed at determining the inter-rater reliability, intrarater reliability and the predictive validity of the 60 second tool.	Interrater and intrarater reliability and validity	- Intrarater reliability: LTC 0.96 (0.93-0.98) right foot, 0.97 (0.95-0.98) left foot; dialysis 1.00 right and 1.00 left foot. Interrater reliability: LTC 0.92 (0.86 –0.96) right foot, 0.93 (0.87 – 0.96) left foot; dialysis 0.83 (0.65 –0.92) right foot and left foot. - Predictive validity: 1 ulcer and 1 amputation	Inlow's tool demonstrates excellent intrarater and interrater reliability wherein predictive validity information is also provided.
Lowe et al.[25]	The Guyana diabetes and foot care project: improved diabetic foot evaluation reduces amputation rates by two-thirds in a lower middle income country	Guyana, South America	To create changes in the health system towards the management and improvement of foot care in people with diabetes and reduce diabetes complications such as lower extremity amputation	July 2010 - March 2013	Simplified 60-second screening tool as mentioned by Woodbury et al. [16] was used in the study.	-	- Two phases of improving foot and diabetes care were rolled out - 68 per cent reduction in major amputations ; 80 per cent reduction in below knee amputations ; above knee amputations remain unchanged	Improved foot care system with the simplified 60 second tool
Din et al.[19]	Prevalence of risk factors for Egyptian Diabetic foot ulceration	Egypt	To examine the risk factors associated with diabetic foot ulceration in the Egyptian population wherein the prevalence of these risk	2014	Modified Inlow's 60-second Diabetic Foot screen is used to determine the risk factor prevalence for diabetic foot ulcers	Tool reliability was calculated using Cronbach, s Alpha test which equal 0.96 (0.93-0.98) right foot, 0.97 (0.95-0.98) left foot.	- More than 47.9 per cent of patients have potential risks of foot ulcer - lack of knowledge regarding diabetic foot	Modified Inlow's 60-second Diabetic foot screen acts as a viable option for the identification of potential risk for diabetic foot

			factors is also assessed				problem, inappropriate footwear and the high prevalence of skin and nail pathology are found to be associated with diabetic foot ulcers	ulcer.
Bethel[26]	In patients wit Type 2 diabetes, what impact does th American Diabetes Association foot care guidelines hav in preventing lower extremit complications'	US	To determine the impact of ADA foot care guidelines on the developmen of lower extremity complications i type two diabetics.	July 2014 - March 2015	- A diabetic lower extremity educational intervention which is based on the guidelines of ADA was provided. - To conclude whether ADA guidelines are followed	-	- The 60 second Tool is used for the screening of High-Risk Diabetic Foot	Adherence to the ADA guidelines for foot care for lower extremity complication reduction, has the potential to significantly improve patient outcomes in Type 2 diabetes patients
Mamo et al.[27]	Risk factors assessment of Diabetic foot ulcer using the sixty seconds screening tool: a hospital based cross-Sectional study At Tikur Anbessa specialized hospital	Ethiopia	To introduce the 60-second DFU screening tool as a basis for routine follow-up of patients with diabetes and to assess the characteristic s and prevalence of the DFU risk factors	April 2014-August 2014	- A cross sectional study involving clinical diagnosis of diabetic foot ulcers using the 60 seconds screening tool	-	-	Diabetic foot ulcer screening, despite an easy practice is barely practiced for outpatients visiting the diabetic clinics and hence a need persists to clinically diagnose diabetic foot ulcers using the 60 seconds screening tool.

DISCUSSION

The present paper is a systematic review which attempts to examine the validity and reliability of the 60 second Diabetic Foot ulcer risk stratification tool developed by InLow.[15] It is evident that for patients with diabetes, podiatry care should be available as a routine technique; however almost in all healthcare systems worldwide, especially in the developing nations, there are limited podiatry resources which makes provision of routine foot care impossible for diabetic patients. Furthermore, Pham et al, state that for diabetic foot ulcerations, isolated clinical assessment is identified as risk markers.[27] Foot screening is hence identified as an important process which is deemed to reduce complications occurring in the foot for patients with diabetes. According to Boike and Hall, for diabetic patients, routine foot examinations are important as diabetes is associated with neuropathic and circulatory breakdowns which leads to ulceration and amputation.[28,29] The Inlow's 60 second foot examination tool is used for the examination of diabetic patients' foot.[30] For a healthy well-being and optimal wound healing, comprehensive wound screening tools are important. The 60 second foot screening tool is developed by researchers as a simple tool that can screen diabetic foot ulcers. The same is also used by healthcare

professionals all over the world; however, the routine use of the tool is still lacking especially in the developing nations.

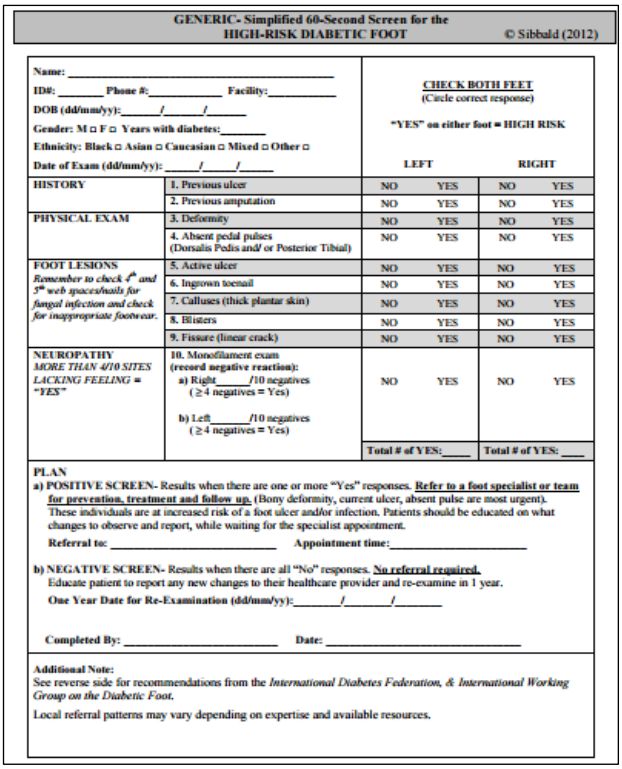
An unmodified Inlow's 60-second diabetic foot screen comprises of the following parts: a) Examination of the feet and shoes; b) Feet palpation; c) Conducting sensory screen and examination.[31] The 60-Second Diabetic Foot Screen tool requires considerable amount of time (in minutes) to assess the foot of diabetic patients wherein it requires a 10-g monofilament and an assessor with clinical assessment skills. The tool further lets the clinician to assign values to the different elements used in the screening tool wherein 12 elements are used. On the basis of value acquired for each category, recommendations and foot care plans can be provided. The tool further prompts clinical experts to refer care and provide timely assistance to patients.[32]

With the benefits of the Inlow's 60 second diabetic tool analysed, a systematic review is conducted wherein the inclusion and exclusion criteria were set to screen research articles. An extensive search of previous researches revealed that only eight studies fit to the requirements of the systematic review and the objectives of the paper. All studies attempted to examine the risks of diabetic foot ulcers, its association with amputation and how the 60-second tool could be administered by clinicians to assess the risks of diabetic foot ulcers. It is revealed that five studies utilized the Inlowe's 60 second risk stratification tool without any modifications or additions to the tool. In the study by Mwandri et al, the case of Tanzania was considered wherein it was revealed that more than 35 per cent of patients referred to diabetic unit in tertiary hospitals suffer from diabetic foot complications.[24] The 60 second tool was used wherein proper use of the tool was ascertained prior conducting the study. Carreau et al, further revealed that Inlow's 60-second Diabetic Foot Screen was used in a complex continuing care setting for the assessment and ease of use of the tool in Canada.[16] Murphy et al, state that Inlow's 60-Second Diabetic Foot screen tool acts as a reliable method for the assessment and prediction of amputations or diabetic foot ulcers wherein the study similar to Carreau et al was conducted in Canada.[17-18] Bethel et al conducted a US based research wherein the 60 second risk stratification tool was used for the screening of High-Risk Diabetic Foot.[26] Mamo et al, conducted a hospital based cross-sectional study wherein 60 second diabetic foot ulcer screening tool was used as a cost effective method to prevent foot ulcers.[27] In almost all the five studies, it was revealed that further modifications are required in the Inlowe's 60 second tool for ease of use of the tool and consistency. Carreau et al and Murphy et al directly state the need for revising the tool which further leads to the testing in the specific settings considered in the research.[17-18] Mamo et al, indirectly revealed the need for modification of the 60 second tool which then becomes a conventient tool to assess diabetic foot ulcers even during busy outpatient visiting hours.[26]

However, considering the need for modifications or revisions in the Inlowe's 60 second tool, three studies utilised the simplified or modified 60 second tool. Woodbury et al, utilised the simplified 60 second tool which had sections to acquire information on previous history of ulcers or amputations, physical examination of the foot, foot lesions, and neuropathy.[16] The same tool is used by Lowe et al, wherein both the researches are conducted in Guyana, South America. The simplified screening tool acts as a method for structured management of diabetic foot with high risks wherein the guidelines referred pertain to the international clinical practice guidelines.[24] Furthermore, it provides intense management information for the prevention of diabetic foot ulcers as the inter-rater reliability of the components in the tool is relatively high. Furthermore, it acts as tool with potential utility (Figure 3).[15]

Four studies in-depth considered the examination of the validity and reliability of the tool wherein several recommendations were put forth by the researchers.[16-19] Woodbury et al, revealed excellent inter-rater reliability of the components in the 60 second tool wherein only one study by Carreau et al, revealed the low value of inter-rater reliability (ICC 0.608 [95% confidence interval 0.349-0.781]) which was associated with variations in the interpretations associated with the assessment of patient population parameters.[15,16] Furthermore, it is evident from studies by Woodbury et al and Din et al, which utilised modified 60 second tool whereas Carreau et al, used the Inlowe's 60 second tool as such.[15,16,18] Hence, revisions are important for the 60 second tool to improve ease of use, consistency, validity and reliability.

However, there is a need to examine the feasibility of utilising the 60 second tool in the context of developing nations, especially in India which has high incidence of diabetes. India is one among the nations with diabetes mellitus as an epidemic making the nation to possess the second highest number of diabetic patients in the world. An approximation is given by International Diabetes Federation which states that around 69 million individuals in India suffer from disease as of 2015.[34] A recent research conducted in India stated that the costs for diabetes care for patients with foot ulcers is four times higher than that of patients without ulcers wherein the cost is US$409 for patients with foot ulcers and US$97 for diabetic patients without foot ulcers.[35] Hence for the reduction of foot complications due to diabetes, effective strategies are required. Though the indicators and goals set for foot care in developed and developing nations are similar, there are differences in the availability of resources to treat the same (both economic and human resources) in India. Such an unfortunate situation reveals the need for other therapeutic strategies, approaches and methods for successful diabetic foot infection management.[36]



GENERIC- Simplified 60-Second Screen for the HIGH-RISK DIABETIC FOOT © Sibbald (2012)

Name: _____
ID#: _____ Phone #:_____ Facility:_____
DOB (dd/mm/yy):_____/_____/_____
Gender: M ☐ F ☐ Years with diabetes:_____
Ethnicity: Black ☐ Asian ☐ Caucasian ☐ Mixed ☐ Other ☐
Date of Exam (dd/mm/yy): _____/_____/_____

CHECK BOTH FEET (Circle correct response)
"YES" on either foot = HIGH RISK

		LEFT		RIGHT	
HISTORY	1. Previous ulcer	NO	YES	NO	YES
	2. Previous amputation	NO	YES	NO	YES
PHYSICAL EXAM	3. Deformity	NO	YES	NO	YES
	4. Absent pedal pulses (Dorsalis Pedis and/ or Posterior Tibial)	NO	YES	NO	YES
FOOT LESIONS *Remember to check 4th and 5th web spaces/nails for fungal infection and check for inappropriate footwear.*	5. Active ulcer	NO	YES	NO	YES
	6. Ingrown toenail	NO	YES	NO	YES
	7. Calluses (thick plantar skin)	NO	YES	NO	YES
	8. Blisters	NO	YES	NO	YES
	9. Fissure (linear crack)	NO	YES	NO	YES
NEUROPATHY *MORE THAN 4/10 SITES LACKING FEELING = "YES"*	10. Monofilament exam (record negative reaction): a) Right_____/10 negatives (≥4 negatives = Yes) b) Left_____/10 negatives (≥4 negatives = Yes)	NO	YES	NO	YES
		Total # of YES:____		Total # of YES: ___	

PLAN
a) POSITIVE SCREEN- Results when there are one or more "Yes" responses. Refer to a foot specialist or team for prevention, treatment and follow up. (Bony deformity, current ulcer, absent pulse are most urgent). These individuals are at increased risk of a foot ulcer and/or infection. Patients should be educated on what changes to observe and report, while waiting for the specialist appointment.
Referral to: _____ Appointment time:_____

b) NEGATIVE SCREEN- Results when there are all "No" responses. No referral required.
Educate patient to report any new changes to their healthcare provider and re-examine in 1 year.
One Year Date for Re-Examination (dd/mm/yy):_____/_____/_____

Completed By: _____ Date: _____

Additional Note:
See reverse side for recommendations from the *International Diabetes Federation, & International Working Group on the Diabetic Foot.*
Local referral patterns may vary depending on expertise and available resources.

Figure 3: Modified 60 second diabetic foot screen tool.

Considering the importance of managing the complications of diabetes, especially foot ulceration and amputation in the Indian scenario, it is evident from the examination of previous researches that the 60 second screening tool can act as a viable option to identify, prevent, and manage diabetic foot ulcers in the Indian population as the results of five studies relate to the context of developing nations. A summary of the key recommendations and key measures for the treatment of diabetic foot ulcers is given by Indian Health Service Division of Diabetes Treatment and Prevention which revealed the following best outcomes in India.[36]

Criteria for high risk feet with diabetes

10-g monofilament testing; examination of foot deformity; prior history of ulceration or amputation; absence of pulse or abnormal pressure in Ankle-Brachial Index (ABI); with the examination of the risks of diabetic foot ulcers, foot care education will be provided by directing the patients to examine and control blood pressure and glucose, and lipid levels for the prevention of neuropathy and Peripheral Vascular Disease (PVD).

These guidelines are covered by the 60 second foot screening tool devised by Inlowe. For the Indian context, the guidelines could be further modified with respect to ease of use and convenience by clinicians as India is a populous nation with diabetic clinics, the most intensive units with high outpatient appearance. This fact is further strengthened by Mamo et al, who stated that the 60 second screening tool is a convenient option to screen patients even during busy outpatient hours which are evident in India.[26] Studies have further revealed that the application of the 60 second foot screening tool is suitable in the developing nations scenario and hence the same could be applied in India.

According to Woodbury et al, the development of the simplified 60 second risk stratification tool is a reverse innovation concept wherein the tool is re-innovated for bringing diabetic foot care even to low and middle income nations.[15] Furthermore, Mwandri et al, state that the simplification and promptness of the 60 second screening tool makes it an effective method for the assessment of diabetic foot ulcers in developing nations.[23] Furthermore, early recognition and prevention of diabetic foot ulcer complications though the use of the 60 second tool might improve quality of life and reduce healthcare associated costs and hence the tool is suitable for a middle income country like India.[17]

CONCLUSION

At present, the systematic review has revealed the feasibility of using the 60 second risk diabetic foot ulcer risk stratification tool in the Indian context as most studies selected for the present paper claim the application of the tool in low and middle-income nations. However, future studies are recommended to examine the feasibility of the tool in Indian scenario through a cross-sectional/prospective study wherein the reliability and validity of the 60 second tool need to be examined in the Indian context.

Furthermore, future studies should also take into account the need for modifications/revisions of the 60 second tool for its application in India.

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