

Measurement Properties and Factor Analysis of the Diabetic Foot Ulcer Scale Short Form (DFSSF) in Brazil

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Abstract

Among the instruments available in foreign literature to assess the Quality of Life (QoL) of people with Diabetic Foot Ulcers (DFU), the Diabetic Foot Ulcer Scale (DFS) stands out, due to its applicability, acceptability, and satisfactory evidence of measurement properties in different countries. Thus, this short commentary was aimed at presenting to the community the performance of the Diabetic Foot Ulcer Scale-Short Form (DFS-SF) instrument in the Brazilian population. A methodological study was carried out, with 290 people with DFU in outpatient follow-up, in which the measurement properties were demonstrated: evaluation of reliability, acceptability, practicability, ceiling and floor effects, responsiveness and structural construct validity. The results show that it is a tool with satisfactory measurement properties to assess the QoL of people with DFU.

Keywords: Nursing; Diabetes mellitus; Surveys and questionnaires; Quality of life; Validation study

Description

Diabetic Foot Ulcer (DFU) is defined as the presence of deep tissue infection, ulceration, and/or destruction associated with neurological abnormalities and varying degrees of Peripheral Vascular Disease (PVD) in people with diabetes mellitus [1].

The consequences of DFU are not only limited to the affected limb, but also to the worsening Quality of Life (QoL) of patients and their caregivers. The consequences are related to functional impairment that leads to disability, hospitalization, and even death. In this direction, there is a need for prolonged rehabilitation and social support with high costs for health care institutions in several countries [2].

There are specific and generic tools to evaluate QoL, such as measurement instruments. Nevertheless, to one be able to develop and use them in research, some criteria are recommended to enable the safety and reliability of the selected instrument. These criteria are called measurement properties, which are represented by two major important measures: reliability (homogeneity and reproducibility of the measurement) and validity [3].

Among the specific instruments for health status assessment used in the clinical evaluation of people with DFU, specifically to identify the treatment and management of ulcer healing, the Diabetic Foot Ulcer Scale (DFS) and its short form, the DFS-SF, are available. The DFS was developed through discussion with patients to identify the specific factors affecting QoL, such as DFU and its management in people with diabetes mellitus. Based on these concepts, DFS was then validated with eleven domains entitled as Leisure, Physical health, Activities of daily living, Emotions, Non-adherence, Family, Friends, Treatment, Satisfaction, Positive attitude and Financial aspects [4].

Although DFS has shown good measurement properties overall, with good reliability and validity; its short version, the DFS-SF, was composed of six domains: Leisure, Physical health, Dependency/Daily living, Negative emotions, Worry about ulcer/feet and Bothered with ulcer care [5]. This multidimensional, easy-to-understand instrument was not excessively long for a self-applicable instrument. Furthermore, the instrument assesses QoL in different and broadened aspects, such as leisure, physical health, dependence, daily life, emotions, concern, and ulcer care. Therefore, it is available for use in clinical trials to evaluate the benefits that treatment promotes in the healing of DFU [6].

The DFS-SF, originally created in the English version, has recently been translated into other languages, including Brazilian Portuguese, Mandarin, Dutch, French, Spanish, Greek, Polish and Korean. So far, only the Chinese, Greek, and Polish versions have gone through a full linguistic validation process [7].

The Brazilian study was conducted among 290 people with DFU in a specialized outpatient clinic, in which the measurement properties and factor analysis of the DFS-SF were evaluated [6]. By then, the Composite Reliability (CR) presented a satisfactory result, indicating that all the values of the domains of the instrument were higher than 0.80. In the context of structural equations this measure is recommended by the literature, since it takes into account, in addition to the measures of internal consistency of the indicators of a construct, complementary to the item-total and inter-item correlations and considers the errors in the indicators, surpassing Cronbach's alpha [8].

It also sought to correlate them with the goal of demonstrating how much the DFS-SF would be related to other measures related to QoL, such as the SF-36, considered the "gold standard" for HRQoL assessment [9]. We observed significant positive correlations ranging from moderate up to strong magnitude between the DFS-SF and the SF-36, indicating that the items effectively measure the constructs it was supposed to evaluate. As for the discriminant validity, the model presented discriminant validity according to the Fornell-Larcker criterion, since the square roots of the AVEs were greater than the correlations between the factors. The analysis of the cross-loadings evidenced that the factorial load of each item was observed according to the model analyzed [6].

Ceiling and floor effects were assessed by the percentage of participants who scored the 15% worst (floor) and 15% best (ceiling)

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possible scale results. Responsiveness (n=34) was assessed through the wound area obtained by photography and evaluated by the Image J Features program and the DFS-SF score at two moments, with a 4-week interval between them. The ceiling and floor effect analysis showed no ceiling or floor effects. Responsiveness was observed in the wound area, but not in the DFS-SF scores in the times [6].

The management of care for the person with DFU involves the periodic evaluation of all factors involving wound healing, requiring changes in treatment and continuous recommendations. Developing skills to understand what is going on in people's lives to improve health professional-patient interaction and to study specific interventions to improve QoL contributing to adaptation to the new life situation is paramount and pressing [10].

The use of DFS-SF in clinical practice can lead to a better understanding of the factors that interfere in the healing of wounds and in people's daily lives, giving more emphasis to some primary factor-assessing not only the physical aspect of the disease, such as pain or discomfort, but also taking into account the social factors that can be affected by living with a chronic disease. Thus, holistic care has an important role in making a difference in people's lives, focusing not only on the disease, but on all the factors that interfere in QoL, besides improving the communication between the health team and the patient, offering integral assistance.

The impact of the use of this instrument will provide important information that can collaborate to the way health professionals can help people with DM, both in assistance and management; through the creation and evaluation of intervention programs to improve QoL and public policies, aiming at understanding the factors that interfere in the QoL of people with DFU and offer them the best form of care.

Conclusion

A questionnaire with evidences of validity and reliability strengthens these measures and can help public health managers to prioritize actions and research, identifying gaps in knowledge regarding the care of people with DFU in order to increase the quality of care.

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