

Diabetic Foot

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Contributor: Davide Costa , Nicola Ielapi , Francesco Caprino , , Antonio Sisinni , Michele Andreucci , Umberto M Bracale , Raffaele Serra

Diabetic foot ulcer (DFU) is a complication of diabetes mellitus (DM). The prevalence of diabetic foot in the world is about 6%, and it is estimated that approximately one out of every six diabetic individuals will experience a foot ulcer in their life. In those individuals, DFU increases mortality and morbidity as well as the risk of going through amputation. Patients with DFU, especially if it does not heal or recurs, report poor quality of life (QoL). DFU is associated with frequent hospitalization and rising costs of treatment. DFU pathophysiology is due to neuropathy, trauma, and peripheral artery occlusive disease (Peripheral neuropathy, including both sensory and motor fibers as well as autonomic nerve fibers, is often an underdiagnosed complication in patients with diabetes.

diabetic foot

sociology of health

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1. Gender Variables and Diabetic Foot

Many studies revealed that there is a gender difference in diabetic foot ulcers. In fact, a study by Reis et al. states that there is a higher prevalence of diabetes mellitus in women. However, in men, there is a higher risk of developing diabetic foot and its complications ([Reis et al. 2020](#)). A study by Pedras et al. states that diabetic foot ulcers are more prevalent in male patients ([Pedras et al. 2020](#)). Lo et al. report that there is a higher proportion of male patients around the world with DFU and consider the increased physical work of males a possible hypothesis for the gender difference ([Lo et al. 2021](#)). A study by Leese et al. analyzed certain risk factors and revealed that the male gender and other factors are associated with major and minor amputations ([Leese et al. 2013](#)). Sheen et al. reported that the male sex may be associated with a higher risk of lower limb amputations because the prevalence of peripheral arterial disease was higher in men than in women, and it is known that peripheral arterial disease is an important risk factor for amputation ([Sheen et al. 2018](#)). Perrin et al. determined that men's access to health services is less compared to women because they think they have less time for their own health ([Perrin et al. 2019](#)). Goodridge et al. studied risk factors for ulcer development, and, moreover, the most important risk factor was the male gender ([Goodridge et al. 2006](#)). As stated by Iversen et al., significant predictors of DFU are male gender and older age ([Iversen et al. 2015](#)). Herber et al. reported a gender analysis in which it was revealed that female patients seemed to have fewer complaints regarding pain compared to male patients ([Herber et al. 2007](#)). A study by Jarl et al. reports that women had worse general health and a negative attitude towards therapeutic shoes, but nevertheless, men had worse foot complications ([Jarl et al. 2019](#)). As stated by Amin et al., men have a greater impact on socio-economic status ([Amin et al. 2014](#)). A study by Wu et al. analyzed that males might have a higher willingness to pay and spend much more attention on their healthcare ([Wu et al. 2018](#)) and Ahmad Sharoni et al. stated that, in males, foot self-care behavior was higher than in females ([Ahmad Sharoni et al. 2017](#)). As Al

Ayed et al. report, in Saudi Arabia, the prevalent constraints of gender segregation and the restrictions imposed by the male guardianship system negatively affect the health-related QoL of females, and for this reason, they have larger ulcer sizes, higher frequencies of unhealed ulcers, and advanced Wagner grades ([Al Ayed et al. 2020](#)). A study by Zhang et al. reports that there are certain demographic factors associated with increased odds of 30-day readmission, such as female sex, black race (vs. white), older age, and others ([Zhang et al. 2021](#)). There are some studies that claim there is no difference between genders, such as the study by Goodridge et al. that reports that between unhealed and healed ulcer groups, there were no significant differences in gender distribution, age, and general health self-rating ([Goodridge et al. 2005](#)), and a study by Salameh et al. reported that there are no differences between DFU and non-DFU groups in terms of gender, as well as other factors ([Salameh et al. 2020](#)). Regarding marital status, Pedras et al. analyzed that almost all patients were married, and the main caregiver reported being the patient's spouse or an offspring. It shows the importance of the role of the family, which seems to be responsible for helping the patient take care of her/his feet ([Pedras et al. 2020](#)).

2. Socioeconomic Status and Diabetic Foot

First of all, socioeconomic status (SES) is a complicated and multifactorial index that allows one to understand the socio-economic position of an individual based on different sub-categories of indicators ([Zhang et al. 2021](#)). In diabetic patients, this index is related to DFU ([Hicks et al. 2018](#)). Many studies, in particular, demonstrated how much worse healthcare outcomes are in patients with a socioeconomic disadvantage ([Hicks et al. 2018](#); [Tatulashvili et al. 2020](#)). It is clear why this happens. The lower the socio-economic availability, the lower the access to treatment and therefore the possibility of preventing, or at least limiting, the aggravation of complications ([Tatulashvili et al. 2020](#)); in particular, SES is important in diabetic patients as a risk factor for different kinds of diabetic complications. Many of the articles report these data. In this regard, for example, the connection between socioeconomic positions and the prevalence of diabetes is very strong ([De Silva et al. 2016](#)): Low SES is associated with unhealthy attitudes, low access to treatment, abnormal activity in care, and a high number of diabetes complications. SES appears to be particularly associated with a higher proportion of microvascular pathologies analyzed among high-socioeconomic patients as well as a higher proportion of macrovascular illness, as compared to lower socioeconomic groups ([De Silva et al. 2016](#)). A final result that appears interesting concerns the relationship between education and SES: Low access to the care system, dietary, and low hygiene rules ([Lamchahab et al. 2011](#)). In this way, SES is very important because it is linked to other social variables. Therefore, the economic burden of diabetic foot can be seen at the national level, within healthcare systems, and, perhaps most dramatically, at the parental and personal level ([Tatulashvili et al. 2020](#); [De Silva et al. 2016](#)).

3. Quality of Life and Social Capital

Complications in diabetic patients are related to the quality of life ([Nabuurs-Franssen et al. 2005](#)). In particular, the QoL changes because sometimes this disease causes amputations, and mobility becomes very difficult. The role, in particular, of foot amputations on health-related QoL in patients with diabetes mellitus is very important ([Nabuurs-Franssen et al. 2005](#)). In particular, qualitative approaches have demonstrated through many

observations that diabetic foot complications have a dangerous negative social and mental aftermath ([De Silva et al. 2016](#)). These dimensions are the main components of the quality of life. Furthermore, many studies have shown how QoL, as an indicator, is a dependent variable ([Polikandrioti et al. 2020](#); [Al Aayed et al. 2020](#); [Nabuurs-Franssen et al. 2005](#); [Jaksa and Mahoney 2010](#)). In this case, the most important result concerns an early exit from the world of work, with an early exit rate that ranges between 50% and 79% of cases ([Nabuurs-Franssen et al. 2005](#)). With this variable, there is another impact on the quality of life in diabetic people, that is, body image changes. In fact, there are many negative psychological and sociological effects on patients with diabetes because many complications are permanent, and for this reason, they change the anatomical and functional activity of the body ([Nurhikmah et al. 2019](#); [Salomé et al. 2016](#)). In addition, according to one study, approximately 56.7% ([Nurhikmah et al. 2019](#)) of diabetic patients have a negative body image. This variable is very important for the social impact of diabetic foot because the body image of diabetic patients is an important social element for all relations. In fact, all variables about which the researchers have spoken are related to the ability of someone who has diabetes to maintain or create social relations. More accurately, the researchers are talking about the concept of social capital, which was used for the first time in sociology and explains the set of relationships and networks available to an individual ([Lochner et al. 1999](#)). Nowadays, this concept is linked to the health of all people ([Kawachi and Kennedy 1997](#); ^[1] [1997b](#)). In particular, in diabetic patients, as in all people with chronic diseases, social capital may be reduced (^[2] [1990](#); ^[3] ^[4] [2020](#)). In this way, a diabetic person is more likely to be alone; in particular, qualitative studies have demonstrated that individuals with diabetic foot have more difficulty relating and sharing their illness experiences with friends or parents ([Vedhara et al. 2012](#)). Furthermore, low social capital is associated with poorer health conditions, which can be related to ulceration risk ([Vedhara et al. 2012](#)). This is a significant problem for those who live with a diabetic person because it reduces social support. Social support is an important component of social capital, and it is a personal prevention factor during a stressful health-related experience and may be necessary for the patient's ability to accept and cohabitate. Matricciani et al., for example, showed the association between social capital and better foot self-care, concerning the positive role of large social capital and self-care behaviors ([Matricciani and Jones 2015](#)). What has been said so far is strictly related to the cultural sphere of reference. It is important because knowledge of the sociocultural imagination of diabetic foot is important for understanding the pathological process and the development of pharmacological and care approaches ([Lopes et al. 2021](#)).

4. Medical Consequences and Diabetic Foot

Regarding the medical consequences of DFU, there are many disorders. Pain is associated with a worsening condition both in the psychological and physical spheres, because in the presence of this symptom, patients are not adherent to foot self-care. Therefore, preventive multidisciplinary interventions are required when pain is present ([Pedras et al. 2020](#)). Amputations and other surgical procedures may be necessary after aggravation of the condition and are associated with a lower health-related QoL ([Polikandrioti et al. 2020](#); [Reis et al. 2020](#); [Korzon-Burakowska and Dziemidok 2011](#); [Rerkasem 2011](#); [Ragnarson Tennvall and Apelqvist 2000](#)). Ulcers have both a predictive role and consequences for DFU and are associated with a low quality of life ([Polikandrioti et al. 2020](#); [Korzon-Burakowska and Dziemidok 2011](#); [Perrin et al. 2019](#); [Rerkasem 2011](#); [Ragnarson](#)

[Tennvall and Apelqvist 2000](#); [Meijer et al. 2001](#); [Elkhider et al. 2021](#); [Fejfarová et al. 2014](#)). Decreased physical mobility is an evident consequence of the physical restrictions imposed by DFU or its risk factors, and it is certainly associated with a low quality of life. Particular attention should be paid to patient mobility in these patients, recommending activities such as physical training ([Polikandrioti et al. 2020](#); [Ragnarson Tennvall and Apelqvist 2000](#); [Meijer et al. 2001](#)). Mental disorders play an important role in DFU patients. Depression is considered both a risk factor and a clinical consequence. Depression is present in DFU patients, particularly after ulceration, determining poor compliance in the successive healing steps. For these patients, social support should be considered. As a risk factor, depression is associated, together with anxiety, with poor compliance with glycemic control, and, consequently, it has negative effects on future wound healing, determining a worse condition ([Polikandrioti et al. 2020](#); [Iversen et al. 2015](#); [Salomé et al. 2016](#); [Vedhara et al. 2012](#); [Elrayah-Eliadarous et al. 2017](#)). Sleep disorders are considered consequences of the negative effects of DFU on the psychological sphere ([Salomé et al. 2016](#)). Stress and suicidal tendencies are possible consequences of the chronicity of this condition ([Goodridge et al. 2006](#); [Iversen et al. 2015](#)). Neuropathy, which is associated with poor glycemic control and is considered a risk factor for DFU, together with angiopathy, is a determinant of a low grade of mobility ([Korzon-Burakowska and Dziemidok 2011](#); [Perrin et al. 2019](#); [Lo et al. 2021](#); [Salameh et al. 2020](#); [Rerkasem 2011](#); [Meijer et al. 2001](#); [Fejfarová et al. 2014](#)). Some conditions determined by low compliance with glycemic control are considered important risk factors, such as retinopathy ([Lo et al. 2021](#); [Al Aayed et al. 2020](#); [Elkhider et al. 2021](#)), foot sensory loss ([Salameh et al. 2020](#)), and nephropathies ([Lo et al. 2021](#); [Salameh et al. 2020](#); [Elkhider et al. 2021](#)). In addition, the presence of foot calluses, together with hypertension ([Lo et al. 2021](#); [Fejfarová et al. 2014](#)), dyslipidemia, heart diseases ([Lo et al. 2021](#)), Charcot osteoarthropathy ([Korzon-Burakowska and Dziemidok 2011](#)), and infections ([Korzon-Burakowska and Dziemidok 2011](#); [Perrin et al. 2019](#)) are considered independent risk factors.

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