

QUALITY OF LIFE OF DIABETIC PATIENTS

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INTRODUCTION

Diabetes Mellitus (DM) is an epidemiologically very relevant disease worldwide, especially in developing countries like Brazil. In 2015, the International Diabetes Federation calculated that 8.8% of the world's population between 20 and 79 years old is diabetic (in a 95% confidence interval, this percentage can vary from 7.2 to 11.4%)¹. It has been highlighted as an important public health problem, due to its high incidence in the world population, thus generating expensive expenses with treatment and lowering of the quality of life of people who suffer from this disease².

A relevant aspect of the clinical course of this disease is the fact that it has several systemic complications, including diabetic nephropathy, retinopathy, neuropathy, coronary artery disease, cerebrovascular disease and peripheral vascular disease. Among these conditions caused by hyperglycemia, the diabetic foot stands out, the object of study in this article. According to the International Working Group on the Diabetic Foot (IWGDF), diabetic foot is "infection, ulceration and/or destruction of soft tissue associated with neurological changes and varying degrees of peripheral arterial disease (PAD).) in the lower limbs"³. This dysfunction is known to be deleterious to the quality of life of patients affected by it.⁴. This complication of diabetes, as it is a chronic disease, is closely associated with cases of depression.⁵ In Brazil, despite the relevance of this subject, there is still no questionnaire that can be applied to patients, with the aim of better studying this and other possible associations between diabetes and mental health. However, there is concrete evidence that points to the importance of these questionnaires: they are able to assess the degree of patient satisfaction with the treatment (regardless of the therapeutic

method used), in addition to providing results that can be used for international comparisons, the which leads to an exchange of therapeutic experiences between different countries⁶. Given the importance of this type of questionnaire, the objective of this study was to evaluate self-care and the degree of satisfaction of patients with diabetic foot through a questionnaire, which was prepared by the author of this work, in a pioneering way in Brazil. This way, it was possible to assess impairments in the quality of life of these people due to their illness.

OBJECTIVES

The main objective of this work was to evaluate the impact of the diabetic foot on the mental health of diabetic patients with this condition.

Furthermore, it was a pioneering attempt to validate a Brazilian questionnaire about the degree of life satisfaction of diabetic patients.

In addition to making it possible to assess the quality of life of this population, this study was an opportunity for these patients to receive general guidance on how to best care for and manage diabetes when applying the questionnaire, given that the author of the project received training proper.

METHODS

As explained in the Introduction, Brazil lacks a national questionnaire regarding the quality of life of patients with diabetic foot. In view of this deficiency, a study was carried out on the foreign questionnaires "QoLHYPO questionnaire"⁷, "Diabetes Acceptance Scale (DAS)"⁸ and "The Diabetes Treatment Satisfaction Questionnaire (DTSQ)"⁹. After this study, the author of this project made an entirely new one (a prototype will be reproduced later). This unprecedented questionnaire was applied in primary and tertiary care. With the data collected, a cross-

sectional study was carried out in order to evaluate the quality of life of this population.

The author received theoretical training from professors in the areas of Internal Medicine and Vascular Surgery, with a focus on increasing quality of life, promoting healthier lifestyle habits and reducing possible complications in these patients. After the theoretical basis given by the specialists, patients with possible complications of the diabetic foot were screened through physical examination, clinical history and laboratory tests. This will be done in routine outpatient care at Basic Health Units (UBS) and Family Health Units (USF) in the city of Botucatu-SP. For those patients who are identified signs or symptoms of diabetes, it was suggested to apply the questionnaire below. Like this, the cohort to be studied was defined as that of diabetics with diabetic foot complications and the control group as that of diabetics without diabetic foot complications. The sample was of convenience from diabetic patients who seek primary care posts in the city of Botucatu (SP).

QUALITY OF LIFE QUESTIONNAIRE FOR DIABETIC PATIENTS

IDENTIFICATION:

Full name:

Age:

Gender: F M

Education: Incomplete Elementary School
 Complete Elementary School Incomplete High School
 Complete High School Incomplete Higher Education
 Complete Higher Education Graduate

Income: Less than 1 minimum wage 1 to 3 minimum wages
 3 to 6 minimum wages More than 6 minimum wages
 I prefer not to answer

Weight (kg):

Height (m):

Abdominal circumference (m):

QUESTIONS:

- 1) Type of diabetes mellitus diagnosed:
 Type I Type II Other I don't know
- 2) Have you been diagnosed with diabetes for:
 Less than 1 year Between 1 and 5 years
 Between 5 and 10 years More than 10 years
- 3) Has been under treatment for:
 Less than 1 year Between 1 and 5 years
 Between 5 and 10 years More than 10 years
- 4) Do you suffer from complications such as "diabetic foot"?
 Yes, more than 1 year ago Yes, less than 1 year ago No
- 5) Do you suffer from any other complications of diabetes?
 Eye Kidney Heart Finger amputation
 Foot amputation Leg amputation Thigh amputation Other
- 6) Do you have any of the following comorbidities:
 Systemic Arterial Hypertension ("High blood pressure") Dyslipidemia ("excessive fats in the blood") Obesity Depression
 Others – Which ones?
- 7) Type of treatment for diabetes (it is possible to sign more than one option):
 Lifestyle change Insulin Oral medication for diabetes (eg Glifage®) I am not undergoing treatment Others - Which ones?
- 8) Do you perform physical activities regularly?
 Yes No

9) Are you a smoker?

Yes No

10) I accepted having diabetes.

I Agree I partially agree I disagree

11) I give diabetes the space it needs in my life.

I Agree I partially agree I disagree

12) I am aware of what diabetes is and its consequences for my health.

I Agree I partially agree I disagree

13) I make sure my diabetes treatment works well.

I Agree I partially agree I disagree

14) I am motivated to treat my diabetes properly.

I Agree I partially agree I disagree

15) I integrate diabetes into my daily routines as much as possible.

I Agree I partially agree I disagree

16) I fully accept and take good care of diabetes.

I Agree I partially agree I disagree

17) I suffer from having diabetes.

I Agree I partially agree I disagree

18) I often ignore diabetes.

I Agree I partially agree I disagree

19) I refuse to accept diabetes as part of my life.

I Agree I partially agree I disagree

20) Diabetes contributes to dissatisfaction with my life.

I Agree I partially agree I disagree

21) I find it difficult to motivate myself to perform good self-care with diabetes.

I Agree I partially agree I disagree

22) I neglect diabetes self-care because I want to avoid diabetes-related topics.

I Agree I partially agree I disagree

23) Diabetes makes me unable to carry out common day-to-day activities (cleaning the house, washing clothes, sweeping the floor).

I agree I partially agree I disagree

24) Diabetes interferes with my leisure time (going to the park, walking, running).

I Agree I partially agree I disagree

25) Did diabetes make it difficult/impossible for you to do something you could do before?

No Yes- What?

26) Other comments:

STATISTICAL ANALYSIS

General demographics		Control(n=50)	Study (n=50)	p-value
Age		56.9	59.8	0.23
Weight		80.8	84.2	0.38
Height		1.60	1.70	0.02
BMI		29.7	29.1	0.60
Gender	Feminine	27(54%)	13(26%)	0.004
	Masculine	23(46%)	37(74%)	
Education	incomplete fundamental	16(32%)	28(56%)	0.16
	Complete Elementary	8(16%)	7(14%)	
	Incomplete high school	3(6%)	1(2%)	
	Complete high school	11(22%)	5(10%)	
	Incomplete higher	4(8%)	1(2%)	
	Graduated	6(12%)	7(14%)	
	Postgraduate	2(4%)	1(2%)	
Income	Less than 1 minimum wage	3(6%)	6(12%)	0.22
	1 to 3 minimum wages	27(54%)	34(68%)	
	3 to 6 minimum wages	11(22%)	7(14%)	
	More than 6 minimum wages	3(6%)	1(2%)	
	Rather not answer	6(12%)	2(4%)	

Table 1 - General demography of the studied population

Diabetes Demographics		Control(n=50)	Study (n=50)	p-value
Diagnosed type of diabetes mellitus	Type I	7(14%)	6(12%)	0.96
	Type II	41(82%)	42(84%)	
	The person was not informed	2(4%)	2(4%)	
Diagnosed with diabetes	Less than 1 year	3(6%)	3(6%)	0.14
	Between 1 and 5 years	10(20%)	6(12%)	
	Between 5 and 10 years	9(18%)	6(12%)	
	More than 10 years	28(56%)	38(76%)	
The person has been under treatment	Less than 1 year	3(6%)	4(8%)	0.26
	Between 1 and 5 years	10(20%)	6(12%)	
	Between 5 and 10 years	10(20%)	5(10%)	
	More than 10 years	27(54%)	35(70%)	
Suffer from complications such as "diabetic foot"	Yes, more than 1 year ago	0(0%)	31(62%)	<0.0001
	Yes, less than 1 year ago	0(0%)	19(38%)	
	No	50(100%)	0(0%)	

Suffer from any other complication of diabetes	None	22(44%)	3(6%)	<0.001
	Eye (1)	11(22%)	7(14%)	
	Kidney (2)	2(4%)	0(0%)	
	Heart (3)	6(12%)	0(0%)	
	Amputation of fingers (4)	0(0%)	7(14%)	
	Leg amputation (6)	0(0%)	2(4%)	
	Other (8)	3(6%)	0(0%)	
	(1)+(2)	3(6%)	2(4%)	
	(1)+(3)	1(2%)	2(4%)	
	(1)+(4)	0(0%)	8(16%)	
	(1)+(6)	0(0%)	1(2%)	
	(1)+(8)	0(0%)	1(2%)	
	(2)+(3)	0(0%)	1(2%)	
	(2)+(4)	0(0%)	1(2%)	
	(1)+(2)+(3)	1(2%)	0(0%)	
	(1)+(2)+(4)	1(2%)	0(0%)	
	(1)+(2)+(5)	0(0%)	2(4%)	
	(1)+(3)+(4)	0(0%)	7(14%)	
	(2)+(3)+(4)	0(0%)	1(2%)	
	(2)+(3)+(6)	0(0%)	1(2%)	
(1)+(2)+(3)+(4)	0(0%)	2(4%)		
Do you have which of the following comorbidities	None	7(14%)	7(14%)	0.66
	SAH (1)	5(10%)	8(16%)	
	Dyslipidemia (2)	5(10%)	4(8%)	
	Obesity (3)	1(2%)	2(4%)	
	Depression (4)	0(0%)	2(4%)	
	Others (5)	2(4%)	0(0%)	
	(1)+(2)	7(14%)	13(26%)	
	(1)+(3)	4(8%)	1(2%)	
	(1)+(4)	1(2%)	0(0%)	
	(2)+(3)	2(4%)	1(2%)	
	(2)+(4)	1(2%)	1(2%)	
	(2)+(5)	0(0%)	1(2%)	
	(1)+(2)+(3)	5(10%)	3(6%)	
	(1)+(2)+(4)	3(6%)	3(6%)	
	(1)+(2)+(5)	1(2%)	1(2%)	
	(1)+(3)+(4)	1(2%)	1(2%)	
	(2)+(3)+(4)	2(4%)	0(0%)	
	(1)+(2)+(3)+(4)	1(2%)	2(4%)	
	(1)+(2)+(3)+(5)	1(2%)	0(0%)	
	(1)+(2)+(3)+(4)+(5)	1(2%)	0(0%)	

Type of treatment for diabetes?	None	1(2%)	1(2%)	0.004
	Insulin (2)	1(2%)	5(10%)	
	Oral medications for diabetes (3)	16(32%)	4(8%)	
	Lifestyle change (1) + (2)	6(12%)	7(14%)	
	(1)+(3)	12(24%)	4(8%)	
	(2)+(3)	6(12%)	15(30%)	
	(1)+(2)+(3)	7(14%)	14(28%)	
	(2)+(3)+(5)	1(2%)	0(0%)	
Do you perform physical activities regularly?	Yes	14(28%)	18(36%)	0.45
	No	36(72%)	32(64%)	
Are you a smoker?	Yes	4(8%)	9(18%)	0.14
	No	46(92%)	41(82%)	

Table 2 - Specific diabetes demographics

Subjective perception of the disease		Control(n=50)	Study (n=50)	p-value
I accepted having diabetes	I agree	18(36%)	18(36%)	0.96
	partially agree	8(16%)	9(18%)	
	I disagree	24(48%)	23(46%)	
I give diabetes the space it needs in my life	I agree	19(38%)	26(52%)	0.37
	partially agree	9(18%)	7(14%)	
	I disagree	22(44%)	17(34%)	
I am aware of what diabetes is and its consequences for my health	I agree	47(94%)	45(90%)	0.70
	partially agree	1(2%)	1(2%)	
	I disagree	2(4%)	4(8%)	
I make sure my diabetes treatment works well	I agree	38(76%)	28(56%)	0.09
	partially agree	8(16%)	17(34%)	
	I disagree	4(8%)	5(10%)	
I am motivated to treat my diabetes properly	I agree	40(80%)	45(90%)	0.33
	partially agree	9(18%)	4(8%)	
	I disagree	1(2%)	1(2%)	
I integrate diabetes into my daily routines as much as possible	I agree	37(74%)	39(78%)	0.89
	partially agree	8(16%)	7(14%)	
	I disagree	5(10%)	4(8%)	
I fully accept and take good care of diabetes	I agree	28(56%)	30(60%)	0.14
	partially agree	10(20%)	15(30%)	
	I disagree	12(24%)	5(10%)	
I suffer from having diabetes	I agree	26(52%)	43(86%)	0.001
	partially agree	2(4%)	2(4%)	
	I disagree	22(44%)	5(10%)	
I often ignore diabetes	I agree	21(42%)	23(46%)	0.92
	partially agree	9(18%)	8(16%)	
	I disagree	20(40%)	19(38%)	
I refuse to accept diabetes as part of my life	I agree	18(36%)	23(46%)	0.48
	partially agree	6(12%)	7(14%)	
	I disagree	26(52%)	20(40%)	

Diabetes contributes to dissatisfaction with my life	I agree	25(50%)	35(70%)	0.11
	partially agree	7(14%)	3(6%)	
	I disagree	18(36%)	12(24%)	
I have difficulties motivating myself to perform good self-care with diabetes	I agree	19(38%)	28(56%)	0.04
	partially agree	9(18%)	2(4%)	
	I disagree	22(44%)	20(40%)	

Table 3- Patient's subjective perception of their disease

Subjective perception of functionality		Control (n=50)	Study (n=50)	p-value
I neglect diabetes self-care because diabetes-related topics	I agree	16(32%)	25(50%)	0.17
	partially agree	4(8%)	4(8%)	
	I disagree	30(60%)	21(42%)	
Diabetes makes me unable to carry out common day-to-day activities	I agree	18(36%)	23(46%)	0.01
	partially agree	3(6%)	2(4%)	
	I disagree	29(58%)	15(30%)	
Diabetes impairs my leisure	I agree	18(36%)	35(70%)	0.003
	partially agree	6(12%)	2(4%)	
	I disagree	26(52%)	13(26%)	
Did diabetes make it difficult/impossible for you to do something you could before?	No	24(48%)	42(84%)	<0.0001
	Yes	26(52%)	8(16%)	

Table 4 - Subjective perception of the patient in relation to its functionality

DISCUSSION

The study included 100 diabetic patients, half of whom had the diabetic foot complication (study group), while the other half did not (control group). There was no statistical significance when we compared age, weight and BMI of these patients. The average age was 58 years, the average weight was 82.5 kg and the average BMI was 29.4 kg/m². However, when we analyzed gender, there was significance: 74% of the patients in the study group were men, whereas, in the control group, 46% of the patients were male. This finding is in line with the literature: a meta-analysis¹⁰ and a Brazilian study¹¹ found that diabetic men have worse foot care when compared to women, which makes them more susceptible to this type of complication.

The level of education and family income varied greatly, possibly reflecting the diversity of the public served by the institution, since the

Basic Health Units (UBS) and Family Health Units (USF) in which the questionnaire was applied, belong to the HCFMB complex, the largest public institution linked to the SUS (Unified Health System) in the region, serving a population of approximately 2 million people.

The question "Do you suffer from diabetic foot complications?" was statistically significant, with 100% of the patients in the study group answering "yes" and 100% of the patients in the control group answering "no". Since the study aims to analyze the differences between these two populations, it was essential that the result found was this. Otherwise, some methodological error in the application of the questionnaires and conduction of the study would be attested.

The question "Do you suffer from any other complications of diabetes?" obtained statistical significance. The prevalence of diabetes-

related complications was much higher in the study group than in the control group. This demonstrates the greater difficulty of the control group in carrying out the necessary care with diabetes, confirmed by the answers given to the question “Do I have difficulty in carrying out good care with diabetes?”, which also showed statistical significance, 56% of the study group population reported having difficulty performing good self-care, while only 36% of the population in the control group had the same complaint. According to DUBSKY et al¹², the occurrence of diabetic foot is associated with poor control of glycemic levels, which may reflect low patient engagement in treatment and lack of psychological support. According to the author, the worst control of the disease would lead, therefore, to a greater occurrence of complications from diabetes. Thus, psychological interventions could reduce the occurrence of this type of complication, which has been verified in some studies^{13,14}, however a systematic review¹⁵ published in 2021 attests that it is not possible to be sure whether psychological intervention reduces the number of patients who present the diabetic foot.

In this sense, it is presumable that the group with more complications and with greater difficulty in performing good self-care, perform more robust treatments: the question “Type of treatment performed?” showed that most patients in the study group use the combination of oral hypoglycemic agents and insulin, while most patients in the control group use only oral hypoglycemic agents. This finding is in line with a cross-sectional study¹⁵ conducted in 2015 that analyzed 62,681 patients from a database in Saudi Arabia. The Arabic study also found that insulin use is a risk factor with OR > 2 (95% CI) for the development of foot ulcers, gangrene and amputations. The association

between insulin and diabetic foot is also evidenced in other studies^{16,17}.

Still on treatment, the question “I guarantee that my treatment against diabetes works well” tended to significance ($p=0.09$). Only 56% of the study group population strongly agreed with this statement, while 76% of the control group population strongly agreed. Probably, with a larger number of patients studied, this issue would also be statistically significant, which would corroborate that not only the type of treatment, but also the degree of confidence in the treatment is a sensitive issue for differentiating the two studied populations. Patients with diabetic foot need a longer treatment, which often leads to psychological disorders such as, for example, anxiety and depression¹⁸ which could explain the lower degree of satisfaction with the treatment in the studied population,

Suffering was another sensitive topic to differentiate the two groups studied, assessed by the question “I suffer because I have diabetes”. While 90% of respondents in the study group agreed or partially agreed with the statement, 56% of respondents in the control group agreed or partially agreed with the statement. Thus, it is evident how the diabetic foot negatively impacts the mental health of people with diabetes. Several studies^{18,19,20,21} found results similar to those of the present study and correlate the diabetic foot with a higher incidence of anxiety and depression. These studies suggest that psychological intervention, especially in the early stages of the diabetic foot, manages to reduce the development of these mental disorders.

Another factor that also negatively impacts mental health is the loss of functionality - closely related to quality of life. All the questions in the questionnaire that dealt with loss of functionality “Diabetes makes me unable to perform common day-to-day activities”, “Diabetes impairs my leisure time”

and “Diabetes hindered/impossible to do something I could before” were statistically significant, being more prevalent in the study group. A Portuguese study²² carried out in 2018 analyzed 202 patients with diabetic foot, applying questionnaires that assessed the physical health, mental health and functionality of these people. Only 18.3% of the interviewees had complete independence for day-to-day activities, which illustrates the negative impact on functionality and, therefore, on the quality of life of people with diabetic foot. This study suggested that rehabilitation programs and multidisciplinary follow-up can have a positive impact on increasing the quality of life of this population.

Some caveats must be made to the study. In the question “I accepted having diabetes”, it is not possible to know what meaning the interviewees attributed to the word “I accepted”. The interviewer noted that some patients interpreted the term as being in agreement and willing to face the disease; while others interpreted it as a passive attitude towards the illness, which caused the disease to develop. According to Priberam’s Portuguese language dictionary, accepting can mean “according to” and can also mean “receiving what is offered”. These meanings illustrate the two possible interpretations. As the instrument used is a closed Likert scale, it is not possible to apprehend the meaning attributed by the interviewees to the verb “I accepted”. Although this ambiguity has drawn more attention on this issue specifically, it also occurred to a lesser extent on other issues. Therefore, it is suggested that, in future studies, the definition desired by the author of the work be brought when there are ambiguous terms in the questions.

In addition, the questionnaire has 25 questions, of which only 7 questions managed to differentiate between the two studied groups. Therefore, it was not possible to

validate the Brazilian questionnaire about the degree of satisfaction with life of patients with diabetic foot. However, the questions provide subsidies for us to think about future questions to be elaborated that could validate this type of instrument. Questions about treatment, functionality and suffering seem to be sensitive themes for the studied population.

CONCLUSION

The results found reinforce that the diabetic foot has a negative impact on the mental health and quality of life of patients who suffer from this complication.

Patients with diabetic foot report greater suffering, less functionality and a lower degree of confidence in the treatment when compared to diabetic patients who did not develop this complication.

There were some limitations in the study. It was not possible to validate a national questionnaire on the degree of satisfaction with life of patients with diabetic foot. However, the questions provide subsidies for us to think about future questions to be elaborated that could validate this type of instrument. It is suggested that, in the creation of new questionnaires, more questions about treatment, functionality and suffering be used. Furthermore, if there are ambiguous words or terms in these new questions, it would be interesting to have some explanation regarding the meaning attributed by the author.

Despite these shortcomings, the strength of the work is based on demonstrating the degree of suffering and loss of functionality of patients with diabetic foot, suggesting that psychological and multidisciplinary interventions can be valid strategies to increase the degree of satisfaction with life in this severely affected population.

REFERENCES

- 1 Ogurtsova, K., da Rocha Fernandes, J. D., Huang, Y., Linnenkamp, U., Guariguata, L., Cho, N. H., ... Makaroff, L. E. (2017). IDF Diabetes Atlas: Global estimates for the prevalence of diabetes for 2015 and 2040. *Diabetes Research and Clinical Practice*, 128, 40–50
- 2 de Oliveira PEJ, Junior RMM, Vencio S. Diretrizes da Sociedade Brasileira de Diabetes 2017-2018. Editora Clannad, 2017. 12-18
- 3 Shahbazian H, Yazdanpanah L, Latifi SM. Risk assessment of patients with diabetes for foot ulcers according to risk classification consensus of International Working Group on Diabetic Foot (IWGDF). *Pak J Med Sci*. 2013 May;29(3):730-4
- 4 de Groot M, Anderson R, Freedland KE, Clouse RE, Lustman PJ. Association of depression and diabetes complications: a meta-analysis. *Psychosom Med*. 2001 Jul-Aug;63(4):619-30
- 5 Boing AF, Melo GR, Boing AC, Moretti-Pires RO, Peres KG, Peres MA. Associação entre depressão e doenças crônicas: um estudo populacional [Association between depression and chronic diseases: results from a population-based study]. *Rev Saude Publica*. 2012 Aug;46(4):617-23. Portuguese.
- 6 Use of Diabetes Treatment Satisfaction Questionnaire in Diabetes Care: Importance of Patient-Reported Outcomes - Saisho Y. Use of Diabetes Treatment Satisfaction Questionnaire in Diabetes Care: Importance of Patient-Reported Outcomes. *Int J Environ Res Public Health*. 2018 May 9;15(5):947.
- 7 Orozco-Beltrán D, Artola S, Jansà M, Lopez de la Torre-Casares M, Fuster E. Impact of hypoglycemic episodes on health-related quality of life of type-2 diabetes mellitus patients: development and validation of a specific QoLHYPO® questionnaire. *Health Qual Life Outcomes*. 2018 Mar 23;16(1):52.
- 8 Rivas T, Carreira M, Domínguez-López M, Ruiz de Adana MS, Anarte MT. Development and Preliminary Validation of a New Type 1 Diabetes Adjustment Scale (DAS-1). *Front Psychol*. 2020 Apr 16;11:533
- 9 Baccaro F, Novelli Poisson P, Arduin J, Hilliar V. Diabetes Treatment Satisfaction Questionnaire (DTSQ) of in non-ambulatory type 2 diabetic patients. *Bol Asoc Med P R*. 2016;108(1):57-62. PMID: 29193919.
- 10 TANG, ZQ; CHEN, HL; ZHAO, FF. Gender Differences of Lower Extremity Amputation Risk in Patients With Diabetic Foot: A Meta-Analysis. *J Low Extrem Wounds*, [S. l.], p. 107-204, 8 ago. 2014.
- 11 ROSSANEIS, Mariana Angela; HADDAD, Maria do Carmo Fernandez Lourenço; MATIAS, Thaís Aidar de Freitas; MARCON, Sonia Silva. Diferenças entre mulheres e homens diabéticos no autocuidado com os pés e estilo de vida. *Revista Latino Americana de Enfermagem*, [S. l.], p. 1-8, 12 fev. 2016
- 12 DUBSKÝ, Michal; JIRKOVSKÁ, Alexandra; BEM, Robert; FEJFAROVÁ, Vladimira; SKIBOVÁ, Jelena; SCHAAPER, N.C; LIPSKY, B.A. Risk factors for recurrence of diabetic foot ulcers: prospective follow-up analysis in the Eurodiale subgroup. *Internacional Wound Journal*, [S. l.], p. 555-561, 10 out. 2013
- 13 IMRAN, I; DEFA, A; HARYANTO, H; SURIADI, J; MAKOTO, O; MAYUMI, O; et al. Effects of understanding wellbeing on psychological aspects and wound healing in patients with diabetic foot ulcer recurrence: a pilot randomised controlled trial. *Diabetic Foot Journal* p.119-26, 14 fev. 2019
- 14 MCBRIDE, E; HACKING, B; O'CARROLL, R; YOUNG, M; JAHR, J; BORTHWICK; et al. Increasing patient involvement in the diabetic foot pathway: a pilot randomized controlled trial. *Diabetic Medicine*, 2016
- 15 AL-RUBEAN, Khalid et al. DIABETIC Foot Complications and Their Risk Factors from a Large Retrospective Cohort Study. *Plos One*, [S. l.], p. 1-17, 6 maio 2015.
- 16 LACLÉ, A; VALERO-JUAN, L.F. Diabetes-related lower-extremity amputation incidence and risk factors: a prospective seven-year study in Costa Rica. *Revista Panamericana de Salud Publica*. p. 192–198. 2012.
- 17 ABOLFOTOUH, M.A; ALFAIFI, AS; AL-GANNAS, A.S. Risk factors of diabetic foot in central Saudi Arabia. *Saudi Med J*; p. 32: 708–713, 2011

18 CHEN, Huifen; CAI, Cong; XIE, Jun. The effect of an intensive patients' education program on anxiety, depression and patient global assessment in diabetic foot ulcer patients with Wagner grade 1/2. *Medicine Open Journal* , [S. l.], p. 1-10, 2019.

19 FU-HUI, Jiang; et al. The Incidence of Depression in Patients With Diabetic Foot Ulcers: A Systematic Review and Meta-Analysis. *The Internacional Journal of Lower Extremity Wounds*, p 161-173, 11 June. 2020

20 POLIKANDRIOTI, M; VASILOPOULOS, G; KOUTELEKOS, I; PANOUTSOPOULOS, G; GEROGIANNI, G; ALIKARI, V; DOUSIS, E; ZARTELOUDI, A. Depression in diabetic foot ulcer: Associated factors and the impact of perceived social support and anxiety on depression. *Internacional Wound Journal*, Aug. 2020

21 AHMAD, Ali et al. "Anxiety and Depression Among Adult Patients With Diabetic Foot: Prevalence and Associated Factors." *Journal of clinical medicine research* vol. 10, p. 411-418, 10 May. 2018

22 PEDRAS, S; CARVALHO, R; PEREIRA, M.G; Predictors of quality of life in patientswith diabetic foot ulcer: the role of anxiety, depression, and functionality. *Journal Health Psychology*, p.1488-98, 17 July. 2016