ORIGINAL ARTICLE

REVISTA ENFERMAGEM ATUAL IN DERME

MEN'S HEALTH: RELATIONSHIP BETWEEN RISK FACTORS FOR DIABETES MELLITUS AND QUALITY OF LIFE

SALUD DEL HOMBRE: RELACIÓN ENTRE FACTORES DE RIESGO PARA DIABETES MELLITUS Y CALIDAD DE VIDA

SAÚDE DO HOMEM: RELAÇÃO ENTRE FATORES DE RISCO PARA DIABETES MELLITUS E QUALIDADE DE VIDA

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ABSTRACT
Aim: To evaluate the relationship between risk factors for diabetes mellitus and quality of life in male employees of the university campus marco zero of Universidade Federal do Amapá. **Methods**: cross-sectional study with 103 men in Macapá-Amapá. The Finnish Diabetes Risk Score - FINDRISC and the Short-Form Health Survey (SF-12) were used. To study the relationship between risk factors for diabetes mellitus and quality of life, Pearson's and Spearman's correlation coefficients, Student's T test and ANOVA were used. **Results**: positive correlation (R=0.345; p<0.001) between age and the psychological dimension of quality of life; negative correlation between FINDRISC with the physical dimension (R= - 0.312, p=0.001) and psychological dimension (R= -0.201, p=0.042) of quality of life, indicating better quality of life and lower risk of developing diabetes. **Conclusion:** The risk for diabetes among male servants participating in this study was correlated with quality of life for the physical and psychological dimensions, demonstrating the lower the risk factors, the better the quality of life. Implications for practice: Assessment of the relationship between risk factors risk for diabetes and quality of life contributes to human health care, creating possibilities for the construction of protocols for comprehensive care.
Keywords: Quality of life; Risk factors; Diabetes Mellitus; Men's Health.

RESUMEN
Objetivo: Evaluar la relación entre los factores de riesgo para diabetes mellitus y la calidad de vida en empleados del sexo masculino del campus universitario Marco Zero de la Universidad Federal de Amapá. **Métodos:** estudio transversal con 103 hombres en Macapá-Amapá. Se utilizaron la puntuación finlandesa de riesgo de diabetes -FINDRISC y la encuesta de salud de formato corto (SF-12). Para estudiar la relación entre los factores de riesgo para diabetes mellitus y la calidad de vida, se utilizaron los coeficientes de correlación de Pearson y Spearman, la prueba T de Student y ANOVA. **Resultados:** correlación positiva (R=0,345; p<0,001) entre la edad y la dimensión psicológica de la calidad de vida; correlación negativa entre FINDRISC con la dimensión física (R= -0,312, p=0,001) y dimensión psicológica (R= -0,201, p=0,042) de la calidad de vida, indicando mejor calidad de vida ymenor riesgo de desarrollar diabetes. **Conclusión:** Elriesgo de diabetes entre los servidores varones participantes de este estudio se correlacionó con la calidad de vida en las dimensiones física y psicológica, demostrando que cuanto menores son los factores de riesgo, mejor es la calidad de vida. Implicaciones para la práctica: La evaluación de la relación entre los factores de riesgo de diabetes y los factores de calidad de vida contribuye al cuidado de la salud humana, creando posibilidades para la construcción de protocolos de atención integral.
Palabras clave: Calidad de Vida; Factores de Riesgo; Diabetes Mellitus; Salud Del Hombre.

RESUMO
Objetivo: Avaliar a relação entre fatores de risco para diabetes mellitus e qualidade de vida em servidoreshomens do campus universitário marco zero da Universidade Federal do Amapá. **Métodos**: estudo transversal com 103 homens em Macapá-Amapá. Utilizou-se o FinnishDiabetes Risk Score -FINDRISC e o Short-Form Health Survey(SF-12). Para o estudo da relação entre fatores de risco para diabetes mellitus e a qualidade de vida, utilizou-se os coeficientes de Correlação de Pearson e de Spearman, o Teste T de Student e ANOVA. Resultados: correlação positiva (R=0,345;p<0,001)entre idade e a dimensão psicológica da qualidade de vida; correção negativa entre FINDRISC com a dimensão física (R= -0,312, p=0,001) e dimensão psicológica (R= -0,201,p=0,042)da qualidade de vida, indicando melhor qualidade de vida menor risco de desenvolver diabetes. Conclusão: O risco para diabetes entre os servidores homens participantes deste estudo apresentou correlação com qualidade e vida para as dimensões física e psicológica, demonstrando quanto menor os fatores de risco, melhor a qualidade de vida. Implicações para prática: Avaliação da relação entre os fatores de risco para diabetes e qualidade de vida contribui na atenção a saúde do homem, criando possibilidades à construção de protocolos para assistência integral.
Palavras-chave: Qualidade de Vida; Fatores de Risco; Diabetes Mellitus; Saúde do Homem

REVISTA ENFERMAGEM ATUAL IN DERME

INTRODUCTION

The construction of “men's health” as a target for policies and research in Brazil is recent. Its promotion remains a challenge for Primary Health Care (PHC) services. 1 According to the National Policy for Integral Attention to Men's Health (PNAISH)[1], men's health is in line with and must be promoted in line with the national guidelines for the Unified Health System, which give a central and ordering place to PHC and to the Family Health Strategy.

The general objective of the PNAISH is to promote the improvement of the health conditions of the male population, in an effective way, to reduce the morbidity and mortality of the referred population, through the rational confrontation of risk factors[1]. From this perspective, it is understood the importance of identifying men at risk for developing diabetes mellitus (DM) with a focus on health care, due to the possibility of reversing the risk situation, since many of the factors are modifiable[2].

Comparative studies between men and women prove that men are more vulnerable to diseases, especially serious and chronic illnesses[3]. Among the diseases, DM stands out, which is one of the main chronic diseases that affect contemporary man[3-4]. Among risk factors, the following stand out: family history of diabetes, urbanization, lifestyle, inadequate diet, sedentary lifestyle, alcohol consumption and high blood pressure. In addition to these factors, age, gender and high capillary glycemia rate[4].

DM is recognized worldwide as a public health problem. It is estimated that there were 537 million adults living with diabetes in 2021 and this number is set to increase to 783 million in 2045. One in two adults with diabetes is undiagnosed. Many of these people live with the disease for long periods of time and are unaware of their condition [5].

Men usually have more difficulties in the search for health care, they seek health services late, because culturally they are not in the habit of preventing themselves against diseases and this means that, in most cases, the disease is discovered at an advanced stage, initiating the delayed treatment, making recovery difficult and increasing the possibility of death[1]. They reject the possibility of getting sick, possibly due to difficulty in recognizing their health needs. As a result, they have higher morbidity and mortality and lower life expectancy when compared to women[1].

Quality of Life (QoL) is made up of different factors, among them: individual well-being, satisfaction in social, environmental and cultural relationships, etc. These factors depend on the person's knowledge, the place where they live, the social group and their own hopes in relation to comfort and well-being[6]. Even though QoL is evaluated individually, there are parameters that promote knowledge about health needs, in this sense, the understanding of QoL as a social, environmental and personal balance, encompassing the human being holistically, including aspects of self-care, habits of life, spirituality, values and beliefs, among others[7], are important parameters for planning care strategies for men's health. Therefore, the identification of factors that interfere with QoL supports the planning and implementation of

REVISTA ENFERMAGEM ATUAL IN DERME

interventions that are effective, specific and capable of minimizing or preventing its impairment[7].

There is a tendency to find young adults vulnerable to developing diabetes on university campuses, because, with the search for professional stability, they adhere to a sedentary lifestyle and being overweight, influenced by technological evolution that minimizes physical effort in daily activities and fast and healthy eating. practice[8].

It is assumed that men who have these characteristics described above have compromised QoL as a result of adherence to an inadequate lifestyle. From this perspective, the research question arose: what is the relationship between risk factors for type 2 diabetes mellitus (DM2) and quality of life in male servants on the university campus marco zero -Unifap? Observing the scarcity of studies related to the topic in question[8], it is believed that there is a relationship between risk factors for DM2 and QoL. In this context, this research proposal on the university campus gained space, making it possible to study the theme in a process of caring and contributing to the male health policy.

Aware of these issues and considering that non-transmissible chronic diseases, especially DM2, are related to lifestyle and social and cultural habits that circumscribe men's daily lives for a long period, it is believed that health interventions should precede the processes of illnesses. Thus, feedback on the results from this research may contribute to thinking, planning and implementing preventive strategies anchored in health practices, in order to minimize risk factors and/or reduce the exposure of male employees who work on the Marco Zero campus. from Unifap to these factors.

In view of the above, this study aimed to evaluate the relationship between risk factors for DM and QoL in male servants on the university campus Marco Zero of the Federal University of Amapá.

METHODS

This is a cross-sectional, descriptive study, guided by the STROBE tool. Held at the Federal University of Amapá-Unifap, Marco Zero campus, located in the city of Macapá, Amapá, Brazil. Data collection took place between January and June 2021.

The study population consisted of 103 Unifap employees, male, aged 18 years and over. The sample was non-probabilistic, of the convenience and accessibility type, selected in 2021. The inclusion criterion took into account the effective servers of the different workspaces on the Marco Zero campus, residing in the city of Macapá. Those with a clinical diagnosis of Diabetes Mellitus and mental disorders were excluded.

A survey was carried out in the database of the Pro-Rectory of Personnel Management – PROGEP/Unifap to select the effective male servants from the different work environments. Those selected to participate in the research were approached and guided online about the research objectives, information related to benefits and risks, reading of the Free and Informed Consent Form (TCLE) and request for signature.

REVISTA ENFERMAGEM ATUAL IN DERME

Data collection was carried out using: 1) a questionnaire to characterize the sample, consisting of closed questions related to social, economic and demographic variables; 2) Questionnaire Item Short-Form Health Survey (SF-12)[9] consists of twelve items derived from the SF-36, the SF-12 assesses eight different dimensions of influence on quality of life, considering the person's perception of regarding aspects of your health in the last four weeks. Each item has a group of responses distributed on a graduated Likert-type scale, evaluating the following dimensions: physical function, physical aspect, pain, general health, vitality, social function, emotional aspect and mental health. This instrument has its own algorithm, two scores can be measured: the physical (Physical Component Summary or PCS) and the mental (Mental Component Summary or MCS). In both, the score varies on a scale from zero to one hundred, with higher scores associated with better levels of quality of life. Internal consistency measured by Cronbach's alpha coefficient equal to 0.836(9). 3) The Finnish Diabetes Risk Score -FINDRISC[10] questionnaire, a screening tool to estimate the risk probability of developing type 2 diabetes mellitus over the next 10 years, as well as the probability of asymptomatic DM2, without the need for laboratory tests, whose Cronbach's alpha internal consistency coefficient equals 0.84[10]. Composed of 8 questions related to age, blood pressure, Body Mass Index (BMI), waist circumference, physical activity, diet, use of antihypertensive medication, history of high blood glucose and family history of DM. The FINDRISC score ranges from a minimum of zero to a maximum of 26 points and allows classifying people according to their risk for developing diabetes: low (< 7 points); slightly moderate (between 7 and 11 points); moderate (12-14 points); high (15-20 points) and very high (more than 20 points). To study the association between the risk of diabetes and other variables, the sample was divided into men with FINDRISC scores < 12 and ≥ 12 points[11].

The questionnaires were applied with the help of the Google Forms digital tool, generating a search link that was sent to all servers through the e-mails registered in the university's people management system. The research was also disseminated through the institution's communication channels: the University's website and official networks, such as Facebook and Instagram, University Radio and Whatsapp groups.

In the descriptive analysis, the Statistical Package for the Social Sciences (SPSS) program, version 26 for Windows[12] was used. For quantitative variables, the minimum, maximum, mean and standard deviation (SD) descriptive measures were used; and, for the qualitative ones, absolute (n) and relative (%) frequencies were used. The reliability of the SF-12-quality of life questionnaire was assessed using Cronbach's alpha value, with values greater than 0.70 being considered adequate [13].

To study the association of sociodemographic factors with the scores of the dimensions of quality of life, Pearson's correlation coefficient was applied to study the correlation with quantitative variables (age and

REVISTA ENFERMAGEM ATUAL IN DERME

FINDRISC score) and Spearman's correlation coefficient to study the correlation with ordinal variables (schooling, financial situation, family income). Student's t test was also applied to assess the significance of differences in QoL scores regarding sexual orientation (dichotomous variable) and ANOVA regarding nominal qualitative variables with more than two categories (race/color, marital status, religion). In these tests, the null hypothesis points to the absence of differences between the variable categories (sexual orientation, race/color, marital status, religion and sexual orientation). As for the scores of the QoL dimensions, the alternative hypothesis points to the existence of differences between the variable categories. Data normality and variance homogeneity, necessary conditions for using Student's t test and ANOVA, were tested and validated with the Kolmogorov-Smirnov test and the Levene test, respectively.

For the conclusions of the results of the statistical tests, a significance level was considered of 5%, that is, associations were considered statistically significant when the significance value was less than 0.05 ($p < 0.05$).

The study complied with the principles and norms pre-established by Resolution n. 466/2012 of the National Health Council, being approved by the Research Ethics Committee of the Federal University of Amapá-UNIFAP, CAAE:18340619.0.0000.0003, opinion n. 3.718.246.

RESULTS

Study participants were aged between 20 and 66 years, mean age (41.9±10.3) years. The majority declared themselves to be of mixed race/color (68.0%). Data related to schooling show high levels of schooling (55.3%) have a master's or undergraduate degree. Regarding their financial situation, (4.9%) said it was bad, (53.4%) regular and (41.7%) good.

Table 1 shows the frequency of responses to the FINDRISC questionnaire and the risk score for developing DM2 over a 10-year period. The results show that (26.2%) had low risk, (25.2%) slightly moderate risk, (17.5%) moderate risk, (30.1%) high risk and (1.0%) very high risk. Considering the cutoff point 12, (48.5%) have a FINDRISC score greater than or equal to 12.

Table 1 - Risk for developing Type 2 Diabetes Mellitus, according to the FINDRISC score, Macapá-AP/Brazil, 2021 (n = 103)

Questions FINDRISC		**n**	**%**
1. What age group do you fall into?	Under 35 years old (0)	25	24,3%
	Between 35 and 44 yeras old (1)	43	41,7%
	Between 45 and 54 years old (2)	19	18,4%
	Between 55 and 64 years old (3)	15	14,6%
	Over 64 years old (4)	1	1,0%
2. Does any member of your family have diabetes?	No (0)	46	44,7%
	Yes, an estranged family member (3)	17	16,5%

REVISTA ENFERMAGEM ATUAL IN DERME

	Yes, a close family member (4)	40	38,8%
3. What is your abdominal measurement at navel level?	Under 94 cm (0)	36	35,0%
	94 to 102 cm (3)	44	42,7%
	More than 102 cm (4)	23	22,3%
4. Do you practice at least 30 minutes of physical activity a day?	Yes (0)	40	38,8%
	No (2)	63	61,2%
5. Do you usually eat vegetables and fruits?	Everyday (0)	42	40,8%
	Rarelly (2)	61	59,2%
6. Do you take medication for high blood pressure?	No (0)	87	84,5%
	Yes (2)	16	15,5%
7. Have you ever found out that you have high blood sugar?	No (0)	70	68,0%
	Yes (2)	33	32,0%
8. What is your body mass index (BMI)?	Under25 kg/m2 (0)	17	16,5%
	Between 25 and 30 kg/m2 (1)	46	44,7%
	More than 30 kg/m2 (3)	40	38,8%
DIABETES RISK			
Risk of developing diabetes	Low (< 7 points)	27	26,2%
	Slightly moderate (7- 11 points)	26	25,2%
	Moderate (12-14 points)	18	17,5%
	High (15-20 points)	31	30,1%
	Very high (> 20 points)	1	1,0%
Risk of developing diabetes	Low risk (< 12 points)	53	51,5%
	Moderate/High risk (≥ 12 points)	50	48,5%

Source: Elaborated by the authors (2021)

The SF-12 Quality of Life questionnaire includes 12 questions that assess two dimensions of QoL: Physical Dimension with 6 questions (1, 2a, 2b, 3a, 3b, 5) and Psychological Dimension also with 6 questions (4a, 4b, 6a, 6b, 6c, 7). The scores for the two dimensions were obtained following the instructions available on the website https://labs.dgsom.ucla.edu/hays/pages/programs_utilities. The scores of the SF-12 items were recoded and the scores calculated in order to obtain scores ranging from zero to one hundred, with higher scores associated with better levels of quality of life. The response frequencies for each SF-12 question are shown in Table 2.

Table 2 - Results of the domains evaluated by applying the Quality of Life questionnaire - SF-12, Macapá-AP/Brazil, 2021 (n = 103)

Questions SF-12		**n**	**%**
PHYSICAL DIMENSION			
1. Generally, how would you classify your health:	1 Excelent (5.0)	9	8,7%
	2 Very well (4.4)	28	27,2%
	3 Good (3.4)	43	41,7%
	4 Rasonable (2.0)	23	22,3%
	5 Weak (1.0)	0	0,0%
2. Does your current health limit you in these			

REVISTA ENFERMAGEM ATUAL IN DERME

activities:			
2A. moderate activities, such as moving a table, sweeping or vacuuming, cycling, or swimming	1 Yes, very limited		
	2 Yes, a little limited (2)	3	2,9%
	3 No, not at all limited (3)	27	26,2%
		73	70,9%
2B. climb several stairs	1 Yes, very limited(1)		
	2 Yes, a little limited (2)	1	1,0%
	3 No, not at all limited (3)	29	28,2%
		73	70,9 %
3. During the last 4 weeks, how much time have you had at your job or other regular daily acitivities any of the following problems as a result of your physical state of health:			
3A. Did less than intended	1 Always (1)		
	2 Most of the time (2)		
	3 Some time (3)	1	1,0%
	4 Little time (4)		
	5 Never (5)	12	11,7%
		13	12,6%
		41	39,8%
		36	35,0%
3B.felt limited at your job or other activities	1 Always (1)		
	2 Most of the time (2)		
	3 Some time (3)	0	0,0%
	4 Little time (4)		
	5 Never (5)	2	1,9%
		19	18,4%
		38	36,9%
		44	42,7%
5. During the past 4 weeks, how has pain interfered with your work? (related to work outside the home and domestic work)	1 Absolutely nothing (5)		
	2 A little (4)	49	47,6%
	3 Moderately (3)		
	4 Enough (2)		

	5 Immense (1)		
		34	33,0%
		14	13,6%
		5	4,9%
		1	1,0%
PSYCHOLOGICAL DIMENSION			
4. During the last 4 weeks, hoew much time have you had any of the following problems with your job or other regular activities, caused by any emotional problems(as depression or anxiety)			
	1 Always (1)		
	2Most of the time (2)		
4A. Did less than intended	3 Some time (3)	3	2,9%
	4 Little time (4)		
	5 Never (5)		
		10	9,7%
		22	21,4%
		30	29,1%
		38	36,9%
	1 Always (1)		
	2Most of the time (2)		
4B. Worked or did other activities less careful than usual	3 Some time (3)	0	0,0%
	4 Little time (4)		
	5 Never (5)		
		5	4,9%
		23	22,3%
		32	31,1%
		43	41,7%
6. How much time, during the last 4 weeks:			
	1 Always (1)		
	2Most of the time (2)		
6A. Felt calm or relaxed?	3 Some time (3)	19	18,4%
	4 Little time (4)		
	5 Never (5)		
		56	54,4%
		16	15,5%
		9	8,7%
		3	2,9%
6B. Felt willing?	1 Always (1)	13	12,6%

	2Most of the time (2)		
	3 Some time (3)		
	4 Little time (4)		
	5 Never (5)		
		61	59,2%
		16	15,5%
		13	12,6%
		0	0,0%
	1 Always (1)		
	2Most of the time (2)		
6C. Felt sad or depressed?	3 Some time (3)	1	1,0%
	4 Little time (4)		
	5 Never (5)		
		10	9,7%
		20	19,4%
		40	38,8%
		32	31,1%
	1 Always (1)		
	2Most of the time (2)		
7. During the past 4 weeks, to what extent has your physical health or emotional problems limited your social activity (such as visiting family or close friends)?	3 Some time (3)	5	4,9%
	4 Little time (4)		
	5 Never (5)		
		8	7,8%
		18	17,5%
		35	34,0%
		37	35,9%

Source: Elaborated by the authors (2021)

Table 3 shows the values of the Cronbach's Alpha for the Physical Dimension of the SF-12 was 0.821 and for the Psychological Dimension was 0.902, both being indicators of adequate levels of reliability. The Physical Dimension score ranged from a minimum of 30.0 to a maximum of 100.0 points, with an average of 76.3 (SD = 17.3). The mean score for the Psychological Dimension was 71.8 (SD = 20.3), ranging from a minimum of 20.8 to a maximum of 100.0.

Table 3 - Reliability and characterization of the dimensions of the SF-12, Macapá-AP, Brazil, 2021 (n = 103)

REVISTA ENFERMAGEM ATUAL IN DERME

Dimensions of SF-12	Alpha de Cronbach	Minimum	Maximum	Average	Standard deviation
Physical Component	0,821	30,0	100,0	76,3	17,3
Psychological Component	0,902	20,8	100,0	71,8	20,3

Source: Elaborated by the authors (2021)

Table 4 presents the results of the study of the association of sociodemographic data and the risk of developing DM with the two dimensions of QoL. The results show a positive correlation (Pearson's coefficient) between age and the Psychological Dimension of QoL (R = 0.345, p < 0.001), but not with the Physical Dimension (R = 0.096, p = 0.341). Financial situation and family income are also positively correlated with the two dimensions of QoL, indicating that the better the financial situation and the higher the family income, the better the QoL both physically and psychologically.

The Pearson Correlation Coefficient values of the FINDRISC score with the Physical Dimension (R = -0.312, p = 0.001) and with the Psychological Dimension (R = -0.201, p = 0.042) of QoL were negative, indicating the existence of a association of better quality of life with lower risk of developing diabetes. No significant association was found (p>0.05) with race/color, marital status, religion, education, or sexual orientation.

Table 4 - Correlation between sociodemographic variables, risk factors for Type 2 Diabetes Mellitus and dimensions of quality of life-SF-12, Macapá-AP, Brazil, 2021 (n = 103)

Factors	Life Quality (SF-12)	
	Physical Dimension	**Psychological Dimension**
Age		
Spearman Correlation Coefficient	*R = 0,096, p = 0,341*	***R = 0,345, p < 0,001***
Race/color		
Brown	75,4 (17,6)	69,0 (23,3)
White	75,8 (17,6)	71,0 (20,5)
Black	79,3 (16,9)	79,4 (14,9)
ANOVA	*p = 0,750*	*p = 0,267*
Marital status		
Married	76,3 (18,3)	72,5 (21,3)
Single	77,4 (16,4)	71,3 (20,0)
Stable Union	75,0 (17,4)	71,4 (20,0)
ANOVA	*p = 0,855*	*p = 0,960*
Religion		
Catholic	75,2 (18,9)	70,7 (19,6)
Christian	80,6 (15,0)	72,5 (17,3)
Others	73,6 (17,8)	72,9 (21,8)
None	75,4 (15,6)	72,5 (26,3)
ANOVA	*p = 0,541*	*p = 0,974*
Schooling		
Spearman Correlation Coefficient	*R = 0,025, p = 0,800*	*R = 0,179, p = 0,070*
Financial Situation		

Spearman Correlation Coefficient	***R = 0,366, p < 0,001***	***R = 0,219, p = 0,026***
Family income		
Spearman Correlation Coefficient	***R = 0,195, p = 0,048***	***R = 0,219, p = 0,026***
Sexual Orientation		
Heterossexual	77,1 (17,1)	73,3 (20,5)
Homossexual/ Bissexual	71,9 (18,4)	64,2 (17,9)
T test Student	*p = 0,260*	*p = 0,092*
Diabettes Risk (score FINDRISK)		
Spearman Correlation Coefficient	***R = -0,312, p = 0,001***	***R = -0.201, p = 0,042***

Source: Elaborated by the authors (2021)

DISCUSSION

The motivation for carrying out this study is due to the fact that men take less care of their health in a preventive way and have a self-care deficit, which makes it difficult to identify chronic diseases early, leading to late treatment[14], resulting in higher morbidity and mortality in men[15]. The resistance of the male population to seek health services increases the physical and emotional suffering of the man and his family in the struggle to preserve the health and quality of life of these people[16].

The risk factors observed by the FINDRISC score, in the sample investigated in this study, showed a higher prevalence with low risk and slightly moderate risk, a score similar to that of the study carried out in a municipality in southern Brazil[17]. However, a significant portion (48.5%) of that sample had a moderate to very high risk of developing DM2 in the next 10 years. Although studies with a male population such as this study, applying FINDRISC, are not identified in the literature, these results are higher when compared to studies carried out in the South and Northeast regions of Brazil[12,16], which presented (18.6%) and (18.1%) respectively, and lower than the results of the study carried out in the Southeast region (51.2%)[17].

Among the non-modifiable risk factors, the degree of kinship (close family member with a history of DM) and age were evidenced in the data of this study. These results are corroborated by the literature, which reveals that family history increases the risk for DM2, as measured by the single nucleotide polymorphism (SNP) rs7903146 of the 7-like2 transcription factor gene in many ethnic populations, which is a non-changeable characteristic, hence the importance of preventing other risk factors[18]. Young adults composed the sample of this study, in which the mean age was 41.9 years, although the recommendation of the Ministry of Health is to screen people aged ≥ 45 years, it is observed that there is a counterpoint in the literature when it shows people with age younger than 45 years, presenting risk factors for developing DM2[19].

However, the Sociedade Brasileira de Diabetes (SBD)[6] recommends screening for people under 45 years of age, whose overweight or obesity factors are composing the degree of risk, and even if the person has more than one risk factor from the list that proposes. The sample studied here, in addition to factors related to weight and age, had a sedentary lifestyle and

REVISTA ENFERMAGEM ATUAL IN DERME

family history, which reinforces the SBD recommendation. It is important to highlight the fact that most of the sample consisted of young-adult workers, therefore, the younger the age, the lower the chance of developing chronic diseases [20], especially DM2.

When it comes to the health of the male population, these data can favor health services in the elaboration of strategies to comply with the light of the health promotion policy, since it makes it possible to implement actions for the prevention of DM.

Among the modifiable risk factors (body mass index and waist circumference), most of those investigated in this study exceed the normality parameter, contributing to the high and very high risk in which a significant part of the participants was classified. These factors collaborate to indicate the degree of obesity or overweight, and body fat distribution, both of which are relevant in studies investigating risk factors, given that it has been established that the place of deposit and distribution of fat in the body represent the degree of different risk, so that the abdominal adipose tissue, and more specifically the perivisceral adipose tissue, is the one that is associated with the highest risk of diseases such as DM2, among others[21]. The important interaction with the genetic susceptibility that obesity presents is highlighted, cooperating with the increase in insulin resistance favoring the increased risk of developing DM2[2,22] allowing a relationship between the increase in waist circumference and the consequent higher risk for DM2.

Physical inactivity and non-consumption of fruits and vegetables in the daily menu were also modifiable risk factors identified in the sample of this study and confirm data from other studies [2,23] in which the same factors were altered. Physical inactivity favors obesity, which in itself is a risk factor for DM2. A study carried out in Ceará[17] found that the most predominant risk factors were abdominal obesity and sedentary lifestyle by FINDRISC, corroborating the results of this study. It is estimated that physical inactivity is responsible for 7% of DM2 cases[22]. Therefore, the risk of developing DM2 is strongly associated with low physical activity, unhealthy diet, and abdominal obesity, all of which can be influenced and modified by supporting healthy lifestyles[19]. In such a way, physical activity contributes to reducing the risk of developing DM2. The contribution of occupational characteristics as additional risk factors for the development of DM2 appears in the literature, as workers whose work routines make it difficult to adopt healthy habits related to food and physical activity increase their vulnerability to developing this type of DM[17] .

Among the modifiable risk factors, the adoption of healthy habits related to food is the main one, which, associated with weight control and the practice of physical exercise, reduces insulin resistance and, therefore, the probability of men developing DM2, even those with a family history of the disease[24].

As for the QoL scores evaluated with the SF-12 (Table 4), it was observed that the physical dimension had the highest mean, while the psychological dimension, slightly lower,

REVISTA ENFERMAGEM ATUAL IN DERME

suggesting a slight weakness in the perception of the psychological dimension of QoL. However, considering the study on a sample of men, young adults, workers, with a very good level of schooling, included because they were male and belonged to the university's permanent staff, and not because they had any risk factor, this characteristic becomes evident and may deserve credit for prevention. It is believed in the hypothesis that men develop positive beliefs regarding their physical and psychological attributes as individual and collective coping strategies[25] of risks that were identified in the results of this study. The investigation of the hypothesis may be the motivation for further study.

The positive correlation between age and the psychological dimension suggests that the participants' perception of QoL is more favorable in younger men. In this context, although the study carried out in Vitória has a field and instrument that are different from those used in this study, even so, it demonstrated that the perception of the QoL domains was less favorable in users who were older and from a lower socioeconomic class[25]. It corroborates the results found in this study, as in addition to the sample being younger, it has a better economic condition. The financial situation and family income also showed a positive correlation with the physical and psychological dimensions, suggesting that the number of people who report health problems decreases as income increases, which places the country in a pattern of large social differences in terms of health terms[26].

The statistically significant relationship identified between risk factors for developing DM2 (FINDRISC score) and the dimensions of quality of life, it was not possible to be discussed, due to the scarcity of studies, which makes this relationship still unknown, constituting a challenge for future investigations. However, it answers our research question and confirms our hypothesis, reinforcing the importance of scales that make it possible to identify male workers at risk or with undiagnosed DM2, it contributes to screening these men for referral to health services for screening appointments, as well as studies previous studies have demonstrated[19,27]. This finding reinforces the applicability of FINDRISC and SF-12 in clinical practice as highly accurate tools for estimating QoL with assessment of physical and mental health status[20] and the risk of developing DM2[17,28].

STUDY LIMITATIONS

As limitations of the study, the cross-sectional design does not allow establishing a causal relationship. The sample belongs to only one university campus in a municipality; therefore, there is a limit to the generalizability of the results. The fact that data collection took place online, at a time when activities on campus were suspended due to the COVID-19 pandemic, may not have reached all male workers on UNIFAP's ground zero campus, since neither all have internet access. The scarcity of current studies related to the focus on men's health with risk factors for DM2 and quality of life is another limitation of the present study. However, as

REVISTA ENFERMAGEM ATUAL IN DERME

potentiating factors, we highlight the application of consecrated instruments indicated in the literature, the recognized importance of identifying risk factors for DM2 and the assessment of QoL related to men's health.

CONTRIBUTIONS TO THE PRACTICE

The assessment of the relationship between risk factors for DM2 and QoL contributes to men's health care, as it allows identification, capture and creation of possibilities for the construction of protocols for comprehensive and continuous care for men, as guided by the PNAISH. It is believed that the evidence identified in the results of this study will contribute to the Brazilian scientific production on the risk of DM2 and quality of life in the male population, due to the relevance and the few national studies that deal with this theme, pointing to the importance of prevention and reduction of factors of risk for T2DM in male university campus workers.

CONCLUSION

The risk for DM2 among male civil servants participating in this study correlated with quality of life for the physical and psychological dimensions, demonstrating that the lower the risk factors, the better the QoL. In addition, the modifiable risk factors were those with the highest risk indicator, as it favors the planning of interventions to reduce them. As for QoL, a correlation was observed between age and the psychological dimension, as well as family income and financial situation and the psychological and physical dimensions, influencing QoL, since the sample of this study consisted of young adults, with a good level of education, however, family income and financial situation are considered regular, indicating weakness in QoL. The performance of longitudinal studies that can infer causality factors for risk factors for DM2 and quality of life are indicative raised from this study.

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Authors' contribution

Amiraldo Dias Gama: Contributed substantially to the design and planning of the study, to obtaining, analyzing and interpreting data, as well as to the writing and critical review and final approval of the published version.
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Jéssica Gomes da Silva: Contributed to the critical review and final approval of the published version.
José Luis da Cunha Pena: Contributed to the analysis and interpretation of data, as well as to the writing and critical review and final approval of the published version.
Cecília Rafaela Salles Ferreira: Contributed to the analysis and interpretation of data, as well as to the writing and critical review and final approval of the published version.
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Francineide Pereira da Silva Pena: Contributed substantially to the conception and planning of the study, obtaining, analyzing and interpreting data, as well as writing and critically reviewing and final approval of the published version.

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