







## **FACTORS ASSOCIATED WITH RESILIENCE IN PEOPLE WITH DIABETES DURING THE SOCIAL DISTANCING PERIOD IMPOSED BY THE COVID-19 PANDEMIC**

Jaciely Gondim Sidrônio de Lucena<sup>1</sup>   
Thaysa Fernandes de Azevedo<sup>1</sup>   
Lucas David Maia Matias<sup>1</sup>   
Waleska de Brito Nunes<sup>1,2</sup>   
Marta Miriam Lopes Costa<sup>3</sup>   
Lidiane Lima de Andrade<sup>1</sup> 

<sup>1</sup>Universidade Federal de Campina Grande, Unidade Acadêmica de Enfermagem. Cuité, Paraíba, Brasil.

<sup>2</sup>Universidade Federal do Rio Grande do Norte, Programa de Pós-graduação em Saúde Coletiva. Natal, Rio Grande do Norte, Brasil.

<sup>3</sup>Universidade Federal da Paraíba, Programa de Pós-graduação em Enfermagem. João Pessoa, Paraíba, Brasil.

### **ABSTRACT**

**Objective:** to verify the association of socioeconomic and clinical data and behavioral habits with the resilience level in people with Diabetes Mellitus during social distancing in the pandemic caused by the new coronavirus disease.

**Method:** a cross-sectional, analytical and exploratory study. The population consisted of users monitored in the Family Health Strategy, diagnosed with Diabetes Mellitus, in the municipality of Cuité, Paraíba, Brazil. The sample consisted of 300 participants. The data were collected between November 2020 and February 2021 and operationalized through two forms: one containing socioeconomic and clinical aspects, as well as behavioral habits; and another that was part of the Connor Davidson Resilience Scale for Brazil, consisting of 25 items divided into four factors, namely: tenacity, adaptability, tolerance, dependence on external support, and intuition. In the bivariate analysis, the Pearson's Chi-square and Fisher's Exact tests were performed, and the prevalence ratio was calculated, along with the respective 95% confidence intervals. Finally, Poisson Regression with robust variance was applied.

**Results:** the prevalence of having high resilience levels was 43% higher in people under 60 years old, 39% higher in Evangelicals, 36% higher in people who consumed alcoholic beverages and 29% higher in people who practiced some physical activity.

**Conclusion:** an association was evidenced between socioeconomic/clinical data and behavioral habits and a high resilience level; such findings lead to the elaboration of inclusive actions during the pandemic, especially considering the emotional and social aspects, in order to suggest the creation of care strategies aimed at mental health.

**DESCRIPTORS:** Diabetes Mellitus. Coronavirus infections. Social isolation. Psychological resilience. Nursing.

**HOW CITED:** Lucena JGS, Azevedo TF, Matias, LDM, Nunes WB, Costa MML, Andrade LL. Factors associated with resilience in people with diabetes during the social distancing period imposed by the COVID-19 pandemic. *Texto Contexto Enferm* [Internet]. 2022 [cited YEAR MONTH DAY]; 31:e20210215. Available from: <https://doi.org/10.1590/1980-265X-TCE-2021-0215>

# FATORES ASSOCIADOS À RESILIÊNCIA DE PESSOAS COM DIABETES NO DISTANCIAMENTO SOCIAL DA PANDEMIA DA COVID-19

## RESUMO

**Objetivo:** verificar a associação entre dados socioeconômicos, clínicos e hábitos comportamentais ao nível de resiliência em pessoas com diabetes mellitus durante o distanciamento social na pandemia da doença causada pelo novo coronavírus.

**Método:** estudo de corte transversal, analítico e exploratório. A população consistiu em usuários acompanhados na Estratégia Saúde da Família, diagnosticados com diabetes mellitus, no município de Cuité, Paraíba, Brasil. A amostra foi composta de 300 participantes. Os dados foram coletados entre novembro de 2020 a fevereiro de 2021 e operacionalizados por meio de dois formulários: um contendo aspectos socioeconômicos, clínicos, hábitos comportamentais e; outro que constou da Escala de Resiliência de Connor-Davidson para o Brasil, constituída por 25 itens divididos em quatro fatores, sendo eles: tenacidade, adaptabilidade-tolerância, dependência de apoio externo e intuição. Na análise bivariada foram realizados testes Qui-quadrado de Pearson e Exato de Fisher e calculada a razão de prevalência, com os respectivos intervalos de confiança de 95%. Por fim, foi operacionalizada a Regressão de Poisson com variância robusta.

**Resultados:** a prevalência em ter alto nível de resiliência foi 43% maior em menores de 60 anos, 39% maior em evangélicos, 36% maior em pessoas que consumiam bebida alcoólica e 29% maior em pessoas que praticavam atividade física.

**Conclusão:** evidenciou-se associação entre dados socioeconômicos, clínicos e hábitos comportamentais ao nível de resiliência alto; tais achados direcionam para a construção de ações inclusivas durante a pandemia, considerando, sobretudo os aspectos emocionais e sociais, com o intuito de sugerir a criação de estratégias de cuidado voltada à saúde mental.

**DESCRITORES:** Diabetes mellitus. Infecções por coronavírus. Isolamento social. Resiliência psicológica. Enfermagem.

# FACTORES ASOCIADOS A LA CAPACIDAD DE RECUPERACIÓN DE PERSONAS DIABÉTICAS DURANTE EL PERÍODO DE DISTANCIAMIENTO SOCIAL DE LA PANDEMIA DE COVID-19

## RESUMEN

**Objetivo:** verificar la asociación de diversos datos socioeconómicos y clínicos y hábitos conductuales con el nivel de capacidad de recuperación en personas con Diabetes Mellitus durante el período de distanciamiento social en la pandemia de la enfermedad causada por el nuevo coronavirus.

**Método:** estudio de corte transversal, analítico y exploratorio. La población estuvo compuesta por usuarios monitoreados en la Estrategia de Salud de la Familia, diagnosticados con Diabetes Mellitus, en el municipio de Cuité, Paraíba, Brasil. La muestra estuvo compuesta por 300 participantes. Los datos se recolectaron entre noviembre de 2020 y febrero de 2021 y se operacionalizaron por medio de dos formularios: uno con aspectos socioeconómicos y clínicos y hábitos conductuales; y otro que incluyó la Escala de Capacidad de Recuperación de Connor-Davidson para Brasil, constituida por 25 ítems divididos en cuatro factores, a saber: tenacidad, adaptabilidad-tolerancia, dependencia de apoyo externo, e intuición. En el análisis bivariado se aplicaron las pruebas Chi-cuadrado de Pearson y Exacta de Fisher, además de calcularse la relación de prevalencia, con los respectivos intervalos de confianza del 95%. Por último, se aplicó Regresión de Poisson con varianza robusta.

**Resultados:** la prevalencia de tener un nivel de capacidad de recuperación elevado fue 43% mayor en personas de menos de 60 años de edad, 39% mayor en individuos evangélicos, 36% mayor en personas que consumían bebidas alcohólicas y 29% mayor en quienes practicaban alguna actividad física.

**Conclusión:** se hizo evidente una asociación de diversos datos socioeconómicos/clínicos y hábitos conductuales con niveles elevados de capacidad de recuperación; dichos hallazgos conducen al diseño de acciones inclusivas durante a pandemia, considerando especialmente los aspectos emocionales y sociales, con el propósito de sugerir la elaboración de estrategias de atención dirigidas a la salud mental.

**DESCRIPTORES:** Diabetes Mellitus. Infecciones por coronavirus. Aislamiento social. Capacidad de recuperación psicológica. Enfermería.

## INTRODUCTION

Diabetes Mellitus (DM) is a chronic disease characterized by high blood glucose levels due to inability of the pancreas to produce the insulin hormone in sufficient amounts or when such hormone is not used properly by the body. It is estimated that 463 million people have DM in the world and that nearly 16.8 million are diagnosed in Brazil. Thus, given the clinical progress of the pathology and the high number of cases, it is considered a global health problem<sup>1</sup>.

An aggravating factor for the health of individuals with DM is the fact that the pathology makes them more susceptible to developing infections, with a high risk of uncontrolled disease and consequent immunological dysfunctions, responsible for rapid progression of infections and for poor prognoses. Diverse evidence leads to consider the possibility of this association between diabetes and the disease caused by the new coronavirus (COVID-19)<sup>2</sup>.

COVID-19's clinical status varies from asymptomatic infections to severe respiratory problems<sup>3</sup>. A study carried out with 1,590 patients diagnosed with COVID-19 in China evidenced that people with at least one circulatory or endocrine comorbidity, including diabetes, presented more severe cases of the disease, when compared to those who did not have any underlying disease<sup>4</sup>.

In addition to the physiological problems that affect individuals with DM, with the COVID-19 pandemic, the well-being of such people was compromised, as they are facing some challenges in relation to physical and mental self-care due to social distancing, eating habits, physical activities, purchase of anti-diabetic drugs and routine consultations with health professionals, which add to the anxious feelings and fear of being infected by the virus<sup>5</sup>.

The negative psychological effects from the pandemic, such as anguish and anxiety symptoms, sense of danger and uncertainty are increasing and, consequently, lower resilience levels are being presented; such phenomenon is influenced by gender, age, schooling level, marital status, occupational activity and previous physical and mental health problems, which cause psychological instability and exert an impact on people's quality of life<sup>6</sup>.

Regarding the psychoemotional situation, resilience can be pointed out, defined as a person's ability to resist and overcome difficulties as an ancillary attitude in the management of chronic diseases, allowing diabetes control and a better quality of life, even in the face of problematic situations experienced in the pandemic<sup>7</sup>.

Resilience exerts a significant impact on the proper performance of the diabetes care measures, especially in healthy eating and professional guidance, limited intake of sweets and blood glucose monitoring, in addition to the psychoemotional aspects. Consequently, resilience allows for greater empowerment, self-confidence and competence in self-care<sup>8</sup>.

Given the findings presented, resilience is observed as an essential tool to cope with complex conditions in people's lives. However, even recognizing the relevance of this theme and given the existence of studies that point to resilience related to people with diabetes, research studies relating the impact of social distancing caused by COVID-19 with the resilience of people with diabetes are still incipient.

Therefore, this study will enable health professionals to develop or reinforce care strategies aimed at improving the quality of life of this population, considering physical, emotional, social and spiritual aspects and taking into account the social distancing scenario to which individuals who live with DM are exposed.

This study aims at verifying the association of socioeconomic and clinical data and behavioral habits with the resilience level in people with Diabetes Mellitus during social distancing in the COVID-19 pandemic.

## METHOD

This is a cross-sectional, analytical and exploratory study. The population consisted of users monitored in the Family Health Strategy, diagnosed with DM, in the municipality of Cuité, located in the Curimataú area of Paraíba, northeastern Brazil. The individuals excluded were those aged less than 18 years old and with certain deficit in the communication process as described in the Nursing records contained in the medical charts.

To define the population, information was requested from the Municipal Health Secretariat of the study locus, which consulted the individual registration report, obtained through e-SUS and e-SUS PEC (Electronic Citizens' Record), indicating a total of 1,350 users registered in the five Basic Health Units in the urban area. Sample size calculation was carried out using public domain program OpenEpi, version 3.01, considering a 95% confidence level and a 5% sampling error, obtaining a sample number of 300 individuals.

The participants were selected through simple random probabilistic sampling; thus, to proceed with data collection and make it possible to locate the users, all the medical records of individuals diagnosed with DM in each Basic Health Unit were consulted, and the names and the addresses were recorded. After that, the data identified were associated with numbers, to enable the use of the quick draw application, which carried out the draw of the numbers necessary to meet the sample size.

The data were collected from November 2020 to February 2021 in person and at the users' homes; thus, personal protection equipment was used and a distance of two meters was maintained between the researcher and the research participant.

Collection was carried out through two forms, the first with socioeconomic and clinical aspects and behavioral habits; the second consisted of the Connor Davidson Resilience Scale for Brazil (CD-RISC-Br) which includes 25 items divided into four factors, namely: tenacity, adaptability, tolerance, dependence on external support, and intuition, which are evaluated by means of a *Likert* scale, with the following answer options: not true at all (zero); rarely true (one); sometimes true (two); sometimes true (three), and almost always true (four); the questions that make up the questionnaire refer to the last month, and the final score of the scale can vary from 0 to 100 points, where the higher the value, the better the resilience level<sup>9</sup>.

In a previous study, the scale was analyzed in relation to internal consistency, test/re-test, convergent validity and discriminant validity, as well as to the structural factor, and presented satisfactory psychometric properties, making it possible to differentiate people with lower and higher resilience levels<sup>7</sup>.

For data analysis, the resilience level was considered as outcome, attributing the term "low" to scores from 24 to 70, and "high" to scores from 71 to 98, according to the data obtained through the descriptive analysis of the database. The exposure variables were as follows: gender, age group, marital status, paid activity, years of study, monthly family income, number of people living on the income, self-declared skin color, religion, time since diagnosis, comorbidities, complications, consumption of alcoholic beverages, tobacco use, diet (hypoglycemic) and exercise.

It is noteworthy that the exposure variables were categorically analyzed (nominal or ordinal), emphasizing that consumption of alcoholic beverages, tobacco use, diet (hypoglycemic) and physical exercise were nominal and dichotomous (yes/no). The categories of the paid activity variable were unified since, in the context of social distancing, unemployed and retired people were restricted to their homes, while active workers might need to go out of their houses; therefore, it is assumed that these factors could influence the psychological and social issues related to resilience.

In the univariate analysis, the absolute and relative frequencies for the categorical variables were estimated, as well as the mean values and standard deviations for the numerical variables. In the bivariate analysis, association tests such as Pearson's Chi-square and Fisher's Exact were performed, and the Prevalence Ratio (PR) was also calculated, along with the respective 95% Confidence Intervals (CIs). The variables with statistical significance in the bivariate analysis were pre-selected and progressed for testing in the multivariate model, using Poisson Regression with robust variance, with those variables presenting 5% statistical significance remaining in the final model. The data were processed in the IBM Statistical Package for the Social Sciences (SPSS®) software, version 22.0.

It is worth noting that selection of the variables occurred through the evaluation of the quality of the model; thus, in Model 1, the following predictors were found: age group (60 years old), paid activity (active worker), years of study (8), family income ( $\geq 3$  minimum wages), self-declared skin color (white), religion (Evangelical), comorbidities (no), complications (no), consumption of alcoholic beverages (yes), physical exercise (yes), obtaining an Akaike Information Criterion (AIC) of 520.36 and a p-value in the Omnibus Test of 0.050. In Model 2, the predictors were age group (60 years old), religion (Evangelical), consumption of alcoholic beverages (yes), physical exercise (yes), with an Akaike Information Criterion (AIC) of 511.41 and a p-value in the Omnibus Test of 0.006. Therefore, the best model according to the adjustment criteria was Model 2.

The research was approved by the Research Ethics Committee and respected all the ethical precepts set forth in Resolution No. 466/12 of the National Health Council.

## RESULTS

Three hundred users participated in this research, of which 183 (61.0%) were female, the majority were older adults with a mean age of 63.5 ( $\pm 13.1$ ) years old, 170 (56.6%) lived on less than one minimum wage, 174 (58.0%) were married or lived in stable unions, and 231 (77.0%) had less than eight years of study. It is noted that 156 (52.0%) presented high resilience levels.

Table 1 presents the socioeconomic characterization and its respective association with the resilience level. Associations were observed between the following variables: age group, paid activity, years of study, monthly family income, self-declared skin color and religion.

Therefore, the prevalence of having a high resilience level was 55% higher in the participants under 60 years of age, 33% higher in active workers and 53% higher in people with more than eight years of study; 44% higher in people earning three or more minimum wages when compared to those earning one to two minimum wages, 57% higher in people earning three or more minimum wages compared to those earning less than one minimum wage; 28% higher in white-skinned individuals, and 42% higher in Evangelicals.

**Table 1** - Associations between the socioeconomic variables and the resilience level in individuals with Diabetes Mellitus during the COVID-19 pandemic. Cuité, PB, Brazil, 2020-2021. (n=300)

Variables	Resilience level				
	High n (%)	Low n (%)	PR*	95% CI†	p-value
Gender					0,053‡
Male	69 (59,0)	48 (41,0)	1,24	1,00-1,53	
Female	87 (47,5)	96 (52,5)	1	-	
Age group					<0,001‡
< 60	74 (67,3)	36 (32,7)	1,55	1,26-1,92	
≥ 60	82 (43,2)	108 (56,8)	1	-	
Marital status					0,409‡
Married/Stable union	94 (54,0)	80 (46,0)	1.09	0,877-1,374	
Single/Divorced/ Widowed	62 (49,2)	64 (50,8)	1	-	
Paid activity					0,004‡
Active worker	57 (69,5)	25 (30,5)	1.33	1,11-1,60	
Unemployed/Retired	156 (52,0)	144 (48,0)	1	-	
Years of study					<0,001‡
> 8	49 (71,0)	20 (29,0)	1,53	1,24-1,88	
≤ 8	107 (46,3)	124 (53,7)	1	-	
Monthly family income					
≥ 3 minimum wages	24 (75,0)	08 (25,0)	1,44	1,09-1,89	0,022‡
From 1 to 2 minimum wages	51 (52,0)	47 (48,0)	1,57	1,22-2,03	0,004‡
< 1 minimum wage	81 (47,6)	89 (52,4)	1	-	
Number of people living on the income					0.831‡
< 3 individuals	56 (52,8)	50 (47,2)	1,02	0,81-1,28	
From 1 to 3 individuals	100 (51,5)	94 (48,5)	1	-	
Self-declared skin color					0,029‡
White	56 (61,5)	35 (38,5)	1,28	1,03-1,59	
Black/Brown	100 (47,8)	109 (52,2)	1	-	
Religion					0,014‡
Evangelical	28 (70%)	12 (30,0)	1,42	1,12-1,80	
Catholic/Others	128 (49,2)	132 (50,8)	1	-	

\*PR: Prevalence Ratio; †95% CI: 95% Confidence interval; ‡Pearson's Chi-square test. Value of the minimum wage during the collection period: R\$ 1,100.

Table 2 presents the clinical characterization, the behavioral habits, and their respective associations with the resilience level. Associations are observed between the following variables: comorbidities, complications, consumption of alcoholic beverages and physical exercise.

Therefore, the prevalence of having high resilience levels was 28% higher in people who did not have comorbidities, 33% higher in people who had no complications, 50% higher in individuals who consumed alcoholic beverages and 36% higher in those who practiced physical exercise.

**Table 2** - Associations between the clinical variables, behavioral habits and the resilience level in individuals with Diabetes Mellitus during the COVID-19 pandemic. Cuité, PB, Brazil, 2020-2021. (n=300)

Variables	Resilience level				
	High n (%)	Low n (%)	PR*	95% CI†	p-value
Time since diagnosis					0,859‡
< 10 years	120 (51,7)	112 (48,3)	0,97	0,75-1,26	
≥ 10 years	36 (52,9)	32 (47,1)	1	-	
Comorbidities					0,032‡
No	52 (61,9)	32 (38,1)	1,28	1,03-1,59	
Yes	104 (48,1)	112 (51,9)	1	-	
Complications					0,019‡
No	113 (56,8)	86 (43,2)	1,33	1,03-1,72	
Yes	43 (42,6)	58 (57,4)	1	-	
Consumption of alcoholic beverages					0,002‡
Yes	32 (72,7)	12 (27,3)	1,50	1,20-1,87	
No	124 (48,4)	132 (51,6)	1	-	
Smoking					0,987‡
No	142 (52,0)	131 (48,0)	1,00	0,68-1,46	
Yes	14 (51,9)	13 (48,1)	1	-	
Hypoglycemic diet					0,830‡
Yes	88 (51,5)	83 (48,2)	0,97	0,78-1,21	
No	68 (52,7)	61 (47,3)	1	-	
Physical exercise					0,005‡
Yes	78 (61,4)	49 (38,6)	1,36	1,09-1,68	
No	78 (45,1)	95 (54,9)	1	-	

\*PR: Prevalence Ratio; †95% CI: 95% Confidence interval; ‡Pearson's Chi-square test; §Fisher's Exact test.

Table 3 it was observed that, after the multiple analysis by means of Poisson regression, the following variables remained associated with high resilience levels: age group, religion, consumption of alcoholic beverages and physical exercise. The prevalence of having high resilience levels was 43% higher in people under 60 years of age, 39% higher in Evangelicals, 36% higher in people who consumed alcoholic beverages, and 29% higher in those who practiced some physical activity.

**Table 3** - Variables associated with high resilience levels in individuals with Diabetes Mellitus during the COVID-19 pandemic and after the Poisson Regression analysis. Cuité, PB, Brazil, 2020-2021. (n=300)

Variables	PR*	95% CI†	p-value
Age group			0,001‡
< 60	1,43	1,16-1,76	
≥ 60	1	-	
Religion			0,009‡
Evangelical	1,39	1,08-1,78	
Catholic/Others	1	-	
Consumption of alcoholic beverages			0,011‡
Yes	1,36	1,07-1,73	
No	1	-	
Physical exercise			0,015‡
Yes	1,29	1,05-1,59	
No	1	-	

\*PR: Prevalence Ratio; †95% CI: 95% Confidence Interval; ‡p-value of the multivariate analysis model (Poisson Regression with robust variance).

## DISCUSSION

The sociodemographic and clinical characteristics of the participants in this study diverge from those found in other studies conducted with people living with DM during social distancing in the COVID-19 pandemic, in which there is predominance of users with undergraduate/graduate degrees, aged between 30 40 years old and self-declared white skin<sup>10-11</sup>.

In relation to the high resilience level in slightly more than half of the sample, it may have been a strategy and defense mechanism of the participants for better coping in the control of DM in view of social distancing during the COVID-19 pandemic. It is to be noted that resilience involves several factors, such as physical, psychoemotional, social and spiritual.

A research study that investigated the relationship between self-care and resilience in people living with DM showed that participants with desirable self-care in the following items: following a healthy diet, following dietary advice, eating sweets and taking insulin injections as recommended, had high mean values of resilience<sup>7</sup>.

A research study that aimed at investigating the mental health status of 1,770 individuals in the Chinese population during COVID-19 presented prevalence of depression, anxiety and somatization symptoms, identified as 47.1%, 31.9% and 45.9% respectively. In addition, it attested to the negative correlation between resilience and the aforementioned symptoms, pointing out that individuals with high resilience in the face of a public health emergency were less likely to develop negative emotional symptoms<sup>12</sup>.

With regard to the factors associated with the resilience of people with DM, another research study indicates that advanced age is related to better psychological conditions in the face of COVID-19, despite the greater vulnerability of older adults to the disease, and that aged individuals are less concerned with the disease when compared to young people<sup>13</sup>. However, the findings of this study contradict this premise, corroborating a finding revealing that most of the older adults with DM present moderate resilience levels when related to functional capacity<sup>14</sup>.



Therefore, when observing that people over the age of 60 had a lower resilience levels, a possible relationship is inferred from the fact that older adults are included in the risk group for the worst COVID-19 prognosis and sometimes live with chronic diseases, requiring more care and demanding that they practice social isolation in order to protect themselves, so that confinement has generated feelings of impotence and uncertainty, in addition to depression and anxiety<sup>15-16</sup>. The difference in the resilience level related to different age groups was not verified in a study carried out before the pandemic, as it was a population living with another chronic disease<sup>17</sup>.

Assuming that resilience is the ability to deal with adverse situations that generally fluctuate throughout life and that are often related to psychological conditions, stress and coping, aging changes, even more in the path of an older adult's mental health, compromising the behavior of protecting themselves and avoiding psychological harms resulting from bad experiences<sup>18</sup>.

The findings also indicated that people who profess the Evangelical religion present higher resilience levels in relation to Catholics and other religions; however, religiousness and spirituality are perceived as tools that assist in coping with adverse situations such as chronic diseases, as well as other research studies show that, regardless of the type of religion, the more religious and spiritual people are, the greater their resilience levels<sup>19-20</sup>.

Religiousness and spirituality have been identified as protective factors against resilience, as they allow establishing and maintaining personal relationships, add access to social support and strengthen moral values, which provide opportunities for personal development and growth<sup>21</sup>.

Although a number of studies indicate an increase in health risk behaviors during the pandemic<sup>22</sup>, in this research, it was noticed that people who consumed alcoholic beverages presented higher resilience levels when compared to those who did not do so. Therefore, it can be inferred that, with the stress caused by the pandemic and social isolation, there was an increase in the consumption of alcoholic beverages, which can be understood as a coping strategy to deal with the impacts generated by COVID-19.

A study corroborates these findings, as it pointed out that alcohol consumption increased significantly during the pandemic<sup>23</sup>. However, in a study carried out before the pandemic with a population of older adults affected by chronic diseases, no significance was observed between the two variables and, on the other hand, it was observed that those who consumed alcoholic beverages had a risk for low resilience levels<sup>24</sup>.

Practice of physical exercise was related to higher resilience levels, which is understood by the fact that it favors physical and mental well-being, and may contribute to alleviating the negative impacts generated by the pandemic<sup>25-26</sup>. It is important to clarify that, although it is a non-pharmacological intervention, physical exercise is of significant importance for people with diabetes, as it acts on the metabolic and physiological reactions, controlling blood glucose and favoring respiratory and cardiac functions<sup>27</sup>.

However, a major discussion is perceived regarding the practice of physical activities during the pandemic, since social distancing is indicated as a preventive measure in order to verify demotivational factors among the participants, such as difficulties in finding adequate physical structures, professionals and places adjusted to the conditions imposed by the pandemic<sup>28</sup>. In this sense, it is indispensable to search for strategies that facilitate permanent physical exercise, accompanied by a professional and appropriate to deal with the conditions imposed by the pandemic.

Finally, although some variables did not remain in the multivariate model, the highest resilience level was observed as associated with the highest schooling level, which can be understood by the fact that people who had more than eight years of study acquired specific knowledge, as well as they have more experiences related to organization, planning, achievement of goals, tests, different situations and challenges. In addition to the schooling level, monthly family income can predispose to higher resilience levels, considering that the financial situation contributes to a better quality of life, as shown in a study carried out with a general Brazilian population with similar results<sup>29</sup>.

It is important to emphasize that, as a result of the pandemic, many people were affected by work-related modifications and by changes in the family income. This is proven in an research study whose data showed that 43.2% of the participants had their monthly family income reduced<sup>11</sup>. In addition to the elements herein presented, a research study that investigated mental health and work attitudes among people who returned to work during the COVID-19 pandemic pointed out that the main risk factor for mental health impairment was concern with unemployment, as being unemployed meant losing their source of income and not having financial security<sup>30</sup>.

In this logic, the relevance of the findings of this research is confirmed in the sense of providing data that enable better care to be provided by a multidisciplinary team to the users living with diabetes. Reverse temporality is pointed out as a research limitation, due to the cross-sectional design, despite being advantageous given its speed and low cost. Therefore, longitudinal studies that attest to the impact of social distancing imposed by the COVID-19 pandemic on the resilience of people with chronic diseases are suggested, especially those living with DM.

## CONCLUSION

It was possible to evidence an association of the socioeconomic and clinical data and behavioral habits with the resilience level in people with DM during social distancing in the COVID-19 pandemic.

Consequently, the following variables were related to high resilience levels: age group, religion, consumption of alcoholic beverages and physical exercise. It can be inferred that the prevalence of having high resilience levels was 43% higher in people under 60 years old, 39% higher in Evangelicals, 36% higher in people who consumed alcoholic beverages and 29% higher in those who practiced some physical activity.

It is believed that this study adds significant contributions to the scientific community, to the professionals involved in care and to the users living with DM, as the findings are aimed at devising inclusive actions during the pandemic, especially regarding the emotional and social aspects. Thus, it is suggested to devise care strategies aimed at mental health, mainly through the provision of tools that encourage greater adherence to the activities to improve quality of life.

## REFERENCES

1. International Diabetes Federation. IDF Diabetes Atlas [Internet]. 9th ed. Diabetes Atlas; 2019 [cited 2020 Jul 2]. 166 p. Available from: [https://diabetesatlas.org/idfawp/resource-files/2019/07/IDF\\_diabetes\\_atlas\\_ninth\\_edition\\_en.pdf](https://diabetesatlas.org/idfawp/resource-files/2019/07/IDF_diabetes_atlas_ninth_edition_en.pdf)
2. Angelidi AM, Belanger MJ, Mantzoros CS. Commentary: COVID-19 and diabetes mellitus: What we know, how our patients should be treated now, and what should happen next. *Metabolism* [Internet]. 2020 Jun [cited 2020 Jun 18];107:154245. Available from: <https://doi.org/10.1016/j.metabol.2020.154245>

3. Meo SA, Alhowikan AM, Al-Khlaiwi T, Meo IM, Halepoto DM, Iqbal M, et al. Novel coronavirus 2019-nCoV: prevalence, biological and clinical characteristics comparison with SARS-CoV and MERS-CoV. *Eur Rev Med Pharmacol Sci* [Internet]. 2020 Feb [cited 2020 Jul 8];24(4):2012-9. Available from: [https://doi.org/10.26355/eurrev\\_202002\\_20379](https://doi.org/10.26355/eurrev_202002_20379)
4. Guan W-J, Liang W-H, Zhao Y, Liang H-R, Chen Z-S, Li Y-M, et al. Comorbidity and its impact on 1590 patients with COVID-19 in China: a nationwide analysis. *Eur Respir J* [Internet]. 2020 May 14 [cited 2020 Jul 10];55(5):2000547. Available from: <https://doi.org/10.1183/13993003.00547-2020>
5. Banerjee M, Chakraborty S, Pal R. Diabetes self-management amid COVID-19 pandemic. *Diabetes Metab Syndr* [Internet]. 2020 Jul-Aug [cited 2020 Jun 18];14(4):351-4. Available from: <https://doi.org/10.1016/j.dsx.2020.04.013>
6. Karasar B, Canli D. Psychological resilience and depression during the covid-19 pandemic in turkey. *Psychiatr Danub* [Internet]. 2020 [cited 2020 Jul 26];32(2):273-9. Available from: <https://doi.org/10.24869/psyd.2020.273>
7. Boell JEW, Silva DMGV, Echevarria-Guanilo ME, Hegadoren K, Meirelles BHS, Suplici SR. Resilience and self-care in people with diabetes mellitus. *Texto Contexto Enferm* [Internet]. 2020 [cited 2020 Jul 6];29:e20180105. Available from: <https://doi.org/10.1590/1980-265X-TCE-2018-0105>
8. Coutinho MPL, Costa FG, Coutinho ML. Bem-estar subjetivo e resiliência em pessoas com diabetes mellitus. *Estud Interdiscip Psicol* [Internet]. 2019 Dec [cited 2020 Jul 6];10(3):43-59. Available from: <http://www.uel.br/revistas/uel/index.php/eip/article/view/29896/26610>
9. Solano JPC, Bracher ESB, Faisal- Cury A, Ashmawi HA, Carmona MJC, Lotufo-Neto F, et al. Factor structure and psychometric properties of the Connor-Davidson resilience scale among Brazilian adult patients. *Sao Paulo Med J* [Internet]. 2016 May 13 [cited 2020 Oct 29];134(5):400-6. Available from: <https://doi.org/10.1590/1516-3180.2015.02290512>
10. Barone MTU, Harnik SB, Luca PV, Lima BLS, Wieselberg RJP, Ngongo B, et al. The impact of COVID-19 on people with diabetes in Brazil. *Diabetes Res Clin Pract* [Internet]. 2020 Aug 1 [cited 2021 Oct 24];166:108304. Available from: <https://doi.org/10.1016/j.diabres.2020.108304>
11. Souza GFA, Praciano GAF, Ferreira Neto OC, Paiva MC, Jesus RPF, Cordeiro ALN, et al. Factors associated with psychic symptomatology in diabetics during the COVID-19 pandemic. *Rev Bras Saude Mater Infant* [Internet]. 2021 Feb [cited 2021 Oct 24];21(Suppl 1):177-86. Available from: <https://doi.org/10.1590/1806-9304202100S100009>
12. Ran L, Wang W, Ai M, Kong Y, Chen J, Kuang L. Psychological resilience, depression, anxiety, and somatization symptoms in response to COVID-19: a study of the general population in China at the peak of its epidemic. *Soc Sci Med* [Internet]. 2020 Oct [cited 2021 Oct 24];262:113261. Available from: <https://doi.org/10.1016/j.socscimed.2020.113261>
13. Rossi R, Jannini TB, Socci V, Pacitti F, Di Lorenzo G. Stressful life events and resilience during the COVID-19 lockdown measures in Italy: association with mental health outcomes and age. *Front Psychiatry* [Internet]. 2021 Mar 8 [cited 2021 Apr 5];12:635832. Available from: <https://doi.org/10.3389/fpsy.2021.635832>
14. Frazão MCLO, Pimenta CJL, Silva CRR, Vicente MC, Costa TF, Costa KNFM. Resiliência e capacidade funcional de pessoas idosas com diabetes mellitus. *Rev Rene* [Internet]. 2018 Jan-Dec [cited 2021 Mar 28];19:e3323. Available from: <https://pesquisa.bvsalud.org/portal/resource/pt/biblio-910228>
15. Armitage R, Nellums LB. COVID-19 and the consequences of isolating the elderly. *Lancet Public Health* [Internet]. 2020 May 1 [cited 2021 Mar 30];5(5):e256. Available from: [https://doi.org/10.1016/S2468-2667\(20\)30061-X](https://doi.org/10.1016/S2468-2667(20)30061-X)

16. Soto-Añari M, Anderson-Henderson MA, Camargo L, López JC, Caldichoury N, López N. The impact of SARS-CoV-2 on emotional state among older adults in Latin America. *Int Psychogeriatr* [Internet]. 2021 Feb [cited 2021 Mar 30];33(2):193-4. Available from: <https://doi.org/10.1017/S1041610221000090>
17. Araújo LF, Barros Neto RNS, Negreiros F, Pereira TG. Comportamentos sexuais, resiliência e conhecimento sobre HIV/AIDS: uma análise psicossocial. *Estud Pesqui Psicol* [Internet]. 2018 Jan-Apr [cited 2021 Mar 28];18(1):127-48. Available from: [http://pepsic.bvsalud.org/scielo.php?script=sci\\_arttext&pid=S180842812018000100008](http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S180842812018000100008)
18. Chen L-K. Older adults and COVID-19 pandemic: resilience matters. *Arch Gerontol Geriatr* [Internet]. 2020 Jul-Aug [cited 2021 Oct 24];89:104124. Available from: <https://doi.org/10.1016/j.archger.2020.104124>
19. Böell JEW, Silva DMGV, Hegadoren KM. Sociodemographic factors and health conditions associated with the resilience of people with chronic diseases: a cross sectional study. *Rev Lat Am Enferm* [Internet]. 2016 Sep 1 [cited 2021 Mar 30];24:e2786. Available from: <https://doi.org/10.1590/1518-8345.1205.2786>
20. Carneiro EM, Navinchandra SA, Vento L, Timóteo RP, Borges MF. Religiousness/spirituality, resilience and burnout in employees of a public hospital in Brazil. *J Relig Health* [Internet]. 2019 Apr 1 [cited 2021 Mar 30];58(2):677-85. Available from: <https://doi.org/10.1007/s10943-018-0691-2>
21. Margaça C, Rodrigues D. Spirituality and resilience in adulthood and old age: a revision. *Fractal Rev Psicol* [Internet]. 2019 Jul 30 [cited 2021 Oct 24];31(2):150-7. Available from: <https://doi.org/10.22409/1984-0292/v31i2/5690>
22. Malta DC, Szwarcwald CL, Barros MBA, Gomes CS, Machado IE, Souza Júnior PRB, et al. The COVID-19 pandemic and changes in adult Brazilian lifestyles: a cross-sectional study, 2020. *Epidemiol Serv Saude* [Internet]. 2020 Sep 25 [cited 2021 Apr 8];29(4):e2020407. Available from: <https://doi.org/10.1590/S1679-49742020000400026>
23. Grossman ER, Benjamin-Neelon SE, Sonnenschein S. Alcohol consumption during the COVID-19 pandemic: a cross-sectional survey of US adults. *Int J Environ Res Public Health* [Internet]. 2020 Dec 9 [cited 2021 Mar 30];17(24):9189. Available from: <https://doi.org/10.3390/ijerph17249189>
24. Dullius AAS, Fava SMCL, Ribeiro PM, Terra FS. Alcohol consumption/dependence and resilience in older adults with high blood pressure. *Rev Lat Am Enferm* [Internet]. 2018 Aug 9 [cited 2021 Mar 30];26:e3024. Available from: <https://doi.org/10.1590/1518-8345.2466.3024>
25. Callow DD, Arnold-Nedimala NA, Jordan LS, Pena GS, Won J, Woodard JL, et al. The mental health benefits of physical activity in older adults survive the COVID-19 pandemic. *Am J Geriatr Psychiatry* [Internet]. 2020 Oct 1 [cited 2021 Mar 31];28(10):1046-57. Available from: <https://doi.org/10.1016/j.jagp.2020.06.024>
26. Carriedo A, Cecchini JA, Fernandez-Rio J, Méndez- Giménez A. COVID-19, psychological well-being and physical activity levels in older adults during the nationwide lockdown in Spain. *Am J Geriatr Psychiatry* [Internet]. 2020 Nov [cited 2021 Mar 31];28(11):1146-55. Available from: <https://doi.org/10.1016/j.jagp.2020.08.007>
27. Santos GO, Santos LL, Silva DN, Silva SL. Exercícios físicos e diabetes mellitus: revisão. *Braz J Develop* [Internet]. 2021 Jan [cited 2021 Apr 6];7(1):8837-47. Available from: <https://doi.org/10.34117/bjdv7n1-599>
28. Souza Filho BAB, Tritany EF. COVID-19: the importance of new technologies for physical activity as a public health strategy. *Cad Saude Publica* [Internet]. 2020 [cited 2021 Apr 6];36(5):e00054420. Available from: <https://doi.org/10.1590/0102-311X00054420>

29. Melo CF, Vasconcelos Filho JE, Teófilo MB, Suliano AM, Cisne EC, Freitas Filho RA. Resiliência: uma análise a partir das características sociodemográficas da população brasileira. *Psico-USF* [Internet]. 2020 Jan-Mar [cited 2021 Apr 12];25(1):139-54. Available from: <https://doi.org/10.1590/1413-82712020250112>
30. Song L, Wang Y, Li Z, Yang Y, Li H. Mental health and work attitudes among people resuming work during the COVID-19 pandemic: a cross-sectional study in China. *Int J Environ Res Public Health* [Internet]. 2020 Jul 14 [cited 2021 Oct 24];17(14):5059. Available from: <https://doi.org/10.3390/ijerph17145059>

## NOTES

### ORIGIN OF THE ARTICLE

Extracted from the Umbrella Project - Prevention of COVID-19: Factors associated with the knowledge and practices of users with Diabetes *Mellitus*, *Universidade Federal de Campina Grande*, 2021.

### CONTRIBUTION OF AUTHORITY

Study design: Lucena JGS, Andrade LL.

Data collection: Lucena JGS, Azevedo TS, Matias LDM.

Data analysis and interpretation: Andrade LL, Lucena JGS, Azevedo TS, Matias LDM, Nunes WB.

Discussion of the results: Lucena JGS, Azevedo TS, Matias LDM.

Writing and/or critical review of the content: Andrade LL, Nunes WB, Costa MML.

Review and final approval of the final version: Andrade LL, Costa MML.

### APPROVAL OF ETHICS COMMITTEE IN RESEARCH

Approved by the Ethics Committee in Research Alcides Carneiro University Hospital, opinion No.4,306,495/2020, Certificate of Presentation for Ethical Appreciation 35726820.2.0000.5182.

### CONFLICT OF INTEREST

There is no conflict of interests.

### EDITORS

Associated Editors: Natália Gonçalves, Ana Izabel Jatobá de Souza.

Editor-in-chief: Roberta Costa.

### HISTORICAL

Received: June 08, 2021.

Approved: November 16, 2021.

### CORRESPONDING AUTHOR

Lidiane Lima de Andrade

lidiane.lima@professor.ufcg.edu.br

