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Changes in Lifestyle Habits in Individuals with Diabetes during the COVID-19 Pandemic: The ELSA-Brasil Cohort Study

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Abstract: The COVID-19 pandemic and society's response to it may have constrained the ability of those with diabetes to achieve a healthy lifestyle. We conducted a longitudinal study to assess the frequency and magnitude of sedentary habits, physical activity, sleep, alcohol consumption, weight, and smoking from July 2020 to February 2021 and compared these levels to those before the pandemic (2017–2019) in 1082 participants of the ELSA-Brasil study with known diabetes. Our results showed that inappropriate sleep duration was common (649, 68.9%) before the pandemic. Many (447, 31.1%) with this problem achieved an adequate sleep duration during the pandemic. Significant increases occurred in time in front of screens (1.3; 95%CI 0.66–2.11 h/day) and time sitting or reclining (1.4, 95%CI 0.8–2.3 h/day). Physical activity decreased (270, 95%CI 243–298 MET-min/wk). Alcohol consumption decreased without statistical significance (−19.6, 95%CI −51.1–11.9 g/w). In general, changes were similar between diabetics and non-diabetics, except that screen time in-creased less (−0.18, −0.35–−0.01 h/day) for those with diabetes. Sleep duration improved, but the frequency of sedentary habits increased, and physical activity decreased during the pandemic. Understanding changes brought on by the pandemic is essential to facilitate the implementation of quality health care for those with diabetes in moments of social stress.

Keywords: COVID-19; diabetes mellitus; behavior; healthy lifestyle

Citation: Dartora, W.J.; Schmidt, M.I.; Griep, R.H.; Duncan, B.B. Changes in Lifestyle Habits in Individuals with Diabetes during the COVID-19 Pandemic: The ELSA-Brasil Cohort Study. *COVID* **2023**, *3*, 1601–1611. https://doi.org/10.3390/covid3100109

Academic Editor: Andrea Fiorillo

Received: 25 September 2023
Revised: 6 October 2023
Accepted: 9 October 2023
Published: 12 October 2023

1. Introduction

The COVID-19 pandemic [1,2] caused major disruption to world society. It has been reported that the COVID-19 pandemic negatively impacted participants' social connections and well-being, including the loss of intimacy they experienced with their loved ones, anxiety, depression, and loneliness [3]. Unhealthy eating habits have increased, as have inactivity and sedentary behavior [4]. COVID-19 has been linked to weight gain and reduced time spent on physical activity [5]. In Brazilian society, the impact was also significant. According to official statistics, as of 24 September 2023, more than 37.7 million Brazilians had been infected and 705 thousand had died [6]. To minimize risk and pandemic spread, state and local governments implemented measures, including mandates, to encourage social distancing, and, at times, lockdowns, and recommended special care be taken by those at high risk, including those with diabetes mellitus (DM) [7–14].

As a result, the COVID-19 pandemic, aside from being a direct risk to health and life, indirectly affected disease burden through lifestyle changes [1–5]. Convenience sample data in Brazil suggest major changes occurred in some risk factors [15,16].

The prognosis of diabetes depends to a large extent on controlling risk factors for its complications. While much of this control requires medications, patients can also benefit

from appropriate behavioral habits such as not smoking, engaging in physical activity, obtaining adequate sleep, and avoiding excessive alcohol consumption [17].

The Brazilian Longitudinal Study of Adult Health (Estudo Longitudinal de Saúde do Adulto—ELSA-Brasil), given its prospective nature, broad description of participants, and characterization of important behaviors shortly before the onset of the pandemic, is well-positioned to characterize changes in health-related behaviors during the first year of the pandemic. Thus, our objective is to describe the prevalence of behaviors affecting prognosis during the early months of the pandemic and their change from the pre-pandemic baseline in middle-aged to elderly Brazilian adults with diabetes.

2. Materials and Methods

ELSA-Brasil is a multicenter study of 15,105 employees of public institutions of higher education and research in six Brazilian capitals, initiated between 2008 and 2010 when participants were aged between 35 and 74 years. Almost all had guaranteed job stability or were retirees. Its principal focus is to investigate epidemiologic, clinical, and molecular aspects of chronic non-communicable diseases, especially cardiovascular diseases, and diabetes. ELSA-Brasil was approved by the ethics in research committees of each institution involved, and all participants gave written consent to participate. Sociodemographic and health data were collected through interviews and examinations. The study design and data collection details have been previously reported [18]. We invited consenting participants from five of ELSA-Brasil's six recruitment centers to participate in this survey. Known diabetes was defined by self-report and/or anti-diabetic medication use during previous clinic visits or a report of new onset of the disease by questionnaire during the pandemic.

The COVID-19 pandemic survey consisted of multiple small questionnaires to be completed over a period of weeks. The questionnaires were accessed through ELSA's data-entry system (Otus Solutions, Porto Alegre) for either telephone interview or self-completion via secure, password-protected pages specific for each participant. For the latter, participants received e-mails indicating the availability of questionnaires needing response. Participant responses were tracked on a special dashboard created in R and Shiny for this purpose. When necessary, multiple contacts via e-mail and telephone were attempted to increase the response rate. In one of these, we repeated questions about participants' lifestyle and health habits, which had been previously collected by questionnaire at ELSA's third clinic visit (2017–2019). Among these, 9072 were enrolled in ELSA centers conducting this study during the pandemic. After exclusions, 5376 participated in at least one of the questionnaires of our COVID survey. However, some were excluded due to missing values on covariates, leaving 5304 for our analyses. Of these, 1082 had known diabetes (Supplementary Materials—Figure S1).

We defined an appropriate number of hours of sleep as seven or more per night, with less than this considered inappropriate [19–21]. We ascertained weight loss by asking whether participants had lost, gained, or maintained their weight during the pandemic, and sedentary habits through questions about wake time spent sitting or reclining and in front of screens. We obtained the quantity and frequency of beer, wine, and spirits consumption and expressed alcohol consumption in grams of ethanol per week. We applied the International Physical Activity Questionnaire and expressed physical activity for leisure and transport domains in metabolic equivalent (MET)-minutes per week.

We then calculated pre-pandemic to pandemic changes in these behaviors, expressing these as changes in frequency for categorical variables and mean differences for continuous ones. For categorical variables, we then calculated crude and adjusted prevalence ratios (PRs) and their respective 95% confidence intervals, comparing the frequency of changes by diabetes status via Poisson regression with robust variance. Similarly, we calculated crude and adjusted differences in mean changes by diabetes status using multiple linear regression. We defined the level of significance as $\alpha = 5\%$. Statistical analyses were performed using R 4.1.2.

3. Results

3.1. Data Selection

Of the initial 15,105 ELSA-Brasil participants, 12,636 returned to the third ELSA clinic visit in 2017–2019, immediately before the pandemic. Of those absent, 550 had died, 39 were too sick to attend, 217 were not located, 123 lived too far away, 1540 declined participation, and 3564 were from one of ELSA's six centers that did not join in our COVID-19 survey, leaving 9072 individuals at participating centers. Of these, 54 (0.6%) had died, 13 (0.1%) were too sick to participate, 144 (2%) could not be found, 478 (5%) explicitly requested not to participate, and 2744 (30%) did not respond to contacts. Thus, 5639 enrolled in the COVID-19 survey. Of these, 263 (3%) were missing information to characterize the presence of diabetes at the pre-pandemic visit, and 72 (0.8%) were missing data for covariates. The final sample thus consisted of 5304 (59.2% of those alive and well) participants: 1082 with diabetes and 4222 without (Figure S1).

3.2. Characteristics of Participants

Table 1 shows the characteristics of these ELSA-Brasil participants. Among them, 552 (51%) were women. Most (80.7%) were >55 years of age, 49.2% self-declared skin color as being white and 48.4% as black or brown, and most (65.5%) had completed a university degree. Additionally, the majority (81.6%) were overweight or obese. Comparatively, among those without diabetes (79.6%), more (59.5%) were women, more (57.5%) were white, fewer (63.2%) were >55 years of age, more (75.1%) had completed university degrees, and fewer (62.4%) were overweight or obese.

Table 1. Characteristics of participants with and without diabetes responding to the survey during the COVID-19 pandemic. ELSA-Brasil (N = 5304).

	With Diabetes			Without Diabetes		
	N	**%**	**95%CI**	**N**	**%**	**95%CI**
Gender (%)						
Women	552	51.0	(48.0–54.2)	2514	59.5	(57.6–61.5)
Men	530	49.0	(45.7–51.9)	1708	40.5	(39.1–42.2)
Age Group (%)						
35 to 54 years	209	19.3	(17.0–21.8)	1554	36.8	(33.9–39.8)
55 to 64 years	472	43.6	(39.7–45.8)	1662	39.4	(38.0–41.1)
65 to 74 years	322	29.7	(27.2–32.9)	836	19.8	(18.5–21.0)
over 74 years	79	7.4	(6.4–10.4)	170	4.0	(3.2–5.3)
Color/Race (%)						
White	532	49.2	(46.1–52.3)	2429	57.5	(55.5–59.6)
Brown	334	30.8	(28.1–33.8)	1200	28.4	(26.8–29.6)
Black	190	17.6	(15.5–20.3)	504	11.9	(10.6–12.6)
Yellow (Asian)	13	1.2	(0.9–2.2)	59	1.4	(0.9–1.8)
Indigenous	13	1.2	(0.9–2.2)	30	0.7	(0.4–9)
Educational level (%)						
Complete elementary school or incomplete secondary school	77	7.1	(6.1–9.5)	148	3.5	(2.9–4.0)
Complete secondary school	297	27.4	(24.6–30.1)	905	21.4	(19.0–24.0)
University degree	708	65.5	(62.0–67.9)	3169	75.1	(72.3–77.7)
BMI (%)						
<25 kg/m^2	207	19.2	(16.9–21.7)	1589	37.6	(34.6–40.6)
25–29.9 kg/m^2	446	41.2	(37.3–43.4)	1740	41.2	(39.6–42.7)
≥30 kg/m^2	429	39.6	(35.5–43.4)	893	21.2	(18.6–21.1)

3.3. Changes in Smoking, Sleep, and Weight

Table 2 shows changes in smoking, sleep, and weight by diabetes status during the pandemic. Most (91.9%) with diabetes were non-smokers, and very few (4; 0.4%; 95%CI 0.3–0.5%) reported smoking during the pandemic. In contrast, among the 87 (8.1%) previous smokers, several (21; 24.1%; 95%CI 21.5–26.8%) reported not smoking during the pandemic. Duration of sleep improved. Of those with initially appropriate duration (>7 h), the duration of only 62 (14.3%; 95%CI 12.2–16.6%) became inappropriate, while among those initially with too short a duration, 202 (31.1%; 95%CI 28.3–34.0%) reported achieving appropriate sleep duration. Similar changes in these habits were seen among those without diabetes.

As weight was not measured during our COVID-19 survey, we present self-reported qualitative impressions of weight changes. Weight loss was reported by 36.1% (95%CI 33.2–39.1%) of participants with diabetes and weight gain by 33.6% (95%CI 30.7–36.6%). On the other hand, slightly fewer of those without diabetes reported weight loss (33.7%; 95%CI 30.8–33.7%) than weight gain (41.6%; 95%CI 33.6–44.7%).

3.4. Changes in Sedentary Behaviors, Alcohol Consumption, and Physical Activity

Table 3 shows changes in sedentary habits, alcohol consumption, and physical activity before and during the pandemic. Those with diabetes increased time spent in front of the screens by 1.3 (95%CI 0.66–2.11) h/day and time spent sitting or reclining by 1.4 (95%CI 0.8–2.3) h/day during the pandemic. Reported physical activity also decreased during the pandemic. This decrease, of 270 Met-min/week, is approximately equivalent to walking briskly (METs = 5) for about 7.7 min more daily. Among those without diabetes, the increase in the two sedentary habits was slightly greater: 1.63 (95%CI 0.9–2.6) h/day and 1.62 (95%CI 0.9–2.6) h/day, respectively, and the decrease in physical activity was also slightly greater (343; 95%CI 314–373 Met-min/week). Despite this, as those without diabetes had greater pre-pandemic physical activity, physical activity during the pandemic remained less in those with diabetes: 527 (95%CI 496–557) vs. 643 (95%CI 614–673 Met-min/week). Alcohol consumption decreased to −7.4 g/week (95%CI 5.9–9.2) in those with diabetes and increased a similarly small amount in those without the disease.

Table 2. Changes in smoking, sleep, and weight of ELSA-Brasil participants with and without diabetes during the pandemic.

Behavior	With Diabetes							Without Diabetes						
	Pre-Pandemic		During Pandemic		Change			Pre-Pandemic		During Pandemic		Change		
	N	(%) *	N	(%) *	N	(%) *	95%CI	N	(%) *	N	(%) *	N	(%) *	95%CI
Non-smoker at baseline	995	91.9	991	99.6	4	0.4	(0.3–0.5)	3881	91.9	3857	99.4	24	0.6	(0.4–0.8)
Smoker at baseline	87	8.1	66	75.8	21	24.1	(21.5–26.8)	341	8.1	259	75.9	82	24.0	(21.4–26.7)
Sleep hours—Inappropriate ** at baseline	649	60.0	447	68.9	202	31.1	(28.3–34.0)	2357	55.8	1555	66.0	802	34.0	(31.1–36.9)
Sleep hours—Appropriate ** at baseline	433	40.0	371	85.7	62	14.3	(12.2–16.6)	1865	44.1	1571	84.2	294	15.8	(26.6–32.3)
Decreased weight from baseline	-	-	-	-	391	36.1	(33.2–39.1)	-	-	-	-	1422	33.7	(30.8–33.7)
Increased weight from baseline	-	-	-	-	364	33.6	(30.7–36.6)	-	-	-	-	1755	41.6	(38.6–44.7)

* Pre-pandemic percentages are column percentages, those for During pandemic and Change are row percentages. ** Appropriate number of hours slept is considered to be more than 7 h per night.

Table 3. Changes (expressed as increases) in sedentary behaviors, alcohol consumption, and physical activity of ELSA-Brasil participants with and without diabetes during the pandemic.

Behavior	With Diabetes						Without Diabetes					
	Pre-Pandemic		During Pandemic		Change		Pre-Pandemic		During Pandemic		Change	
	Mean	95%CI	Mean	95%CI	Mean	95%CI	Mean	95%CI	Mean	95%CI	Mean	95%CI
Time (h/day) in front of screens	4.8	(3.5–6.2)	6.0	(4.7–7.6)	1.3	(0.66–2.11)	5.1	(3.8–6.5)	6.7	(5.3–8.4)	1.63	(0.9–2.6)
Time (h/day) sitting or reclining	5.2	(3.8–6.6)	6.6	(5.2–8.3)	1.4	(0.8–2.3)	5.8	(4.4–7.3)	7.4	(5.8–9.0)	1.62	(0.9–2.6)
Physical activity (MET-min/wk)	797	(766–817)	527	(496–557)	−270	(−243–−298)	996	(976–991)	643	(614–673)	−343	(−314–−373)
Alcohol consumption (g/week)	198.3	(174–224)	190.9	(168–217)	−7.4	(−5.9–−9.2)	142.1	(122–165)	154.3	(133–177)	12.2	(10.3–14.4)

3.5. Relative Difference of Change in Lifestyle Habits during the Pandemic

Table 4 evaluates whether changes in smoking, sleep, and weight differed by diabetes status. In the crude model, those with diabetes reported a slightly greater frequency of weight loss (PR = 1.12; 95%CI 1.05–1.19) and a somewhat lesser frequency of reporting a weight gain (PR = 0.96; 95%CI 0.93–0.99). However, no difference was noted after sociodemographic factors had been taken into account. Although those with diabetes reported a lesser frequency of taking up smoking, numbers were very small, and the adjusted difference was not statistically significant. No other differences were noted.

Table 4. Crude and adjusted * relative difference of change in lifestyle habits during the pandemic comparing those with diabetes to those without diabetes.

Behavior	Model I		Model II		Model III	
	PR	95%CI	PR	95%CI	PR	95%CI
Non-smoker pre-pandemic	0.81	(0.66–1.00)	0.90	(0.74–1.09)	0.90	(0.75–1.10)
Smoker pre-pandemic	0.99	(0.63–1.65)	0.94	(0.63–1.46)	0.94	(0.63–1.46)
Sleep hours—Inappropriate pre-pandemic	1.09	(0.93–1.27)	1.05	(0.94–1.20)	1.05	(0.93–1.19)
Sleep hours—Appropriate pre-pandemic	1.10	(0.84–1.46)	1.09	(0.85–1.42)	1.12	(0.88–1.46)
Decreased weight	1.12	(1.05–1.19)	1.05	(0.96–1.06)	1.01	(0.96–1.07)
Increased weight	0.96	(0.93–0.99)	1.00	(0.96–1.05)	1.00	(0.95–1.05)

* From Poisson regression with robust variance on the differences between the pre-pandemic and pandemic moments. Model I: crude; Model II: Model I plus sex, age, and center; Model III: Model II plus race and educational attainment.

3.6. Changes in Lifestyle Habits That Occurred during the Pandemic

As shown in Table 5, increases in sedentary habits were numerically less in those with diabetes, although only for screen time (5.5 min or 0.18 h/day less; 95%CI −0.35–−0.01 h/day) in the fully adjusted analyses. No differences in the decrease in physical activity, or significant differences in the change in alcohol consumption, were found when comparing participants with and without diabetes (−19.6 g/week; 95%CI −51.1–11.9).

Table 5. Crude and adjusted * absolute differences (Diff), comparing those with to those without diabetes, in changes in lifestyle habits during the pandemic.

Behavior	Model I		Model II		Model III	
	Diff	95%CI	Diff	95%CI	Diff	95%CI
Increase in sedentary time in front of screens (h)	−0.34	(−0.51–−0.17)	−0.19	(−0.36–−0.01)	−0.18	(−0.35–−0.01)
Increase in time sitting or reclining (h)	−0.21	(−0.39–−0.03)	−0.08	(−0.27–−0.01)	−0.05	(−0.24–0.12)
Decrease in physical activity (MET-min/week)	−72.1	(−177–33.0)	−78.7	(−185–28.4)	−64.5	(−171–42.9)
Increase in alcohol consumption (g/week)	−19.6	(−51.1–11.9)	−18.7	(−51.8–14.3)	−18.4	(−51.5–14.6)

* From multiple linear regression. Model I: crude; Model II: Model I plus sex, age, and center; Model III: Model II plus race and educational attainment.

4. Discussion

Our study reported that civil servants with diabetes increased their sedentary habits, both sitting or reclining and screen time, during the pandemic compared to the pre-pandemic period. These sedentary habits were initially slightly lower than in participants without diabetes, and their increase was less. Approximately one-quarter of the already small number with diabetes who smoked reported not smoking during the pandemic. Physical activity decreased while sleep duration improved, and frequent weight changes were noted. Little difference in the change by diabetes status was noted for other habits.

To contextualize our survey, when the first participants from the ELSA-Brasil study responded to our COVID-19 pandemic survey in July 2020, the WHO Director-General stated that many people who need treatment for diseases such as cancer, cardiovascular disease, and diabetes would not be receiving health services, including preventive services they needed since the beginning of the COVID-19 pandemic [22]. Shortly after the last participants responded, in February 2021, Brazil registered the second-highest number of deaths during the pandemic and ranked 14th in deaths per capita [23]. Over this period, 34,717 deaths due to COVID-19 were noted in Brazil, many of which occurred during the collapse of health services in certain areas of the country [6].

ELSA-Brasil participants with diabetes reported changes in multiple risk factors for the complications of the disease during these early months of the pandemic. Most notably, changes in movement activities are important in preventing cardiovascular disease, renal disease, and neurologic complications such as dementia [24–26]. On the other hand, a large fraction of those with a sleep duration less than recommended in the pre-pandemic period achieved an adequate sleep duration during the pandemic. Reports of change in weight during the pandemic were very common, but the frequencies of reported gains and losses were similar. Although we noted no statistically significant changes in smoking, many who reported smoking previously had quit. Di Renzo L et al. reported similar findings of smoking being reduced during the confinement of the pandemic [27]. Perhaps individual decisions to maximize pulmonary function, given the risk of COVID-19 pneumonia, led to decreased smoking.

We found alcohol consumption decreased during the pandemic in people with diabetes. This differs from some findings in the literature. An increase in the consumption of alcoholic beverages was evaluated by participants in a Brazilian study during April and May 2020 [28], which corroborates with what we found in individuals without diabetes.

Diabetes is associated with several factors, such as obesity, increased visceral adipose tissue, and sleep apnea, which can affect sleep and wakefulness [29,30]. In addition to these factors, participants' weight gain, lower energy expenditure, increased sitting or reclining time, and stress, anxiety, and depression during the pandemic could worsen their sleep. Sinuraya and colleagues, in a systematic review of sleep problems in patients with diabetes during the pandemic, found prevalences ranging from 19.2% to 74.2%. They noted factors such as stress and anxiety, lack of physical activity, and obesity as contributors to inadequate sleep [31]. A study in Brazil of 120 patients with diabetes followed in public hospitals found moderate/severe sleeping disorders in 77.5% of patients [32]. However, this study and most of the studies in the review were small, and some, based on hospital samples, were probably biased toward patients with more longstanding or severe diabetes. None had prospective pre-pandemic data to provide a less biased evaluation of the change in sleep habits [32]. Our data thus suggest that poor sleep among those with diabetes during the pandemic may be primarily related to their poor sleep in general and that, given financial and job security permits social isolation with less emotional stress, sleep probably improved more frequently than it worsened during the crisis. While self-reported gains and losses in weight during the pandemic were of similar frequency in those with diabetes, caution must be applied in these data as they are self-reported, and changes in sedentary habits and physical activity, as we observed, as well as reported by Barone et al. [15], suggest that weight gains would be more likely than losses.

Our findings of increased sedentary habits and a reduction in physical activity during the confinement of the pandemic are consistent with others' reports [15,28]. However, Renzo et al. report that 38% of respondents reported increased physical activities during the pandemic [27]. The time participants reported being in front of the screens included time using television, smartphones, social media, and computers. This finding of an increase in sedentary habits, given their important role in increasing the risk of metabolic diseases, cardiovascular and neurodegenerative conditions [33–35], and mental disorders [36], is perhaps our most important finding. Social isolation can lead to decreased physical activity,

which can affect the burden of cardiovascular disease [27,32,34,35]. This reduced activity amplifies the increased risk resulting from more sedentary habits.

Limitations of the current study merit mention. An important one, unfortunately common to most online research, was the low response rate (59.2%) of our study. Another relates to what we can consider the social isolation that ELSA participants underwent. The epidemiological window of the study was initiated a few months after the pandemic was officially declared in Brazil and covered the approximately eight succeeding months, during which the impact of the pandemic, in terms of hospitalizations and deaths, was large and vaccines, except at the very end, were not available. During this period, a varying load of COVID-19 cases occurred across the country and thus across the catchment areas of ELSA recruitment centers. As such, social isolation was neither 100% nor uniform across time and study centers. Our data, therefore, represent average changes which occurred within a period marked by considerable heterogeneity. An additional consideration is related to the capacity to generalize our results. Given our participants' job and income stability, our findings are most relevant to individuals with diabetes who have the means, be it due to type of employment, retirement pensions, or adequate social security nets, to financially weather a long period of social isolation. Unfortunately, this does not represent the situation of the vast majority of those with diabetes in Brazil, nor in other low- and middle-income country settings.

Finally, our study has several strengths. It provides prospectively collected data on risk factors for diabetes complications covering both the pre-pandemic and pandemic periods, which is to our knowledge missing to date in the literature. The data stem from a large and long-standing contemporary cohort focused on diabetes and cardiovascular diseases in Brazil, with participants having already undergone three follow-up visits.

5. Conclusions

The COVID-19 pandemic, when compared to the period before it, in participants with diabetes from the ELSA-Brasil sample, affected healthy habits, especially related to movement behaviors, increasing time in front of screens, as well as sitting or reclining, and decreasing physical activity. Unfortunately, given the risk of additional outbreaks of emerging infectious diseases and disasters related to civil or military conflicts or climate change, it is not unreasonable to assume that new periods requiring social isolation will arise in the future and affect those with diabetes. Thus, to minimize a worsening of behavioral risk factors for disease complications, especially in terms of increases in sedentary habits and decreased physical activity, a minimum of contingency planning for actions such as patient management guidelines and social marketing to stimulate healthy behaviors during isolation should be undertaken by health systems or relevant societies. Additionally, compared to other studies, the lesser impact we found on sleep supports government actions to minimize stress and anxiety by guaranteeing jobs and income over these periods of stress. Further research will be necessary to document the long-term effects of the changes noted on disease outcomes. A better understanding of the phenomenon of lifestyle changes caused by social crises with resultant isolation will aid the implementation of actions to maintain a healthy lifestyle among those with diabetes in times of social stress.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/covid3100109/s1, Figure S1: The flowchart of participants selected after inclusions and exclusions criteria.

Author Contributions: Conceptualization, W.J.D. and B.B.D.; Data curation, W.J.D., M.I.S., R.H.G. and B.B.D.; Funding acquisition: R.H.G., M.I.S. and B.B.D.; Methodology, W.J.D. and B.B.D.; Formal analysis, W.J.D.; Software, W.J.D.; Writing—original draft, W.J.D.; Writing—review and editing, W.J.D., B.B.D., M.I.S. and R.H.G. All authors have read and agreed to the published version of the manuscript.

Funding: This work was supported by the Brazilian Ministry of Health (Science and Technology Department) and the Brazilian Ministry of Science and Technology (Project and Study Funding Body and the National Council for Scientific and Technological Development, CNPq) [grant numbers 01 06 0010.00 and 405545/2015-0 RS; 0106 0212.00 and 405551/2015-0 BA; 01 06 0300.00 and 405543/2015-8 ES; 0106 0278.00 and 405552/2015-7 MG; 01 06 0115.00 and 405547/2015-3 SP; and 01 06 0071.00 and 405544/2015-4 RJ], and by the Coordination Office for the Improvement of Higher-Education Personnel (CAPES) Academic excellence program—PROEX (WJD).

Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by ELSA-Brasil and by the Ethics Committees of Hospital de Clínicas de Porto Alegre (under the registration number 1.893.463 and 4.023.601), Hospital Universitário da Universidade de São Paulo (1.801.270 and 4.040.042), Fundação Oswaldo Cruz (1.900.315 and 4.063.982), Universidade Federal de Minas Gerais (47125015.4.1001.5149), Universidade Federal da Bahia (1.930.817 and 4.067.184) and Universidade Federal do Espírito Santo (041/06).

Informed Consent Statement: Written informed consent has been obtained from the participant(s) to participate in this study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to restrictions on permitted uses and disclosure of data.

Acknowledgments: The authors thank the support of all participants and researchers from ELSA-Brasil.

Conflicts of Interest: The authors declare no conflict of interest.

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