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CHANGES IN PHYSICAL ACTIVITY AND ALIMENTATION HABITS DURING THE INITIAL PHASE OF THE COVID-19 PANDEMIC: A DESCRIPTIVE TRANSVERSAL STUDY

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ABSTRACT

Background: Physical exercise and healthy alimentation are considered the two basic columns for a healthy life. This study, objected to describe the impact of physical distancing in the initial phase of the COVID-19 pandemic on these habits in an adult population well known for its high prevalence of overweight and its associated chronic diseases in Brazil. Materials and Method: From May to July 2020, a digital survey was released, questioning about general health, diet and physical activity before and during decreed pandemic restrictions. Results: The majority (56%) of the 1739 respondents fitted the WHO classification criteria for overweight and obesity, 42% reported chronic morbidities and increased body weight since March 2020 (48%). The number of people not practicing any physical exercise had doubled in only three months (from 25% to 48% after March 2020) and time spend sedentary at work (38%) as well as in work-free times had increased (76%). Alimentation routines adapted partly worrisome habits like introducing more vespertine snacks between main meals but also positive changes like cooking at home (53%), and higher consumption of natural products (34%). Conclusion: Considering the age distribution of the participants (67% < 40 years of age), access to digital media, high educational level (77% with university degree), good to excellent basic sanitation (97%), the observed habit changes in only three months are concerning. It shows that even socially privileged people struggle to adapt healthy routines in times of crisis.

Key words: SARS-COV-2. Obesity. Physical activity. Sedentary Behavior. Nutrition.

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RESUMO

Mudanças na atividade física e hábitos alimentares durante a fase inicial da pandemia de covid-19: um estudo transversal descritivo

Introdução: O exercício físico e a alimentação saudável são considerados as duas colunas básicas para uma vida saudável. Este estudo teve como objetivo descrever o impacto do distanciamento físico na fase inicial da pandemia de COVID-19 sobre esses hábitos em uma população adulta conhecida por sua alta prevalência de excesso de peso e doenças crônicas associadas no Brasil. Materiais e Métodos: De maio a julho de 2020, foi divulgada uma pesquisa digital, questionando sobre saúde geral, alimentação e atividade física antes e durante as restrições decretadas pela pandemia. Resultados: A maioria (56%) dos 1.739 entrevistados se enquadrava nos critérios de classificação da OMS para sobrepeso e obesidade, 42% relataram morbidades crônicas e aumento de peso corporal desde março de 2020 (48%). O número de pessoas que não praticam nenhum exercício físico dobrou em apenas três meses (de 25% para 48% após março de 2020) e o tempo de sedentarismo no trabalho (38%) e nos tempos livres aumentou (76%). As rotinas alimentares adaptaram hábitos em parte preocupantes, como introduzir mais lanches vespertinos entre as refeições principais, mas também mudanças positivas como cozinhar em casa (53%) e maior consumo de produtos naturais (34%). Conclusão: Considerando a distribuição etária dos participantes (67% < 40 anos), acesso a mídias digitais, nível educacional alto (77% com nível superior), saneamento básico bom a excelente (97%), as mudanças de hábitos observadas em apenas três meses são preocupantes. Mostra que mesmo pessoas socialmente privilegiadas lutam para adaptar rotinas saudáveis em tempos de crise.

Palavras-chave: SARS-COV-2. Obesidade. Atividade física. Comportamento sedentário. Nutrição.

INTRODUCTION

The COVID-19 pandemic reached Brazil with its first officially registered case on 26th of February 2020 and spread rapidly throughout the whole country reaching the state of Rio Grande de Sul in the extreme south of Brazil on 10th of March 2020 (Sanar Saúde, 2020).

Thereupon, the governor of the state released on 12th of March the first pandemic-associated decree (Brasil, 2020) containing first temporary measures to prevent the propagation of the new coronavirus (SARS-CoV-2).

In its extension, this led to the suspension of teaching in schools and universities and the limitation of face-to-face work only to essential services until the end of the same month.

This unprecedented situation, sending more than half of the population into home office and home schooling reached for parts of the population into 2021.

We used this unique situation to study changes in physical activity and alimentation habits of people because those two are basic columns to sustain a healthy life and well-being, prevent from diseases and even promote healing processes of already established diseases. We choose to apply our questionnaire to a population that occupies a leading position in whole Brazil for its high prevalence of overweight (55.7% of adults >18 years with a BMI≥25, (Brasil, 2019) and associated non-transmissible chronic diseases (NCD) as well as bad habits of alimentation like high regular intake of sugary beverages and sweets (Brasil, 2019).

Because of these data this population is comparable to a number of especially developed countries worldwide with very similar rates of metabolic diseases and unhealthy habits.

A number of NCDs and overweight have been classified to increase the risk of having a severe disease course of the SARS-CoV-2 infection (Codo and collaborators, 2020) making healthy alimentation and regular exercise habits even more important even for people that not yet belong to an actual risk group (Peçanha and collaborators, 2020).

Therefore, we chose to study the effects of decreed physical distancing in the initial 3 months of the COVID-19 pandemic, choosing exemplarily this population, and a time point when divers media called to keep or adjust more healthy habits.

In contrast to other pandemics like the Spanish Flue in 1918, information about healthy life style today, is widely available via the printed and digital communication medias and because of its importance are even included in basic school education in Brazil (Brasil, 2007).

In the authors opinion, this subject has been treated by all media extensively in various forms especially in the initial phase of the pandemic (Brooks and collaborators, 2020).

To explore how much importance the specified population attach to this range of information by adapting healthy alimentation and activity routines in times of physical distancing, we released our online questionnaire in April 2020 when pandemic regulations and health promoting reports in the different media were still new and not already exhausted.

The present article reports the results of this questionnaire, documenting self-reported alimentation and activity habits established before the COVID-19 pandemic and the perception of changes while the first 3 months of decreed physical distancing.

MATERIALS AND METHODS

This descriptive transversal study analyzed the ammonized, auto reported responses of adults (≥ 18 years) living in the extreme South of Brazil (Arroio Grande, Canguçu, Capão do Leão, Cerrito, Cristal, Herval, Jaguarão, Morro Redondo, Pedro Osório, Pelotas, Pinheiro Machado, Piratini, Rio Grande, São José do Norte, São Lourenço do Sul e Turuçú, figure 1).

The questionnaire was published from 13th of May until 06th of July 2020 at Google Forms. As we wanted to capture the moment of the beginning of pandemic-restrictions, we decided to finish the survey when no new response in one week was registered and at the same time political pronouncement implied upcoming changes in local restrictions.

The questionnaire was made public using institutional websites, direct mail lists and social networks of institutions and individuals, and online newspapers covering the municipalities involved (Jornal Tradição, Jornal Lourenciano, Canguçú Online and Clic Net).

The questionnaire was accessible from any device with an internet connection, which makes the sample of this research a non-

probabilistic one with a convenience bias. Anyway, the number of internet accesses in the state Rio Grande do Sul is almost equal to the total population (January 2020) (Anatel, 2020) and was therefore an important tool to use in the beginning of a pandemic which allowed us to obtain satisfactory feedback from the population.

Prior to answering the questionnaire, informed consent form was obtained from all participants. The questionnaire was composed in part of questions created by the authors and in part by questions from the Surveillance of Risk Factors and Protection for Chronic Diseases by Telephone Survey (Brasil, 2019) and the Demographic Census Experimental Questionnaire (IBGE, 2020).

The 53 questions were divided into 3 sections; a first socio-demographic section (birth year, gender, height, weight, ethnic-racial identification, educational level, monthly family income, municipality of residence, number of people, children and elderly (≥60 years) per household, basic sanitation conditions and diagnosed chronic diseases).

The BMI was calculated individually using height and weight reported by the participants.

The other sections were divided into "before" and "after March 2020", a time point when social distancing was decreed for the first time in the state of Rio Grande do Sul / Brazil with the suspension of non-essential face-to-face services (Brasil, 2020).

To draw a more complete picture of physical activity, we included questions about sedentarism at payed jobs and daily routines and asked about job times (hours/week and format), alimentation habits (daily meals, mode of meal preparation, consumption of industrialized, natural foods, alcohol and tobacco) and physical activity habits (time spend sitting at work and at free time, mode and frequency of daily journeys to work etc., and active sports practiced).

Further we included 4 questions auto evaluating the mood and stress level of the participants and the importance of professional orientations for health, sport and alimentation.

Data are presented as total number of respondents (n) and percentage (%). Significant differences between "before" and "after March 2020" were calculated using Pearson Chi^2 test. The sample size was determined using the OpenEpi program - Open-Source Epidemiological Statistics for Public Health, version 3.01, by calculating the frequency to obtain the representativeness of each municipality.

The sample size was calculated with G*Power (Faul and collaborators, 2007) using the 2020 population estimate data taken from the Brazilian Institute of Geography and Statistics (IBGE, 2020) (n=1979, see habitants/ municipality table 1).

The study was approved by the Research Ethics Comity of the authors federal university (protocol 4.024.977), meets the standards of the resolution nr. 510/16 of the National Health Council of Brazil and is in accordance with the World Medical Associations declaration of Helsinki.

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Table 1 - Local distribution of adult respondents of the online questionnaire (n=1739) and estimated number of habitants per municipality in the extreme South of Brazil (n=824261).

RS municipality	Questionnaire		Census 2020	
	n	%	n	%
Arroio Grande	135	7.76	18238	2.31
Canguçú	54	3.12	56211	7.13
Capão do Leão	33	1.90	25409	3.22
Cerrito	20	1.15	6047	0.77
Cristal	4	0.23	8067	1.02
Herval	36	2.07	6814	0.86
Jaguarão	47	2.70	26500	3.36
Morro Redondo	37	2.13	6589	0.83
Pedro Osório	48	2.76	7706	0.98
Pelotas	773	44.45	343132	43.51
Pinheiro Machado	18	1.04	12195	1.55
Piratini	21	1.21	20704	2.63
Rio Grande	443	25.47	211965	26.88
São José do Norte	8	0.46	27721	3.51
São Lourenço do Sul	52	2.99	43540	5.52
Turuçú	10	0.58	3423	0.43

Legenda: RS - Rio Grande do Sul (state of Brazil), Census 2020 - estimated number of habitants/ municipality in 2020 (WHO, 2000).

RESULTS

General description of the study group

From the 1741 participants that accepted to respond to the questionnaire only 2 had to be excluded, because basic data were not filled out completely (total n=1739).

A majority of participants (79.2%) identified themselves as females and 85.9% as Caucasians. The median age was 36 ± 5 years with 67% below 40 years old (table 2).

The majority of participants lived in the two biggest cities of the described area (44.5% Pelotas, 25.5% Rio Grande, table 1).

There were 134 participants (7.7%) that lived with a monthly family income less than the minimum wage which was R$1,045.00 at the time (1US$ = 4.85061R$, average rate for March 2020 (Currencies zone, 2020) while 54% reported a family income of at least R$3,001.00/month.

The study group did not include any illiterate but 77% obtained at least one university degree. 96.9% labelled sanitary and hygienic living conditions of their household as good or excellent (table 2).

We observed a median BMI of 27 ± 5 Kg/m^2 and according to WHO (2000) body weight classifications we found that 56.4% of the participants are living with overweight or obesity (table 2).

A 48.4% of all participants perceived that their bodyweight increased since beginning of decreed physical distancing in March 2020. Further, 42.8% reported to live with a diagnosed chronic disease being the group of respiratory diseases the most frequent condition (26.4%). Of the participants living with chronic diseases, 31% reported to have one chronic condition and 11% accumulated two or more.

A total of 93.2% of the participants considered professional orientation about nutrition and physical exercise at least important (35.5% “important”, 30.3% “very important”, and 27.4% “extremely important”).

On the other hand, 73.3% did not actually search for help, orientation, clarifications or even assistance of these services. When asking for changes in daily routines for personal health care since March 2020, 62.2% reported adaptations.

The perception of an increased stress level was confirmed by 63.7% of the participants and 70.9% reported raised feelings of anxiety. Rating their concerns about personal health in the new situation 73.9% were worried (43.5% “moderately”, 20.6% “very”, and 9.8% “extremely”).

Table 2 - Sociodemographic characteristics of 1739 adult participants of an online questionnaire, living in the extreme South of Brazil.

Variable	Total		Female		Male		NB/GQ	
	n	%	n	%	n	%	n	%
Sex	1739		1376	79.13	352	20.24	11	0.63
Ethnic-racial identification								
Asian	8	0.46	7	0.40	1	0.06	0	0
Black	90	5.18	77	4.43	13	0.75	0	0
Brown	143	8.22	104	5.98	37	2.13	2	0.12
Caucasian	1494	85.91	1186	68.20	299	17.19	9	0.52
Indigenous	4	0.23	2	0.12	2	0.12	0	0
Age groups								
18 to 30 years	745	42.84	592	34.04	146	8.40	7	0.40
31 to 40 years	464	26.68	368	21.16	95	5.46	1	0.06
41 to 50 years	257	14.78	202	11.62	54	3.10	1	0.06
51 to 60 years	196	11.27	153	8.80	41	2.36	2	0.12
≥ 61 years	77	4.43	61	3.51	16	0.92	0	0
Monthly family income* n=1738								
R$1.00 to R$1000.00	134	7.71	112	6.44	20	1.15	2	0.12
R$1,001.00 to R$5,000.00	1097	63.12	889	51.15	200	11.51	8	0.46
R$5,001.00 to R$20,000.00	465	26.75	345	19.85	119	6.85	1	0.06
>R$20,000.00	42	2.42	30	1.73	13	0.75	0	0
Maximal education								
Illiterate	0	0	0	0	0	0	0	0
Elementary School	37	2.13	25	1.44	12	0.69	0	0
High school/technical education	362	20.82	276	15.87	82	4.71	4	0.23
University graduation	729	41.92	566	32.55	158	9.09	5	0.29
Post-graduation	611	35.14	509	29.27	100	5.75	2	0.12
Sanitation and hygiene conditions								
Excellent	1177	67.68	937	53.88	236	13.57	4	0.23
Good	508	29.21	398	22.89	103	5.92	7	0.40
Median	44	2.53	33	1.90	11	0.63	0	0
Bad	4	0.23	4	0.23	0	0	0	0
Very bad	6	0.35	4	0.23	2	0.12	0	0
People living with chronic diseases								
Chronic diseases	745	42.84	618	35.54	121	6.96	6	0.35
BMI categories**								
Underweight	38	2.19	33	1.90	4	0.23	1	0.06
Normal weight	720	41.40	620	35.65	94	5.41	6	0.35
Overweight	606	34.85	437	25.13	167	9.60	2	0.12
Obesity class I	257	14.78	95	5.46	62	3.57	0	0
Obesity class II	84	4.83	65	3.74	18	1.04	1	0.06
Obesity class III and IV	34	1.96	26	1.50	7	0.40	1	0.06

Legenda: *Minimum wage at the time R$ 1,045.00 (=US$215,44), ** World Health Organization categories for Body Mass Index (BMI), % from the total n, NB Non-binary, GQ genderqueer

Alimentation habits

When asking for type of meals people daily take we observed that a small portion of people inserted additional meals they did not take before March 2020: 9.4% of participants inserted a teatime snack, and 6.6% inserted a bedtime snack (P<0.0001, table 3).

Further, before March 2020, 28.8% of the participants reported to prepare 2 or less days/week their meal at home, while 37.7% practiced this each day.

After 3 month of physical distancing, 53% responded to have increased this habit.

The regular consumption of industrialized foods changed for 50.1% of the participants, were half of them reduced and the

other half increased its consumption. The consumption of natural products did not change for 51.4% but increased for 34% of participants.

Of the 76.5% participants that reported a habit to consume alcohol, 20.4% of them increased their consumption after March 2020 and 22.1% reduced. Of the 234 smokers 36.6% related an increased consumption of cigarettes after March 2020, while 19.4% decreased consumption.

Physical activity habits

The number of people that did not practiced any regular sport (before, 24.8%) doubled after March 2020 (47.7%). People that practiced regular sports in community with others, like ball sports reduced these activities by 84.3%, while 90.7% of people that practiced any dance or gymnastic were able to continue doing so (table 3).

Correspondingly, the weekly duration of sports declined were the number of participants that practiced 2h or less per week a sport of their choice slightly increased (2.4% and 3.4%, respectively) while practicing more than 2h decreased (63.5% before and after 45.9%). Anyway, 82% of the participants classified the necessity of doing sport as “important” up to “extremely important”.

To have a broader view of time spent inactive (sedentary) and active, besides practicing physical exercise, we included questions about how people spend work and free times. Before March 2020, 80.5% of the participants were in employment and all of them reported to work presently at their working places.

After March 2020, 59% continued in employment, and 6.3% were temporarily exempted from work. Further, the time spent working reduced for 43.1% of the participants, increased for 8.4% and did not change for 26.1%.

Home office was practiced by 33.3% of participants and 4.6% adapted to half-time home office. Before decreed restrictions, 48.6% spent daily at least 4 hours sedentary at work. Afterwards, 37.6% reported increased, and 18.2% reduced sedentary working time.

In parallel, personal time spent sedentary increased for 75.8% of participants and the frequency of routine walks (to supermarkets, workplace, etc. even by bike) reduced for 45.7%. Nearly half (48.8%) of the participants stated to spend 24h a day at home since beginning of decreed physical distancing.

Table 3 - Types of daily meals taken and sport types practiced regularly by 1739 participants of an online questionnaire, before and after the decreed physical distancing in March 2020.

Variable	Before 03/2020		After 03/2020		
	n	%	n	%	p
Types of daily meals		p < 0.0001; 66.48 DF 7			
Breakfast	1351	77.69	1265	72.74	0.0008
2. Breakfast	434	24.96	329	18.92	****
Lunch	1706	98.10	1681	96.67	0.1080
After lunch snack	684	39.33	681	39.16	0.9446
Teatime snack	945	54.34	1108	63.72	****
Afternoon snack	522	30.02	542	31.17	0.4844
Dinner	1335	76.77	1353	77.80	0.4915
Bedtime snack	125	7.19	240	13.80	****
Sport types		p < 0.0001; 459.7 DF 7			
None	431	24.78	830	47.73	****
Biking	356	20.47	193	11.10	****
Running	243	13.97	123	7.07	****
Walking	686	39.45	366	21.05	****
Ball sports	211	12.13	33	1.90	****
Gymnastic/dance	260	14.95	237	13.63	0.2865
Bodybuilding	507	29.16	237	13.63	****
Others	140	8.05	148	8.51	0.6667

Legenda: **** p<0.0001.

DISCUSSION

Remembering, that our study basis on self-assessments of the participants, in the very initial phase (3 months) of decreed COVID-19 restrictions in 2020, we describe here a population different from that usually examined by huge population surveys like the VIGITEL.

The presented population is relatively young (67% ≤40 years), highly educated (77% with university degree) and reports good basic sanitation (good or excellent 97%). This makes this population particularly interesting because we can expect a general understanding of the pandemic situation and basic knowledge of healthy habits.

Further, the participants responded a digital questionnaire demonstrating access to internet, and thereby access to a wide range of official health information. Additionally, more than half of these participants (56.4%) are overweight or already living with obesity, which makes half of the studied population a COVID-19 risk group.

Exacerbating this scenario, 48.4% of the participants suspect that in these roughly 3 month since March 2020 their bodyweight had increased.

Considering the high number of young participants in our survey this finding is even more alarming especially as long-time effects of that weight gain and belonging adaptations of questionable health habits (see below) might be less foreseeable for, at the moment, young adults.

Analyzing responses to questions about alimentation, we observed a positive change of the considered healthy habit to prepare food at home (Mazzolani and collaborators, 2020) were more than half of the participants (53%) reported to have increased the frequency of these preparations after March 2020.

On the other hand, we noted a slight fall in numbers of participants that daily have breakfast and in place a slight increase in people that reported vespertine meals, considered a less healthy alimentation (Husain and collaborator, 2020).

Taking into account that these findings reflect only changes in the initial phase of the COVID-19 pandemic we wonder if these behaviors might turn into long-time modifications of lifestyle.

Further, the majority of the participants declared themselves female (79.1%). Women traditionally assume the responsibility for alimentation of the family especially in households were children are present. Therefore, our data probably represent a more health-oriented part of the population which could also explain the slight increase in meals prepared at home and the positive increase in consumption of natural products.

As already reported by others, we found a dramatic increase of people that gave up doing physical exercise, doubling the number of those reporting not practicing any regular sportive activity before March 2020 (Peçanha and collaborators, 2020; Malta and collaborators, 2020; Martinez and collaborators, 2020). At the same time, also the time spent practicing these activities reduced, independent of whether these sports were cancelled because of social distancing restrictions like team sports or individual open air activities like jogging. The small portion of people that practiced regular gymnastic or dance were surprisingly unaffected. Next to defined types of sport, we assessed other forms of physically activities like going to work or supermarket to separate these times from those actually spent inactive or sedentary. This way we found that the time spent sedentary increased both for work (37.6%) and especially for work-free time (75.8%), numbers that cannot be fully explained by the 17.7% that lost their job and 33.3% of participants that reported to work at home. Contrasting this, 82% of the participants categorized regular physical activity at least as important but were not able to put this into practice. In the light of the number of new publications about diet and physical activity that might directly influence the COVID-19 disease outcome of each patient our findings are even more worrisome (Codo and collaborators, 2020; Peçanha and collaborators, 2020; Sales-Peres and collaborators, 2020).

As changes in alimentation and exercise habits are tightly related to personal mood (Husain and collaborator, 2020) we analyzed as well simple questions of perceptions about selected feelings finding that with onset of the COVID-19 pandemic in the South of Brazil 63.7% of participants reported increased stress, 70.9% increased feeling of anxiety and 74.4% were worried about their health in comparison to the time before.

Even though our study reflects the responses of a privileged part of the population with access to internet and regular monthly family income we like to stress that these are

only findings from the first 3 month of pandemic restrictions which were expanded afterwards for more than a year in Brazil. Which means, that even if we are able to control future pandemics better with shorter times of physical distancing this already has a profound effect on healthy habits, weight gain, and perceived mood variations.

Furthermore, the importance of healthy habits, and the relation of metabolic diseases to gravity of COVID-19 progression was highly distributed via the media at the time (Brooks and collaborators, 2020).

Reporting here, that these in its majority highly educated people with bright access to health information adopted already questionable habits could be interpreted as sign of helplessness and is even more worrisome when considering less privileged people about those data are scarce.

We believe that our observations are not unique to people living in the South of Brazil and should be discussed internationally to find better preparations for future challenges like new pandemics.

CONCLUSION

Knowing about the importance of healthy alimentation and regular sports and even having access to lots of health information at hand does not mean that people are able to translate this knowledge into actions like restriction-adapted healthy habits.

Learning from our study, strategy planning for upcoming pandemics should therefore include new plans for how to reach people to actively search for specialized help like nutritional and sport educative services.

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REFERENCES

1- Anatel. Agência Nacional de Telecomunicações. Portal do Governo Brasileiro. Portal de dados. https://informacoes.anatel.gov.br/paineis/acessos/. (Accessed 14/12/2020).

2-Brasil. Decreto nº 55.115, de 12 de março de 2020. Dispõe sobre medidas temporárias de prevenção ao contágio pelo COVID-19 (novo Coronavírus) no âmbito do Estado. Governo do Estado do Rio Grande do Sul. Palácio Piratini, Porto Alegre. 2020.

3-Brasil. Ministério da Saúde. Vigitel Brasil 2019: Vigilância de Fatores de Risco e Proteção para Doenças Crônicas por Inquérito Telefônico. Brasília, DF: Ministério da Saúde, Secretaria de Vigilância em Saúde Departamento de Análise em Saúde e Vigilância de Doenças não Transmissíveis. 2019. http://bvsms.saude.gov.br/bvs/publicacoes/vigitel_brasil_2019_vigilancia_fatores_risco.pdf. (Accessed 25/03/2020).

4-Brasil. Decreto nº 6.286, de 05 de dezembro de 2007. Institui o Programa Saúde na Escola - PSE, e dá outras providências. Presidência da República. Casa Civil. Subchefia para Assuntos. Brasilia. 2007.

5-Brooks, S.K.; Webster, R.K.; Smith, L.E.; Woodland, L.; Wessely, S.; Greenberg, N.; Rubin, G.J. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. The Lancet. Vol. 395. p. 912-920. 2020. DOI: https://doi.org/10.1016/S0140-6736(20)30460-8.

6-Codo, A.C.; Davanzo, G.G.; Monteiro, L.B.; Nakaya, H.I.; Farias, A.S.; Moraes-Vieira, P.M. Elevated Glucose Levels Favor SARS-CoV-2 Infection and Monocyte Response through a HIF-1α/Glycolysis-Dependent Axis. Cell Metabolism. Vol. 32. p.437-446. 2020. DOI: https://doi.org/10.1016/j.cmet.2020.07.007.

7-Currencies. zone. Currency Converter - Historic United States dollar Brazilian Real. Available: https://currencies.zone/historic/us-dollar/brazilian-real/march-2020. (Accessed 20/09/2021).

8-Faul, F.; Erdfelder, E.; Lang, A.G.; Buchner, A. G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods. Vol. 39. p.175-191. 2007.

9-Husain, W.; Ashkanani, F. Does COVID-19 change dietary habits and lifestyle behaviours in Kuwait: a community-based cross-sectional

study. Environ Health Prev Med. Vol. 25. Núm. 1. p.61. 2020. DOI: https://doi.org/10.1186/s12199-020-00901-5.

10-IBGE. Agência IBGE notícias. Censo 2020. Com questionário definido, conheça as perguntas que serão feitas no Censo 2020. Disponível em: https://agenciadenoticias.ibge.gov.br/agencia-noticias/2012-agencia-de-noticias/noticias/24914-com-questionario-definido-conheca-as-perguntas-que-serao-feitas-no-censo-2020. (Accessed 25/03/2020).

11-IBGE. Instituto Brasileiro de Geografia e Estatística. Tabela 6579 - População residente estimada (pessoas). 2020. https://sidra.ibge.gov.br/tabela/6579#resultado. (Accessed 14/09/2021).

12-Malta, D.C.; Szwarcwald, C.L.; Barros, M.B.A.; Gomes, C.S.; Machado, I.E.; Souza Júnior, P.R.B.; Romero, D.E.; Lima, M.G.; Damacena, G.N.; Pina, M.F.; Freitas, M.I.F.; Werneck, A.O.; Silva, D.R.P.; Azevedo, L.O.; Gracie, R. The COVID-19 Pandemic and changes in adult Brazilian lifestyles: a cross-sectional study. Epidemiol. Serv. Saude. Vol. 29. Núm. 4. p.e2020407. 2020. DOI: https://doi.org/10.1590/S1679-49742020000400026.

13-Martinez, E.Z.; Silva, F.M.; Morigi, T.Z.; Zucoloto, M.L.; Silva, T.L.; Joaquim, A.G.; Dall'Agnol, G.; Galdino, G.; Martinez, M.O.Z.; Silva, W.R. Physical activity in periods of social distancing due to COVID-19: a cross-sectional survey. Ciênc. saúde coletiva. Vol. 25. (suppl 2). 2020. DOI: https://doi.org/10.1590/1413-812320202510.2.27242020.

14-Mazzolani, B.C.; Smaira, F.I.; Esteves, G.P.; André, H.C.S.; Amarantes, M.C.; Castanho, D.; Campos, K.; Benatti, F.B.; Pinto, A.J.; Roschel, H.; Gualano, B.; Ferreira, C.N. Influence of nutritional status on eating habits and food choice determinants among Brazilian women during the COVID-19 pandemic. MedRxiv the preprint server for health sciences. Preprint. Nov 2020. DOI: https://doi.org/10.1101/2020.11.03.20225136.

15-Peçanha, T.; Goessler, K.F.; Roschel, H.; Gualano, B. Social isolation during the COVID-19 pandemic can increase physical inactivity and the global burden of cardiovascular disease. Am J Physiol Heart Circ Physiol. Vol. 318. Núm. 6. p.H1441-H1446. 2020. DOI: https://doi.org/10.1152/ajpheart.00268.2020.

16-Sales-Peres, S.H.C.; Azevedo-Ailva, L.J.; Bonato, R.C.S.; Sales-Peres, M.C.; Pinto, A.C.S.; Santiago Junior, J.F. Coronavirus (SARS-CoV-2) and the risk of obesity for critically illness and ICU admitted: Meta-analysis of the epidemiological evidence. Obes Res Clin Pract. Vol. 14. Núm. 5. p. 389-397. 2020. DOI: https://doi.org/10.1016/j.orcp.2020.07.007.

17-Sanar Saúde. Sanarmed - Linha do tempo no coronavírus no Brasil. 2020. https://www.sanarmed.com/linha-do-tempo-do-coronavirus-no-brasil. (Accessed 15/04/2020).

18-WHO. World Health Organization. Obesity: preventing and managing the global epidemic. Report of a World Health Organization Consultation. (WHO Obesity Technical Report Series, n. 894). Geneva. World Health Organization. p. 253. 2000.

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