

# Dietary changes and life habits of patients with cystic fibrosis in the COVID-19 pandemic

## Alterações alimentares e hábitos de vida de pacientes com fibrose cística na pandemia de COVID-19

## Cambios en la dieta y hábitos de vida de pacientes con fibrosis quística en la pandemia COVID-19

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# REVISA

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### RESUMO

**Objetivo:** verificar alterações no consumo alimentar e hábitos de vida em pacientes com fibrose cística brasileiros durante o período de isolamento social devido a pandemia de COVID-19. **Método:** pesquisa transversal com levantamento de dados por meio de questionário elaborado pela equipe de nutricionistas especialistas no tratamento de pacientes com fibrose cística, com questões referentes às manifestações respiratórias recentes de pacientes ou familiares, alterações nos hábitos de aquisição e compras de alimentos e alterações quanto ao consumo de grupos alimentares e suplementos. Os dados foram tabulados e foi realizada uma análise descritiva. **Resultados:** 40,34% das famílias de pacientes com fibrose cística mudaram os hábitos de compras de alimentos, cerca de 40% dos pacientes diminuíram a prática de atividade física e aumentaram o tempo de uso de telas em mais de 50% durante o período da pandemia de COVID-19. **Conclusão:** Apesar de algumas dificuldades relacionadas à aquisição dos alimentos e alterações em hábitos de vida, houve manutenção do consumo alimentar da maioria dos grupos alimentares e suplementos pelos pacientes pediátricos com fibrose cística brasileiros durante o isolamento social devido a pandemia de COVID-19.

**Descritores:** Fibrose cística; COVID-19; Estado nutricional; Estilo de vida saudável

### ABSTRACT

**Objective:** to verify changes in food consumption and lifestyle in Brazilian cystic fibrosis patients during the period of social isolation due to the COVID-19 pandemic. **Method:** cross-sectional survey with data collection through a questionnaire prepared by the team of nutritionists specialized in the treatment of patients with cystic fibrosis, with questions regarding the recent respiratory manifestations of patients or family members, changes in the habits of purchasing food and changes regarding the consumption of food groups and supplements. The data were tabulated and a descriptive analysis was performed. **Results:** 40.34% of the families of patients with cystic fibrosis changed their food shopping habits, about 40% of the patients decreased their physical activity and increased the time spent using screens by more than 50% during the pandemic COVID-19. **Conclusion:** despite some difficulties related to the acquisition of food and changes in lifestyle, there was maintenance of the food consumption of most food groups and supplements by Brazilian pediatric patients with cystic fibrosis during social isolation due to the COVID-19 pandemic.

**Descriptors:** Cystic fibrosis; COVID-19; Nutritional status; Healthy lifestyle.

### RESUMEN

**Objetivo:** verificar cambios en el consumo de alimentos y estilo de vida en pacientes brasileños con fibrosis quística durante el período de aislamiento social por la pandemia de COVID-19. **Método:** encuesta transversal con recolección de datos por medio de un cuestionario elaborado por un equipo de nutricionistas especializados en el tratamiento de pacientes con fibrosis quística, con preguntas sobre las manifestaciones respiratorias recientes de pacientes o familiares, cambios en los hábitos de compra de alimentos y cambios en el consumo de grupos de alimentos y suplementos. Los datos se tabularon y se realizó un análisis descriptivo. **Resultados:** el 40,34% de los familiares de pacientes con fibrosis quística cambiaron sus hábitos de compra de alimentos, alrededor del 40% de los pacientes disminuyó la práctica de actividad física y aumentó el tiempo de uso de pantallas en más del 50% durante el período pandémico. COVID-19. **Conclusión:** A pesar de algunas dificultades relacionadas con la adquisición de alimentos y cambios en el estilo de vida, hubo mantenimiento del consumo de alimentos de la mayoría de los grupos de alimentos y suplementos por parte de pacientes pediátricos brasileños con fibrosis quística durante el aislamiento social debido a la pandemia COVID-19.

**Descriptor:** Fibrosis quística; COVID-19; Estado nutricional; Estilo de vida saludable.

ORIGINAL

## Introduction

Cystic fibrosis (CF) is an autosomal recessive genetic disease that manifests itself in a multi-systemic way. Due to cell membrane protein dysfunction called cystic fibrosis transmembrane conductance regulator (CFTR) the patient has repercussions mainly in the respiratory and digestive tracts.<sup>1</sup> There is a strong association between nutritional status and pulmonary function, and multiprofessional treatment of cf patients is essential to ensure a good prognosis of the disease. Due to the increased need for energy, protein and fats, oral supplementation is often required to ensure adequate nutritional intake.<sup>1</sup>

On March 11, 2020, the World Health Organization declared a pandemic covid-19, a disease caused by the new Coronavirus SARS-CoV-2, which emerged from China, with subsequent spread worldwide. In Brazil, measures are taken to reduce exposure to the virus, especially of patients considered at risk, including those with chronic diseases. Italian researchers published an editorial highlighting concerns about cystic fibrosis patients amid the spread of the pandemic, and social isolation is reinforced, as measures such as wearing masks and hand hygiene are already part of the cystic fibrosis patient's routine.<sup>2-4</sup>

The Brazilian Society of Pulmonology and Tisiology (BSPT) in partnership with the Brazilian Cystic Fibrosis Studies Group (BCFSG) was positioned stating that the patient with cystic fibrosis should be considered as part of the risk group for complications related to infection by the new coronavirus due to manifestations of the disease, including relevant impairment of pulmonary function. However, the positioning clarifies that there are no reports of cystic fibrosis patients who have been affected, therefore, it is difficult to establish the real impact of SARS-CoV-2 infection in these patients. The patients described in studies published so far are chronic lung diseases (COPD) and asthma, in addition, the most severe relationship is clear in patients over 60 years of age, an infrequent age group in cystic fibrosis.<sup>5</sup>

BSPT and BCFSG also state that prescribed regular treatments should be maintained during quarantine, such as inalations, oral medications, bronchial hygiene maneuvers, physiotherapy, physical activity and adequate nutrition.<sup>5</sup> A food strategy consulting firm released results of its research on food and well-being of Brazilians during the period of social isolation in combating the SARS-CoV-2 virus responsible for COVID-19. Data from 494 Brazilians from all regions of the country showed a worsening in the dietary pattern, with higher consumption of items for snacks, soft drinks and artificial juices, and worsening in sleep quality. On the other hand, they indicate an increase in the practice of exercises to maintain the well-being.<sup>6</sup>

No studies were found to verify changes in feeding in patients with cystic fibrosis in quarantine, where the decrease in food quality and nutritional status can lead to worsening of health in the medium and long term.

In this sense, the aim of the study was to verify changes in food intake and life habits in patients with Brazilian cystic fibrosis during the period of social isolation due to the COVID-19 pandemic.

## Method

This is a cross-sectional study, with a self-administered questionnaire in an electronic way (dissemination by Brazil) or in person at the Children's and

Adolescents' Institute at Hospital das Clínicas of the Faculty of Medicine of the University of São Paulo (ICr- HCFMUSP) from April 18 to June 8, 2020.

The sample was obtained through e-mail recruitment, electronic messages on mobile phones, dissemination of the questionnaire on social networks and obtaining answers in person from those responsible for cystic fibrosis patients followed at ICr- HCFMUSP, when they were taking medication or supplements.

To calculate the sample number, the calculation formula was used:  $n = \frac{N \cdot Z^2 \cdot p \cdot (1-p)}{Z^2 \cdot p \cdot (1-p) + e^2}$ . N-1 (n: calculated sample, N: population, Z: normal variable, p: real probability of the event, and: sampling error). Considering the population with Brazilian cystic fibrosis of about 3,000 patients, with a margin of error of 10% and reliability of 90%, a sample number of 67 questionnaires was estimated.<sup>7</sup>

Patients using exclusive enteral therapy, exclusively breastfed or hospitalized during the study period were excluded from the sample. Patients from 6 months to 19 years of age with a previous diagnosis of cystic fibrosis were selected.

The questionnaire (Chart 1) was prepared by the team of nutritionists specialized in the treatment of patients with cystic fibrosis and addressed questions regarding recent respiratory manifestations of patients or family members, changes in eating habits and purchases of food and changes in the consumption of food groups and supplements. The possible answers to the different food groups questioned were: (1) did not change consumption, (2) increased consumption or (3) decreased consumption. The data were tabulated in Excel and described according to the distribution of data performed by means of percentages and medians.

**Chart 1** - Questionnaire on changes in food consumption and lifestyle habits in Cystic Fibrosis in quarantine. São Paulo, 2020.

Sample characterization	Questionary
State	Have you had any unusual respiratory symptoms recently?
Date of Birth	Have any family members had any respiratory symptoms recently?
Patient name	Who does food purchases these days?
Name of the person in charge	Has anyone been diagnosed with COVID-19 in the family?
	Have food purchases been modified due to quarantine?
	If you answered "Yes" in the previous question, what changed?
	Did you lose or gain weight in that period?
	Has there been a change in your screen time?
	Was there a change in the amount of physical activity?
	Have you changed fruit consumption recently?
	Have you changed the consumption of vegetables recently?
	Have you changed vegetable consumption recently?

	Have you changed meat consumption recently?
	Have you changed the consumption of milk and dairy products recently?
	Have you changed the consumption of beans recently?
	Have you changed the consumption of soft drinks or artificial juices recently?
	Have you changed the consumption of sweets, chocolates or sugary products recently?
	Have you modified the consumption of cystic fibrosis supplements recently?
	Have you changed the number of daily meals recently?
	In general, have you changed the amount of food consumption recently?

All were invited to participate with clarification that it is a research project and participation is voluntary, without any burden in case of acceptance or not in participation. If accepted, a click on "accepted" was given in the electronic questionnaire or signed the informed consent form. The present study was approved by the Research Ethics Committee (CEP) of the Faculty of Medicine of the University of São Paulo, with Certificate of Presentation for Ethical Appreciation (CAAE) 31751220.6.0000.0068 and opinion no. 4,032,472.

## Results

Responses were obtained from 70 patients to the questionnaire, 45.71% in the face-to-face form. Thus, the vast majority of the data obtained were from the state of São Paulo (64.18% of the sample), followed by Sergipe (with 22.39% participation). Other Brazilian states (Goiás, Minas Gerais, Paraíba, Paraná, Santa Catarina and Rio Grande do Sul) jointly had a 13.43% share in the research.

The median age of the participating patients was 10.2 years. The vast majority (92.86%) of the patients presented stable respiratory condition during the period of social distancing, as assured by the guardian at the time of data collection. Although six patients reported that relatives had respiratory symptoms or cough or fever recently, only two patients had confirmed cases of COVID-19 among family members, and these reported performing complete isolation of contact of the family member with the patient with cystic fibrosis.

Large portion (40.34%) of the families of patients with cystic fibrosis changed the habits of food purchases during the COVID-19 pandemic period. Some of the changes mentioned were: not shopping for hortifruti at free fairs (n=6), buying more frozen or ready-to-eat products (n=3) and only 1 patient reported not finding usual food products for sale. The ones responsible for the purchase of products, in most households (53.13%), were grandparents in the period of social distancing.

Figure 1 shows data regarding changes in weight, time spent on screens (television, tablet, computer, mobile phone, among other sedentary activities) and time spent on physical activities in patients with cystic fibrosis during the period of social distancing.

**Figure 1-** Distribution of patients with cystic fibrosis according to changes in weight pattern, screen time (television, tablet, mobile phone, computer) and physical activities during the period of social distancing due to the COVID-19 pandemic. São Paulo, 2020.

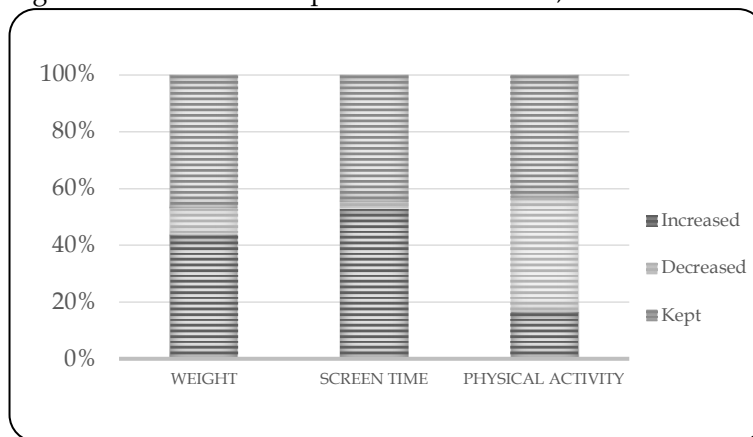
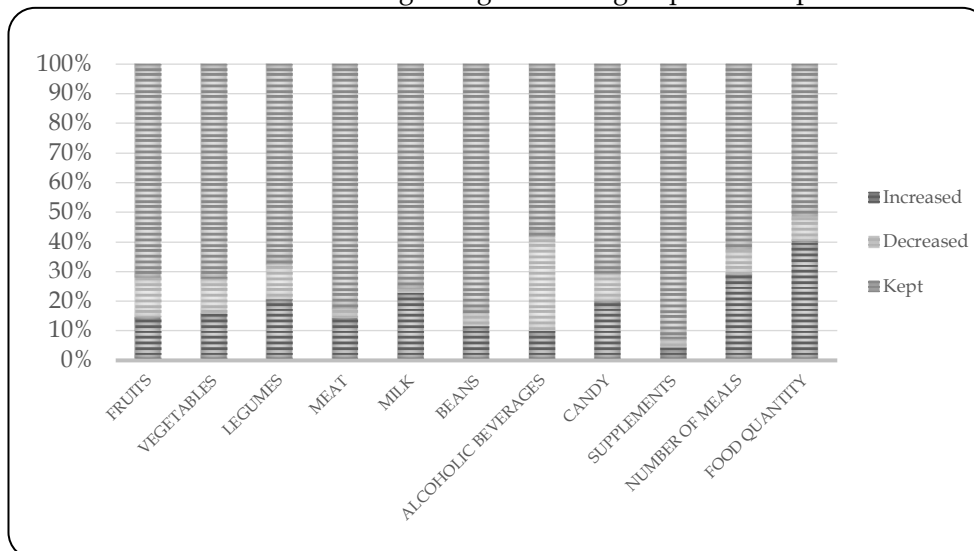


Figure 2 lists the consumption of food groups according to changes in the frequency of consumption during the COVID-19 pandemic period. It is noteworthy that 40% of patients reported an increase in the consumption of the amount ingested during the period considered and more than 90% of the patients maintained the consumption of oral supplements indicated for the treatment of cystic fibrosis.

**Figure 2-** Patients distribution according changes in food groups consumption. São Paulo, 2020.



## Discussion

This unprecedented study showed that, in general, patients with cystic fibrosis maintained the eating habit during the period of social isolation, despite presenting some difficulties related to the acquisition of food. The main changes occurred in relation to life habits, such as decreased physical activity and increased time of screen use.

Most patients maintained or increased weight during the quarantine period, which is a very important finding, especially when dealing with CF patients.<sup>1</sup> Most of them reported that the amount of food consumed throughout the day increased, a result consistent with the increase in weight gain, although they did not significantly alter the food groups consumed. These findings are compatible with the literature, in other studies conducted at the pandemic.<sup>8-9</sup>

The way food was purchased changed during social distancing for most participating families, with changes such as: not buying fruits and vegetables at free fairs, increasing the purchase of frozen and ready-to-eat products or not finding food usually consumed to buy. Studies have shown that quarantine can affect the food supply chain and generate a situation of food and nutritional insecurity, related to the higher consumption of processed foods of greater durability, access and easier use.<sup>10-11</sup> Additionally, limited access to fresh food can negatively affect mental and physical health.<sup>8</sup>

In our study, the food groups mentioned with the highest rates of increased consumption were dairy and sweet. On the other hand, the groups that presented the most decrease in intake were sugary drinks, and to a lesser extent, fruits and vegetables. The vegetable food group, curiously, suffered a reduction in consumption by the participants, on the other hand, another portion of the patients reported an increase in consumption. Another interesting fact is that the consumption of supplements has been maintained for most patients, suggesting that patients consider the use of the supplement as part of the treatment of the disease.

Although no nutrient has been scientifically proven to be beneficial for the prevention or treatment of COVID-19, a diverse diet is important for maintaining an adequate immune system.<sup>9</sup> Many patients reported that they decreased the intake of sugary drinks, as they replaced them with natural juices, in an attempt to improve immunity. A study conducted during social isolation in China also found that many people began, on their own, consuming vitamin C, probiotics and other nutritional supplements during the pandemic.<sup>9</sup>

More than half of the sample reported that the time of use of computer, tablet, mobile phone and/or television during quarantine increased, while most reported decreased physical activity. Many children and young people have their main physical activities related to sports and school activities. With the COVID-19 pandemic, it is known that these shareholdings have greatly decreased.<sup>8</sup> Ammar et al.<sup>12</sup> identified that the use of technologies increased significantly after the onset of social isolation. These restrictions may be associated with health burden, potentially compromising physical fitness, which consequently may decrease the ability to respond to infections and with immunological and cardiopulmonary complications.<sup>8</sup> On the other hand, it seems interesting to promote social communication and physical and mental well-being through the use of internet and other technologies.<sup>12</sup>

Ammar et al. through an online survey of adults from various countries, they found that the number of days of weekly physical activity decreased by 24% during quarantine, and the number of daily hours in which they remained seated increased by 28.6%. The percentage of people reporting eating out of control most of the time or always was higher during home confinement than before it, as well as the number of snacks between main meals or overnight.<sup>8</sup> As CF patients have increased nutritional needs, by about 110 to 200% compared to their healthy peers, higher dietary intake is a habit that is typically encouraged by health

professionals.<sup>1</sup> Perhaps social isolation may have allowed families to be able to give greater attention to the feeding of individuals with CF, due to the increase in family life. In any case, physical activity is also an important part of treatment, and its decrease is harmful.<sup>1</sup>

Regarding respiratory symptoms, most patients reported that there was no change during the period of social isolation. This may have occurred due to the fact that the research was done between March and May, before winter, when pulmonary infections occur more frequently, due to predisposing factors.<sup>13</sup> Few patients had cases of COVID-19 confirmed in the family.

Among the limitations of the study, we highlight the low rate of responses to the electronic questionnaire, which decreased the sample size and the diversity of patients from other Brazilian states. The solution found was to apply the questionnaire with caregivers who came to withdraw medication or supplements in the referral service, which may have skewed the maintenance data of the use of cystic fibrosis supplements. Regarding the strengths, this study showed a potential to prevent nutritional status deficit through the maintenance of a healthy diet and nutritional supplementation, even with social distancing. Thus, we highlight the importance of multiprofessional action with CF patients and studies on the impacts of the most diverse situations in this population.

## Conclusion

Despite some difficulties related to the acquisition of food and changes in life habits such as decreased physical activity and increased screen time, with this study it was possible to conclude that there was maintenance of food consumption of most food groups and supplements by pediatric patients with Brazilian cystic fibrosis during social isolation due to the COVID-19 pandemic.

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## References

- 1- Athanazio RA, Silva Filho LV, Vergara AA, Ribeiro AF, Riedi CA, Procianoy ED, et al. Grupo de Trabalho das Diretrizes Brasileiras de Diagnóstico e Tratamento da Fibrose Cística. Brazilian guidelines for the diagnosis and treatment of cystic fibrosis. *Bras Pneumol.* 2017;43(3):219-45.
- 2- Messina G, Polito R, Monda V, Cipolloni L, Nunno ND, Mizio GD, et al. Functional Role of Dietary Intervention to Improve the Outcome of COVID-19: A Hypothesis of Work. *Int. J. Mol. Sci.* 2020;21(9), 3104.
- 3- Brasil, Ministério da Saúde. Disponível em: [<https://coronavirus.saude.gov.br/>].
- 4- Colombo C, Burgel PR, Gartner S, Koningsbruggen-Rietschel SV, Naehrlich L, Sermet-Gaudelus I, et al. Impact of COVID-19 on people with cystic fibrosis. *Lancet Respir Med.* 2020; Published Online April 15, 2020. [https://doi.org/10.1016/S2213-2600\(20\)30177-6](https://doi.org/10.1016/S2213-2600(20)30177-6)

- 5- Nota de posicionamento da sociedade brasileira de pneumologia e tisiologia em conjunto com o grupo brasileiro de estudos da fibrose cística, Brasília, 16 de abril de 2020.
- 6- RG NUTRI & TECH.FIT. Tracking COVID-19. ALIMENTAÇÃO e BEM-ESTAR. Mar-Abr 2020.
- 7- Cálculos de amostragem. <https://www.solvis.com.br/calculos-de-amostragem/>
- 8- Ammar A, Brach M, Trabelsi K, Chtourou H, Boukhirs O, Masmoudi L, et al. Effects of COVID-19 Home Confinement on Eating Behaviour and Physical Activity: Results of the ECLB-COVID-19 International Online Survey. *Nutrients*. 2020;12(6):1583.
- 9- Zhao Ai, Li Z, Ke Y, Huo S, Ma Y, Zhang Y, et al. Dietary Diversity among Chinese Residents during the COVID-19 Outbreak and Its Associated Factors. *Nutrients*. 2020;12(6):1699.
- 10- Ribeiro KDS, Garcia LRS, Dametto JFS, Assunção DGF, Maciel BLL. COVID-19 and Nutrition: The Need for Initiatives to Promote Healthy Eating and Prevent Obesity in Childhood. *Child Obes*. 2020;16(4):235-23
- 11- Pérez-Escamilla R, Cunningham K, Moran VH. COVID-19 and maternal and child food and nutrition insecurity: a complex syndemic. *Matern Child Nutr*. 2020;16:1-4.
- 12- Ammar A, Trabelsi K, Brach M, Chtourou H, Boukhirs O, Masmoudi L, et al. Effects of home confinement on mental health and lifestyle behaviours during the COVID-19 outbreak: Insight from the "ECLB-COVID-19" multi countries survey. *medRxiv* 2020.
- 13- Faria AM, Baldacci ER. Avaliação da resposta humoral à vacina pneumocócica conjugada 7-valente em crianças com asma moderada em uso de corticoide inalatório e em crianças com fibrose cística. São Paulo. [Mestrado em Pediatria] – Faculdade de Medicina da Universidade de São Paulo; 2009.

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