

# Young people and adolescents have more irregular meals during the COVID-19 pandemic: A nested case-control study on chrono-nutrition before and during the COVID-19 pandemic

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## INTRODUCTION



Chrono-nutrition is an emerging field of research that includes three aspects of time: (1) regularity, (2) frequency, and (3) clock time. Due to the COVID-19 pandemic and the implemented lockdown, daily routines were disrupted, which presented a unique opportunity to investigate chrono-nutrition, in particular in adolescents.

## METHODS

A nested case-control study was conducted and information on chrono-nutrition was collected via an anonymous online questionnaire including 99 participants aged 13 to 20 years (N = 43 before the COVID-19 pandemic and N = 56 during the COVID-19 pandemic). Differences in chrono-nutrition were tested with chi-square and Mann-Whitney U.

## RESULTS

Table 1. Breakfast time, frequency (days) and regularity (%) before the COVID-19 pandemic (n=43) and during the COVID-19 pandemic (n=56).

Chrono-nutrition element	Breakfast before the COVID-19 pandemic (n=43)	Breakfast during the COVID-19 pandemic (n=56)
Clock time	 9:12 ± 45 min	 9:45 ± 53 min
Frequency (days)	5.3 ± 1.3*	4.4 ± 2.5*
Regularity (%)	65%*	34%*

\* Indicates statistical significance (P < 0.05)

## CONCLUSION


During the COVID-19 pandemic, we observed in young people and adolescents that:


- Meal regularity declined during the COVID-19 pandemic.
- Meal frequency, especially snack consumption, increased.


This highlights the importance of maintaining a **regular daily structure** in order to avoid excessive energy intake via snacks.


## Baseline characteristics

Before the COVID-19 pandemic


 Boys: 25 (58.1%)  
Girls: 18 (41.9%)  
Other: 0 (0%)


 15.5 ± 1.2 years


 62.6 ± 9.3 kg


 20.3 ± 2.6 BMI

During the COVID-19 pandemic

 Boys: 25 (44.6%)  
Girls: 27 (48.2%)  
Other: 4 (7.1%)

 16.0 ± 1.8 years

 62.9 ± 12.9 kg

 21.0 ± 3.6 BMI

During the COVID-19 pandemic, participants consumed their breakfast less regularly (34%) compared with participants before the COVID-19 pandemic (65%) (P = .003). Additionally, during the COVID-19 pandemic, participants consumed snacks in the morning (26% vs. 60%, P = .001), afternoon (19% vs. 81%, P < .000), and evening (22% vs. 84%, P < .001) less regularly.. 14%; P = .07).

However, the frequency in afternoon (4.9 ± 2.2 times per week vs. 3.8 ± 1.9 times per week, P = .002) and evening snacks (4.4 ± 2.4 times per week vs. 3.4 ± 2.0 times per week, P = .02) was higher for participants during the COVID-19 pandemic. We also observed that participants reported more sleeping problems during the COVID-19 pandemic (34% vs. 14%; P = .07).