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# A short questionnaire to assess changes in lifestyle-related behavior upon stressful events: translation, cultural adaptation, and validation study for the Portuguese language

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**Abstract** The COVID-19 pandemic impacted considerably university students' health and well-being, justifying the development and use of validated measuring tools to analyse and assess mental/physical health, and well-being throughout consecutive confinements (or lockdowns), or any other endured stressful periods. This study aims to describe the translation, the cultural adaptation, and the validation of a short questionnaire to assess changes in lifestyle-related behavior, due to the COVID-19 pandemic, in Portuguese university students. We enrolled 128 university students (mean age: 38.3 [13.0] studying at/attending the Portuguese Catholic University). The validation study included Cronbach alpha for the whole scale, corrected item-total correlations, and Cronbach alpha to evaluate the scale reliability whenever items were deleted. Exploratory factor analysis was performed, and 3 factors were extracted through the principal component extraction with varimax rotation. Communalities were also observed. The mean and standard deviation of the total questionnaire score was -1.73 (6.65). No difference was seen between genders. However, participants who already had COVID-19 symptoms, and participants who perceived their health as worse than in the prepandemic period, presented lower questionnaire scores. Internal consistency of 0.74, as measured by Cronbach alpha, was considered as acceptable. Exploratory factor analysis corroborated the validity of the tool. This short questionnaire could be applied to detect changes in lifestyle-related behavior throughout stressful situations in a Portuguese university student's population.

**Keywords:** Lifestyle-related behavior, COVID-19, questionnaire, translation, exploratory factor analysis, Portuguese University students

## Introduction

The COVID-19 pandemic imposed life-changing challenges among people across the globe, which prompted individuals for "social distancing" and "self-isolation,"[1,2] and in a short period of time, the world faced a new disease, that was conveying high mortality, mainly in vulnerable population groups. Staying at home for long periods, with food easily available, in conjunction with a perception of boredom and stress, increased the likelihood of overeating, particularly "comfort foods," typically high in sugar, fat, and consequently, energy-dense. Meal-scheduling seemed to be often adapted to accommodate evolving dietary habits, alongside other negative changes such as a lack of physical activity, an increase in sedentary activities and a decrease in sleep hygiene, both in terms of duration and quality. Besides the noticeable impact on quality of life, it is well known that lifestyles play a crucial role in the incidence of chronic diseases, such as obesity, type 2 diabetes, cardiovascular disease, and some cancers.[3]

The pandemic has also significantly compromised work dynamics, academic learning methods, leisure activities, exercise practice, and food availability. All these changes intensified the already stressful scenario set off by the virus SARS-COV-2 dissemination worldwide. Nevertheless, some settings are more conducive to emotional and stressful disorders, than others. Namely, it is known that academy and university students report to be prone to mental health impairments and experience a high incidence in physiological and mental stress.[4] Indeed, the physical and mental well-being of university students has recently become a growing concern, since it seems to be easily compromised, disrupting the learning process itself, by many stressors including increasing stress-related difficulties, academic pressure, and burnout.[5,6] The COVID-19 pandemic has been described to have led to significant and extensive burden on physical health, mental

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*Data availability statement: The data that support the findings of this study are available from the corresponding author upon reasonable request.*



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**Table 1**

**Questionnaire mean scores (M) and standard deviation (SD) for individual items, corrected item-total correlation and internal consistency (Cronbach's alpha) if the item is deleted**

| | M | SD | Corrected item-total correlation | Cronbach's alpha if item is deleted |
|---|---|---|---|---|
| 1. During COVID pandemic, how has your probability of skipping one of the main meals (breakfast/lunch/dinner) changed? (Durante a pandemia por COVID, como variou a probabilidade de saltar refeições principais (pequeno-almoço, almoço, jantar)?) | −0.24 | 0.87 | 0.13 | 0.74 |
| 2. During COVID pandemic, how has your habit of snacking between meals changed? (Durante a pandemia por COVID, como variou o hábito de fazer snacks entre as refeições?) | −0.25 | 0.94 | 0.13 | 0.74 |
| 3. During COVID pandemic, how has your quantity/portions of meals and snacks changed? (Durante a pandemia por COVID, como variaram as quantidades/porções das refeições e snacks?) | −0.49 | 0.68 | 0.15 | 0.74 |
| 4. During COVID pandemic, how has your daily intake of fruits and vegetables changed? (Durante a pandemia por COVID, como variou a ingestão de frutas e de vegetais?) | 0.30 | 0.74 | 0.43 | 0.72 |
| 5. During COVID pandemic, how has your intake of a balanced diet (including healthy ingredients such as whole wheat, pulses, legumes, eggs, nuts, fruits and vegetables) changed? (Durante a pandemia por COVID, como variou a ingestão de uma dieta equilibrada (incluindo ingredientes saudáveis, como por exemplo trigo integral, leguminosas, ovos, frutas e vegetais)?) | 0.33 | 0.81 | 0.46 | 0.71 |
| 6. During COVID pandemic, how has your consumption of junk food/fast food and fried food changed? (Durante a pandemia por COVID, como variou o consumo de junk food/fast food e fritos?) | 0.21 | 0.99 | 0.40 | 0.72 |
| 7. During COVID pandemic, how has your intake of sugar-sweetened beverages (carbonated soft drinks, sugar-sweetened juices) changed? (Durante a pandemia por COVID, como variou o seu consumo de bebidas adoçadas com açúcar (refrigerantes gasosos, sumos doces)?) | 0.23 | 0.86 | 0.43 | 0.71 |
| 8. During COVID pandemic, how has your consumption of sweets/candies/chocolate changed? (Durante a pandemia por COVID, como variou o consumo de doces/guloseimas/chocolate?) | −0.15 | 0.86 | 0.39 | 0.72 |
| 9. During COVID pandemic, how has your participation in cooking new/traditional recipes changed? (Durante a pandemia por COVID, como variou a sua participação em cozinhar receitas novas ou tradicionais?) | −0.44 | 0.78 | −0.34 | 0.77 |
| 10. During COVID pandemic, how has your consumption of unhealthy food when you are bored or stressed or upset changed? (Durante a pandemia por COVID, como variou o seu consumo de alimentos pouco saudáveis quando está aborrecido, stressado ou chateado?) | −0.16 | 0.90 | 0.47 | 0.71 |
| 11. During COVID pandemic, how has your intake of immunity-boosting foods (lemon, turmeric, garlic, citrus fruits and green leafy vegetables) in the diet changed? (Durante a pandemia por COVID, como variou o consumo de alimentos que fortalecem o sistema imune (limão, curcuma, alho, citrinos e vegetais de folha verde) na sua dieta?) | 0.30 | 0.66 | 0.45 | 0.72 |
| 12. During COVID pandemic, how has your intake of nutrition supplements to boost immunity changed? (Durante a pandemia por COVID, como variou o seu consumo de suplementos nutricionais para fortalecer o sistema imune?) | 0.26 | 0.67 | 0.41 | 0.72 |
| 13. During COVID pandemic, how has the support of your family and friends in eating healthy changed? (Durante a pandemia por COVID, como é que o apoio da sua família e amigos, em comer de forma mais saudável, variou?) | 0.20 | 0.67 | 0.32 | 0.73 |
| 14. During COVID pandemic, how has your interest in learning healthy eating tips from the media (newspaper articles/magazines blogs/videos/TV shows/text messages) changed? (Durante a pandemia por COVID, como variou o seu interesse em aprender dicas de alimentação saudável a partir dos media (artigos de jornais/revistas/blogs/programas de TV/mensagens de texto)?) | 0.41 | 0.72 | 0.34 | 0.72 |
| 15. During COVID pandemic, how has your participation in aerobic exercise changed? (Durante a pandemia por COVID, como variou a sua participação em exercício aeróbio?) | −0.01 | 0.95 | 0.39 | 0.72 |
| 16. During COVID pandemic, how has your participation in leisure and household chores changed? (Durante a pandemia por COVID, como variou a sua participação em lazer e tarefas domésticas?) | 0.44 | 0.95 | 0.28 | 0.73 |
| | −1.16 | 0.86 | 0.20 | 0.73 |

(*continued on next page*)

**Table 1** (*continued*)

| | M | SD | Corrected item-total correlation | Cronbach's alpha if item is deleted |
|---|---|---|---|---|
| 17. During COVID pandemic, how has your sitting and screen time changed? (Durante a pandemia por COVID, como variou o tempo que esteve sentado e o tempo de ecrã?) | | | | |
| 18. During COVID pandemic, how have your hours of sleep changed? (Durante a pandemia por COVID, como variaram as suas horas de sono?) | −0.55 | 0.65 | 0.28 | 0.73 |
| 19. During COVID pandemic, how has your quality of sleep changed? (Durante a pandemia por COVID, como variou a qualidade do seu sono?) | −0.28 | 0.89 | 0.35 | 0.72 |
| 20. During COVID pandemic, how have your stress and anxiety levels changed? (Durante a pandemia por COVID, como variaram os seus níveis de stress e de ansiedade?) | −0.68 | 0.76 | 0.45 | 0.71 |

Item 1 to 20 present the Portuguese translation of each question into brackets.
Scoring instructions for the questionnaire: Items 1, 2, 6, 7, 8, 9*, 10, 17, and 20 are scored as: 2 = Significantly decreased, 1 = Slightly decreased, 0 = Grossly similar, −1 = Slightly increased, −2 = Significantly increased. Items 4, 5, 11, 12, 13, 14, 15, 16, and 19 are scored as: 2 = Significantly increased, 1 = Slightly increased, 0 = Grossly similar, −1 = Slightly decreased, −2 = Significantly decreased. Item 3**, 18*** is scored as: 0 = Grossly similar, −1 = Slightly increased/decreased, −2 = Significantly increased/decreased.
*Item 9 is scored assuming that these recipes are usually high in calories. **Item 3 is scored assuming that the person was having normal portion of meals and snacks before COVID pandemic. **Item 18 is scored assuming that the individual was having an adequate 6–8 hours sleep before pandemic.

health, and well-being particularly those of university students.[7,8] Academic students (and staff) should, therefore, be diagnosed, assessed, and supported/intervened accordingly.[4] Indeed, studies have shown that students are concerned with (a) their education experience and suspension of some in-person activities; (b) their family's well-being; and, overall, (c) the uncertainty of life and (d) of future employment.[9] Altogether, these variables lead to an increase in stress levels within students which have an impact on their physiological regulation of emotions and humor.[10] Furthermore, educational attainment is also likely to be impaired. These new challenges, triggered by COVID-19 pandemic, underpinned the need to develop and validate tools that assess the impact of a stressful event in health-related lifestyles, with a significant translation to clinical procedures, but that may also provide insights to public health policymakers in health promotion. In addition, the extension of the impact of these afflictions among university students, reinforced the need to use validated tools. Importantly, any psychological intervention applied to mitigate the adverse effects of stressful situations on education and mental health within university students can only be put into practice if accurately assessed and considered, therefore justifying the urgent need for validated tools to be applied in the Portuguese context.

Vaccines and built-upon scientific insight impacted greatly on COVID-19 associated morbidity and its mortality among vulnerable groups, enabling people to co-exist better with the COVID-19 disease. However, new challenges will certainly appear in the future, and the existence of a validated tool, able to assess the impact of a stressful event on people's health-related lifestyles, may prove very useful, not only from a clinical point of view, but to also provide insights for public health policymakers to address and prevent negative deviations to a healthy lifestyle.

The assessment of lifestyles can be a very time-consuming and complex task, particularly in a clinical context. The existence of a short questionnaire that could easily assess major lifestyle changes would be very useful. In this context, Kumari et al,[11] in 2020, developed a short questionnaire that aims to assess major lifestyles changes, encompassing a tool with 20 items targeting people from Southeast Asian countries. To apply this tool to a Portuguese population, this short questionnaire was translated (M.S. and M.C.) and subsequently validated. The aim of this study was, hence, to translate, culturally adapt and validate the previously developed questionnaire by Kumari et al.[11] in Portuguese university students.

## Methods

### *Questionnaire to assess changes in lifestyle-related behavior during COVID-19 pandemic*

The original questionnaire published by Kumari et al.[11] was developed and validated in India. In short, this new questionnaire is composed of 20 items that assess different lifestyle traits, covering important information required to assess the dietary habits (intake, meal pattern, and snack consumption), the physical activity (duration and type), and the sleep parameters (duration and quality), and it was created after an extensive literature review, the set-up of focus groups, including the general public and experts from different fields of medicine, nutrition, exercise physiology, and clinical psychology, and, finally, the questionnaire was revised by 6 experts from different medical fields.[11] Each item should be answered in a 5-point Likert scale, ranging between significantly increased and significantly decreased. Answers were quoted between −2 to 2, and the 0 corresponded to the absence of variation in the lifestyle. The total score could range between −40 and 36, where negative scores corresponded to a negative impact of COVID-19 in lifestyle-related behavior. The maximum score was 36 since 2 of the items 3 and 18 have as maximum the score "0." The questionnaire was prepared for self-administration, and it required only 5–7 minutes to be answered.

### *Developing the Portuguese version of a questionnaire to assess changes in lifestyle-related behavior during COVID-19 pandemic*

The original short-version questionnaire was translated by 2 of the researchers of the ACT-19 project: Acting on COVID-19, assessing the impact on University of Portugal (UCP) students' health (MC and MS), after the respective authors' approval. After the 2 independent translations into Portuguese, a reconciliation was carried out by the research team. Thereafter, 2 translators converted the Portuguese version back into English (A.G. and S.I., both English native speakers), without having contact with the original version, and the linguistic equivalence between the translations and the original version was assessed. This analysis resulted in minor adaptations of the first translation, so that linguistic and semantic equivalences were respected.

**Table 2**

**Principal axis factoring analysis factor loading and communalities (h2) of the questionnaire items following varimax rotation**

| | Factor 1 | Factor 2 | Factor 3 | $h^2$ |
|---|---|---|---|---|
| 13. During COVID pandemic, how has the support of your family and friends in eating healthy changed? | **0.76** | −0.02 | −0.08 | 0.58 |
| 14. During COVID pandemic, how has your interest in learning healthy eating tips from the media (newspaper articles/magazines blogs/ videos/TV shows/text messages) changed? | **0.75** | 0.10 | −0.18 | 0.60 |
| 11. During COVID pandemic, how has your intake of immunity-boosting foods (lemon, turmeric, garlic, citrus fruits and green leafy vegetables) in the diet changed? | **0.70** | 0.14 | 0.05 | 0.51 |
| 12. During COVID pandemic, how has your intake of nutrition supplements to boost immunity changed? | **0.70** | 0.05 | 0.05 | 0.50 |
| 9. During COVID pandemic, how has your participation in cooking new/traditional recipes changed? | **−0.64** | 0.15 | −0.15 | 0.46 |
| 16. During COVID pandemic, how has your participation in leisure and household chores changed? | **0.59** | −0.05 | 0.23 | 0.40 |
| 5. During COVID pandemic, how has your intake of a balanced diet (including healthy ingredients such as whole wheat, pulses, legumes, eggs, nuts, fruits and vegetables) changed? | **0.52** | 0.46 | −0.11 | 0.50 |
| 4. During COVID pandemic, how has your daily intake of fruits and vegetables changed? | **0.51** | 0.45 | −0.16 | 0.49 |
| 15. During COVID pandemic, how has your participation in aerobic exercise changed? | **0.50** | 0.16 | 0.21 | 0.32 |
| 8. During COVID pandemic, how has your consumption of sweets/candies/chocolate changed? | 0.05 | **0.71** | 0.02 | 0.50 |
| 10. During COVID pandemic, how has your consumption of unhealthy food when you are bored or stressed or upset changed? | 0.03 | **0.70** | 0.20 | 0.53 |
| 7. During COVID pandemic, how has your intake of sugar-sweetened beverages (carbonated soft drinks, sugar-sweetened juices) changed? | 0.25 | **0.65** | −0.01 | 0.49 |
| 6. During COVID pandemic, how has your consumption of junk food/fast food and fried food changed? | 0.07 | **0.60** | 0.21 | 0.41 |
| 2. During COVID pandemic, how has your habit of snacking between meals changed? | −0.25 | **0.44** | 0.11 | 0.27 |
| 3. During COVID pandemic, how has your quantity/portions of meals and snacks changed? | −0.11 | −0.06 | **0.74** | 0.57 |
| 20. During COVID pandemic, how have your stress and anxiety levels changed? | 0.04 | 0.31 | **0.73** | 0.63 |
| 18. During COVID pandemic, how have your hours of sleep changed? | 0.02 | 0.16 | **0.59** | 0.37 |
| 19. During COVID pandemic, how has your quality of sleep changed? | 0.36 | 0.04 | **0.48** | 0.36 |
| 17. During COVID pandemic, how has your sitting and screen time changed? | −0.10 | 0.25 | **0.44** | 0.26 |
| 1. During COVID pandemic, how has your probability of skipping one of the main meals (breakfast/lunch/dinner) changed? | 0.17 | −0.10 | **0.39** | 0.19 |
| Eigenvalue | 4.43 | 2.67 | 1.85 | |
| Variance (%) | 22.15 | 13.33 | 9.22 | |
| Cronbach's alpha | 0.71 | 0.70 | 0.63 | |

Bolded values indicate the highest factor loading for each item, representing the factor to which the item is primarily associated.

This second Portuguese version of the questionnaire was initially answered by 35 university students. Students were invited to fill out the questionnaire on their own and were then asked some debriefing questions about the translated items to assess comprehension. This pilot study indicated that the questionnaire was clear. None of the invited students reported any difficulties in understanding any of the items, and no further adjustments were needed. In the first semester of 2021, a second sample of university students (128 students) was asked to complete the questionnaire prepared in Google Forms. Students were informed of the purpose of this research. The study was approved by the Ethics Committee for Health of the Catholic University of Portugal (123/2019–2023), and informed consent was obtained from all participants.

### *Statistical analyses*

The normality of the distribution of continuous variables was tested by the Kolmogorov-Smirnov test, and, consequently, variables were described as means (M) and respective standard deviations (SD). Two independent samples were compared by the *t* test and more than 2 samples by the ANOVA test.

Cronbach's alpha for the whole scale, corrected item-total correlations, and Cronbach's alpha if the item is deleted were used to evaluate the scale's reliability. Considering Nunnally's criteria,[12] $\alpha \geq 0.70$ will be defined as "acceptable," whereas a criterion of 0.2 is usually recommended for the corrected item-total correlation.[13]

Exploratory factor analyses were conducted with all 20 items of the scale. Bartlett's test of sphericity was calculated. Kaiser-Meyer-Olkin (KMO) was also estimated to evaluate the sampling adequacy to carry out a factor analysis. A KMO value greater than 0.5 should be obtained to proceed to and interpret a factor analysis.[14] Factors were extracted through the principal component extraction with varimax rotation and factor loadings equal to or higher than 0.3 rated as satisfactory.[15] Scree plot examination,[16] parallel analysis,[17] and factor interpretability were considered to ascertain the number of factors that were extracted. Communalities were also observed to assess the magnitude of the variance of each item that accounted for the extracted factor.

Statistical package software SPSS 26.0 version for Windows was used to conduct the statistical analyses. A significant level was set at 0.05.

## Results

The sample consisted of 128 university students from the Catholic UCP. This validation is part of an intervention project targeting university students, named ACT-19, implemented in June 2021.

Students' age ranged from 17 to 75 years (M: 38.3; SD: 13.0). The sample included 84 (65.6%) women with a mean age of 37.2 (SD: 12.6) and 44 (34.4%) men with a mean age of 40.3 (SD: 13.5). Twenty-four (18.8%) of the participants reported a previous positivity for COVID-19 disease and symptoms.

### *Descriptive and reliability analysis*

The mean and standard deviation of the total questionnaire score was −1.73 (6.65). There were no significant differences in the questionnaire score between genders ($P = .857$), but there were

significant differences in the total score between participants who had already had COVID-19 symptoms and participants who had not (−1.59 [SD: 0.56] vs. −2.38 [SD: 2.03], $P = .02$). When participants were asked if their actual health status (a) had worsened, (b) was approximately equal, or (c) was better than before the pandemic, it was found an increased score, with a better perception of health status, compared with the prepandemic period ("worse": −4.06 [SD: 1.31] vs. "approx. equal": −1.32 [SD: 0.69] vs. "better": 0.80 [SD: 1.40], $P = .02$).

Table 1 shows the means of the questionnaire individual items' scores, respective standard deviations, corrected item-total correlation coefficients, and Cronbach's alphas if the item is deleted. Individual item mean scores ranged from −1.16 for item 17 "During COVID pandemic, how has your sitting and screen time changed?" to 0.44 for item 16 "During COVID pandemic, how has your participation in leisure and household chores changed?"

Internal consistency, as measured by Cronbach's alpha, was 0.74, and was considered acceptable. Corrected item-total correlation coefficients ranged between 0.32 and 0.47 for 13 of the 20 items (specifically items 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 19, and 20). Item 9, related to participation in cooking new/traditional recipes, obtained a negative item-total correlation coefficient (−0.34). Three other items 1, 2, and 3 showed very low correlation coefficients. If items 1, 2, 3, and 9 were excluded Cronbach's alpha would increase only to 0.79, and, for that reason, we maintained the original scale.

### *Exploratory factor analysis*

The Bartlett's test of sphericity was significant (833.97; $P < .001$), which allows to conclude that the variables are significantly correlated. KMO analysis revealed a value of 0.71, indicating that the correlation matrix was suitable for factor analysis. A total of 6 domains were identified after the factor analysis, exactly as in the original study.[11] After scree plot examination and general analysis of the questionnaire, the selection of a 3-factor model was suggested (Cronbach's alpha were 0.71, 0.70 and 0.63 for factor 1, factor 2, and factor 3, respectively). The loadings for this solution are shown in Table 2. The first factor was responsible for 22.2% of the variance with an eigenvalue of 4.43. This factor included 9 items associated with food habits related to health and the item related with the engagement in aerobic exercise. The second factor was also related to food habits, namely the consumption of high-energy foods and fast food, changes in snacking patterns and in portion sizes. This second factor explained 13.3% of the variance with an eigenvalue of 2.67. Finally, the third factor included items associated with sleep patterns and emotional traits. This factor explained 9.22% of the variance, with an eigenvalue of 1.85. The total variance explained by these 3 factors was 44.70%.

Item communalities are presented in the last column of Table 2. Item 1, specifically, "During COVID pandemic, how has your probability of skipping one of the main meals (breakfast/lunch/dinner) changed?," showed a low value, which can mean that it does not strongly contribute to factor 3.

## Discussion

The short questionnaire to assess changes in lifestyle-related behavior developed by Kumari et al.[11] targeting Southeast Asian countries was successfully translated and validated for application among the Portuguese student population.

Throughout life, people acquire and maintain different health-related lifestyles because of their education, imitation of their relatives and educators, social interactions, beliefs, and as a result of health professionals counseling. In normal conditions, it is hard to change habits and lifestyles. For instance, quite often attempts to practice a healthier diet, or to be more physically active, fail, as they imply a high compromise, motivation, and willpower.[18] Nevertheless, behavioral change is maximized whenever a big motivation is in the causing root of the change, such as life-threatening situations and limiting financial situations. In the case of COVID-19 pandemic, unprecedented conditions arose, including compulsory lockdowns which meant people were forced to change their lifestyles, almost overnight. In the clinical setting, there is a vast amount of evidence linking lifestyles with the incidence/management of chronic diseases, such as obesity, type 2 diabetes, or cardiovascular diseases. The positive effect of lifestyles will only be notable if behaviors are maintained over time. In this context, a tool that assesses major health-related lifestyles, as well as their variation over time, could be of importance in clinical settings, and from a public health point of view, might allow adjusting strategies to improve population's health. To the best of our knowledge, there is no such tool validated for the Portuguese population; for that reason, this newly validated tool could be of considerable interest and pertinence.

The mean score of the tool was −1.73 (6.65), showing a slight impact of the pandemic on participants' lifestyles, since negative scores are associated with a negative impact. This score was lower among participants who had already experienced COVID-19 symptoms and among those who perceived their actual health as worse than in the prepandemic stage. These results are in accordance with what was expected, showing the ability of the tool to rank individuals.

The item with a worse mean score was related with the amount of time that people spent sitting and watching a screen. This is perfectly compatible with the lockdown context, since in the first stage, people could not find solutions and they were not motivated to maintain themselves physically active. On the other hand, the best classified item was related to the people's participation in leisure and household chores. Again, this is compatible with the imposed scenario.

The questionnaire showed a high internal consistency with a Cronbach's alpha of 0.74. The original version presented a Cronbach's alpha of 0.72, very similar to the value obtained. Questionnaires with a coefficient value of 0.7 or higher are considered internally consistent. Moreover, when calculating Cronbach's alpha, if the item was deleted, the values remained all very close.

In the exploratory factor analysis, we were able to define 3 factors: the first was related with the practice of a balanced diet, including information regarding healthy diet, consumption of immunity-boosting foods, and physical activity changes. The second was related with the consumption of sugars and fast food, namely as a response to situations of stress and boredom. Finally, the third included items related with sleep patterns, the occurrence of stress and anxiety and the change in portion sizes. The item related with the probability of skipping one of the main meals showed a low contribution to this latter factor. This could be explained by the Portuguese tradition in maintaining a regular meal schedule.

Despite the importance of having a tool to assess the impact of stressful events on lifestyle-related behavior translated and tested in a Portuguese sample, it is important to note that the sample included university students from a private university, associated with a high level of education and the likelihood of a higher living

standard. This association with a higher education level also likely relates to better housing conditions, more space, and access to better equipment for maintaining regular physical activity. Moreover, most of the students are undergraduate, living in their parents' house, and without children to take care of. Indeed, these students most probably faced daily stress associated with remote working but had more time to care for themselves. Notwithstanding, feelings of uncertainty related to the immediate and distant future greatly affected this group. It is also important to highlight that a sample size of 128 to validate a scale with 20 items is a small sample size.

Public health and higher education authorities need to be proactive and offer adequate support solutions for students to guarantee their general well-being and development in such unstable scenarios. Enrolling in programs showcasing stress management strategies could support students to better cope with these challenges.

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