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Cultural adaptation of an internet-based intervention for the promotion of healthy lifestyle in Brazilian adolescents

Adaptação cultural de uma intervenção baseada na internet para a promoção de estilo de vida saudável em adolescentes brasileiros

Adaptación cultural de una intervención basada en internet para la promoción de un estilo de vida saludable en adolescentes brasileños

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Abstract
Objectives: To describe the process of cultural adaptation of the American version of the StayingFit programme to the context of Brazilian adolescents and to test the usability of the adapted version. Methods: The adaptation process included translation of the material, synthesis of the translated versions, creation of the expert panel for reviewing the original and translated versions, and a pre-test of the adapted version. The usability of the programme was tested using the system usability scale (SUS). Results: Changes in the programme were made to make it compatible with the cultural standards, meanings, and values of Brazilian adolescents. Participants' answers to usability tests reflected that they were satisfied with the format and content of the programme and demonstrated good understanding, ease of navigation, and approval of the VLE layout. Conclusion: The process of cultural adaptation of the StayingFit programme was successful and resulted in an easily understood prototype for adolescents.
Keywords: Culture; Adaptation; Internet; Adolescents; Diet healthy.

Resumo
Objetivo: Descrever o processo de adaptação cultural do StayingFit ao contexto de adolescentes brasileiros e testar a usabilidade da versão adaptada. Métodos: O processo de adaptação incluiu tradução do material (dois tradutores separados), síntese das versões traduzidas, criação do painel de especialistas para revisão das versões original e traduzida e pré-teste da versão adaptada. A usabilidade do programa foi testada por meio da escala de usabilidade do sistema (SUS). Resultados: Mudanças foram realizadas no programa para compatibilizá-lo aos padrões, significados e valores culturais dos adolescentes brasileiros, não foram observadas modificações nos elementos centrais. O texto oral e escrito da intervenção foi ajustado aos níveis de leitura e compreensão da população-alvo de 7ª a 8ª séries. Foi

decidido usar o feedback generalizado para a "entrega" do programa. A interface do usuário foi ajustada de acordo com o ambiente virtual de aprendizagem (AVA), Moodle. As respostas aos testes de usabilidade refletiram que eles estavam satisfeitos com o formato e conteúdo do programa e demonstraram bom entendimento, facilidade de navegação e aprovação do layout. Conclusão: O processo de adaptação cultural do StayingFit foi bem-sucedido e resultou em um protótipo de fácil compreensão para adolescentes.
Palavras-chave: Cultura; Adaptação; Internet; Adolescentes; Alimentação saudável.

Resumen
Objetivo: Describir el proceso de adaptación cultural de StayingFit al contexto de los adolescentes brasileños y probar la usabilidad de la versión adaptada. Métodos: El proceso de adaptación incluyó la traducción del material (dos traductores separados), la síntesis de las versiones traducidas, la creación de un panel de expertos para revisar las versiones original y traducida y probar previamente la versión adaptada. La usabilidad del programa se probó mediante la escala de usabilidad del sistema (SUS). Resultados: Se realizaron cambios en el programa para hacerlo compatible con los estándares, significados y valores culturales de los adolescentes brasileños, no se observaron cambios en los elementos centrales. El texto oral y escrito de la intervención se ajustó a los niveles de lectura y comprensión de la población objetivo en los grados 7-8. Se decidió utilizar la retroalimentación generalizada para la "entrega" del programa. La interfaz de usuario se ajustó de acuerdo al entorno virtual de aprendizaje (EVA), Moodle. Las respuestas a las pruebas de usabilidad reflejaron que estaban satisfechos con el formato y el contenido del programa y demostraron una buena comprensión, facilidad de navegación y aprobación del diseño. Conclusión: el proceso de adaptación cultural de StayingFit fue exitoso y resultó en un prototipo fácilmente comprensible para los adolescentes.
Palabras clave: Cultura; Adaptación; Internet; Adolescentes; Alimentación saludable.

1. Introduction

The growth of obesity in adolescence and its comorbidities has become an important public health problem worldwide (WHO, 2016). Environmental factors related to lifestyle have contributed to the development of weight gain in this age group. The physical inactivity and sedentarism associated with unhealthy diet – consumption of foods with high energy density, excess saturated fats, sugars and other carbohydrates with high glycaemic index, and poor fibre and polyunsaturated fat content – are the main factors contributing to this situation of malnutrition (Brasil, 2013). In Brazil, the National Adolescent School-Based Health Survey (PeNSE, for its abbreviation in Portuguese) showed an increase in the prevalence of overweight from 23.2% to 25.1% among Brazilian schoolchildren aged 13-15 years from 2009 to 2016 (IBGE, 2010), (IBGE, 2016).

The prevention of overweight in children and adolescents requires attractive and problematizing approaches that consider the physiological, psychological, cultural, and socioeconomic determinants of this condition (Ramos, Santos, & Reis, 2013). Evidence suggests that interventions should use multimedia tools and other innovative technological resources (Roseman; Riddell; Haynes, 2011). Interventions based on information and communication technologies (ICTs), such as the Internet, social media, smartphone applications, and video games, have been considered in the prevention of overweight/obesity in recent years, especially when interventions focus on the practice of physical activity and diet (Ezendam; Brug; Oenema, 2012), (Chamberland et al., 2017).

Internet-based interventions are a recent and innovative phenomenon in the field of nutrition and health in Brazil, with no significant scientific production in this area (Brug; Oenema; Campbell, 2003). However, developing technologies with a satisfactory degree of capability requires time and access to technological and financial resources for the stages of development, refinement, and testing of the effectiveness of interventions. An alternative to this problem is the appropriation of interventions with scientifically proven validity and efficacy, adjusting them to the target population through the process of cultural adaptation. This process involves the systematic modification of the intervention, considering the language, culture, and context to make the intervention compatible with the cultural standards, meanings, and values of the target population (Bernal; Jiménez-Chafey; Domenech Rodríguez, 2009).

Given the lack of validated interventions of this nature in Brazil, this article aims to describe the process of translation and cultural adaptation of the StayingFit programme for adolescents from public schools in the city of Salvador, Bahia.

StayingFit is a programme developed by researchers at the University of Stanford in the United States, the goal of which is to promote the development of healthy weight and habits and the reduction in adolescents' dissatisfaction with their weight and physical appearance (Taylor et al., 2012), (Jones et al., 2014). The programme has been shown to be effective in reducing BMI; increasing consumption of fruits, vegetables, and greens; increasing the level of physical activity; and reducing soda consumption and screen time (Taylor et al., 2012), (Jones et al., 2014). Thus, the objective of this article is to describe the process of translation and cultural adaptation to Brazil of the StayingFit programme for adolescents from the public school system of the city of Salvador/BA/Brazil. An additional objective is to evaluate the usability of the translated and culturally adapted programme for later use in a prospective randomized controlled study in this population.

Description of the StayingFit programme

StayingFit is an online programme with 16 thematic sessions. Each session includes approximately 10 to 15 pages of online content, developed for a 9th-grade reading level, designed to take approximately 20 to 30 minutes to complete. The programme uses the principles of cognitive behavioural therapy (CBT), based on a universal and selective/directed approach that offers customized tools to young people (Taylor et al., 2012). The central content and structure of the StayingFit programme were developed based on a set of validated programmes: Student Bodies (Taylor et al., 2006) and Student Bodies-BED (Binge Eating Disorders) (Jones et al., 2008).

StayingFit is divided into two student tracks. The "Healthy Habits" (HH) track, designed for students below the 85th percentile for age- and gender-adjusted BMI, seeks to prompt healthy habits related to nutrition and physical activity. The "Weight Management" (WM) track, designed for students above the 85th percentile for age- and gender-adjusted BMI, seeks to promote healthy eating and exercise for weight maintenance. Track differences are found mainly in the language used to describe the content and exercises rather than the content itself. However, students in the "Weight Management" track also have access to an optional weight record (see Table 1) if they choose to monitor their weight weekly. We chose to use the "Healthy Habits" track, regardless of the anthropometric status of the student.

Students have the opportunity to access the programme at any time during non-school hours during the intervention. However, at least half of the programme modules must be completed during school hours. The other half can be completed at home if the participating schools cannot provide time for the student to complete all sessions during school hours. The components of the programme are detailed in Table 1. The details of the session contents are included in Table 2. The StayingFit programme was designed to be sustainable and easily implemented in classroom environments.

Table 1. Components that structure the virtual learning environment of *StayingFit* Brazil.

Components	Description
Thematic Sessions	Each session contains 10 to 15 pages of online content with texts aimed at 7th and 8th grade adolescents that could be read in approximately 30 minutes.
Learning questions	At the end of each session, students answered questions about their learning on that week's topic. The questions (multiple choice and open-ended answers) evaluated the assimilated knowledge.
Food Log	Programme users completed an online food-intake questionnaire regarding the last 7 days. After the adolescents had submitted their food frequency data, the participants received automated (general) feedback aligned with the recommendations of the Food Guide for the Brazilian Population, 2014 (Ms, 2014).
Meal Size Record	In the Meal Size Record, students record meal times, sizes, and hunger before and after meals. Automatic feedback is given based on the number and size of the meal, designed to encourage regular eating.
Physical activity log	The adolescents reported how often they had physical activity over the last 7 days. They received automated feedback on the adequacy of their physical activity aligned with the recommendations of the WHO (Who, 2010).
Weight Tracking (Weight Management Track)	Weight track students can also complete a Weight Tracker in which they record their weight weekly and receive a warning if they report unhealthy weight loss or a motivational warning if they report weight gain.
Hunger and satiety scale	A hunger/satiety scale ranging from 0 (hungry/voracious) to 10 (satiated) was used to teach adolescents to attend more to their appetite. Participants were encouraged to monitor their levels of hunger throughout the day, to start eating when their internal signs of appetite reached a hunger level of 3, and to stop eating when they reached a level 7.
Goals log	Adolescents were encouraged to record their goals regarding food consumption and physical activity.
Discussion forum	The adolescents were invited to anonymously discuss issues related to the programme material in a discussion forum.
Material for parents	Parents received printed material of the content of the sessions given to students.
Material for teachers	"*StayingFit* FAQs" (available on the *StayingFit* Brazil website) was made available to teachers, who were encouraged to contact the research team if they had questions.

From: Authors (2018).

The table above presents all the components that are part of the StayingFit program. Observe how each one of them was thought and especially the structure of each one of them.

Table 2. Topics/content of the *StayingFit* Brazil sessions.

1	Introduction to the programme: Internet etiquette; reasons to adopt healthy eating habits and lifestyles
2	Introduction to healthy eating practices; classifying food groups (red, yellow, and green); defining serving sizes and "flexible eating"
3	Moving the body: importance, strategies to increase physical activity, daily recommendations, and variety
4	Healthy lifestyle: routines beneficial to the body and how to overcome barriers to healthy eating
5	Binge eating: definition and triggers; how to identify and monitor the signs of hunger and satiety; distinction between healthy and unhealthy snacks; definition of goals for healthy eating
6	Weight stigma: Why weight stigmas are harmful and how to stay confident in the face of this problem
7	Labels: understanding the components of food nutritional labels; healthy eating away from home; the harmful effects of sugary drinks
8	Eating disorders; reflecting on food myths; warning signs for risky behaviours; ways to stay healthy
9	Signs of the body; identifying good practices that lead to eating more slowly; identifying practices of conscious eating; reflecting on emotional eating
10	Body image components that comprise self-esteem; the direct and indirect triggers of negative thoughts and feelings that affect body image
11	Barriers to the adoption of healthy eating; planning a healthy lunch box
12	Overcoming difficulties; barriers to exercise
13	Food planning: Why do diets not work? The negative consequences of diets; eating disorders
14	"Fad diets": The influence of the media. The importance of making healthy, smart, and informed decisions; the benefits of water consumption
15	Responding to your inner critical sense. Strategies to improve body image.
16	Final review; encouraging the maintenance of healthy habits over the long term

From: Authors (2018).

The table above presents the thematic sections of the program. Note the topics covered in each of them.

Identification of StayingFit

To identify the E-Health programme to be adapted, a systematic review was performed, which followed the recommendations proposed by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Moher et al, 2009), to evaluate the effect of computer interventions (website and CD-ROM) on food consumption and anthropometric parameters of adolescents in the school environment. Based on that review, the project team selected the StayingFit programme for cultural adaptation. The prior adaptation of the StayingFit programme in the European context (Austria and Spain) (Jones et al., 2018) motivated our choice. Once the intervention was selected, the appropriate legal procedures were followed to obtain authorization to adapt StayingFit. After authorization by the developers (Thrive Network, Inc. San Francisco, CA USA, 2014; https://thrivenetworks.org/), the content of the programme was adapted by the Research Centre in School Health and Nutrition of the School of Nutrition of the Federal University of Bahia, Brazil.

2. Methodology

Translation

The translation process was necessary for cultural adaptation because StayingFit is an American intervention written in English (the official language of the United States of America). The written content of the intervention was translated by qualified translators (two translators) with fluency in English and Brazilian Portuguese from American Journal Experts (https://www.aje.com/en). The professionals responsible for the translation were informed of the study objectives and warned of the importance of performing a conceptual – and not literal – translation. Each translator prepared a report of the translation, clarifying which items contained expressions that were difficult to translate, any doubts, and the choices made. Next, a bilingual researcher, a member of the project team, reconciled the initial translations (together with the translators). Next, the consolidated version (consensus version) was submitted for examination by a committee of experts/judges.

Review by an expert committee

The committee of judges was composed of the following five members: a psychologist with experience in the area of cultural adaptation of programmes for mental health promotion and prevention of risks for mental disorders (1); a nutritionist specialized in health education (1); a nutritionist specialized in the food area (1); a physical education professional (1); and an elementary and middle school teacher (1). The literature suggests the formation of a multidisciplinary committee composed of bilingual individuals who specialize in the knowledge area of the intervention (Hutchinson, 1996).

The process was initiated with the invitation to the members to compose the committee of judges: these individuals received a letter/e-mail that described the study and the StayingFit programme and explained the reasons why the individual was chosen to be a judge, along with the relevance of the participation of those selected and the intervention as a whole. Upon agreeing to participate in the study, the members of the committee received specific instructions on the process of cultural adaptation evaluation and judging. Thus, it was up to the judges to assess the equivalence between the original instrument and the translated instrument in terms of semantic equivalence (equivalence in the meaning of oral and written words), idiomatic equivalence (intrinsic to a given language), experimental/cultural equivalence (situations represented in the original version but that should be adapted to the cultural context of the target language), and conceptual equivalence (related to the validity of concepts) (Guillemin; Bombardier; Beaton, 1993). At the end of this stage, adjustments were performed to address the inconsistencies of the two versions (Portuguese and English). The necessary adaptations/equivalences were performed. This

stage was conducted by the project team.

Before the usability test, pre-tests were performed to evaluate the clarity and ease of understanding of the text content (verbal and non-verbal). Adolescents from the 7th and 8th grades, aged between 12 and 15 years, recruited randomly in a public school in Salvador, participated in this stage. The adolescents did not receive financial compensation for their participation. The experts were invited to work together with the project team on adjusting and refining the text to ensure the absence of issues in the final version of the instrument.

Virtual learning environment (VLE)

In the Brazilian version, the characteristics of the original VLE (texts, media, learning exercises, self-monitoring record, discussion forum, etc.) were reproduced on the Moodle platform <https://moodle.org/>. The platform was chosen because it is a free, multilingual, flexible, and customizable software, in addition to being the official learning platform of the Federal University of Bahia, indexed in its server and in the official domain of the university. The VLE was developed by SQuaRe (Safety, Quality and Reliability), which constitutes one of the lines of work of the research group "Processes and Technology (PROTEC)" of the Federal University of Bahia (UFBA) <http://www.novomoodle.ufba.br/course/view.php?id=1085>. Meetings were held between the project team and study collaborators (a programmer and a production engineer) to make the necessary adjustments to make the StayingFit interface attractive to young Brazilians (now called StayingFit Brazil).

The participants' access to the StayingFit Brazil VLE occurred by registering on the Moodle platform and creating an account on the site using the following data: e-mail address and Individual Taxpayer's Number (CPF, for its abbreviation in Portuguese). Each participant received a username and password to log in and access the programme. To protect students' confidentiality, the research team defined the username and password of each student according to their unique identification numbers, ensuring the individuality and confidentiality of the participants' information. Students were not aware of their username and password, preventing the use of the programme without the supervision of the project team and ensuring the privacy of their information.

Usability test

The usability test included the participation of eight adolescents (five girls and three boys) from the 7th and 8th grades, aged between 12 and 15 years. Nielsen (2012) states that testing with five users is sufficient and adds that the important thing is to observe users performing the tasks (Nielsen, 2012). This stage was performed in a full school, on the counter-shift, to avoid compromising the progress of school activities. Students accessed the programme once a week for 30 minutes in the school library with Internet access. At all stages, students were supervised by a researcher and a nutrition student to assist participants in navigating the programme and overcoming possible technical difficulties of access. After each session, the system usability scale (SUS) questionnaire was applied. In addition to the five required tasks, students were encouraged to discuss questions related to the educational material of the programme, anonymously, in a discussion forum.

The SUS instrument, already tested and validated in Brazil (Tenório et al, 2010), was developed in 1986 by John Brooke in the laboratory of the Digital Equipment Corporation, UK, and contains ten questions, with five response options (Likert scale) ranging from completely disagree (1) to strongly agree (5). The result of the SUS is the sum of the individual contributions of each item. For odd items, the score is the user's response minus one, while for even items, the score is five minus the user's response. After the score of each item is obtained, the scores are added, and the result is multiplied by 2.5. Thus, the result obtained will be a satisfaction index ranging from 0 to 100 (Brooke, 1986). The results are then evaluated according to the classification proposed by Bangor et al., 2009 (Bangor; Kortum; Miller, 2009), namely: a) 80-90 points,

excellent usability; b) 70-80 points, good usability; c) 60-70 points, acceptable usability; and d) < 60 points, unacceptable usability.

Refinement of the culturally adapted intervention (focus group)

In this stage, the results obtained in the usability test served as a basis for adjustments to the final version of the prototype (Wingood; DiClemente, 2008). Decision-making at this stage required judgement by the project's main team.

Ethical aspects

The study received a favourable opinion from the Ethics Committee of the School of Nutrition of the Federal University of Bahia (n.893.944/14). All study subjects were informed about the objectives and procedures of the study, thus ensuring the interviewees' anonymity. Two separate and identical copies of the informed consent forms (school and students) were signed by the informants (or the legal guardian) and by the researchers.

3. Results

The feedback from several informants in the various stages of translation and cultural adaptation encouraged the project team to make several changes to the programme (surface and deep). One of the changes was to adjust the intervention to the reading level of the target population, 7th and 8th grade students.

It is important to emphasize that although the original intervention was based on a tailored approach, i.e., offering personalized feedback based on participants' individual responses, we opted for the use of generalized feedback (changes in the deep structure). This feedback was derived from and supported by the recommendations of the Food Guide for the Brazilian Population, an official document launched by the Ministry of Health/2014, which outlines the concepts and recommendations of an adequate and healthy diet. This document was designed to promote healthy diets based on fresh and minimally processed foods at the expense of the consumption of processed and ultra-processed foods (Ms, 2014). This guide is a tool specially prepared to assist in the process of dietary and nutritional education of the Brazilian population in all life stages (Carara & Santos, 2016), (Conte, Franz, Berlezi, & Oliveira, 2017), (Danelon et al., 2018). The instruments for collecting information about food consumption and physical activity (questionnaires) that replaced those from the original programme and were used to support generalized feedback were the same as those from an important study in Brazil with elementary school students (http://www.ibge.gov.br/home/estatistica/populacao/pense/2015/) (IBGE, 2015).

Changes were also made in the language (surface structure). These changes included the use of terms that were more culturally accepted by and more characteristic of the local population. After translation and language changes, the materials were reprinted, and the images were altered to better match the characteristics of the local people. The videos/links were adapted to make them more sensitive to the local culture and more didactic. The examples provided (sports, typical foods, etc.) were also adapted to local situations. The project team also sought to make changes to the audio-visual media (photographs, scenarios, images, videos, etc.) of the original programme to value the ethnic-racial identity, sociocultural aspects, and subjective construction of the target audience. Such changes were approached from the perspective of appreciation of everyday school life and respect for the subjects' ethnic-racial differences, without neglecting the need to capture the same concept as the original materials. Data from the 2010 Census show that, in Salvador, Bahia, Brazil, 51.7% of the overall population was mixed-race, 37.8% was black, 18.9% was white, and 0.28% was indigenous (IBGE, 2012). Given the ethical and legal aspects (Federal Constitution, Article five, item X and Civil Code - Federal Law No. 10.406, of January 10, 2002) of the process, authorization from the institute (the school, represented by the principal) and personal authorizations (teacher and students) were obtained. The school principal, teacher, students, and parents signed forms granting permission for the use of their image

in the StayingFit Brazil programme, free of charge and with their express consent for the purposes of image use.

The adaptation process also considers the adaptations to the user interface of the original StayingFit so that adolescents could best develop their online tasks and demonstrate better performance and, in particular, greater satisfaction with the instrument. With regard to the new visual identity, a "product" was sought that would allow users to feel the security of reading original content in their own language. A new StayingFit logo was designed (StayingFit Brazil). The work performed by the team of experts – composed of professionals with experience in the field of health and IT – allowed a greater alignment of the user interface with the adolescents' universe so as not to compromise the equivalence between the original instrument and its Portuguese version (Table 3).

Table 3. Details of changes to the nature of content and adjustments made to the *StayingFit.*

Categories	Adaptation / Adjustments / Refinement	Changes
Reading	Content adaptation to the 7th and 8th grade reading level.	Deep structure
Substitution of session elements	The instruments for collecting food consumption and physical activity information (questionnaires), replacing those of the original program, were the same as those of an important research in Brazil with elementary school youth (http://www.ibge.gov.br/home/estatistica/populacao/pense/2015/) (IBGE 2015).	Deep structure
Another approach to intervention was integrated	Although the original intervention was based on the tailored conception, that is, offering personalized feedbacks based on the participants' individual responses, it was decided to use general feedbacks based on the dietary recommendations of the Food Guide for the Brazilian Population (24) and the recommendations of the World Health Organization (WHO) regarding aspects related to the practice of physical activity (43). Only used the module "Healthy Habits" (HH).	Deep structure
Language	Adjustment of the American population specific expressions to the Brazilian Portuguese language. Substitution of terms considered inconsistent with the experiences lived by the target population (eg stigma, trigger, self-confidence, subtle, dairy products, among others).	Surface structure
Materials / activities	Changes to examples, photos, websites, educational videos, and other graphic materials. We adopted nutrition education material recommended by the Ministry of Health: Food Guide for the Brazilian Population (BRAZIL 2014). ("Far Beyond Weight", 2012 - ww.youtube.com/watch?v=8Uge5GiHCT4); and links (always considering those recommended by the Health Ministry) - Brazilian Regional Foods (2015); Adolescent Health Handbook (2010); Obesity prevention booklet in children and adolescents.	Surface structure
Structure (User Interface)	Program insertion in an open source learning platform (Moodle). Adequacy of the original program layout, equally based on user centered design (DCU).	Surface structure

From: Authors (2018).

The table above presents the adjustments made when comparing the American program and the national adaptations made for Brazil.

Usability evaluation

All participants in the usability test completed the five required tasks in each programme session, but none of them accessed the discussion forum. All tasks were completed within the stipulated time (30 to 50 minutes). Two sessions (sessions two and seven), because they were longer, took longer to complete. The mean scores (0 to 100) obtained in the sessions showed relatively high values (69.4 to 75.6), with results considered satisfactory, good, and good to excellent, according to the classification proposed by Bangar et al. 2009 (Bangor et al., 2009), which reflected adequate platform performance and use indicators. Table 4 shows the SUS scores of the StayingFit Brazil programme sessions. The SUS scale is not intended to interpret individual items; thus, only the overall score presented in the Calculator Multimedia programme was considered in the analysis (Nitsch et al., 2016).

Table 4. SUS Scale Averages for StayingFit Brazil Sessions.

Questions / Sessions	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	S13	S14	S15	S16
1. I would like to use the *StayingFit* frequently	4,2 [b]	4 [b]	4 [b]	4 [b]	4,2 [b]	3,6 [a]	4,5 [b]	5 [b]	4,8 [b]	4,3 [b]	4,2 [b]	4 [b]	4 [b]	5 [b]	5 [b]	5 [b]
2. The *StayingFit* was complex to use	2,7 [c]	2,8 [c]	2,5 [c]	2 [c]	2,5 [c]	3,2 [a]	2,3 [c]	2,7 [c]	2,7 [c]	2,8 [c]	2 [c]	2 [c]	2 [c]	2 [c]	1,6 [c]	1,4 [c]
3. The *StayingFit* was easy to use	4 [b]	4,1 [b]	4,2 [b]	4,3 [b]	4,1 [b]	3,3 [a]	4 [b]	4,1 [b]	4,3 [b]	4,4 [b]	4 [b]	4,3 [b]	4,3 [b]	4,3 [b]	4,1 [b]	4,1 [b]
4. I would need support of a technical person to be able to use this *StayingFit*	2,7 [c]	2,6 [c]	3 [a]	2,1 [c]	3 [a]	3,3 [a]	2,7 [c]	2,8 [c]	2,2 [c]	3 [a]	2,1 [c]	2,1 [c]	2,1 [c]	2,7 [c]	1,8 [c]	2,1 [c]
5. Functions in the *StayingFit* were well integrated	4,1 [b]	4 [b]	4,5 [b]	4,5 [b]	4,2 [b]	3,8 [b]	4,1 [b]	3,8 [b]	4,2 [b]	4,4 [b]	3,6 [a]	4,5 [b]	4,5 [b]	3,8 [b]	3 [a]	3 [a]
6. There was too much inconsistency in the *StayingFit*	2,7 [c]	2,5 [c]	2,3 [c]	3 [a]	2,3 [c]	2,8 [a]	2,3 [c]	3 [a]	3 [a]	2,5 [c]	2,5 [c]	3 [a]	3 [a]	3 [a]	1,5 [c]	2,1 [c]
7. I believe most people would learn to use the *StayingFit* very quickly	4 [b]	4,2 [b]	4,5 [b]	4,6 [b]	3,3 [a]	3,3 [a]	4,1 [b]	4,6 [b]	3,6 [a]	4,7 [b]	3,2 [a]	4,6 [b]	4,6 [b]	3,8 [b]	3,2 [a]	3,5 [a]
8. I found the *StayingFit* very cumbersome to use	1,9 [c]	3,2 [a]	2,3 [c]	2 [c]	2,3 [c]	3,6 [a]	2,5 [c]	3 [a]	2,7 [c]	2,5 [c]	1,8 [c]	2 [c]	2 [c]	2,7 [c]	2 [c]	2,5 [c]
9. I felt very confident using the *StayingFit*	4,1 [b]	4,2 [b]	4 [b]	3,6 [a]	3,6 [a]	3,1 [a]	4,1 [b]	3,7 [a]	4 [b]	4,1 [b]	3,5 [a]	3,6 [a]	3,6 [a]	4,1 [b]	3 [a]	3 [a]
10. I needed to learn so many things before I could use the *StayingFit*	2,6 [c]	3,5 [a]	3,2 [a]	3,5 [a]	3,2 [a]	4 [b]	2,8 [c]	3 [a]	2,7 [c]	3 [a]	2,3 [c]	3,5 [a]	3,5 [a]	1,7 [c]	2,5 [c]	1,8 [c]
Session Average	70,3	71,6	70,0	75,6	72,2	69,4	70,1	69,8	69,9	71,0	69,5	75	74	70,3	71,2	70,0

a Neutral Response: Indifferent; b Positive answer: Completely agree or agree with positive questions; strongly disagree or disagree with the negative questions; c Negative answer: Strongly agree or agree with negative questions; strongly disagree or disagree with positive questions. From: Authors (2018).

The table above presents the values of the usability tests of the platform. Note the final row values that indicate the overall usability of the platform.

4. Discussion

We describe here the process of translation and cultural adaptation of the *StayingFit* programme to a Brazilian context and the results of the usability test. Studies describing the cultural adaptation of evidence-based online interventions are rare, despite its great importance (Bernal; Adames, 2017). This study is the first to describe the process of cultural adaptation of an internet-based intervention for adolescents implemented in Brazil (details in Table 3). In this study, the cultural adaptation of *StayingFit* required changes in the language and other components of both the surfac and deep structures of the intervention to adapt it to the language, culture, and values of the new population (Castro, Barrera Jr, Holleran Steiker, & Steiker, 2010). Systematic adaptation contributes to maintaining the fidelity of the original intervention (Marsiglia & Booth, 2015). Some dilemmas in this process are worth noting, such as the difficulties related to the complexity and specificity of words and expressions typical of the language of American adolescents, as well as the fact that the instrument was not developed specifically for adolescents from developing countries or with a 7th- and 8th-grade reading level.

In any case, the adolescents in this study, in general, reported a good understanding of the translated and culturally adapted programme. According to the usability test, the adolescents showed approval of the platform (Bangor et al., 2009), (Sauro; Lewis, 2011), as confirmed by the results of the participants' perceptions as evidenced in the positive results of the usability domains. Usability tests contribute to the greater success of the intervention implemented for the users and, therefore, should be encouraged (Bangor et al., 2009). It is believed that the meticulous, transparent, and necessary procedures undertaken in the process of translation and cultural adaptation have contributed to the good adequacy/equivalence of the *StayingFit* programme in Brazilian Portuguese (Mohr et al, 2013). The expert committee was crucial in the process of cultural adaptation, given the group's experience in the field of education, health, and nutrition.

There is no way to disregard the theoretical foundations of cognitive behavioural therapy (CBT) that support *StayingFit*. The fundamental principle of CBT is that the way individuals perceive and process reality will influence the way they feel and behave. Thus, the therapeutic objective of CBT, since its inception, has been to restructure and correct these distorted thoughts and collaboratively develop pragmatic solutions to produce change and improve emotional disorders (Beck, 1963). CBT has been shown to be effective in the organization of contingencies for changes in weight and behaviours, in principle, related to the self-control of eating behaviours and within a broader situational context (Prates et al., 2016), (Abreu; Murta, 2016). The articulation between virtual reality and cognitive behavioural techniques has, in fact, contributed to the management and treatment of disorders and discomforts (Prates et al., 2016).

In the conception of the *StayingFit* programme, a user-centred design (UCR) process that focuses on the needs and requirements of the target audience (adolescents) was used in the software development processes (Jones et al., 2014). Users were involved and engaged in the process of software development (conceptualization, development, and implementation of software systems), which is a vital element for the successful development of *StayingFit*. In addition, the design was conducted and refined by user-centred evaluations. This approach should be highlighted because it may explain why no technical problems or the need for any additional user assistance or training in any of the usability tests could be identified. Furthermore, this user-centred approach may explain why we found good usability because the participants reported that they could relate specifically to the different components of the programme and thus provided the most valuable feedback from the end-user perspective.

The *StayingFit* Brazil programme was designed for a generic target group of adolescents and aimed to promote healthy habits. The adolescents reported that they enjoyed accessing the programme at school and learning psychological strategies for how to deal with adversity. Given that adolescents' free time may be limited, measures such as high efficiency (tasks completed within the allocated time period) and ease of use may be of great importance because they do not occupy too much of adolescents' free time. The accessibility of the internet, with its options for what, when, and where to read and to create their

own objectives/goals, may be beneficial for adolescents, who may be in a stressful stage of life with school activities. The programmes (WEBSITES) may have several advantages compared to traditional face-to-face treatments, including their availability 24 hours a day/7 days a week, portability, interactive nature, and flexible scheduling (Sarno; Canella; Bandoni, 2014).

Another important element to consider is the barriers to reading, which disadvantages adolescents in the public education system in obtaining and following health recommendations. A report presented by the National Institute for Educational Studies and Research "Anísio Teixeira" (INEP) to the Ministry of Education on the quality of teaching offered in public schools found that only 3% of 8th-grade students exhibited the appropriate level of learning, which hinders the full use of these technologies (Menezes-Filho, 2007). It is possible that these coping technologies, used alone, may not be the most appropriate methods to train adolescents with low reading levels. The important role of the family and school community in the use of interventions of this nature is acknowledged, which is a required condition for achieving the much-needed changes in adherence to healthy eating habits and weight.

Limitations and strengths

This study has some limitations. The main one refers to the possibility of the participants being influenced by the research proposal itself, with the observation by the researchers potentially causing unintentional reactions or statements. However, an attempt was made to reduce this possible bias by explaining the purpose of the study and the importance of being faithful to their impressions in using the programme. Moreover, the linguistic barrier experienced in Brazilian public schools may have compromised the students' understanding of the content of the programme sessions, despite all the care taken in the cultural and linguistic adaptation of StayingFit. Nevertheless, the present study contributes to the knowledge in the area and to the evolution of the theoretical models of cultural adaptation of evidence-based programmes by systematizing and detailing the process of cultural adaptation of the StayingFit programme to Brazil, something still scarce in the literature.

Nonetheless, the fact that there is no guarantee that StayingFit Brazil will be effective in another location in the country, especially due to the great cultural diversity in Brazil, should not be disregarded. Each area of the country has its distinct social specificities and contexts, and therefore, the cultural adaptation of the programme must be performed systematically, with methodological care and guided by a model that considers the adopting culture and respects its identity, language, cultural values, needs, and standards (Kumpfer; Whiteside, 2008), (Castro et al., 2010).

5. Final Considerations

The process of cultural adaptation of the StayingFit programme was successful and resulted in an easy-to-understand prototype for adolescents. The indicators of the usability test and feedback from the pre-test and the focus group demonstrate that the cultural adaptation of StayingFit may indeed be appropriate for the population for which it is intended. Despite being a difficult process that demands financial investment, planning, time, improvement of materials, a skilled multidisciplinary team, and scientific rigour, the adaptations of evidence-based interventions should be encouraged due to their potential in the performance of interventions to promote healthy habits in Brazil (Murta, Leissa, & Leandro -França, 2015). Further studies should be conducted to assess the continuity of the process of cultural adaptation in diverse regions and populations and the applicability of these interventions in Brazil.

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