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Physical activity for older adults: Physical Activity Guidelines for the Brazilian Population

Atividade física para idosos: Guia de Atividade Física para a População Brasileira

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ABSTRACT

At the Ministry of Health initiative, in collaboration with national researchers, the first Physical Activity (PA) Guidelines for the Brazilian Population was prepared, including recommendations for the various stages of life and special populations. This study aims to present the methodological process of the chapter on PA recommendations for the older adults. The Older Adults Work Group had 11 researchers/professionals who held weekly virtual meetings, made a systematic review of reviews, which included 50 articles, and promoted a listening among older adults (n = 22), managers (n = 17) and professionals (n = 143) from all country regions, through telephone interviews and online forms. Based on the review and the listening results, a first version of the PA Guidelines for the older adults was elaborated, which was submitted to public consultation. Forty-six valid suggestions were received for the Guide's writing, of which 34 were accepted and incorporated into the final text since they had technical and/or social relevance. As results, the Guidelines highlight the major benefits of PA for the older adults, such as enhancement of the physical, mental and social aspects, and recommends a minimum of 150 minutes of moderate PA or 75 minutes of vigorous PA per week, considering PA in free time, getting to and from places and household chores, as well as in work/study time. It is believed that these Guidelines will help the older adults and health professionals to get to know the benefits of PA, the recommended amount, and the different possibilities of practice through culturally appropriate messages and examples. Politically, it will reinforce the central role of PA in the prevention and control of chronic non-communicable diseases, boosting actions for its dissemination and implantation.

Keywords: Physical exercise; Older Adults population; Guidelines.

RESUMO

Por iniciativa do Ministério da Saúde, em colaboração com pesquisadores nacionais, elaborou-se o primeiro Guia de Atividade Física (AF) para a População Brasileira, incluindo recomendações para as várias fases da vida e populações especiais. O objetivo deste estudo é apresentar o processo metodológico e os resultados do capítulo de recomendações de AF para idosos. O Grupo de Trabalho Idosos (GT Idosos) contou com a participação de 11 pesquisadores/profissionais que realizaram reuniões virtuais semanais, revisão sistemática de revisões, que incluiu 50 artigos ao final, e escutas com profissionais de Educação Física (n = 143), gestores (n = 17) e com idosos (n = 22), de todas as regiões do país, por meio de entrevistas telefônicas e formulários eletrônicos. Baseado nos resultados da revisão e das escutas, elaborou-se uma primeira versão das recomendações de AF para idosos, que foi submetida à consulta pública. No total foram recebidas 46 sugestões válidas, das quais 34 foram aceitas e incorporadas ao texto final por possuírem relevância técnica e/ou social. Como resultados, o Guia destaca os principais benefícios da AF para idosos, como melhora dos aspectos físicos, mentais e sociais, e recomenda um mínimo de 150 minutos por semana de AF de intensidade moderada, ou 75 minutos de intensidade vigorosa, considerando as AF no tempo livre, no deslocamento, no trabalho/estudo ou nas tarefas domésticas. Acredita-se que o Guia auxiliará os idosos e profissionais de saúde a conhecerem os benefícios da AF, a quantidade recomendada e as diversas possibilidades de prática, por meio de mensagens e exemplos culturalmente apropriados.

Introduction

The aging process entails numerous morphological, neuromuscular, metabolic, physiological, cognitive and behavioral changes that can significantly compromise health, autonomy, quality of life and, consequently, longevity[1]. With advancing age, there is a reduction in muscle mass, accompanied by an increase in body fat (visceral and intramuscular), a decrease in bone density and mineral content, changes that favor the development of sarcopenia, obesity and osteoporosis, respectively[1]. Additionally, the reduction in muscle strength and functional capacity makes the older adults more fragile and vulnerable to imbalances, falls, injuries and fractures[3].

This set of factors contributes to a reduction in the level of habitual physical activity (PA) and an increase in sedentary behavior among the older adults, two important health risk factors that are closely related to the increase in the prevalence and incidence rates of chronic degenerative diseases, resulting in high health costs, due to the need for the growing use of medicine, combined with the increase in the number of medical consultations, hospitalizations and surgeries[4-6]. Therefore, a major challenge for researchers and health professionals is to develop non-pharmacological strategies that favor healthy aging and good quality of life since scientific and technological advances, especially in the medical field, have provided an increase in life expectancy in the vast majority of countries in the world.

Thus, small changes in the PA domains, whether in household tasks, getting to and from places, work/study or even in free time can significantly contribute to the well-being of the older adults population. In addition, the inclusion of PA or physical exercise programs in the daily lives of this population can greatly help to control weight, improve strength and muscle mass, strengthen joints, and other benefits that can promote well-being, reduce pain and improve the quality of life of the older adults[7-11].

Guidelines and recommendations on the practice of PA for the older adults have been developed and disseminated in all continents[7-11]. Recently, the World Health Organization (WHO) organized a set of PA recommendations for different population groups, including the older adults[8]. However, considering that Brazil has peculiar demographic, socioeconomic and cultural characteristics, the elaboration of specific recommendations for this population can provide a very interesting contribution to the increase in the level of PA in the Brazilian population. Thus, as one of the priorities of the federal government in the area of health, the Health Department in a collaborative process with national researchers organized the first Guide, with specific recommendations for the older adults. Therefore, the objective of this study is to present the elaboration process and the main results of the chapter on PA recommendations for the older adults that makes up this important document.

Method

The writing of the PAGBP chapter with recommendations for the older adults took place between May and November 2020, involving several stages (Figure 1). The first stage consisted on the search for theoretical-scientific knowledge existing in similar documents, organized in different countries, as well as in national and international scientific journals (systematic reviews and meta-analysis). Then, structured questionnaires and interviews were elaborated in an attempt to gather additional information, based on the opinion of the main actors, that is, older adults people, professionals and managers from all regions of the country (hearing process). Finally, the first version of the chapter's wording was submitted to public consultation. More detailed information on all processes carried out in the preparation of the Guide is available in the technical report released by the Health Department[12].

It is noteworthy that, throughout the process of

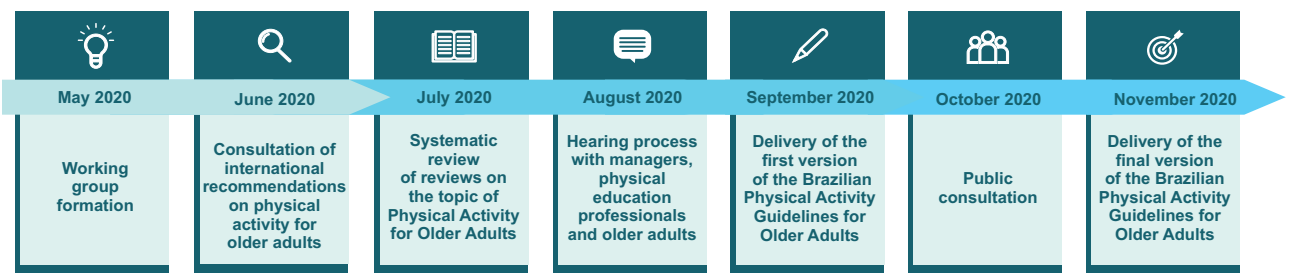

Figure 1 – Timeline of the process of preparing the chapter on Physical Activity Guidelines for Older Adults of the "Physical Activity Guidelines for the Brazilian Population".

drafting the document, weekly virtual meetings of the working group (WG Older Adults) were held with the participation of the coordinator, seven researchers, a member of the Scientific Committee and a representative of the Health Department in the technical area responsible for coordinating the preparation of the Guide. All meetings were recorded and their files, as well as the record of decisions made, were stored in Google Drive folders. The chapter's construction process will be described below.

A systematic review was structured based on review studies on the topic of PA for the older adults (PROSPERO CRD42020210073). For this purpose, searches were performed in *MEDLINE* (via *PubMed*), SciELO and Cochrane databases, from the keyword combinations: ("*Exercise*" [*MeSH terms*] AND "*Systematic Review*" [*MeSH terms*] NOT "*child**"[*MeSH terms*]). Variations and synonyms of terms were used in searches in titles and abstracts and the Boolean operators "*AND*", "*OR*" and "*NOT*" were used in the different combinations. Gray literature, including Google Scholar searches and CAPES' thesis catalogue, was used to identify papers that could be included. Additionally, consultations on reference lists of selected studies and specialists in the field were complementary strategies.

Screening, reading of titles and abstracts for selection of studies, checking for divergences and data extraction were performed by two reviewers, on the *Rayyan* platform, and met the following eligibility criteria: systematic review studies, with or without meta-analysis, involving the older adults population (≥ 60 years old), without distinction of sex and ethnicity, participants in PA and/or physical exercise programs including morphological, neuromuscular, cardiometabolic and/or behavioral outcomes based on observational or experimental designs. In case of differences between the pairs, a third researcher was consulted. For the analysis of the risk of bias, the AMSTAR 2[13] assessment instrument was used.

The hearing process involved Physical Education professionals, managers and older adults and sought to identify the importance of the PAGBP with recommendations for older adults, the factors that can help or hinder such individuals to become more physically active and the most appropriate ways for description, presentation and disclosure of the document. A pilot study was used to analyze the questionnaires prepared in an electronic form in the Google Forms application, the procedures to be used and the time of application of the instrument.

The questionnaire for managers consisted of 30 questions, including personal identification, education and professional performance data, factors that can help the older adults to become more physically active, besides specific questions about the Guide. On the other hand, the questionnaire for professionals was structured with 34 questions, including personal identification, training and professional performance data focused on PA for the older adults, in addition to information about the Guide. Professionals and managers confirmed the reading of the Consent Form (CF) before completing the questionnaires.

In the case of the older adults, the interview was carried out via telephone, with the CF being presented verbally by the interviewers. The interview was based on a structured questionnaire with 40 questions, including personal identification data, information about the practice of PA before and during the measure of social distancing due to the Corona Virus Disease 2019 (COVID-19) pandemic, in addition to information on how to access the Guide's document.

Quantitative data were tabulated in Excel and analyzed using absolute and relative frequency (categorical variables) and position and dispersion measurements (numerical variables) using the IBM *Statistical Package for Social Sciences* (SPSS) software, version 24.0. A thematic content analysis was performed for qualitative data.

For the public consultation process, the preliminary version of the chapter was made available on the Health Department website in August 2020, together with an online form that allowed the registration of criticisms and suggestions for the drafting of the Guide. The suggestions were analyzed by the group of experts responsible for the elaboration of the recommendations and were justified when not followed[12].

Results

Considering the result of the systematic review, after removing duplicates, the research process resulted in 14.388 studies, of which 333 studies were selected based on the reading of titles and abstracts. Subsequently, these studies were read in full and subdivided according to the type of main outcome, namely: morphological, neuromuscular, cardiometabolic and behavioral. Then, 50 studies were selected for qualitative and quantitative analysis, based on the eligibility criteria described above (methods section). The main results are shown in

Chart 1. The complete list of references will be presented in a later publication.

Chart 1 – Summary of the results of the systematic review of physical activity reviews for the older adults

Morphological characteristics The results of systematic reviews support a beneficial effect of regular physical activity and exercise on bone health. Regarding the effects on body composition, although some studies and other Physical Activity Guidelines cite the benefits of physical activity, the results are still uncertain. Two systematic reviews have analyzed the effects of physical exercise on muscle mass and found no significant changes, while no study has evaluated the effects of physical activity on body fat. Therefore, the findings support the effects of physical activity on bone health, but are insufficient to indicate a beneficial effect on body composition.
Neuromuscular characteristics The results of systematic reviews showed a beneficial effect of physical activity and physical exercise on muscle strength, balance and flexibility. In addition, results from moderate to high quality reviews demonstrated a beneficial effect of physical activity and exercise in reducing the risk of falls.
Cardiometabolic characteristics The benefits of physical activity and exercise on maximal oxygen uptake were confirmed in four reviews, two of which were considered of moderate quality, one of low quality and one of critically low quality. The benefits of physical activity and exercise on blood pressure were confirmed in a systematic review with moderate quality meta-analysis, whereas no systematic review analyzed the effects of physical activity on lipid and glucose profiles.
Behavioral characteristics Regarding cognitive performance, three systematic reviews were considered, one of low quality and two of moderate quality. Regarding anxiety, only one systematic review met all the inclusion criteria, although it was of low quality. Regarding quality of life, four reviews based only on randomized clinical trials met the inclusion criteria, two of which were moderate and two were of low quality. Only one systematic review on sleep was included, but a high quality one. This review was based only on randomized clinical trials, totaling a sample of 470 individuals, of which 39.9% were male, aged between 65 and 75 years. The intervention analyzed the effectiveness of Tai Chi, performed in sessions of 20 to 60 min, two to five times a week, for a period of eight to 24 weeks (intensity not informed). The observed results indicate that this activity can promote important sleep benefits.

Regarding the process of listening to the target audience of the recommendations, among the 143 PE professionals participating in the hearing (38.1 ± 10.0 years old), 59.4% (n = 85) were male and 81.1% (n = 116) had a postgraduate degree. These professionals worked in different places, such as gyms/studios (n = 51; 43.2%), universities, colleges, National Trade Social Service (SESC) and Social Service for Industry (SESI) (n = 50; 42.4 %), among others (n = 42; 14.4%).

Most professionals (n = 141; 98.6%) considered it important to prepare a PAGBP with recommendations for the older adults. According to the professionals, the main information that should be addressed in the Guide would be: (1) benefits of PA; (2) clinical, physical and functional assessments; (3) general recommendations, including PA types, frequency, duration, intensity and volume; (4) places and equipment for PA practice; (5) conceptual definition of sedentary behavior, PA and physical exercise; (6) tips to encourage PA practice; (7) basic care related to safety in the execution of exercises and PA contraindications; (8) information about the main diseases that affect the older adults and their possible influence on the practice of PA; (9) examples of physical exercise; (10) information about the different characteristics of the older adults, (11) other information, such as: suitable clothing/shoes for practice, hydration, adequate nutrition.

Regarding the textual description or visual presentation of the Guide, most professionals considered the most important aspect to have a succinct textual part (n = 92; 65.3%), photographs (n = 76; 53.9%), illustrations/drawings (n = 73; 51.8%) and animations for virtual dissemination (n = 71; 50.4%). As for the means of dissemination of the Guide, the highest degrees of importance were indicated for digital media (n = 56; 39.7%) and printed material (n = 53; 37.6%).

Regarding the main factors that make it difficult for the older adults to become more physically active, the highlights were the lack of an incentive policy aimed at the implementation of projects/programs related to PA for this population (n = 106; 74.1%), the lack of trained professionals to meet the repressed demand (n = 97; 67.8%), the limited amount of environments adequately prepared for the practice (n = 94; 65.7%), in addition to the absence of a family social support network (n = 91; 63.6%) and knowledge about the importance of being physically active (n = 71; 49.6%).

Of the 17 managers who participated in this investigation, most were female (n = 14; 82.3%). All of them had completed higher education and postgraduate studies, with highlight to the areas of Nursing (n = 6; 35.2%), Physical Education (n = 4; 23.5%) and Medicine (n = 3; 17.6 %). The importance of preparing a PAGBP with recommendations for the older adults was defended by all managers. Regarding the content to be included in the recommendations, the managers suggested emphasizing exercise and combined activity guidelines (physical/cognitive). Most managers considered it important that the textual description or visual presentation of the Guide be succinct (n = 9; 52.9%), with photographs and animations for virtual dissemination (n = 12; 70.6%) and with illustrations/drawings (n = 11; 64.7%), in addition to the dissemination being carried out in printed form (n = 8; 47.1%).

Managers highlighted the importance of the following strategies to help the older adults to become

more physically active: implementation of PA projects/programs (n = 17; 100%), construction of favorable environments for the practice of PA (n = 16; 94.1%), implementation of training programs for professionals (n = 16; 94.1%), public and private financial incentives for the implementation of actions/activities (n = 16; 94.1%), facilitating public and free access to different PA practice environments (n = 14; 82.4%) and awareness campaigns on the importance of PA (n = 13; 76.5%).

Of the 22 older adults who participated in this investigation, 11 were female and 11 were male, with an average age of 69.5 ± 7.6 years old, of which 14 (63.6%) had a high level of education (secondary or higher). Most older adults people practiced PA (n = 18; 81.8%), especially walking (n = 9; 50%), weight training (n = 7; 38.9%), swimming (n = 4; 22 .2%) and dancing (n = 4; 22.2%). The frequency ranged from four to six times a week (n = 11; 61.1%), with an average duration between 50 and 60 minutes (n = 12; 66.7%) and predominantly in the morning (n = 11; 61 ,1%) at universities, colleges, SESC and SESI (n = 7; 38.9%), public outdoor spaces (n = 6; 33.3%) and at home/condominium (n = 3; 16.7%). In these places, PA practice occurred both individually (n = 9; 50.0%) and collectively (n = 8; 44.4%), through participation in organized groups. It is noteworthy that 14 of the participants (77.8%) reported receiving guidance for the practice, mainly by PE professionals (n = 11) and physicians (n = 5).

Among the main reasons associated with the practice of PA, the participants indicated a desire to improve their health (n = 9; 24%) and pleasure in the practice (n = 9; 24%). Unfortunately, due to the social isolation resulting from the pandemic caused by COVID-19, most older adults (n = 18; 81.8%) were forced to significantly modify their PA practice habits. Finally, about receiving the Guide, 10 participants (45.4%) showed interest in receiving the material in printed form (newspaper, magazine, pamphlet, manual, book, booklet), while another 10 (45.4%) showed interest in having access to it through digital media (internet communication and mobile apps).

With regards to the public consultation, managers and professionals from State or Municipal Health Secretariats, higher education and basic education teachers, health professionals, Health Department technicians, undergraduate and graduate students and public and private sector managers have participated. For the chapter referring to PA for the older adults, 46 valid suggestions were received, of which 34 were included in the final document for presenting coherence and technical and/or social relevance. It is noteworthy that none of these suggestions resulted in substantial changes to the original text.

Figure 2 presents the summary of the chapter referring to the older adults on the PA Guide for the Brazilian Population, with information on the benefits of the practice, types of activity, intensity and volume suitable for this population. In summary, we recommend that the older adults perform at least 150 minutes/week of moderate intensity PA or 75 minutes/week of vigorous PA. Such recommendations can be achieved by combining household chores, activities at work/study, getting to and from places or free time.

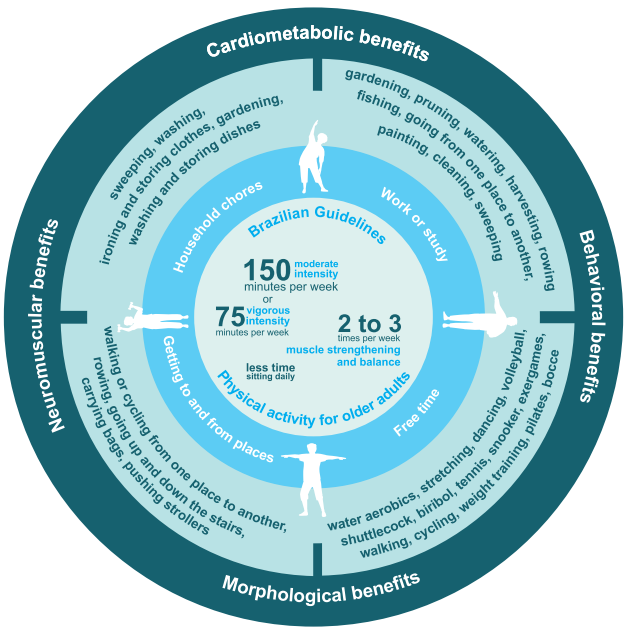

Figure 2 – Brazilian Physical Activity Guidelines for Older Adults.

Chart 2 presents a set of messages to encourage and reduce barriers to the practice of physical activity among the older adults. The main support networks for the older adults on the practice of physical activity are presented in Chart 3.

Discussion

The PAGBP chapter – Physical Activity for Older Adults – is a teaching material that provides clear recommendations based on scientific and empirical evidence on the benefits of PA practice on the health of the older adults. The information regarding the work process and preparation of the document were summa-

rized in this article and will help the older adults, health professionals and managers to know the benefits of PA, the recommended amounts and the various possibilities for practice.

Chart 2 – Examples of messages of encouragement and reduction of barriers to the practice of physical activity among the older adults proposed in the Physical Activity Guide for the Brazilian Population.

If you do not yet meet the recommended time for physical activity, do not give up and increase gradually both quantity and intensity. Doing any physical activity, in the time and place that is possible, is better than doing nothing.
Planning a physical activity schedule is a good start. Identify spots in your routine that are better suited for the practice of physical activity.
Remember that you do not need to spend money to be physically active. Practice the activities that you are able to do.
Having a physically active day is very safe. Concerns about injuries or health problems should not stop you from practicing physical activity.
Practicing physical activity in groups can be more pleasant and joyful. Invite your friends and family.

Chart 3 – Support networks for the older adults to practice physical activity, as proposed in the Physical Activity Guide for the Brazilian Population.

Basic Health Unit (UBS): present in all municipalities in the country and, in many of them, offers guidance and health education for the older adults.
Health Gym Program: Health Department program aimed at promoting health through actions that include physical activity practices. It has several poles distributed in several Brazilian municipalities.
Universities, faculties and Sistema S institutions (SESC, SESI, SEST/ SENAT e SENAC) offer physical activity programs for the older adults.
Community Centers for the Older Adults: present in some municipalities in the country and develops actions to promote active aging linked to the community articulation management of the Municipal Secretariat for the Older Adults.
Sports Clubs: offer infrastructure for the practice of physical activities and sports for different populations, including the older adults.
The local sports, leisure and tourism or social assistance secretaries may offer programs dedicated to physical activity for older adults.

Although the recommendations here presented have been developed in an attempt to meet the specificities of the Brazilian older adults population, many of them are similar and consistent with the guidelines of the WHO[8] and other similar documents developed in several countries[7,9-11]. The revised information indicates that the regular practice of PA can promote morphological[14], cardiometabolic[15,16], neuromuscular[17,18] and behavioral benefits for the older adults population[19-21]. Therefore, we recommend that the older adults perform at least 150 minutes/week in moderate-intensity PA or 75 minutes/week in vigorous-intensity PA. Such recommendations can be achieved in different ways, combining moderate and vigorous intensity activities in household chores, at work/study, getting to and from places or free time, throughout the week or even at different times of the day.

It is important to highlight that despite the PA practice recommendations being a difficult goal for at least part of the older adults population to reach, the practice of some PA can already contribute to a sense of well-being, in addition to gradual increases in the usual level of PA that may provide additional health benefits. Furthermore, the Brazilian recommendations reinforce the importance of performing multicomponent training, focusing on activities that involve muscle strengthening and balance improvement, due to benefits in reducing the risk of falls, injuries and fractures.

Another aspect that deserves to be highlighted in the Brazilian PA recommendations for the older adults is the need to reduce sedentary behavior. Despite the lack of consistent information about the daily time limit that would be adequate to remain in this type of behavior without the development of harmful effects on health, it is well established in the literature that large periods spent in activities performed in the sitting, reclining or lying position are negatively associated with the health of the older adults[22]. Furthermore, physical inactivity associated with longer time spent in sedentary behavior seems to accentuate the negative health effects[23].

The WHO has recently included in its recommendations a ceiling of 300 minutes/week for moderate PA and 150 minutes/week for vigorous PA. For the older adults population, mostly insufficiently active, it is possible that this ceiling may discourage PA practice, as it seems unattainable[24]. Therefore, we prefer to adopt a different posture in the PAGBP by not stablishing a ceiling for PA practice.

It is worth mentioning that this Guide can result in important practical implications for health professionals, managers and, especially, for the lives of the older adults[25]. The document provides information on the benefits of PA, safety aspects, the recommended amount and the various possibilities for practice, as well as culturally appropriate messages and examples for this population. Health professionals, especially those in Physical Education, will find in the Guide a valuable support tool in conducting their interventions, both to strengthen arguments, contributing to health education, and to guide their planning.

For managers, the standardization of language and the definition of some concepts present in the Guide, as well as the summary of the benefits, strategies to increase the PA levels of the older adults and some examples of support networks, can facilitate intersectoral

communication and at different administrative levels, assisting in the elaboration of public policies and programs to promote PA among this population. It is noteworthy that all managers interviewed during the hearing phase have considered it important to elaborate PA Guidelines for Older Adults. In this sense, a document aimed at managers and health professionals is being developed by the Health Department and will help this public to disseminate the Guide.

Regarding public policies, the document will reinforce the central role of PA in the prevention and control of non-communicable chronic diseases, promoting actions for its dissemination and implementation. In Brazil, governmental institutions and programs seek to promote and provide opportunities for PA for the older adults. Universities, the "Programa Academia da Saúde", Basic Health Units, Older Adults Reference Centers, Community Centers for the Older Adults, Social Assistance Reference Centers and Day Centers (Centros-dia) are examples of important initiatives which contemplate adequate physical structure and trained professionals to disseminate and implement the PA Guidelines. The important role played by universities and entities such as SESC and SESI in the creation of support networks for PA practice among the older adults was highlighted in the hearing process.

The establishment of national recommendations specific for the older adults, will also allow the improvement of research and surveillance processes in PA, including, for example, its temporal trends. In this sense, it is worth noting that some adaptations, especially in the surveillance instruments applied to the older adults may be necessary, such as the inclusion of issues related to muscle strengthening exercises, as these exercises have become increasingly important for the health and quality of life of this population[8].

In short, the PA recommendations for the older adults, presented in the PAGBP, were elaborated by Brazilian researchers, based on the scientific evidence available to date, as well as on the processes of hearing and public consultation, involving different segments of the population, from different regions of Brazil. Therefore, we believe that the elaborated material contemplates cultural, socioeconomic and environmental aspects associated with the access and involvement of this population with PA. However, further investigations involving multifactorial aspects of the physical activity and aging relationship are still needed. Finally, although we are aware of the importance of developing this material for the Brazilian population, the success of this initiative with regards to increasing PA levels among the older adults depends fundamentally on intersectoral cooperation, involving managers and professionals in health, sport, education, safety and infrastructure, among others, as this task force seems essential to the processes of dissemination, facilitation and encouragement of the older adults population in an attempt to reach the proposed goal.

Conflict of interest

The authors declare no conflict of interest.

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Author Contributions

Coelho-Ravagnani CF, Sandreschi PF, Piola TS, Santos L, Santos DL, Marzo GZ, Meneguci J, Correia MA, Germano-Soares AH participated in the conception and writing of the manuscript, data collection and analysis. Benedetti TRB participated in the conception, collection, analysis and revision of the manuscript. Hallal PC, participated in the conception and general revision of the manuscript, Cyrino ES, participated in the data analysis, writing and general revision of the manuscript.

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