Popular education, health promotion and active aging: an integrative literature review

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Abstract *Population ageing is a global phenome*non and requires actions to promote well-being and prevent illnesses and unnecessary hospital admissions. The objective of this study was to identify education and health promotion actions aimed at promoting active aging. An integrative literature review was conducted of relevant articles written in Portuguese, English and Spanish published between 2005 and August 2018 using the following electronic databases and virtual libraries: Lilacs, MEDLINE, SciELO, and BVS. The initial search resulted in 2,069 articles, of which 33 met the inclusion criteria. The analysis showed that the actions identified by the review promoted the adoption of healthy habits and participation of older people, characterizing them as actions that promote active aging. However, the actions were limited almost exclusively to this age group, which may lead to age segregation, and focused on old age rather than adopting a life course perspective of active aging. Despite the importance of these actions, only 11 were evaluated, suggesting that the evaluation of education and health promotion actions to demonstrate effectiveness and promote replication in other locations or services is not very common practice.

Key words Popular health education, Health promotion, Active aging, Public health

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Introduction

Population aging is a global phenomenon that began in high-income countries and is now gaining pace in middle and low-income countries, including Brazil. Despite being desirable and one of humanity's greatest triumphs, the pace of population aging has dramatic social, economic, political, and health implications^{1,2}. The most notable demographic changes have occurred at the extremes of the age spectrum, with a reduction in the proportion of people aged under 15 and an increase in the proportion of people aged 65 and over, from 5.5% in 2000 to a forecasted 10.7% in 2025^{3,4}, 18.7% in 2030, and 32.9% in 2060^{3,4}. This is set to lead to a fourfold increase in the old-age dependency ratio (the number of older people compared to the economically active population⁵) up to 2050, requiring new policy measures⁵ to address the problem of rising pension expenditures and falling revenues for the pension system. These changes will also affect country epidemiological profiles and morbidity and mortality indicators^{3,4} and be accompanied by a shift in disease patterns.

In response to the vulnerabilities and specific needs of older people, policies such as the Older Persons Statute⁶, National Health Policy for Older Persons⁷, and National Policy for Older Persons⁸ have emerged. These policies seek to uphold the rights of older people, including the right to life and health, by focusing on health promotion and disease prevention and ensuring the protection, autonomy and dignity⁶ of older people and their effective integration and participation in society. Despite being clearly established under law, health policies often fail to uphold and guarantee the rights of older people in practice.

Although studies of population aging tend to focus on its public health implications, there are a number of national and international movements that emphasize the social role of older people⁹ and develop popular education and health promotion actions aimed at promoting active aging.

Although there are various understandings of the concept^{10,11}, health education (HE) may be said to be a process that contributes to the deepening of health knowledge. However, it tends to be a vertical process aimed at changing health behaviors in which responsibility for health is placed mainly on the individual, thus disregarding a range of factors and social determinants of health that hinder the adoption of healthy habits.

HE entered a new phase with the adoption of popular health education (PHE), a term brought

from popular education refined by the educator Paulo Freire^{12,13} in the 1960s. PHE is shaped around pedagogical practice "with" rather than "for" the population in order to develop autonomy in a participatory manner¹². PHE recognizes the value of health service users and "popular" knowledge, and seeks to establish horizontal relations between health professionals and the community and local social movements. PHE is a political and educational process that transforms and emancipates individuals and groups¹²⁻¹⁴

The definition of health promotion proposed by the Ottawa Charter¹⁵ and exhaustively used in the health literature incorporates the idea of empowerment, suggesting that it should increase the options available to people to exercise control over their own health and listing a number of prerequisites for health and emphasizing the importance of public participation and intersectoral integration. This approach faces a number of obstacles in practice, since major structural changes are required to tackle the primary socioeconomic determinants of health (income, housing, employment, education inequalities) and enable people to achieve their fullest health potential. These changes are increasingly difficult to implement in Brazil given the prevailing neoliberal economic model and rising threats to democracy.

To address these and other concerns and considering the need to provide quality care for ageing populations, in 2005, the World Health Organization (WHO) launched its active ageing policy framework, defining active aging as "the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age". The word "active" refers to "continuing participation in social, economic, cultural, spiritual and civic affairs, not just the ability to be physically active or to participate in the labor force". Active aging aims to extend healthy life expectancy and quality of life regardless of age¹⁶.

These three approaches are interrelated and implicitly or explicitly view participation as a form of empowerment¹⁵ and fundamental condition for people to achieve their fullest health potential. The interdependence between these approaches has led some authors to suggest that PHE is a component of health promotion¹⁷, whereas others see it as a health promotion strategy^{18,19}. Nonetheless, both contribute to active aging, which in turn can facilitate both approaches, since people of all ages can contribute to the implementation of PHE and health promotion ac-

tions, resulting in a virtuous circle for individual and collective well-being.

Key factors influencing active aging include functional capacity, degree of independence, and autonomy. Policies, programs and projects aimed at promoting well-being in older people should therefore seek to enhance, maintain, or recuperate these aspects. These are priorities set out in the Older Persons Statute⁶ and health policies aimed at older people^{7,8}, which stress that older people should be seen as, and have the opportunity to be, active participants in society, particularly in relation to matters that concern them. However, despite the participatory discourse and official documents embodying the principles of participation, achieving public participation in practice is no easy task because it implies a sharing of power.

It is important to highlight that habits, attitudes and behaviors adopted during childhood can influence quality of life in older age. Healthy practices and public participation should therefore be encouraged throughout the life course to ensure they are perpetuated into old age. Older people should be aware of the power they have, given that this segment of the population is becoming increasingly important to different kinds of interests and has the potential to be a political force.

Thus, considering the pace of population ageing in Brazil, risks of health problems, the need to develop emancipatory practices, and the importance of the latter for making aging a pleasant and active phase of life, the present study sought to identify education and health promotion actions aimed at promoting active aging.

Method

The method used in the present study was an integrative literature review, which synthesizes and critically evaluates theoretical and empirical literature on a topic of study. Integrative reviews therefore have the potential to provide a comprehensive understanding of the current state of knowledge about a particular phenomenon or healthcare problem, identify effective health care interventions and cost reductions, build health knowledge, and enhance health policy and practice^{20,21}. We followed the recommended steps for this type of review²⁰ using the following guiding question: what education and health promotion

actions are being developed to promote active aging? The study period was 2005 to August 2018 on account of the launch of the WHO paper on active aging in 2005. A literature search was conducted of the following databases: Literatura Latino-Americana e do Caribe em Ciências da Saúde (Lilacs) and Medical Literature Analysis and Retrieval System Online (Medline), and the virtual libraries Scientific Electronic Library Online (SciELO) and Biblioteca Virtual em Saúde (BVS). The following combinations of descriptors were used: "health education" "aged" and health promotion. We also used the keywords "active aging" and "popular health education", which are not found in the DeCS (Health Sciences Descriptors). The descriptors and keywords were used in Portuguese, English and Spanish together with the Boolean operator "AND", as shown in Figure 1.

Relevant articles were initially selected by reading the titles and abstracts. We included only full versions of articles in Portuguese, Spanish, and English on the theme of education with an emphasis on PHE and those related to health promotion aimed at promoting active aging. Literature reviews, theses, and duplicate articles were excluded. The selected articles were then read in their entirety using the following inclusion criteria: articles that explicitly or implicitly addressed the promotion of active aging and articles involving popular health education and health promotion actions that followed underlying principles such as active participation geared towards participant empowerment, intersectorality, and promotion of the autonomy, independence, and functional capacity of participants.

Results and discussion

The literature search resulted in 2,069 articles, of which 33 met the inclusion criteria (Figure 1).

A synthesis of the results is shown in Chart 1. The analysis showed that the studies were carried out predominantly in primary healthcare settings^{30,31,33,36,38,41,42,45-48,50,53} and universities^{22,24,26-28,32,35,37,39,44,51,52,54}. This is to be expected in the case of primary healthcare settings, given that health promotion is one of the priorities of the National Primary Healthcare Policy⁵⁵, health centers are closer to the community, and these kinds of actions tend to be restricted to the health system in Brazil. The review also shows that uni-

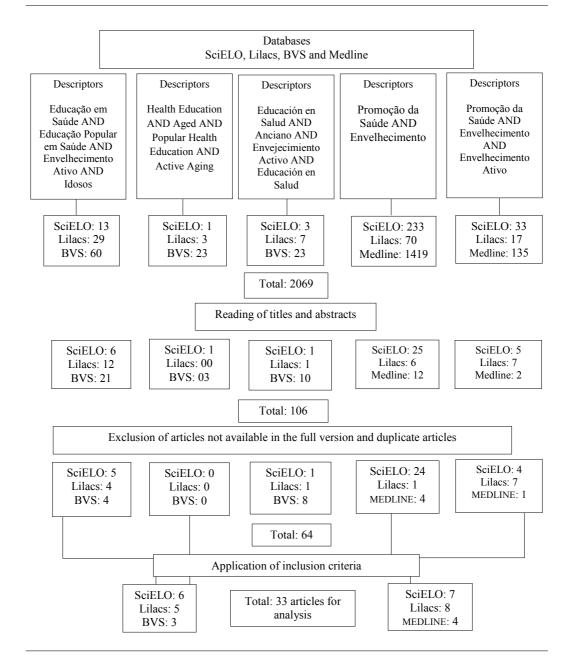


Figure 1. Flow diagram of the article search and selection process.

Source: Conducted by Alexandre Soares de Barros.

versities are increasingly developing actions with older people, be it through open universities of the third age or extension projects, indicating an awakening of interest in issues related to aging in these institutions and bringing them closer to the community, which could in turn facilitate other similar interventions and influence other sectors. Community involvement in the development of the actions appeared to be limited. Nonetheless, some of the studies mentioned the importance of community participation for promoting more far-reaching results. Studies that reported the in-

Chart 1. Publications on popular education and health promotion directed at active aging by author, year of publication, place of study, title, objectives, and type of action developed.

Authors	Year of publication, place of study and action setting	Title	Objective	Action
Assi ^{s22}	2005, Rio de Janeiro, Brazil, older adult outpatient clinic at a university hospital.	Active aging and health promotion: reflecting on education actions for older people.	To make a contribution to the discussion of the ethical and political aspects of education actions with older people.	Application of an individual assessment instrument and education action with a group of older people: Multidimensional Health and Quality of Life Assessment.
Sancho Castiello et al ⁻²³	2006, Spain, Spanish Society of Geriatrics and Gerontology.	Knowing how to age. Preventing dependence. A model for designing teaching materials.	To describe an action research project using qualitative research methods aimed at promoting active aging and avoiding dependence.	Development of audiovisual teaching materials based on research with 13 focus groups consisting of people aged between 55 and 80 in 6 cities in Spain.
Assis et al ⁻²⁴	2007, Rio de Janeiro, Brazil, older adult care center at a university of the third age.	Education actions for health promotion during old age: the experience of an older adult care center at UNATI/ UERJ	To present an extension project and demonstrate its contribution to a care model and professional training based on comprehensive care and health promotion.	Range of group activities: health meetings, health circles, and production of educational materials (pamphlets and murals).
Martins et al ²⁵	2007, Florianópolis, Brazil, reference outpatient clinic.	Health education as quality of life support for older people	To understand the health education needs of older people attending older adult groups.	Group techniques and activities, questionnaires, and participant observation related to diabetes, high blood pressure, osteoporosis, arthritis and arthrosis, and a balanced diet
Alencar et al ⁻²⁶	2008, Piauí, Brazil, university of the third age.	Social and political inputs of nutrition education from a healthy aging perspective	To reflect on classroom experiences from game-based learning workshops with older people from a university of the third age.	Weekly game-based learning workshops dealing with nutrition, health and aging with older persons attending a program at a university of the third age.
Bernardo et al ⁻²⁷	2009, Rio de Janeiro, Brazil, older adult care center at the Open University of the Third Age/UERJ.	Health in dialogue with everyday life: the experiences of education work with older people in the health circle group.	To present the methodology of the "Health Circle" and highlight some assessment data from the activities records.	Educational "afternoon tea" groups aimed at encouraging reflection and collective production regarding topics related to health and quality of life.
Mazo et al ²⁸	2009, Florianópolis, Brazil, third age study groups at the University of the State of Santa Catarina.	From appraisal to action: third age study groups: an alternative for the promotion of active aging	To describe the functioning of actions to promote physical exercise as part of an extension program to provide inputs to support future programs.	Physical activity actions of the third age study group.

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Kuczmarksi, Cotugna. ²⁹	2009, Delaware, United States, Wilmington Senior Center.	Outcome evaluation of a 3-year senior health and wellness initiative.	To describe the development and implementation of the assessment methodology and results of a multidisciplinary senior health and wellness initiative.	11 multidisciplinary programs addressing senior health and well- being over a 3-year period.
Combinato DS et al. ³⁰	2010, Paranaíba, Brazil, Mato Grosso do Sul, primary healthcare.	Chat groups: older people's health in the family health strategy.	To develop a group process for health promotion with older people geared towards active aging and quality of life.	Closed weekly, predominantly female, chat groups.
Firmino et al ⁻³¹	2010, João Pessoa, Brazil, primary healthcare.	Popular education and health promotion directed at older people: reflections based on the experiences of university extension with groups of older adults in João Pessoa.	To document experiences and outline lessons learnt and the difficulties and concerns of participants in a university extension project.	Health education activities with older people focused on nutrition.
Paiva et al ^{.32}	2010, São Paulo, Brazil, São Paulo State University (UNESP).	Dance and aging: a partnership in motion	To present a program that develops a range of activities with people aged over 60.	Dance lessons as part of the Third Age Physical Activity Program (PROFIT) at UNESP.
Tahan, Carvalho ³³	2010, Ribeirão Preto-São Paulo, Brazil, primary healthcare.	Reflections of older people participating in health promotion groups geared towards aging and quality of life.	To analyze and reflect on older people's perceptions of quality of life, aimed at promoting comprehensive care after adhesion to the health promotion groups.	Open handicraft, dance, relaxation and health groups using game-based learning and leisure activities.
Souza, Grundi ³⁴	2011, Ceilândia- Distrito Federal Brazil, primary school.	Intergenerational integration, social capital and health: a theoretical framework and results from a qualitative study	To evaluate intergenerational activities developed in a school and develop a theoretical framework to explain observed changes.	Intergenerational intervention where older people shared their life stories with teenage primary school students, evaluated using focus groups made up of individuals from both age groups.

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Wichmann et al ⁻³ 5	2011, Santa Cruz do Sul – Rio Grande do Sul, Brazil, teaching clinic at Santa Cruz do Sul University (UNISC).	Promotion of healthy aging: the adoption of a multidisciplinary approach to the provision of care for older people (UNISC)	To document the experiences of a university extension project and socialize multiprofessional and interdisciplinary practices adopted in the project.	Older adult groups for the discussion of topics related to health in old age with various activities.
Andrade PT et al ^{.3} 6	2012, Ouro Preto- Minas Gerais, Brazil, community interaction center.	Projeto conviver: encouraging social interaction between older people from Catete, Ouro Preto, Minas Gerais.	To describe the experiences of a project to promote social interaction between groups of older people.	Workshops and encounters dealing with health-related topics.
Costa et al. ³⁷	2012, Patos- Paraíba, Brazil, teaching clinic at a higher education institution.	Health education: a strategy for the promotion of quality of life in the third age	To investigate whether level of quality of life in the third age is influenced by the teaching of psychomotor exercises as a health education strategy.	Older people practiced kinetic and functional exercises twice a week; the study used a pretest posttest design.
Patrocínio, Todaro ³⁸	2012, Campinas - São Paulo, Brazil, primary healthcare.	The healthy aging education program.	To implement and evaluate a healthy aging education program.	Weekly 150-minute meetings with 16 older people during a 4-month period developed from a Freirean perspective.
Silveira et al. ³⁹	2012, Rio Grande do Sul, Brazil, state universities.	Gerontological education, human aging, and educational technologies: reflections on active aging.	To reflect on aging and the possibility of participating in gerontological education, enhancing quality of life.	Actions developed by universities offering programs to older people.
Cyarto et al. ⁴⁰	2013, Melbourne, Victoria, Australia.	Promoting healthy ageing: development of the Healthy Ageing Quiz	To design an easy-to-use instrument that allows older adults and people approaching old age to evaluate their lifestyle.	Development and application of the Healthy Ageing Quiz to increase awareness and knowledge of how to age well.
Patrocínio, Pereira ⁴¹	2013, Campinas- São Paulo, Brazil, primary healthcare.	Effects of health education on the attitudes of older people and its contribution to gerontological education.	To evaluate the effects of a community-based popular health education program for older persons dealing with attitudes towards old age.	16 weekly 150-minute meetings with groups of older people to discuss positive and negative images of old age.

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Mendonça et al. ⁴²	2013, Viçosa-Minas Gerais, Brazil, multiprofessional senior care reference center.	Experiences from educational workshops with older people: (Re) thinking practice in the light of Freirean thinking.	To document experiences to promote reflection on the use of workshops as a health education strategy from a Freirean perspective.	Workshops with older people on medication use.
Morrow- Howell et al. ⁴³	2014, United States, schools.	Volunteering as a pathway to productive and social engagement among older adults.	To examine the effects of volunteering on subsequent social and civic activity of older adults.	Volunteering among older adults.
Sato et al. ⁴⁴	2014, São Paulo, Brazil, a university gerontology laboratory.	Memory stimulation and related cognitive function programs: opinions and behaviors of participating older persons.	To show the influence of a memory program on the performance of activities of daily living and incorporation of habits into everyday life.	Group activities with older people consisting of lectures and discussion classes, experiential activities, including memory strategies and reflection on active and healthy living behaviors.
Almeida et al. ⁴⁵	2015, Viçosa – Minas Gerais, Brazil, primary healthcare.	Community intervention project "In Common-Age": contributions to health promotion among older people in Viçosa, Minas Gerais.	To analyze possible changes in anthropometric measurements and functional physical fitness levels among project participants.	Food and nutrition education and physical exercise and leisure workshops and conversation circles on topics related to healthy aging; intervention evaluation.
Massi et al. ⁴⁶	2015, Curitiba, Brazil, primary healthcare.	Language and aging: autobiographical writing practices with older persons.	To analyze, from a literacy perspective, the effects of autobiographical writing practices on autonomy and well-being among older people.	Weekly literacy workshops to promote literacy and the discussion of various topics, such as old age, family, the labor market, and spirituality.
Patrocínio ⁴⁷	2014, São Paulo, Brazil, primary healthcare.	Practical activities for active aging.	To present a set of practical activities for promoting healthy aging developed from a Freirean and active aging perspective.	Meetings with older people involving various activities and discussion of various topics.
Valer et al. ⁴⁸	2015, Porto Alegre - Rio Grande do Sul, Brazil, primary healthcare.	The meaning of healthy aging from the perspective of older people participating in education groups.	To describe the meaning of healthy aging from the perspective of older people participating in health education groups in a local health center.	Application of an instrument with older people participating in health education groups.

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Authors Zanjani et al. ⁴⁹	Year of publication, place of study and action setting 2015, Kentucky, United States, various public places.	Title Memory Banking: a life story intervention for aging preparation and mental health promotion.	Objective To examine the feasibility of Memory Banking as a tool for aging preparation.	Action Activity where older people document and share their life story, including mapping out future dreams, aspirations, plans, and decisions.
Costa NP et al. ⁵⁰	2016, Belém – Pará, Brazil, primary healthcare	Story telling: a care technology in permanent education for active aging.	To evaluate the relevance and effectiveness of the "story telling" method as an active aging strategy.	Story telling activities aimed at older people.
Inouye et al. ⁵¹	2018, São Paulo, Brazil, the Open University of the Third Age.	The effect of the Open University of the Third Age on the quality of life of older people.	To determine the effect of the Open University of the Third Age program on the quality of life of older students.	Interviews with older students at the beginning and end of the academic year to measure the effects of education on quality of life.
Massi et al. ⁵²	2018, Curitiba- Paraná, Brazil, university.	Active aging: an intervention-research report.	To examine the effects of activities such as language activities on autonomy and public participation among older people.	Evaluation of the effects of life story language activities on autonomy and public participation.
Mendes et al. ⁵³	2018, Belém-Pará, Brazil, primary healthcare.	Socio-educational video debate technology for active aging promotion.	To evaluate the effectiveness of socio-educational video debate technology as a strategy for active aging.	8 video debate workshops with the association of videos with the participants' life stories and habits.
Olympio, Alvim ⁵⁴	2018, Vitória- Espírito Santo, Brazil, the Open University of the Third Age.	Board games: gerotechnology in nursing care practice.	To develop a board game to be used as a gerotechnology for the promotion of active aging.	Interviews, participant observation, and group discussions, resulting in the development of a board game for older persons.

tegration of various sectors in the development of actions were also scarce. This is partly due to the common notion that health is influenced by purely biological factors. The role social determinants of health play, and therefore the need for joint action across various sectors, is not well understood and therefore often overlooked. This remains one of the major challenges in implementing effective health promotion actions⁵⁶.

Workshops and the formation of groups were the most commonly used techniques, with groups being made up of between eight and 20 individuals and predominantly female. A number of reasons may explain the predominance of women in these types of actions, including: men are more resistant to adopting healthy practices and participating in activities for older adults; the proportion of women is higher in the older

population; and many older men still work to complement their income²⁰. According to the authors, the discussions involved topics of interest to the participants. This approach played an important role in making the actions attractive, ensuring they had a positive impact, and promoting the exchange of professional and popular knowledge, one the aims of popular education¹¹⁻¹³. The principles of popular education underpinned the majority of activities addressing various themes, ranging from sharing of life stories to practical issues related to healthy eating, physical activity, and the discussion of chronic diseases. Only one action involved older people and teenagers, seeking to promote intergenerational sharing of life stories³⁴. This finding supports the observation that education and health promotion activities for older people are still limited almost exclusively to this group, which may unconsciously promote age segregation. This may be due to the following: difficulties in bringing together various age groups in the same activity; the prevailing idea that actions with older people should be restricted to this group; or unconsciously preconceived ideas that both older and young people prefer to be with their peers, which has been demystified by previous studies9,34.

Only 11 of the 33 interventions were evaluated^{22,23,25,34,37,40,45,48,51,52,54}, suggesting that evaluation is not very common practice in education and health promotion activities. According to the authors, results and benefits depend on the type of intervention. However, all studies involved the promotion of the autonomy, independence, and participation of older people, characterizing them as actions that promote active aging^{16,17}. In most of the actions older persons had the freedom to express opinions and participate freely, often conducting the workshops and activities themselves, with few examples of lectures or activities where participation was more passive. All articles made some kind of reference to education, health promotion, or active aging, illustrating the interdependence and interrelation between PHE and health promotion highlighted by Reis¹⁷ and highlighting the difficulty in defining whether they are a single methodology, as proposed by Vasconcelos¹⁸, or whether PHE is a health promotion strategy, as suggested by Pedrosa¹⁹. The findings of the present study seem to indicate that PHE is a means of achieving health promotion, which in turn fosters active aging. However, there are no boundaries defining where one begins and the other ends; the three form a virtuous circle of mutual influences and dependencies.

According to the authors of the articles, older people perceived an improvement in their memory and self-esteem and there was a reduction in anxiety levels and improved awareness of the importance of self-care among older people, thus promoting well-being, interest in life, knowledge gains, and the adoption of healthy lifestyle habits. The authors also reported that the actions helped prevent future complications related to chronic disease and led to significant improvements in functional capacity, the performance of activities of daily living, engagement in physical activity, and mental health. However, more in-depth, long-term studies are required to confirm these findings.

With regard to social benefits, in general, the findings show an increase in the autonomy and active participation of older people in the actions, the promotion of social interaction between the individuals and professionals involved, sharing of experiences, strengthening of affective bonds, building of new relationships, and expansion of social support networks. These findings illustrate the importance of popular education and health promotion, which take a holistic approach to the question of health that goes beyond physiological needs.

Considering that empowerment is a key factor in health promotion actions¹⁵, all of the actions analyzed in this review appear to be in alignment with this principle, which suggests that they transform the environment and ways of dealing with daily challenges.

The findings also demonstrate the diversity of actions aimed at promoting active aging and the numerous benefits they provide to older people. Although research on this approach is scarce, we found studies that made a contribution to the knowledge and understanding of active aging and its multiple benefits for health and well-being. However, there was little discussion of intersectorality and community participation in the planning of actions in the studies analyzed by this review.

The findings indicate that it is possible to replicate the actions analyzed by this review in other services and locations, which is one of the aims of integrative reviews^{20,21}. However, it is also clear that actions could have an even greater impact if they increased the involvement of the community, schools, universities and other sectors in health services at all levels, as envisaged by popular education and health promotion⁹⁻¹³, thereby enabling people and groups to take control over their lives and health and be actors in their own destiny.

One of the main limitations of our review is that it only considered articles available in the full version, which may have limited the number of publications, particularly those in English and Spanish.

Final considerations

The present study achieved the proposed objective of identifying education and health promotion actions aimed at promoting active aging. The promotion of active aging should be encouraged in Brazil given the current scenario for life expectancy. It is therefore essential to develop health actions aimed at promoting greater autonomy, well-being, and participatory culture, and new research in this area.

The idea of active aging proposed by the WHO is opportune and should be understood from a life course perspective so that people can develop

the habit of engagement and critical capacity to enable them to become actors in their own health and life and drive lasting social change.

This integrative review facilitated reflection on replicable practical activities and research, allowing for the reflective observation of what has been published for this purpose. It also draws attention to existing gaps, such as the need for evaluation to demonstrate effectiveness, and to the fact that old age can be a productive, desirable, and pleasant phase of life.

Governments and health managers in general therefore need to understand the value of health education and promotion for all ages and the importance of tackling social injustices. This in turn could help promote the active participation of older people in society, consequently reducing their demand for social resources and unlocking their potential power, thus enabling them to demand the effective implementation of policies aimed at them.

Collaborations

EM Souza, DPP Silva and AS Barros participated in all stages of this study. AS Barros also elaborated the flow diagram of the article search and selection process. All the collaborators read and approved the content of the manuscript.

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