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What is the Current Knowledge and Experience on Preventive Pathway for Healthy Ageing in Italy? A Scoping Review

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Keywords: Lifestyle; active ageing; preventive program; longevity
Parole chiave: Stili di vita; invecchiamento attivo; programma preventivo; longevità

Abstract

Background. *Worldwide population is ageing rapidly. Lifestyle factors are essential targets for leading to behaviour change interventions that promote healthy aging.*
Study design. *We performed a scoping review aimed to underline the current knowledge and experience on preventive interventions for healthy and active ageing in Italy. Secondly, it intended to study the manner in which this country will pursue the topic in this research area.*
Methods. *The search was conducted on different databases: PubMed, CINAHL, Embase, and Scopus on July 25th, 2023, and search results were filtered to include only articles published from 2003.*
Results. *A total of 951 potentially relevant records were retrieved. After duplicates removal, 810 unique records were screened. Finally, four studies fulfilling established criteria were included. All the studies were conducted in the northern and central regions of Italy. The investigated populations were older adults, and all four studies were focused mainly on primary prevention and health promotion strategies based on self-efficacy and motivation of the participants, including physical activity, diet and cognitive training. In addition, two studies used mobile health technologies to deliver the preventive intervention for healthy ageing.*
Conclusion. *Our scoping review underlines the limited knowledge and experience of preventive healthy aging interventions in the national setting. The new preventive pathway that promotes healthy ageing healthily should be based on tailored lifestyle interventions, managed by multidisciplinary teams with the use of digital tools, in order to improve older people's safety. The characteristics of the settings are still not clear.*

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Introduction

Worldwide population is ageing rapidly. This phenomenon, also known as the third demographic transition, will lead to a relevant increase of the number of older people. It has been estimated that the proportion of citizens in the European Union over 65 years of age will rise from 18% to 28% by 2060, and the percentage of over-80s will increase from 5% to 12% during the same period (1). Moreover, recent literature has acknowledged that the process of ageing is multifaceted and determined by a complex interaction between biological, cultural, community, and environmental aspects (2). The World Health Organization (WHO) defined active ageing as "the process of optimising opportunities for health, participation, and security in order to enhance quality of life as people age" for "helping people stay in charge of their own lives for as long as possible as they age and, where possible, to contribute to the economy and society" (3). In order to mitigate the effects of an ageing population on society, and in particular on healthcare systems, 194 countries in the world adopted the global strategy and action plan on ageing and health (2016–2030), which aimed to a full promotion of healthy ageing WHO stated that healthy ageing is "the process of developing and maintaining the functional ability (i.e., people's capabilities of being and doing what they have reason to value) that enables well-being in older age" (4). The aim of healthy ageing is not only to extend lifespan, but also to improve quality of life and both physical and mental health of older people (5). The global strategy and action plan on ageing and health is aligned with the 2030 Agenda for Sustainable Development Goals (6), which aims to ensure that every human being can fulfil their potential in dignity and equality in a healthy environment. Furthermore, aging population is a phenomenon that is observed in Italy, where 23.3% of the population is 65 years old or older, and 7.5% is 80 years or older (1). In addition, the life expectancy of Italian citizens is one of the highest in the world and not just in Europe. This position as a front-runner of ageing, together with the country's extraordinary regional social health disparities, makes Italy the ideal "empirical laboratory" to address how different combinations of biological, clinical, cultural, and socioeconomic factors are leading to different individual and social outcomes. Thus, Italy represents an exceptional context in which designing, testing, and implementing innovative solutions, and to adopt different models of intervention for prevention, health and long-term care, working arrangements, political agendas, and societal outreach. Moreover, as population is progressively ageing, we need to take into account that frailty-related conditions such as chronic diseases are rising; even if national initiatives are trying to spread health promotion and disease prevention programs and policies, people are at risk of developing diseases as they age. Access to care becomes indispensable as most of the elderly live in the community, therefore care services should be offered within primary health care settings (11). As chronic diseases are increasing and the population needs are changing, a shift from a treatment model to a coordinated and comprehensive continuum of care is needed. This will require a reorientation in health systems that are currently organised around acute, episodic experiences of disease. The present acute and chronic care models of health service delivery are inadequate to address the health needs of rapidly ageing populations (11). Looking at the practical viewpoint, health centres, primary care facilities or community setting among the national setting are implementing and integrating heath intervention designed for high-priority diseases such as diabetes, hypertension, depression, and cardiovascular diseases. In particular, inside the National Health System we have several care pathways tailored for different diseases. A "care pathway" is a way to translate evidence into practice, in order to reduce medical costs while delivering optimal patient-centred care (12). The diagnostic therapeutic care pathway is a series of predefined, structured and coordinated services performed at an outpatient and/or inpatient and/or territorial level, which provides for the integrated participation of different specialists and professionals, at the hospital level and/or a local one, in order to carry out the most appropriate diagnosis and therapy for a specific pathological situation or even the health care needed in particular life conditions (13,14). Recently, the concept of a care pathway based on health reinforced the concept of attention to aspects of prevention and proactive care of the assisted person (15); however, to date, no clear preventive pathway specifically aimed to improve active and healthy ageing exists. According to the WHO, living arrangements including social support, social wealth, and background factors (e.g., age, gender, marital status, employment status, educational background, income, size of the family) are considered influential in active and healthy ageing (16). A further fundamental factor in the vision of healthy aging is the digital aspect. Digital health is becoming important in the management of aging

and for the reform of local preventive care as stated in the Mission 6 of the National Recovery Plan and Resilience (PNRR). It is therefore strategic to understand how digital health tools can be included in the preventive pathway. To do this it is necessary to reach a consensus on the taxonomy fold, on how to evaluate digital tools, by giving a definition of their role within care pathways and by measuring patient's benefits from their use (17).

Healthy lifestyle is not the only method to promote healthy ageing, but can be an easy way (5). Lifestyle factors are essential targets for leading to behaviour change interventions that promote healthy aging; in particular physical activity, nutrition, and cognitive function are the main influential factors in active and healthy ageing (18).

In this scenario, our scoping review aimed to underline the current knowledge and experience on preventive interventions for healthy and active ageing in Italy and, secondly, to display the manner in which our country will pursue this topic on in this research area. The innovative aspect of this scoping review consists in defining the main characteristics of a preventive pathway model applied to the national contest, which can subsequently be translated, adapted and implemented in other countries. This scoping review is conducted within the Age-It Project framework, part of the National Research Plan 2021-2027 (19).

Materials and Methods

1. Study design

This scoping review (20) was conducted following the methodological framework outlined by Arksey and O'Malley (21) and it was reported according to the PRISMA extension for Scoping Reviews (22).

2. Review question

The search strategy was based on the following review question: What is the current knowledge on preventive pathway for healthy ageing in Italy? More specifically, what has already been done and how is Italy moving in this healthy ageing research area?

3. Inclusion and exclusion criteria

Eligibility criteria were established according to the PCC (Population, Concept, Content) framework (23). The review focused on studies on older adults, namely aged 60 years or older, with any health condition. Studies considering different subjects' age were included only if it was possible to isolate information about the older adults. The concept of the study was the existing preventive pathway or preventive program for healthy ageing. Moreover, this scoping review tried to understand if aspects related to acceptability of preventive pathways by older adults were considered. Studies were excluded if no clear description of preventive pathways was included. Studies conducted in both primary care and community/municipality settings were included. Research conducted outside of Italy were excluded. All studies on primary data (e.g., experimental and quasi-experimental, observational, and qualitative studies) were included. In contrast, we did not include commentaries, opinion papers, and literature syntheses.

4. Search strategy

A comprehensive search strategy was developed combined appropriate keywords, MeSH terms, and Boolean operators. The search string was: *((Pathway* OR Path OR Approach OR Percorso) AND ("Healthy Aging"[Mesh] OR "Healthy Ageing" OR "Aging Healthy" OR "Ageing Healthy" OR "Aging Well" OR "Well Aging" OR "Active Aging" OR "Active Ageing" OR "invecchiamento in salute" OR "invecchiamento sano" OR "invecchiamento attivo" OR Longevity OR Longevità OR "Health promotion" OR "Prevention Plan*" OR "Preventive Health Program*" OR "Program* Preventive Health" OR "Preventive Program*" OR "Programma preventivo" OR "Promozione della salute") AND ("Aged"[Mesh] OR elderly OR anzian* OR "giovani anziani" OR "Older Adult*") AND ("Methods"[Mesh] OR methodology OR metod* OR Metodologia OR Design OR Model* OR Modello OR Modeling OR "Model* composition"OR Polic*) AND (Italy OR Italia OR Italy [text word] OR Italian [text word] OR Italia [text word] OR Italiano [text word] OR "Italian Country" OR "Italian Region"[text word] OR "Italian Context"[text word]))*.

The search was conducted on different databases, namely Medline (PubMed), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Embase, and Scopus. The databases were queried on July 25th, 2023; search results were filtered to include only articles in Italian or English published from 2003, as it was around this time that the WHO promoted and launched a healthy ageing campaign among the community (24). Study selection and data extraction. After removing duplicate records, title and abstract were independently screened by four reviewers (AM, IP, NC and AI). Then, full texts of relevant articles

were retrieved and independently assessed by at least two researchers. Disagreements between researchers were solved through team discussion and a fifth reviewer (AC) was involved to solve discrepancies. Eligible articles were extracted and summarised independently using a standardised form. Extracted information included: authors, publication year, location, study design, participant characteristics, study setting, involved professional figures, outcomes, preventive intervention description, key findings. Then, extracted information was double-checked by a second researcher.

5. Quality assessment

Even if scoping review guidelines do not state the mandatory phase of quality assessment, authors decided to perform the risk of bias analysis. In detail, methodological quality was assessed by four researchers (AM, IP, NC and AI) using the Joanna Briggs Institute (JBI) Critical Appraisal Checklists for Cohort Studies (25), Quasi Experimental Studies (25), and Qualitative Studies (26). The criteria to generate the overall score were decided and approved by the whole research team. In detail, the overall score was assigned as following: (i) High quality if all the criteria were met; (ii) Medium quality if one or more criteria were unclear; (iii) Low quality if one or more criteria were not met. The quality assessment was independently conducted by at least two researchers for each included study, and disagreements were resolved with the involvement of a third researcher.

Results

1. Search results

A total of 951 records were retrieved. After duplicates removal, 810 unique records were screened. Of them, 795 records were excluded based on title, abstract, and/or portion of text. Then, 15 studies were eligible for full-text screening. Finally, four studies fulfilling established criteria were included. Figure 1 shows the PRISMA-ScR flowchart (27). The main reason for exclusion was the topic not matching the research question.

2. Quality assessment

Quality assessment summary is presented in Table 1.

In detail, the quasi-experimental study performed by Antonietti et al. (28) was scored as medium quality for the inappropriate statistical analysis used and for unclear participants follow-up. The cross-sectional study published by Bortoluzzi et al. (29) was classified as a medium quality due to the lack of strategies to deal with confounding factors. The qualitative study conducted by Rampioni et al. (30) was classified as medium quality level considering the absence of

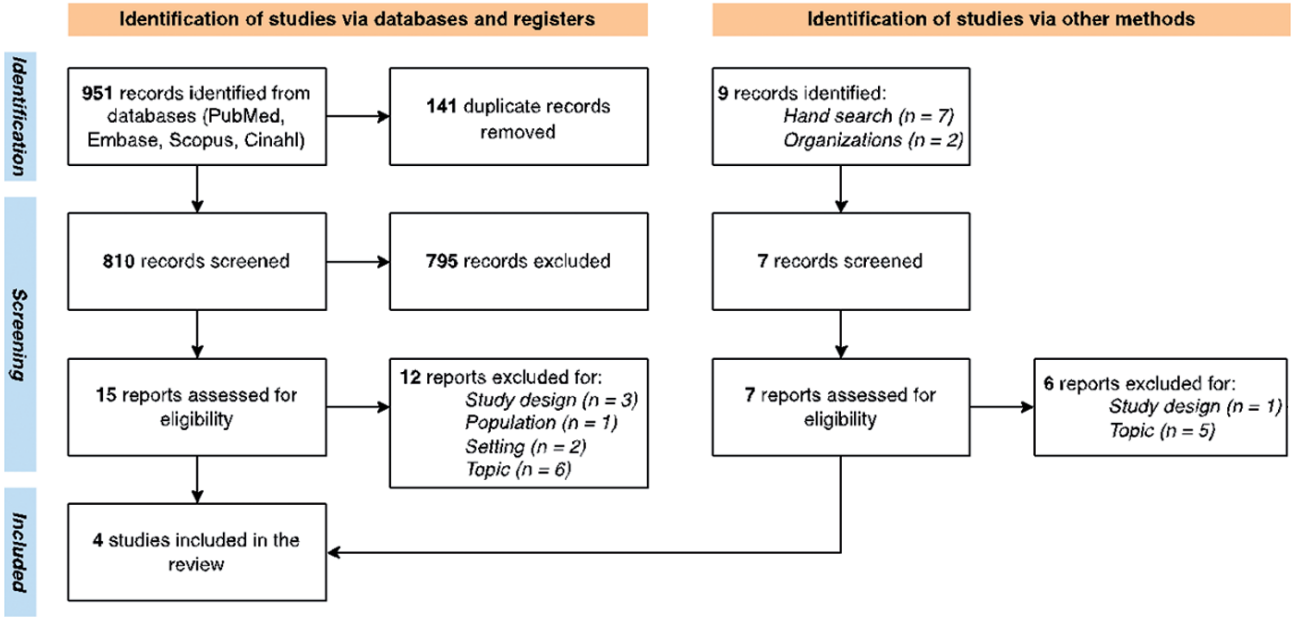

Figure 1. PRISMA flowchart.

Table 1 - Quality assessment of the included studies.

Article	Study design	Assessment tool	Overall quality
Antonietti et al., 2014	Quasi experimental	JBI for Quasi-experimental	Medium
Bortoluzzi et al., 2022	Cross sectional	JBI for Cross Sectional	Medium
Rampioni et al., 2021	Qualitative	JBI for Qualitative	Medium
Santini et al., 2020	Qualitative	JBI for Qualitative	Low

ethical committee approval and the unclear statement locating researchers culturally or theoretically. Finally, the qualitative study performed by Santini et al. (31) was scored as low quality for no evidence of ethical approval by an appropriate body, for unclear statement locating the researcher culturally or theoretically, and for unclear influence of the researcher on the research and vice-versa.

3. General characteristics

Studies characteristics and data extraction of the included studies are shown in Table 2, while Table 3 presented the mail outcomes and results obtained in each included study. Antonietti et al. (28) and Bortoluzzi et al. (29) conducted their studies in the cities of Milan and Vercelli (northern Italy), respectively. Santini et al. (31) and Rampioni et al. (30) settled the intervention in Ancona (centre Italy). Santini et al. (31) and Rampioni et al. (30) tested digital methods (e.g., computer and sensing technologies) for active and healthy ageing and digital health coaching technologies. The quasi-experimental study conducted by Antonietti et al. (28) aimed to evaluate four different healthy ageing strategies integrated in a cohesive empowerment pathway to enhance life skills of older people. The aim of the study conducted by Bortoluzzi et al. (29) was to evaluate the effectiveness of the Dedalo Project, a community multicomponent intervention promoting healthy ageing. The research involved 365 participants with an average age of 60 years, living in Vercelli. Rampioni et al. (30) conducted a qualitative research on active and healthy ageing technologies. The study aimed to gather and evaluate the viewpoints of older adults, caregivers, and stakeholders in the care and technology sectors. The research focused on a range of devices designed to support healthy ageing and independent living. A sample of 30 participants, including 13 patients, eight caregivers, and nine stakeholders were enrolled. Finally, Santini et al. (31) carried out a qualitative study on the benefits of a digital coach in enabling healthy ageing for older adults who are transitioning into retirement. The study involved 15 participants, including five older workers, five retirees, and five colleagues. The primary objective of this study was to explore the potential of digital health coaching systems in promoting healthy ageing among older adults.

The preventive pathway characteristics are described in Table 2. The four preventive pathways described were heterogeneous but all focused on lifestyle interventions.

4. Preventive pathway characteristics from quantitative studies

Particularly, the intervention proposed by Antionetti et al. (28) consisted in an "empowerment pathway" including four main actions: cognitive and brain stimulation, theory of mind and decision making, framing effects of communication on healthy eating, and nutrition. The pathway aimed to identify which messages were more effective in activating behavioural intentions that can lead to better health and well-being of the older people. With regards to cognitive and brain stimulation, preliminary evidence suggested an improvement in performance after the cognitive/neuromodulation process. In terms of decision making, the subjects were strongly oriented towards fair behaviour when taking decisions about financial issues. With regards to healthy eating, participants' intentions to eat more or less of different foods in the future depend on both the framing of persuasive messages and individual differences in self-efficacy and regulatory focus. For example, messages describing the positive consequences for well-being when meat consumption was limited weremore effective than messages describing the negative consequences of frequent meat consumption. However, the effectiveness of message framing was moderated by diet-related self-efficacy. Among participants with low self-efficacy, messages describing the positive consequences reduced the intention of eating meat, more than messages describing the negative consequences. Among participants with high self-

Table 2 - Studies characteristics and data extraction

Author, years and country	Study Design	Participants characteristic (Age, gender)	Preventive pathway intervention	Study Setting	Involved professionals figures
Antonietti A, et al. 2014	1 Phase: quasi-experimental design 2 Phase: quasi-experimental design 3 Phase: qualitative design	Age: 65 years old	**Empowerment pathway:** 1) Cognitive and brain stimulation 2) Theory of Mind and Decision-Making 3) Framing effects of communication on healthy eating and nutrition, (4) Engaging the elderly in pleasant activities to enhance emotional, social and cognitive skills	Department of Psychology of the Catholic University of the Sacred Heart of Milan	Research team Psychologists
Bortoluzzi S, et al. 2022	Cross sectional study	N=369 Total participants EG: N=155, 58.97±8.84 CG: N=214, 57.59±10.09	**Dedalo Project:** Four preventive path focus on healthy diet, physical exercise, socialization and culture, and discovery of the local territory.	Vercelli municipality	Vercelli Local Health, University, Organization
Rampioni M, et al. 2021	Qualitative Study	N= 30 Total Participants N=13 Patients, age:78.31 (6.62), Male 84.61% N=8 caregivers 51.8 (11.06), Male 50% N=9 stakeholder, age: 43.67 (17.73), Male 33.3%	**The SAVE system** Dygital solution to support end users in staying in their familiar environments for as long as possible, exercising their autonomy and self-management, and avoiding social isolation.	INRCA	Reasearch Team Psychologysts
Santini S, et al. 2020	Qualitative	N=15 Total participants; N=5 Older workers; N=5 Retirees; N=5 Colleagues; Mean: 59.8 years	**AgeWell Project:** Online digital health promotion programs: diet behavior, physical activity, and social inclusion. Virtual coaching to support a healthy and meaningful life of older adults and employees in their retirement process.	INRCA	Research team

efficacy, both types of messages were associated with reduced future intentions to eat meat, suggesting that those who believed they could follow a healthy diet were easily motivated by both gain-framed and loss-framed messages. The success of health and nutrition messages for older people individuals relied on matching the message delivery with the receivers' abilities.

The Dedalo project conducted by Bortoluzzi et al. (29) was a multifaceted initiative that used social marketing and community coalitions to promote healthy lifestyles through four main categories. The "good diet, good health" path, was designed to provide information on how to adopt a healthy diet through the organisation of cooking courses, workshops, seminars, and thematic dinners. The "Let's work out together" path, encouraged collective exercise by offering gym classes, walking groups, and martial art courses. The "Surprise and amazement" pathway aims to encourage socialising and cultural participation through museum

Table 3 - Outcomes and results

Study	Physical activity	Health status	Psychosocial status	Wellbeing	Food, smoking, and drinking habits	Cognitive/mental status	Other outcomes	Main Results
Antonietti A, et al. 2014	-	Subjective perception of daily functioning improvements	-	-		Improvements in performance on memory-related tasks, enhancements in executive functioning, particularly in non-verbal tasks. Assessment of the ability to understand the intentions and emotions of self and others. Fairness perceptions and risk attitudes using the Ultimatum Game and questionnaires	-	**Cognitive and brain stimulation** Improved performance after the cognitive/neuromodulation process of empowerment in determined cognitive areas. **Theory of mind and decision making** Subjects are strongly oriented towards a fair behaviour in the decision of the division of money **Healthy eating** Participants' intention to eat more or less depends both on the framing of the persuasive messages and on individual differences in self-efficacy and regulatory focus. Participants with low self-efficacy, messages describing the positive consequences of limited meat consumption reduce the intention to eat red meat more than messages describing the negative consequences. Among participants with high self efficacy both types of messages are associated with reduced intention to eat meat in the future, indicating that those who believe to be able to follow a healthy diet are easily motivated by both gain-framed and loss-framed messages. **Engaging** Interventions based on music may promote improvements in the elderly.

Study	Physical activity	Health status	Psychosocial status	Wellbeing	Food, smoking, and drinking habits	Cognitive/mental status	Other outcomes	Main Results
Bortoluzzi S, et al. 2022	Moderate and high-intensity physical activity duration and frequency	Self-reported diseases, body mass index	Life satisfaction, number of unhealthy days reported in the past month	Overall well-being and satisfaction measures associated with participation in the Dedalo project	Daily intake of fruits and vegetables, consumption of sugar drinks, frequency of smoking, Daily alcohol intake	-	-	The Dedalo project was mainly attended by women. They had a higher SES and they were healthier than general population. Participants self-reported most often a medium–high level of life satisfaction, a higher number of unhealthy days for psychological conditions, less diagnosis of myocardial infarction, arthrosis but more diagnosis of cancer. Participants in the Dedalo project were less exposed to all the analysed risk factors. The percentage of individuals reporting high levels of "life satisfaction" was higher in Dedalo group than the control.
Rampioni M, et al. 2021	-	-	-	-	-	-	Learnability, security, independence, coaching values and impact of the proposed technology	Older adults recognized the importance of a system that not only reduces the effort to learn something new and complex, but also reduces the need to ask a relative and/or a friend for help. They stressed the need for the system to be able to not only protect users' vulnerabilities and security, but also to support them in maintaining their abilities and to make them feel as active and determined as possible.
Santini S, et al. 2020	Improvement in frequency and intensity of physical activity.	-	Improvement in social interactions and quality of life themes post-intervention.	-	-	Assessment of enhanced cognitive capabilities through various measures	Associated risks such as stigma and privacy concerns regarding digital health coaching	Older adults were likely to use a digital health coach to stay healthy before and after retirement. The digital health coach was expected to provide them with information about social and cultural events and the rights of older people and pensioners. They would also like a coach that could adapt to their needs and motivate them to a healthy lifestyle

visits, reading experiences, and active theatre and music experiences. Meanwhile, the "Discovery of the territory" path, aimed to promote active life and the discovery of territory by organising events such as hiking or walking in local forests and natural parks. The instruction was carried out in the form of meetings and classes. The evaluation study showed results in smoking and diet, physical activity, alcohol intake, body mass index, cognitive activity, socialising, and well-being. The participants of the Dedalo project reported a medium-high level of life satisfaction and experienced more days of poor mental health than the control group. Participants in the Dedalo project were less exposed to all the assessed risk factors.

5. Preventive pathway characteristics from qualitative studies

In the qualitative study conducted by Rampioni et al. (30) the proposed intervention was based on the SAVE system. The SAVE system is a platform that used several smarthome and wearable sensors. These sensors streamed to a cloud-based platform where algorithms detected any changes in behaviour and physiology. Authors identified six main areas that communication/sensing technology should concentrate on: ease of use, safety, autonomy, empowerment, guidance principles, isolation, habit and cultural impact, and personalised solutions. Digital solution helped people to stay in their own homes for as long as possible, while maintaining their independence, managing their own care, and avoiding loneliness. They also assisted family caregivers in providing the necessary assistance while balancing their personal and professional lives. This study was aligned with the Active Aging framework and considered factors that influenced how useful and beneficial information and communication technologies are to promote healthy and active ageing in older adults.

Finally, Santini et al. (31) designed a preventive intervention based on "The AgeWell digital health coach"; these systems could potentially delay the need for intensive care and improve individuals' independence over time. The AgeWell digital health coach was a software that looked and behaved like a human. Older people were likely to use a digital coach to stay healthy in their retirement. They expected the coach to provide information about cultural and social events, along with the rights and benefits of pensioners. Moreover, they required a coach that could adjust to their specific needs and motivate them towards a healthy lifestyle. The focus groups identified the necessary preventive intervention, which included online promotion programs for healthy dietary behaviour, physical activity, and social inclusion. Moreover, virtual coaching was used to support older adults and employees in their retirement process to promote a healthy and purposeful life.

6. Study setting and professional figures involved

Study setting and professional figures involved in the preventive pathway are displayed in Table 2.

The project conducted by Bortoluzzi et al. (29) was settled in the community and aimed to create networks and it involved local stakeholders in providing preventive opportunities for the population. This includes building networks, coordinating actors and communicating Dedalo events to the population. The study conducted by Antonietti et al. (28) was carried mainly in a scientific and controlled University setting. The other two included studies (30,31) were both conducted by the National Institute of Health and Science on Aging (INRCA) based in Ancona, a public organisation that oversees five geriatric hospitals and residential care facilities in Italy. INRCA is dedicated to conducting clinical, biological, and socioeconomic research on ageing. Therefore, INRCA had various professionals holding different roles, including office workers, nurses, doctors, therapists, administrators, biologists, as well as gerontologists, geriatricians, and biologists. Rampioni et al. (28) involved a multidisciplinary team of two psychologists, one user-centred design expert, and two engineers that carried out iterative work to interpret the data, while Santini et al. (29) created a virtual coaching used to support older adults and employees in their retirement process to promote a healthy and purposeful life adjusting the specific needs of older adults and motivate them towards a healthy lifestyle.

Discussion

This scoping review aimed to explore the current knowledge and experience on preventive pathways for healthy and active ageing in the Italian setting. Our results summarized the available information regarding existing preventive pathways in Italy. Moreover, it displayed the manner in which this country will pursue this topic in the future through the PNRR, which is promoted by the European community.

As regards the structure of the existing preventive pathway, all four studies were coherent with the WHO definition of "healthy aging". In all the included studies healthy ageing took into account cognitive

functioning, social and productive functionality, life satisfaction, and well-being. Only Bortoluzzi et al. (29), in addition to the previous elements, took into consideration health status (diseases, taking medications and self-monitoring of blood pressure). This description of healthy ageing was in line with the aim of prevention and health promotion programs around the world (4). In this scenario, programs were able to empower elder people to pursue healthy aging by, preventing, for example, social isolation or throughout the assistance of effective integrated social services, limiting interventions carried out by the National Health Service. A shift from a hospital-centre model to a community-centred care approach is crucial. Therefore, it becomes important to address people's needs before they access healthcare/welfare settings, when they already have a significant burden of illness and disability.

The main interventions proposed in the preventive pathway were primary prevention and health promotion programs, such as physical activity and diet adherence. These were similar to the ones described in the WHO global action plan for healthy ageing (32) and in recent international literature that show how lifestyle interventions represent an effective solution in public health (5). Physical activity and nutritional intervention can contribute to remaining healthy and to improve physical and mental health. It is well known that PA is a powerful tool for the prevention of non-communicable diseases, through reduction of main risk factors (33). Moreover an emerging line of research investigated the efficacy of lifestyle interventions also in improving cognitive functions or preventing the cognitive decline of individuals suggesting positive results (34).

In addition, preventive pathways should take into account the level of self-efficacy and motivation of the participants. Among the included studies only Antionetti et al. (28) took into consideration self-efficacy aspects in order to adapt the interventions to the specific health needs and state of awareness of the patient. As suggested by the recent randomised control trial published by Taksler et al. (35), it is necessary to tailor preventive interventions based on the participant's willingness; what am I supposed to do to improve my health? this is the future to create personalised disease prevention programs for healthy ageing. Among the four included studies, Rampioni et al. (30) and Santini et al. (31) used mobile health intervention which showed important health benefits in terms of improving healthy ageing. These preliminary results suggest an increasing interest in technology-based health programs. In outlining a preventive pathway aimed at healthy ageing it will therefore be necessary to take into consideration the growing presence of interventions that involve the use of technology (36-38). Also the European commission published a communication on "enabling the digital transformation of health and care in the Digital Single Market; empowering citizens and building a healthier society", suggesting the use of advance digital tools to support integrated care. Moreover, the Ministerial Decree 77/2022 (39) has reorganised Italian territorial healthcare assistance according to a new model through the developing of new services and functions, such as community homes, community hospitals, and primary care operating centres. Furthermore, it is highlighted the importance of home as the first place of care and the need of implementing telemedicine service that provide assistance through the use of digital devices., Nevertheless, these services should be quickly implemented in the new developed preventive pathways. In the two studies (30,31) where digital technology is used, focus groups were fundamental to bring the intervention closer to a real application, where the intervention itself is fully accepted and can therefore produce the desired effects. These interventions are included in policies for active ageing in Italy (40), in alignment with the Madrid International Plan of Action on Ageing (41). Digital literacy in the elder counteracts marginalisation and encourages their participation in society, which is an element of advantage for healthy ageing.

As far as concern the setting and the professional figures involved Bortoluzzi et al. (29), with the Dedalo project, gave evidence of the importance of various stakeholders, public and private entities that operated at a local level for the benefit of the older people (Regions, local authorities, third sector organisations, etc.). Local and regional initiatives should in fact encourage communication and interaction between the various actors involved in the process, including Regions (42). However, it appears that the settings studied aren't feasible to provide models that can be used in real contests. Apart from the Dedalo Project (29), which is based on a specific community program, the other projects were mainly confined to the research field. The professional figures involved in the preventive pathway were still unclear and heterogeneous. Recent scientific evidence suggests that family and community nurses, psychologists, kinesiologists, and nutritionists play a fundamental role in the promotion and prevention of health in several target populations (43,44).

Study Limitation and future direction

It is worth mentioning that this scoping review presents some limitations. First of all, the small number of included studies. Today the topic of healthy ageing is addressed by various task forces and in several European projects (i.e., Erasmus Sport Plus Project). However, to date these projects have not produced scientific evidence or practical experiments on Italian territory. In addition, many studies focused on individual lifestyle interventions (supervised physical activity programs, dietary changes, fall prevention) (45-48) without inserting these lifestyle interventions into structured pathways. Moreover, we decided to focus our scoping review only on studies conducted in Italy due to the fact that we are interested in understanding what is the current knowledge and experience on preventive pathways for Healthy ageing in our national contest; however we believe that our results can be useful for the creation of a new preventive pathway for healthy ageing in other countries; especially because a clear definition of this pathway for prevention does not exist even in the international scenario. At the same time, many Italian projects (i.e., SUNFRAIL, SPRINTT) based on healthy ageing are focused on specific diseases or on subjects with high clinical complexity that require hospital supervision (49). Nowadays, as suggested by the small number of articles found, preventive pathways have not received enough attention; therefore, research should move toward defining practice models that are effective in local contexts. Then, a systematic review more focused on effectiveness and sustainability of this preventive pathway inside an international context would take place. Recently a new project financed by the National Recovery and Resilience Plan (PNRR) named Age-It focused on addressing the consequences and challenges posed by the ageing population in Italy (50). A multifaceted and complex process that presents risks, but also opportunities to promote inclusive well-being with implications for the entire society. The project involves public and private partners with an interdisciplinary approach, to contribute to this field of research and support the development of related goods and services for the market.

Conclusions

Our scoping review underlines the limited knowledge and experience of preventive healthy aging interventions in the national setting. The new preventive pathway aimed to healthy ageing should be based on lifestyle interventions (i.e., physical activity, nutrition and cognitive training), managed by multidisciplinary teams (i.e., family and community nurse, psychologists, kinesiologists, nutritionists) with the use of digital tools (i.e., mobile health, digital coach) in order to improve the safety of older people. The setting characteristic is not clear, future study should be focused on how to implement this type of intervention outside a research context. Finally, one of the main challenges is the participation of this type of population in preventive intervention. Therefore, effective strategies are needed to promote engagement in care, tailored to the needs of older people. These main characteristics of a preventive pathway model applied in the national contest could be subsequently translated, adapted and implemented in other countries.

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Riassunto

Quali sono le attuali conoscenze ed esperienze in merito ad un percorso preventivo per l'invecchiamento in buona salute in Italia? Una revisione scoping

Introduzione. La popolazione mondiale sta invecchiando rapidamente. I corretti stili di vita sono obiettivi fondamentali per interventi orientati al cambiamento del comportamento per promuovere un invecchiamento in buona salute.

Disegno dello studio. Abbiamo condotto una revisione scoping con l'obiettivo di sottolineare le attuali conoscenze ed esperienze in merito a interventi preventivi per l'invecchiamento sano e attivo in Italia e il modo in cui il nostro paese si muoverà in quest'area di ricerca.

Metodi. La ricerca è stata condotta su diversi database: PubMed, CINAHL, Embase e Scopus sino al 25 luglio 2023 e i risultati della

ricerca sono stati filtrati per includere solo articoli pubblicati a partire dal 2003**.**

Risultati. Sono stati recuperati un totale di 951 record potenzialmente rilevanti. Dopo la rimozione dei duplicati, sono stati sottoposti a screening 810 record univoci. Infine, sono stati inclusi quattro studi che soddisfacevano i criteri stabiliti. Tutti gli studi sono stati condotti nelle regioni del Nord e del Centro Italia. La popolazione indagata era composta da anziani e tutti e quattro gli studi si sono concentrati principalmente su strategie di prevenzione primaria e promozione della salute basate sull'autoefficacia e sulla motivazione dei partecipanti nei confronti dei corretti stili di vita, in particolare, attività fisica, dieta e allenamento cognitivo. Inoltre, due studi hanno utilizzato dispositivi digitali per veicolare un intervento preventivo per un invecchiamento in buona salute.

Conclusioni. La nostra revisione scoping sottolinea la limitata conoscenza ed esperienza esistente nel contesto nazionale riguardo agli interventi preventivi per l'invecchiamento in buona salute tra le persone anziane. Il nuovo percorso preventivo finalizzato all'invecchiamento in buona salute dovrebbe basarsi su interventi personalizzati sullo stile di vita, gestiti da team multidisciplinari con l'uso di strumenti digitali, al fine di migliorare la sicurezza delle persone anziane. Le caratteristiche del setting di implementazione del percorso preventivo non sono ancora chiare.

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