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Ageing Joyfully: The Role of Physical Activity for Sustainable Healthy Ageing

Envejecer con alegría: el papel de la actividad física para un envejecimiento saludable y sostenible

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Abstract

Introduction: Growing older is often associated with physical and mental decline, and diminished quality of life. However, global research emphasizes that physical activity plays a vital role in promoting disease stabilization, healthy ageing, and overall well-being. This study aimed to examine the association between physical activity and sustainable healthy ageing, with a particular focus on rural elderly happiness. **Methods:** A descriptive research design was adopted to explore the association between physical activity and healthy ageing. Considering the inclusion and exclusion criteria, a sample of 540 rural elderly respondents was selected for the study. Participants were drawn from Vedapatti Town Panchayat in the Thondamuthur constituency of Coimbatore District. Their levels of healthy ageing were measured using the Healthy Ageing Inventory (HAI), along with demographic data to assess physical activity and healthy ageing levels. **Results:** Physical activity was found to be positively associated with higher levels of healthy ageing. Rural elders who engaged in regular physical activity demonstrated better levels of sustainable healthy ageing. The findings confirm that physical activity plays a critical role in enhancing rural elderly happiness, aligning with existing literature. In the discussion, the researcher employs the ICOPE model developed by the World Health Organization to illustrate how physical activity supports not only survival but also the personal, familial, and leisure dimensions of life. **Conclusion:** These findings underscore the importance of regular physical activity in promoting physical and mental well-being, ultimately improving the overall quality of life and happiness of rural elderly individuals.

Keywords: Elderly Happiness, Healthy Ageing, Physical Activity, Social Support, Sustainability.

Resumen

Introducción: Envejecer a menudo se asocia con un declive en la salud física, mental y la calidad de vida. Sin embargo, los investigadores globales recomiendan que la actividad física desempeña un papel esencial en la estabilización de enfermedades en conexión con el envejecimiento saludable y el bienestar general. Este estudio tuvo como objetivo comprender la asociación entre la actividad física y el envejecimiento saludable sostenible, con un enfoque particular en la felicidad de los ancianos rurales. **Métodos:** Se adaptó un diseño de investigación descriptivo para encontrar la asociación entre la actividad física y el envejecimiento saludable. Considerando los criterios de inclusión y exclusión, se empleó una muestra de (N=540) ancianos rurales para este estudio de investigación. Los encuestados del estudio eran del panchayat de la ciudad de Vedapatti, circunscripción de Thondamuthur del distrito de Coimbatore. Los niveles de los encuestados se midieron a través del Inventario de Envejecimiento Saludable (HAI) junto con sus detalles demográficos para evaluar sus niveles de actividad física y envejecimiento saludable. **Resultados:** La actividad física está positivamente asociada con niveles más altos de envejecimiento saludable. Los ancianos rurales que participan en actividad física regular tienen más probabilidades de alcanzar mejores niveles de envejecimiento saludable y sostenible. A partir de los resultados de este estudio, es evidente que la actividad física desempeña un papel crucial en la mejora de la felicidad de los ancianos rurales, respaldando así la literatura existente. En la discusión, el investigador emplea el modelo ICOPE desarrollado por la Organización Mundial de la Salud para resaltar cómo la actividad física no solo es una cuestión de supervivencia, sino que también contribuye a las dimensiones personales, familiares y de ocio de la vida. **Conclusión:** Estos hallazgos subrayan el papel de la actividad física regular en la promoción del bienestar físico y mental, mejorando en última instancia la calidad de vida y la felicidad de los ancianos rurales.

Palabras clave: Felicidad de las personas mayores, envejecimiento saludable, actividad física, apoyo social, sostenibilidad.

Introduction

Globally, the growing population has experienced a marked increase in life expectancy, and people across age groups are increasingly aware of the importance of health, well-being, and quality of life [1, 2]. In connection with non-communicable diseases, physical activity serves as both a preventive and curative measure that enhances physical and mental health [3]. Physical activity is generally defined as any bodily movement produced by skeletal muscles that results in energy expenditure [4], as compared to resting.

Comprehensive research integrating physical activity and exercise [5] demonstrates positive health outcomes. In addition, regular physical activity reduces mortality rates and promotes better overall health [6] and cognitive function [7]. The nature of human physical activity can be categorized as either structured or unstructured, depending on the nature of the work or activities performed [8]. A structured physical activity, such as exercise, is organized, planned, and repetitive, helping improve strength, flexibility, coordination, and balance [9]. Conversely, unstructured physical activity fosters autonomous experiences that enhance self-management skills, including basic motor abilities [10].

Physical activity is universally recognized as a leading indicator of health [11] and is widely acknowledged as a key component of healthy ageing. In recent decades, numerous research studies on functional status and elderly well-being have shifted the focus from "active" or "successful" ageing [12] to the more encompassing concept of *healthy ageing*. The World Health Organization (2015) defines healthy ageing as "the process of developing and maintaining functional ability that enables older people to do the things that matter to them" [13]. Importantly, participation in physical activity for healthy ageing is not limited to those who have been active throughout adulthood. Numerous longitudinal studies have shown that even initiating physical activity in late adulthood or old age yields substantial benefits for health and well-being.

Disease Stabilization and Rural Elderly Health Promotion

Ageing is an unavoidable reality, and as it progresses, characteristics such as dependency, vulnerability, and frailty increase substantially. In today's world, the ageing process brings gradual yet adaptive changes in human beings, often leading to the development of both chronic and acute diseases that affect quality of life [14]. Despite living longer, rural elderly individuals are frequently exposed to various illnesses such as obesity, cancer, diabetes, respiratory diseases, and cardiovascular conditions. Consequently, promoting health and preventing disease among the rural elderly should be prioritized to foster active, successful, and healthy ageing [15].

A preventive approach to managing disease among the elderly in rural settings requires a comprehensive strategy [16] that begins at the primary health care (PHC) level. This approach depends on strong community participation to achieve meaningful improvements in rural elderly health [17]. Following the recent global pandemics, rural populations have shown increased awareness and understanding of health literacy [18], enabling individuals to make more informed decisions about their own well-being [19]. Therefore, improving health literacy among rural elders can play a vital role in disease stabilization and in achieving better health outcomes during old age.

Sustainable Healthy Ageing: Physical Activity Approach

Physical activity is a key determinant of universal health outcomes [20]. In recent years, with increasing life expectancy, the duration of illness and disability in later life has grown disproportionately. As people age, the intensity and frequency of physical activity tend to decline [21], underscoring the need to promote physical activity, particularly among rural elderly populations.

To address this issue, the **United Nations Decade of Healthy Ageing (2021–2030)** [22] was developed with sustainability at its core, aiming to improve the lives of older people globally. This vision of sustainability is supported through the creation of age-friendly environments, provision of essential health care services, health promotion initiatives, and disease prevention strategies [23]. In 2020, the **World Health Organization (WHO)** published guidelines encouraging older adults to engage in physical activity and reduce sedentary behavior. These recommendations include moderate, vigorous, and intense forms of exercise—such as aerobic and muscle-strengthening activities [24]. Additionally, the WHO guidelines emphasize that older adults should participate in activities they

enjoy, ensuring accessibility and sustainability in practice, thereby fostering *"the future we want"* [25]. Globally, there remains a pressing need to advance sustainable healthy ageing. For rural and ageing populations, the recommendations of international bodies such as the United Nations and WHO focus on embedding sustainability within elderly care policies to promote active and healthy ageing [26]. Exploring the intersection between sustainability and healthy ageing reveals the necessity of a multidimensional approach—an essential paradigm shift that enables individuals to age well and thrive [27].

Methods

Procedure and Participants

This quantitative study employed a descriptive research design. The respondents were rural elderly individuals of both sexes, aged sixty (60) years and above, residing in Vedapatti Town Panchayath, Thondamuthur constituency of Coimbatore District, Tamil Nadu, India. The town panchayath consists of fifteen (15) wards; however, only eight (8) wards with the highest elderly population (N = 2,890) were selected for the present study.

Following a basic screening test, participants who met the inclusion criteria—permanent residents of the locality, independent, and functionally active—were invited to participate. Those who experienced severe medical conditions or cognitive impairments were excluded. All participants were assured of confidentiality, and written informed consent was obtained prior to participation.

The sample size was statistically determined using OpenEpi, Version 3, an open-source calculator (https://www.openepi.com/SampleSize/SSPropor.htm), with a 99% confidence interval. After thoughtful consideration of the inclusion and exclusion criteria, the final sample size for the primary study was established as five hundred and forty (N = 540).

Measures

Sociodemographic details of the respondents—including age, gender, presence of chronic illness, and information on physical activity—were collected during the basic screening process. The Healthy Ageing Inventory (HAI) [28] was employed as a standardized tool to assess levels of healthy ageing. The scale comprises nine factors and thirty-five items, each rated on a uniform five-point Likert scale ranging from *Absolute Not* to *Absolute Yes*. The instrument contains no negative statements or reverse scoring items.

The HAI was evaluated for face validity using dichotomous measures, allowing for favorable or unfavorable responses for each item. The obtained Cohen's Kappa Index value was 0.724, which falls within the range of *0.61–0.80*, indicating a substantial level of agreement. The Cronbach's Alpha value derived from the reliability test was 0.923, demonstrating high internal consistency and strong reliability of the instrument.

Analytical Approach

A quantitative methodology was employed for data analysis using IBM SPSS Statistics version 20 (IBM Corp.; https://www.ibm.com/products/spss-statistics). Statistical tests such as simple frequency analysis and the Chi-square test were utilized in this study. Frequency analysis provided insight into the distribution of categorical variables. The fit for normal distribution was examined using the Kolmogorov–Smirnov test, and the scale scores met the assumptions of normality. Consequently, the Chi-square test was applied to estimate the association between the categorical variables—specifically, physical activity and healthy ageing. The Chi-square test was deemed appropriate, as it determines whether a dependency exists between the variables. This analytical approach facilitated a comprehensive understanding of the dataset, validated the statistical significance of the results, and contributed meaningfully to the existing body of knowledge in the field.

Research Approval and Consent to Participate

This study was registered with Ph.D. Registration Communication from Bharathiar University Coimbatore (C2/SOW19POCT01/19,DATE:14.10.2019) and the permission was granted by the Doctoral Committee Approval from Department of Social Work, Bharathiar University Coimbatore (C2/9846,2021,DT:23.07.2021). Informed consent form was collected from all the respondents participated in the main study. COVID-19 protocols were also strictly followed during the data collection process.

Results

Table 1 presents the distribution of respondents by age, gender, presence of chronic illness, and engagement in physical activity. The age distribution reveals that slightly less than half (45.7%) of the respondents fall within the 60–65 years age group. More than one-fifth (22.6%) are between 66–70 years, while over one-tenth (15.7%) are aged 71–75 years. A smaller proportion (7.8%) are between 76–80 years, followed by 4.1%, 3.3%, and 0.7% in the 86–90 years, 81–85 years, and 90 years and above categories, respectively. Regarding gender distribution, more than two-thirds (68.9%) of the respondents were female, while slightly less than one-third (31.1%) were male. This indicates that a significantly higher proportion of female participants took part in the study. The data also show that the majority (87.8%) of respondents reported suffering from chronic illness, whereas a little more than one-tenth (12.2%) indicated they do not suffer from any chronic illness. In terms of physical activity, more than three-fourths (78.9%) of the respondents reported regular participation in physical activity, while a little more than one-fifth (21.1%) reported no engagement in such activity.

Table 1. Elderly Respondents Demographics and Health Characteristics

Variable	Attributes	Frequency	Percentage	Total
Age	60-65	247	45.7	
	66-70	122	22.6	
	71-75	85	15.7	540
	76-80	42	7.8	(100%)
	81-85	18	3.3	
	86-90	22	4.1	
	90 and above	4	.7	
Gender	Male	168	31.1	540
	Female	372	68.9	(100%)
Suffering From Chronic Illness	Yes	474	87.8	540
	No	66	12.2	(100%)
Physical Activity	Yes	426	78.9	540
	No	114	21.1	(100%)

Table 2. Cross – Tabulation of Physical Activity Recode and Healthy Ageing Inventory Categories

Physical Activity * Recode Healthy Ageing Inventory Cross Tabulation							
			Recode Healthy Ageing Inventory				Total
			1-2 Very Low	2-3 Low	3-4 Moderate	4-5 High	
Physical Activity	Yes	Count	65	264	87	10	426
		% within Physical Activity	15.3%	62.0%	20.4%	2.3%	100.0%
		% of Total	12.0%	48.9%	16.1%	1.9%	78.9%
	No	Count	24	47	41	2	114
		% within Physical Activity	21.1%	41.2%	36.0%	1.8%	100.0%
		% of Total	4.4%	8.7%	7.6%	0.4%	21.1%
Total		Count	89	311	128	12	540
		% within Physical Activity	16.5%	57.6%	23.7%	2.2%	100.0%
		% of Total	16.5%	57.6%	23.7%	2.2%	100.0%

The cross-tabulation table 2 presents a contingency table showing the relationship between "Physical Activity" and "Recode Healthy Aging Inventory". It includes counts and percentages for each combination of physical activity levels and healthy aging levels. The table shows how many elderly people fall into each category based on their level of physical activity and healthy aging. For example,

in the "Yes" category for physical activity, 15.3% have a "Very Low" level of healthy aging, while 62% have a "Low" level, and so on. In the "No" category for physical activity, 21.1% have a "Very Low" level of healthy aging, and so forth.

Table 3: Chi – Square Test of Association between Physical Activity and Recode Healthy Ageing Inventory

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	17.859[a]	3	.000
N of Valid Cases	540		

Table 3 presents the Chi-square test of independence between *Physical Activity* and the *Recode Healthy Ageing Inventory*. The table includes the Chi-square value, degrees of freedom (df), and the associated p-value (Sig.). The Chi-square value was 17.859 with 3 degrees of freedom (df = 3), and the corresponding p-value was 0.000, which is less than the significance level of 0.05. This highly significant result indicates a strong association between physical activity and healthy ageing among the elderly population. These findings suggest that elderly individuals who engage in regular physical activity are more likely to demonstrate higher levels of healthy ageing. In conclusion, there is a statistically significant and positive association between physical activity and healthy ageing among the elderly participants.

Discussion

The core findings of this research clearly demonstrate a significant and encouraging association between physical activity and healthy ageing among the rural elderly population. This relationship goes beyond the simple goal of extending lifespan—it profoundly influences functional autonomy, mental health, and overall life satisfaction. The results make it evident that physical activity is a critical contributor to rural elderly happiness, reaffirming and strengthening the existing body of literature on this subject.

This discussion draws upon the World Health Organization's ICOPE (Integrated Care for Older People) model [(29)] to illustrate how physical activity—when integrated with mental wellness, consistent lifestyle practices, and sustainable routines [(30)]—enhances the ageing process by addressing both intrinsic abilities and external supports.

The ICOPE model, with its holistic emphasis on strengthening intrinsic capacity across locomotor, cognitive, sensory, psychological, and vitality domains [(31)], provides a robust framework for understanding the multiple dimensions of physical activity. Within this framework, the study emphasizes motor intrinsic capacity, in which physical activity directly mitigates declines in muscle strength, coordination, balance, and flexibility—critical aspects of intrinsic function that form the foundation of mobility [(32)]. Engaging in regular, individualized physical activity helps maintain these capacities, reducing the likelihood of falls [(33)], improving gait speed, and supporting independence in activities of daily living [(34)].

Maintaining these intrinsic capacities supports **extrinsic mobility,** allowing older adults to navigate their physical and social environments, access community resources, and sustain meaningful social interactions [(35)]. In rural contexts, this mobility is particularly vital for preserving independence and social connectedness.

Beyond its physiological benefits, this study highlights that physical activity exerts profound effects on mental health [(36)]. Exercise stimulates the release of neurotrophic factors (NTFs) and neurotransmitters that protect brain health and elevate mood, thereby reducing symptoms of depression and anxiety [(37)]. These psychological improvements enhance motivation and engagement in physical activity itself. Moreover, community-based programs promoting physical movement often serve as platforms for social participation, reducing isolation and fostering emotional well-being [(38)]. This mutually reinforcing loop forms a sustainable pathway toward healthy ageing.

However, the longevity of these benefits depends on consistency. Intermittent or sporadic activity yields limited long-term outcomes [(39)]. Integrating physical activity into daily routines is therefore essential to sustain both intrinsic capacity and extrinsic mobility. The ICOPE model advocates for

individualized care plans based on comprehensive assessments of personal needs and preferences—an approach especially critical for designing physical-activity interventions that are realistic, attainable, and culturally appropriate for rural elders.

Ultimately, integrating physical activity within the ICOPE framework supports sustainable, healthy ageing outcomes. By nurturing intrinsic motor capacity and strengthening extrinsic mobility, older adults in rural communities are better equipped to maintain independence, participate actively in community life (40), and experience an enhanced quality of life over a longer span. Furthermore, the mental health benefits associated with physical activity reinforce sustainability by fostering psychological resilience and reducing the onset of conditions that limit mobility and overall well-being [(41)].

Conclusion

Elderly people who actively engage in physical activity experience notable improvements in health and well-being. While this study's findings are descriptive, they highlight the importance of interpreting the relationship between physical activity and healthy ageing through a multidimensional, holistic lens.

In conclusion, this study reaffirms a strong and positive association between physical activity and healthy ageing. Through its direct influence on motor intrinsic capacity, external mobility, and mental health, physical activity emerges as a cornerstone for promoting happiness and well-being among rural elderly populations. Guided by the ICOPE model, recognizing and fostering physical activity is not merely a recommendation—it represents a vital investment in the autonomy, resilience, and holistic wellness of ageing individuals [(42,43)].

Study Limitations

This study was conducted among elderly individuals residing in rural areas of Coimbatore District. The data were collected shortly after the COVID-19 pandemic, and several limitations should be acknowledged. First, the data were self-reported, which may introduce social desirability and recall bias. Second, the cross-sectional design limits the ability to infer causal relationships between physical activity and healthy ageing among the rural elderly population. Third, the findings cannot be generalized to all rural populations, particularly those from differing cultural or socio-economic contexts, where physical activity and lifestyle choices may vary depending on available time and resources. Moreover, the post-pandemic environment posed exceptional challenges for the researcher, including restrictions on mobility, limited social interaction, and evolving public health guidelines during the data collection period. These factors may have influenced participants' levels of physical activity, perceptions of happiness, and overall healthy ageing outcomes. Finally, this study focused primarily on the relationship between physical activity, happiness, and healthy ageing, and did not include an in-depth examination of other contributing factors such as social engagement, cognitive stimulation, or nutritional adequacy. Future studies should consider these dimensions to provide a more comprehensive understanding of healthy ageing in rural settings.

Author's Contribution

Conceptualization – First and Second Author; Methodology – First Author; Validation – Second Author; Data analysis and data synthesis – First Author; Writing original draft preparation – First Author; Writing review and editing – First Author and Second Author; all authors have read and agreed to the published version of the manuscript.

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References

1. Sun F, Norman IJ, While AE. Physical activity in older people: a systematic review. BMC Public Health [Internet]. 2013 May 6;13(1). Available from: https://doi.org/10.1186/1471-2458-13-449
2. Langhammer B, Bergland A, Rydwik E. The Importance of Physical Activity Exercise among Older People. BioMed Research International [Internet]. 2018 Dec 5;2018:1–3. Available from: https://doi.org/10.1155/2018/7856823
3. Gualdi-Russo E, Zaccagni L. Physical activity for health and wellness. International Journal of Environmental Research and Public Health [Internet]. 2021 Jul 23;18(15):7823. Available from: https://doi.org/10.3390/ijerph18157823
4. Piggin J. What is physical activity? a holistic definition for teachers, researchers and policy makers. Frontiers in Sports and Active Living [Internet]. 2020 Jun 18;2. Available from: https://doi.org/10.3389/fspor.2020.00072
5. Reiner M, Niermann C, Jekauc D, Woll A. Long-term health benefits of physical activity – a systematic review of longitudinal studies. BMC Public Health [Internet]. 2013 Sep 8;13(1). Available from: https://doi.org/10.1186/1471-2458-13-813
6. Yates LB, Djoussé L, Kurth T, Buring JE, Gaziano JM. Exceptional Longevity in men: Modifiable factors associated with survival and function to age 90 years. Obstetrical & Gynecological Survey [Internet]. 2008 Dec 22;64(1):28–29. Available from: https://doi.org/10.1097/01.ogx.0000340774.22542.88
7. Newson RS, Kemps EB. Cardiorespiratory fitness as a predictor of successful cognitive ageing. Journal of Clinical and Experimental Neuropsychology [Internet]. 2006 Jul 7;28(6):949–967. Available from: https://doi.org/10.1080/13803390591004356
8. Brach M, De Bruin ED, Levin O, Hinrichs T, Zijlstra W, Netz Y. Evidence-based yet still challenging! Research on physical activity in old age. European Review of Aging and Physical Activity [Internet]. 2023 Mar 17;20(1). Available from: https://doi.org/10.1186/s11556-023-00318-3
9. Izquierdo M, Merchant RA, Morley JE, Anker SD, Aprahamian I, Arai H, Aubertin-Leheudre M, Bernabei R, Cadore EL, Cesari M, Chen L k., De Souto Barreto P, Duque G, Ferrucci L, Fielding RA, García-Hermoso A, Gutiérrez-Robledo LM, Harridge SDR, Kirk B, Kritchevsky S, Landi F, Lazarus N, Martin FC, Marzetti E, Pahor M, Ramírez-Vélez R, Rodriguez-Mañas L, Rolland Y, Ruiz JG, Theou O, Villareal DT, Waters DL, Won CW, Woo J, Vellas B, Singh MF. International Exercise Recommendations in Older Adults (ICFSR): Expert Consensus guidelines. The Journal of Nutrition Health & Aging [Internet]. 2021 Jul 1;25(7):824–853. Available from: https://doi.org/10.1007/s12603-021-1665-8
10. Abusleme-Allimant R, Hurtado-Almonacid J, Reyes-Amigo T, Yáñez-Sepúlveda R, Cortés-Roco G, Arroyo-Jofré P, Páez-Herrera J. Effects of structured and unstructured physical activity on gross motor skills in preschool students to promote sustainability in the physical education classroom. Sustainability [Internet]. 2023 Jun 27;15(13):10167. Available from: https://doi.org/10.3390/su151310167
11. Keadle SK, McKinnon R, Graubard BI, Troiano RP. Prevalence and trends in physical activity among older adults in the United States: A comparison across three national surveys. Preventive Medicine [Internet]. 2016 May 16;89:37–43. Available from: https://doi.org/10.1016/j.ypmed.2016.05.009
12. Rowe JW, Kahn RL. Human aging: usual and successful. Science [Internet]. 1987 Jul 10;237(4811):143–149. Available from: https://doi.org/10.1126/science.3299702
13. Dey A. World report on ageing and health. The Indian Journal of Medical Research [Internet]. 2017 Jan 1;145(1):150. Available from: https://doi.org/10.4103/0971-5916.207249
14. Fonseca C, De Pinho LG, Lopes MJ, Marques MDC, Garcia-Alonso J. The Elderly Nursing Core Set and the cognition of Portuguese older adults: a cross-sectional study. BMC Nursing [Internet]. 2021 Jun 23;20(1). Available from: https://doi.org/10.1186/s12912-021-00623-1
15. Reis MGM, Casas-Novas MV, Serra I, Magalhães MDDC, Sousa LMM. The importance of a training program on active aging from the perspective of elderly individuals. Revista Brasileira De Enfermagem [Internet]. 2021 Jan 1;74(suppl 2). Available from: https://doi.org/10.1590/0034-7167-2019-0843

16. Karlsson SG. Looking for elderly people´s needs: teaching critical reflection in Swedish social work education. Social Work Education [Internet]. 2019 May 20;39(2):227–240. Available from: https://doi.org/10.1080/02615479.2019.1617846
17. Marcus-Varwijk AE, Madjdian DS, De Vet E, Mensen MWM, Visscher TLS, Ranchor AV, Slaets JPJ, Smits CHM. Experiences and views of older people on their participation in a nurse-led health promotion intervention: "Community Health Consultation Offices for Seniors." PLoS ONE [Internet]. 2019 May 13;14(5):e0216494. Available from: https://doi.org/10.1371/journal.pone.0216494
18. Nouri SS, Barnes DE, Volow AM, McMahan RD, Kushel M, Jin C, Boscardin J, Sudore RL. Health literacy matters more than experience for advance care planning knowledge among older adults. Journal of the American Geriatrics Society [Internet]. 2019 Aug 19;67(10):2151–2156. Available from: https://doi.org/10.1111/jgs.16129
19. Nutbeam D, McGill B, Premkumar P. Improving health literacy in community populations: a review of progress. Health Promotion International [Internet]. 2017 Feb 22;33(5):901–911. Available from: https://doi.org/10.1093/heapro/dax015
20. Saint-Maurice PF, Coughlan D, Kelly SP, Keadle SK, Cook MB, Carlson SA, Fulton JE, Matthews CE. Association of Leisure-Time Physical activity across the Adult Life course with All-Cause and Cause-Specific mortality. JAMA Network Open [Internet]. 2019 Mar 8;2(3):e190355. Available from: https://doi.org/10.1001/jamanetworkopen.2019.0355
21. Madden R, Fortune N, Gordon J. Health statistics in Australia: What we know and do not know. International Journal of Environmental Research and Public Health [Internet]. 2022 Apr 19;19(9):4959. Available from: https://doi.org/10.3390/ijerph19094959
22. Keating N. A research framework for the United Nations Decade of Healthy Ageing (2021–2030). European Journal of Ageing [Internet]. 2022 Jan 12;19(3):775–787. Available from: https://doi.org/10.1007/s10433-021-00679-7
23. Salvo D, Garcia L, Reis RS, Stankov I, Goel R, Schipperijn J, Hallal PC, Ding D, Pratt M. Physical activity promotion and the United Nations Sustainable Development goals: building synergies to maximize impact. Journal of Physical Activity and Health [Internet]. 2021 Jul 13;18(10):1163–1180. Available from: https://doi.org/10.1123/jpah.2021-0413
24. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, Carty C, Chaput JP, Chastin S, Chou R, Dempsey PC, DiPietro L, Ekelund U, Firth J, Friedenreich CM, Garcia L, Gichu M, Jago R, Katzmarzyk PT, Lambert E, Leitzmann M, Milton K, Ortega FB, Ranasinghe C, Stamatakis E, Tiedemann A, Troiano RP, Van Der Ploeg HP, Wari V, Willumsen JF. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. British Journal of Sports Medicine [Internet]. 2020 Nov 25;54(24):1451–1462. Available from: https://doi.org/10.1136/bjsports-2020-102955
25. Rudnicka E, Napierała P, Podfigurna A, Męczekalski B, Smolarczyk R, Grymowicz M. The World Health Organization (WHO) approach to healthy ageing. Maturitas [Internet]. 2020 May 26;139:6–11. Available from: https://doi.org/10.1016/j.maturitas.2020.05.018
26. Figueira HA, Figueira OA, Corradi-Perini C, Martínez-Rodríguez A, Figueira AA, Da Silva CRL, Dantas EHM. A descriptive analytical study on physical activity and quality of life in sustainable aging. Sustainability [Internet]. 2021 May 25;13(11):5968. Available from: https://doi.org/10.3390/su13115968
27. Mavrodaris A, Mattocks C, Brayne CE. Healthy ageing for a healthy planet: do sustainable solutions exist? The Lancet Healthy Longevity [Internet]. 2021 Jan 1;2(1):e10–e11. Available from: https://doi.org/10.1016/s2666-7568(20)30067-2
28. Thiamwong L, Maneesriwongul W, Malathum P, Jitapunkul S, Vorapongsathorn T, Stewart AL. Development and Psychometric Testing of the Healthy Aging Instrument. Pacific Rim International Journal of Nursing Research [Internet]. 2008 Jan 1;12(4):285–296. Available from: https://www.tci-thaijo.org/index.php/PRIJNR/article/view/5866
29. Organization, W. H. (2025). *Integrated care for older people (ICOPE): guidance for person-centred assessment and pathways in primary care*. World Health Organization.
30. Thiyagarajan, J. A., De Carvalho, I. A., Peña-Rosas, J. P., Chadha, S., Mariotti, S. P., Dua, T., Albanese, E., Bruyère, O., Cesari, M., Dangour, A., Dias, A., Guerra, M., Keeffe, J., Kerse, N., Khan, Q. U. A., Liu, C., Murthy, G. V. S., Ndegwa, S. N., Reginster, J., . . . Beard, J. R. (2019). Redesigning care for older people to preserve physical and mental capacity: WHO guidelines on community-level interventions in integrated care. *PLoS Medicine*, *16*(10), e1002948. https://doi.org/10.1371/journal.pmed.1002948
31. Alias, S. B., Cuevas-Lara, C., Martínez-Velilla, N., Zambom-Ferraresi, F., Soto, M. E., Tavassoli, N., Mathieu, C., Muxella, E. H., Garibaldi, P., Anglada, M., Amblàs, J., Santaeugènia, S., Contel, J. C., Domingo, À., & Casanovas, A. S. (2021). A Multi-Domain Group-Based Intervention to Promote Physical Activity, Healthy Nutrition, and Psychological Wellbeing in Older People with

Losses in Intrinsic Capacity: AMICOPE Development Study. *International Journal of Environmental Research and Public Health*, *18*(11), 5979. https://doi.org/10.3390/ijerph18115979

32. Adams, M., Gordt-Oesterwind, K., Bongartz, M., Zimmermann, S., Seide, S., Braun, V., & Schwenk, M. (2023). Effects of Physical Activity Interventions on Strength, Balance and Falls in Middle-Aged Adults: A Systematic Review and Meta-Analysis. *Sports Medicine - Open*, *9*(1). https://doi.org/10.1186/s40798-023-00606-3
33. Papalia, G. F., Papalia, R., Balzani, L. a. D., Torre, G., Zampogna, B., Vasta, S., Fossati, C., Alifano, A. M., & Denaro, V. (2020). The Effects of Physical exercise on balance and Prevention of Falls in Older People: A Systematic Review and Meta-Analysis. *Journal of Clinical Medicine*, *9*(8), 2595. https://doi.org/10.3390/jcm9082595
34. Indrakumar, J., & Silva, S. (2024). Physical Activity in the Older Adults: A Review of the Benefits and Recommendations for Promoting Healthy Aging through Exercise. *Journal of the Indian Academy of Geriatrics*, *20*(4), 207–213. https://doi.org/10.4103/jiag.jiag_49_24
35. Steinhoff, P., & Reiner, A. (2024). Physical activity and functional social support in community-dwelling older adults: a scoping review. *BMC Public Health*, *24*(1). https://doi.org/10.1186/s12889-024-18863-6
36. Ohrnberger, J., Fichera, E., & Sutton, M. (2017b). The relationship between physical and mental health: A mediation analysis. *Social Science & Medicine*, *195*, 42–49. https://doi.org/10.1016/j.socscimed.2017.11.008
37. Kurdi, F. N., & Flora, R. (2019). Physical Exercise Increased Brain-Derived Neurotrophic Factor in Elderly Population with Depression. *Open Access Macedonian Journal of Medical Sciences*, *7*(13), 2057–2061. https://doi.org/10.3889/oamjms.2019.574
38. Gough, C., Barr, C., Lewis, L. K., Hutchinson, C., Maeder, A., & George, S. (2023). Older adults' community participation, physical activity, and social interactions during and following COVID-19 restrictions in Australia: a mixed methods approach. *BMC Public Health*, *23*(1). https://doi.org/10.1186/s12889-023-15093-0
39. Pinheiro, M. B., Oliveira, J. S., Baldwin, J. N., Hassett, L., Costa, N., Gilchrist, H., Wang, B., Kwok, W., Albuquerque, B. S., Pivotto, L. R., Carvalho-Silva, A. P. M. C., Sharma, S., Gilbert, S., Bauman, A., Bull, F. C., Willumsen, J., Sherrington, C., & Tiedemann, A. (2022). Impact of physical activity programs and services for older adults: a rapid review. *International Journal of Behavioral Nutrition and Physical Activity*, *19*(1). https://doi.org/10.1186/s12966-022-01318-9
40. Zhou, Y., & Ma, L. (2022). Intrinsic capacity in older adults: recent advances. *Aging and Disease*, *13*(2), 353. https://doi.org/10.14336/ad.2021.0818
41. Toth, E. E., Ihász, F., Ruíz-Barquín, R., & Szabo, A. (2023). Physical activity and Psychological Resilience in Older Adults: A Systematic Review of the literature. *Journal of Aging and Physical Activity*, *32*(2), 276–286. https://doi.org/10.1123/japa.2022-0427
42. McPhee, J. S., French, D. P., Jackson, D., Nazroo, J., Pendleton, N., & Degens, H. (2016). Physical activity in older age: perspectives for healthy ageing and frailty. *Biogerontology*, *17*(3), 567–580. https://doi.org/10.1007/s10522-016-9641-0
43. Eckstrom, E., Neukam, S., Kalin, L., & Wright, J. (2020). Physical activity and healthy aging. *Clinics in Geriatric Medicine*, *36*(4), 671–683. https://doi.org/10.1016/j.cger.2020.06.009

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