






Review

What Do We Know about the Use of the Walk-along Method to Identify the Perceived Neighborhood Environment Correlates of Walking Activity in Healthy Older Adults: Methodological Considerations Related to Data Collection—A Systematic Review

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Abstract: **Background:** The “walk-along interview” (WAI) is a qualitative spatial method that consists of a researcher walking alongside a participant during the time of an interview to identify perceived neighborhood environments. The use of the WAI method increased in various disciplines, including the fields of public health and gerontology, to assess the relationship between the individual, spaces, and walking activity. However, how and in what settings the WAI method has been implemented with healthy older adults needs to be documented and synthesized. **Objective:** Our aim is to conduct a systematic review of published studies that have used the WAI method to identify the perceived neighborhood environment correlates of walking activity in healthy older adults, with a specific focus on the methodological aspects related to the data collection of this method. **Methods:** Following the PRISMA guidelines, PubMed, Web of Science, Scopus, and SocINDEX databases were systematically searched with no limitations on publication date. **Results:** From 99 articles identified, 31 met all inclusion criteria, totalizing 1207 participants. Description of the method through the assessment of participants and environmental characteristics and the data collection (before, during, and after WAI characteristics). **Conclusion:** This review provides detailed information WAI method to assess perceived neighborhood and walk activity among healthy older adults. WAI provides different sets of opportunities and challenges. Some suggestions, such as exhaustive participants’ socio-demographics, anthropometric descriptions and data collection methods, were highlighted to be essential elements when conducting WAIs. In addition, the current findings of this review could serve as a basis for researchers, students, and the professional community who wish to apply the WAI.

Keywords: walk-along interview; parours commentés; go-along interview; qualitative methods; older adults; elderly; walking; neighborhood environment; pedestrian; systematic review

1. Introduction

According to the United Nations World Population Prospects [1], by 2050, one in six people in the world (16%) will be over the age of 65, and one in four people in Europe and North America (25%) could be 65 or older. Numerous countries are already facing the unprecedented challenges posed by these anticipated changes, and new tools and solutions must be explored today to better meet the future needs and expectations of older adults [2].

Then, how do we gain accurate and reliable information from qualitative spatial studies on walking elsewhere by walking? The present work was specifically designed

to update knowledge about the usage of walk-along interviews (after WAI) to identify perceived neighborhood environments correlates of walking activity, presenting published studies that make use of different forms of WAIs with healthy older adults and discusses the interest, utility, and usability of each.

In order to face the new mobility paradigm [3] or the “spatial turn” in social sciences [4], a series of original qualitative methods have been developed next to more classical one such as qualitative interviews or quantitative surveys. Here, the “walk-along interview” [5–9], also known as the “go-along method” [10], “go-along interview” [11,12] or “commented paths method” [13] has become an internationally recognized qualitative spatial method within the research and professional communities, next to other ones such as the “photovoice” method using picture elicitation to better understand a situated experience of aging [14,15] or like “community-based participatory research”, referring to a mix of qualitative methods including focus groups [16–18]. This increasingly popularity of WAI methodology in social sciences [19], which originated in the fields of ethnography, geography, anthropology, and mobility studies [20], is now used in fields as diverse as architecture and urban planning, e.g., [21], design, e.g., [6], or transportation, e.g., [5], public health [11,22], gerontology [23], social, e.g., [24], and environmental sciences, e.g., [25].

The WAI is a type of in-depth qualitative interview [11] that is conducted with at least one interviewer and one participant together along a route [26]. In WAI, the participant is accompanied through familiar surroundings, such as a neighborhood or a larger local area [11], which will serve as both the subject of study and the context for discussion between the two interlocutors [26]. As Thibaud [27] indicated, “the main objective of the WAI is to access the sensitive experience of the passerby, it is, above all, to obtain accounts of perception in motion, therefore, three simultaneous activities are requested: walking, perceiving and describing” [27] (p. 81). There are two main approaches to conducting WAI. The first approach is when the participant chooses the route to follow, she/he is the expert of a given geographical location and indicates meaningful places to the researcher [22,28,29]. The second approach is when the route is pre-defined by the researcher, allowing hence testing of prior hypotheses and multiplying data on a given geographical location. The WAI is generally audio-recorded, e.g., [30], and sometimes video-taped, e.g., [31].

Today there is no longer any need to demonstrate the added value of this type of qualitative interview, either on its own or in conjunction with other methods, to explore and subsequently enhance understanding of people’s experiences in their residential or local context [11,24,27,32]. At this point, however, there are still limited published works on the use of the WAI method or about the relationship between individuals, places, and walking activity in older adults [33,34]. Accordingly, better knowledge and understanding of how this method has been applied is crucial to improve its effective use. Along these lines, the present review is specifically designed to identify available published studies that have used the WAI method with healthy older adults. We specifically focus on the methodological aspects related to data collection of the method: how and in what settings this method has been implemented with older healthy adults. As such, we do believe that the present work will benefit students, researchers, and the professional community working on relational space, walk activity, pedestrian perceptions, walkable and livable cities, and older adults [23,35–38].

2. Materials and Methods

2.1. Protocol and Registration

This review follows the recommendations of the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [39] statement and the Cochrane Handbook for Systematic Reviews guidelines [40]. Since this systematic literature review was limited exclusively to publicly available literature, no human ethics committee review was required.

2.2. Data Sources and Search Strategy

A comprehensive search of Web of Science, Scopus, PubMed, and SocINDEX from inception through 4 July 2022 was performed. The search terms were the combinations of the Medical Subject Headings terms of (1) the population, i.e., older adults, and (2) the intervention, the WAI method. The search strategy included a combination of these keywords found in the abstract or the title of the included articles: (“Marche commentée” OR “Marche commentee” OR “Parcours commentés” OR “Parcours commentes” OR “Commented routes” OR “Routes commented” OR “Commented walk” OR “Commented Path” OR “Walk-along interview” OR “Go-along interview” OR “walking interviews” or “walking interview”) AND (aging OR ageing OR aged OR older OR old OR elder OR elderly OR senior OR geriatric). Note that our search method included French keywords (“Marche commentée”, “Marche commentee”, “Parcours commentés”, “Parcours commentes”) insofar as the WAI was originally developed in France by Thibaud [27], and various authors have employed the original terms in French [13,41]. For example, in the abstract of the paper by Lima and Machado [13], we can find “Parcours Commentés”. Additional articles were found from the reference lists of the included articles and from the authors’ own literature files.

2.3. Eligibility Criteria

Studies were included if they: (1) were original articles published in English-language peer-reviewed journals; (2) reported the use of WAI method to identify the perceived neighborhood environment correlates of walking activity in healthy older adults with a mean age of ≥ 55 years. Studies were excluded if they: (1) were case reports, abstracts, editorials, conference abstracts, letters to the editor, reviews, meta-analyses; expert opinions, or protocol studies that did not contain any data or results; (2) were published in languages other than English with no translation [34]; (3) did not use WAI method to identify the perceived neighborhood environment correlates of walking activity in healthy older adults with a mean age of ≥ 55 years.

2.4. Study Selection

Study selection was performed by two independent reviewers (VA and MC), who screened the titles, abstracts, and keywords identified by the search strategy and applied the inclusion and exclusion criteria. After this initial selection, full-length texts were subjected to the same procedure. In case of disagreement and if subsequent discussions between the two reviewers were inconclusive, a third reviewer resolved the discrepancies in determining if an article met eligibility criteria (NV).

2.5. Data Extraction

Data extraction was performed by two independent reviewers (VA and MC) following a prebuilt table including information about: (1) study characteristics; (2) sample description; (3) data collection method. The two reviewers (VA and MC) compared the data for consistency. Any discrepancies between these two reviewers were resolved at a consensus meeting. If disagreement persisted, a third reviewer (NV) was consulted to reach a final decision.

3. Results

3.1. Study Selection

Figure 1 shows the flow diagram of the articles identified by the literature search, screened for eligibility, and included in the systematic review. A total of 164 articles were identified through database searching, 47 identified through Web of Science, 84 through Scopus, 18 through PubMed, and 15 through SocINDEX. Additional article ($n = 1$) was identified through hand searching. After removing duplicates ($n = 65$), 99 records were identified. After screening titles and abstracts, 37 full texts were reviewed for eligibility, of which 31 articles fulfilled the inclusion criteria and were included in this systematic review. There is no question that systematic review quality is highly dependent on the

literature search(es) used to identify relevant studies. It, therefore, follows that searching one or more electronic databases is often supplemented by searching by hand (the “manual search approach” or “hand searching”) to identify additional primary studies for systematic reviews. As such, hand searching is recognized a critical part of the review to find materials not found through traditional searches, e.g., [42,43], and is now a common process in systematic reviews articles, e.g., [14,44,45]. Indeed, even when these materials are included in electronic databases, they may not contain relevant search terms in the titles or abstracts or be indexed with terms that allow them to be automatically identified as eligible studies for the systematic review. This was precisely the case for the study from Yoo and Kim [46] that was included in our systematic review through hand searching.

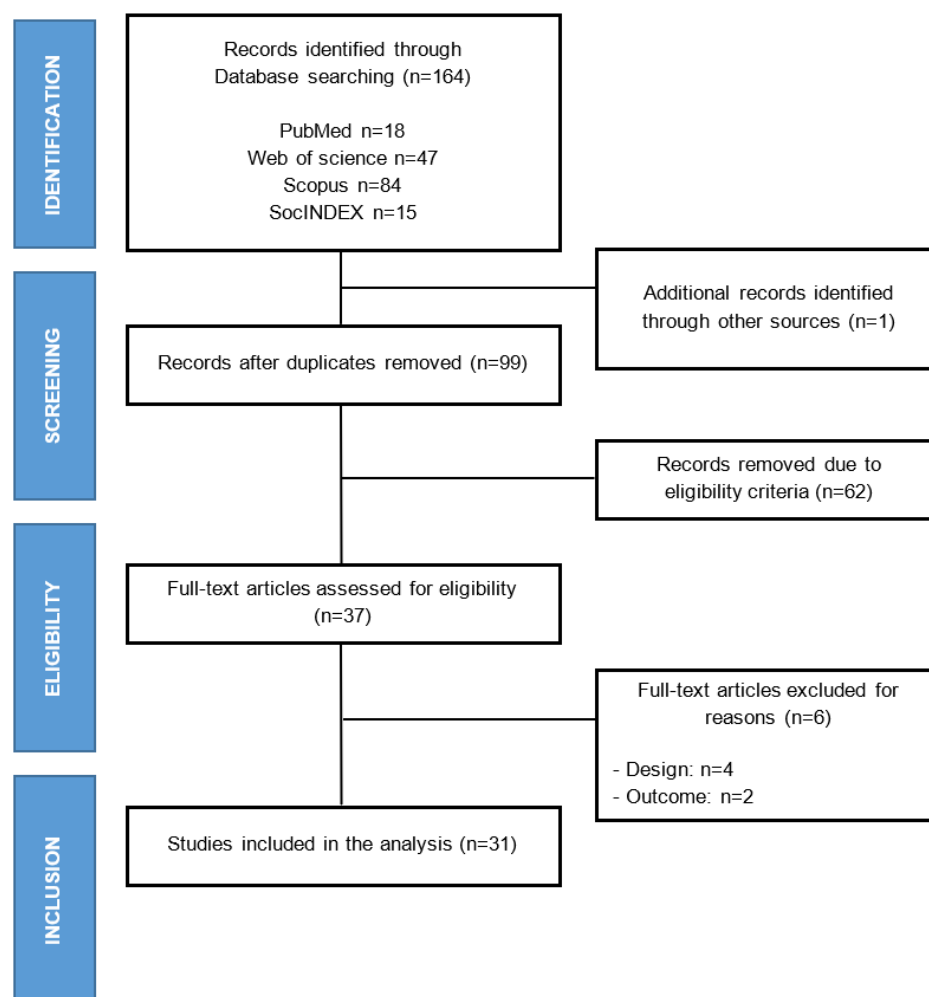


Figure 1. Flowchart of the study selection.

3.2. Study Characteristics

Table 1 summarizes the characteristics of the 31 included articles from the most recent to the oldest publications.

Publication year. Figure 2 illustrates the number of included articles published per year. The publication year of the 31 included studies ranged from 2012 [5] to 2022 [9]. One study (3%) was published in 2012 [5], 1 (3%) in 2014 [47], 1 (3%) in 2015 [48], 5 (16%) in 2016 [32,46,49–51], 1 (3%) in 2017 [52], 5 (16%) in 2018 [23,30,37,38,53], 3 (10%) in 2019 [6,25,54], 4 (13%) in 2020 [7,55–57], 9 (29%) in 2021 [8,10,35,36,58–62], and 1 (3%) in 2022 [9].

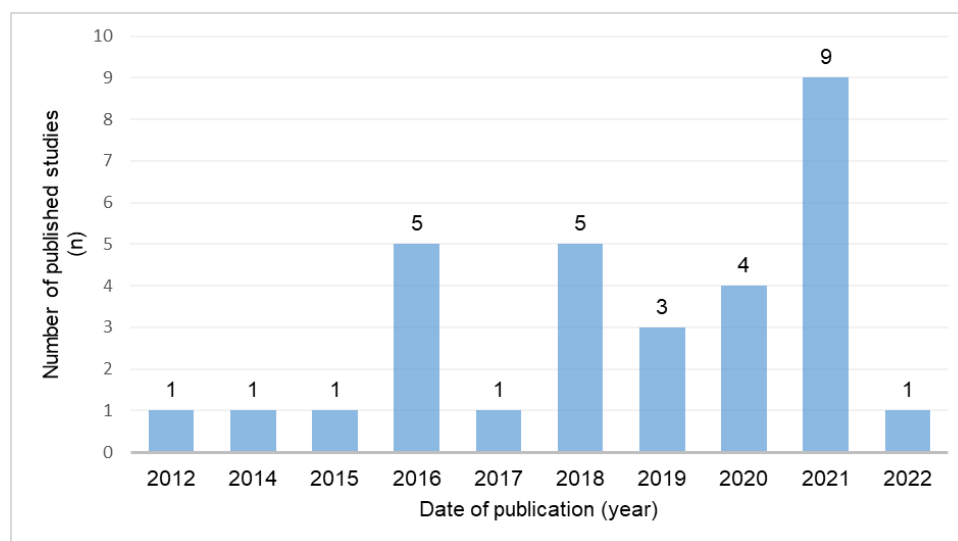


Figure 2. Number of published studies per year (*n*).

Journal. The 31 included articles have been published in 21 peer-reviewed different journals: 7 (26%) in International Journal of Behavioral Nutrition and Physical Activity [6,8,25,51,52,54,57], 3 (10%) in Journal of Transport & Health [9,30,62], 2 (6%) in Social Science & Medicine [49,61], 2 (6%) Urban Forestry & Urban Greening [7,36], and 1 (3%) in the following 17 journals: American Journal of Men's Health [38], Architecture and interaction: Human computer interaction [32], Disability and Rehabilitation [47], Ethnologia Fennica [37], Frontiers in Public Health [58], Geoforum [48], Gerontologist [23], Health and Place [59], International Journal of Behavioral Nutrition and Physical Activity [5], Journal of Aging and Physical Activity [60], Journal of Housing and the Built Environment [55], Journal of Occupational Science [10], Preventive Medicine [46], Proceedings of the Institution of Civil Engineers: Urban Design and Planning [50], Scandinavian Journal of Caring Sciences [53], Scandinavian Journal of Occupational Therapy [56], and Social & Cultural Geography [35].

Country of first author's affiliation. The total number of countries of the first author's affiliation for the 31 included articles is 13: 8 (26%) in Canada [8,10,23,30,38,47,49,56], 4 (13%) in the U.K. [25,50,51,58], 3 (10%) in the Netherlands [35,48,52], 2 (6%) in those six following countries: Belgium [5,59], China [36,62], Finland [32,37], Ireland [54,61], Singapore [6,9], and Sweden [53,57], and 1 in those 4 following countries: Australia [7], Chile [60], Denmark [55], and Republic of Korea [46].

Funding. Among the 31 included articles, 24 (77%), have received funding [7,8,10,23,25,32,36–38,46,48,50–62]. One study (3%) mentioned that they received no external funding [6]. The other 6 studies (19%) did not mentioned any funding information [5,9,30,35,47,49].

Table 1. Included articles in chronological order of publication.

Author	Publication Year	Country	Title	Journal	Funding
Močnik et al. [9]	2022	Singapore	Exploring facilitators and barriers of older adults' outdoor mobility: A walk-along study in Singapore.	Journal of Transport & Health	This research is supported by Singapore's Ministry of National Development and National Research Foundation under the L2NIC Award No L2NICTDF1-2017-2. Any opinions, findings and conclusions or recommendations expressed in this material are those of the authors and do not reflect the views of Singapore's Ministry of National Development and National Research Foundation.
Lauwers et al. [59]	2021	Belgium	Exploring how the urban neighborhood environment influences mental well-being using walking interviews.	Health and Place	This work was supported by the Belgian Federal Science Policy Office (BELSPO) [grant number BR/175/A3/NAMED].
Herrmann-Lunecke et al. [60]	2021	Chile	Perception of the built environment and walking in pericentral neighbourhoods in Santiago, Chile.	Journal of Aging and Physical Activity	This work was supported by ANID under grant Fondecyt Regular No. 1200527 and by CONICYT under grant Fondecyt Regular No. 1170292.
Grove [61]	2021	Ireland	Ageing as Well as You Can in Place: Applying a Geographical Lens to the Capability Approach.	Social Science & Medicine	This research was funded by the Health Research Board in Ireland (SPHeRE/2013/1).
Sun and Lau [62]	2021	China	Go-along with older people to public transport in high-density cities: Understanding the concerns and walking barriers through their lens.	Journal of Transport & Health	This research is supported by Research Grants Council (RGC) of Hong Kong No. 17600818.
Lager et al. [35]	2021	The Netherlands	Neighbourhood walks as place-making in later life.	Social & Cultural Geography	Not mentioned.
Kou et al. [36]	2021	China	Physical environmental factors influencing older adults' park use: A qualitative study.	Urban Forestry & Urban Greening	This work was supported by the Economic & Social Research Council as part of the wider Healthy Urban Living and Ageing in Place (HULAP) Project [ES/N013336/1, 2016]. Ruibing Kou was supported by the Chinese Scholarship Council No. 201606370019.
Hand et al. [10]	2021	Canada	Applying the Go-along Method to Enhance Understandings of Occupation in Context.	Journal of Occupational Science	This work was supported by the Social Science and Humanities Research Council of Canada under No. 435-2018-1440.

Table 1. Cont.

Author	Publication Year	Country	Title	Journal	Funding
Saint-Onge et al. [8]	2021	Canada	Older Public Housing Tenants' Capabilities for Physical Activity Described Using Walk-along Interviews in Montreal, Canada.	International Journal of Environmental Research and Public Health	The main author received a doctoral research scholarship from the FRQ-SC during this study.
Li and Woolrych. [58]	2021	U.K.	Experiences of Older People and Social Inclusion in Relation to Smart "Age-Friendly" Cities: A Case Study of Chongqing, China.	Frontiers in Public Health	This study was supported by The School of Energy, Geoscience, Infrastructure and Society (EGIS) at Heriot-Watt University.
Veitch et al. [7]	2020	Australia	Designing parks for older adults: A qualitative study using walk-along interviews.	Urban Forestry & Urban Greening	This research was funded by an Australian Research Council Discovery Project (No. DP170100188). JV is supported by a Future Leader Fellowship from the National Heart Foundation of Australia (ID 101928).
Carroll et al. [55]	2020	Denmark	Going along with older people: exploring age-friendly neighbourhood design through their lens.	Journal of Housing and the Built Environment	This research was supported by Områdefornyelsen Sydhavnen, The Danish Foundation for Culture and Sports Facilities, The Velux Foundations, and TrygFonden.
Hand. [56]	2020	Canada	Older Women's Engagement in Community Occupations: Considerations of Lifespan and Place.	Scandinavian Journal of Occupational Therapy	The author gratefully acknowledges funding from the Social Sciences and Humanities Research Council of Canada.
Sundevall and Jansson [57]	2020	Sweden	Inclusive Parks across Ages: Multifunction and Urban Open Space Management for Children, Adolescents, and the Elderly.	International Journal of Environmental Research and Public Health	This research was funded by Stiftelsen Carl-Fredrik von Horns fond and Stiftelsen Fonden för markvård till minne av Sanders Alburg through The Royal Swedish Academy of Agriculture and Forestry (KSLA).
Cao et al. [6]	2019	Singapore	Using Walk-Along Interviews to Identify Environmental Factors Influencing Older Adults' Out-of-Home Behaviors in a High-Rise, High-Density Neighborhood.	International Journal of Environmental Research and Public Health	This research received no external funding.

Table 1. Cont.

Author	Publication Year	Country	Title	Journal	Funding
Macintyre et al. [25]	2019	England	I Would Never Come Here Because I've Got My Own Garden": Older Adults' Perceptions of Small Urban Green Spaces.	International Journal of Environmental Research and Public Health	This research was funded as part of the GHIA project by the Natural Environment Research Council, the Arts and Humanities Research Council and the Economic and Social Research Council under the Valuing Nature Programme, grant number NE/N013530/1. J.S.B.
Cassarino et al. [54]	2019	Ireland	Cognitive and Sensory Dimensions of Older People's Preferences of Outdoor Spaces for Walking: A Survey Study in Ireland.	International Journal of Environmental Research and Public Health	This research received no external funding. This work was partially supported by Seed Award funding granted by the School of Applied Psychology, University College Cork, Ireland.
Thandi et al. [38]	2018	Canada	Engaging Older Men in Physical Activity: Implications for Health Promotion Practice.	American Journal of Men's Health	The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This study was funded by the Canadian Institutes of Health Research (Ref. Number 138295). Writing up of this work was partly funded by Movember Canada (No. 11R18455).
Lee and Dean. [30]	2018	Canada	Perceptions of Walkability and Determinants of Walking Behaviour among Urban Seniors in Toronto, Canada.	Journal of Transport & Health	Not mentioned.
Hand et al. [23]	2018	Canada	Toward Understanding Person-Place Transactions in Neighborhoods: A Qualitative-Participatory Geospatial Approach.	Gerontologist	This study was supported by the Social Science and Humanities Research Council (No. 430-2015-00618).
Suopajarvi [37]	2018	Finland	From Tar City to Smart City Living with the Smart City Ideology as a Senior City Dweller.	Ethnologia Fennica	This article is based on research projects that were funded by the Academy of Finland No. 258570 and No. 132847.
Nordin et al. [53]	2018	Sweden	The physical environment, activity and interaction in residential care facilities for older people: a comparative case study.	Scandinavian Journal of Caring Sciences	The School of Education, Health and Social Studies at Dalarna University supported this study.

Table 1. Cont.

Author	Publication Year	Country	Title	Journal	Funding
Zandieh et al. [52]	2017	The Netherlands	Do Inequalities in Neighborhood Walkability Drive Disparities in Older Adults' Outdoor Walking?	International Journal of Environmental Research and Public Health	This research was financially supported by Erasmus Mundus scholarship supplied by the European Union.
Luusua et al. [32]	2016	Finland	Northern Urban Lights: Emplaced Experiences of Urban Lighting as Digital Augmentation.	Architecture and interaction: Human computer interaction	We would like to thank our participants, the Academy of Finland for their support of the UBI Metrics and the Adaptive Urban Lighting projects, as well as the Nokia Foundation for their support.
Ottoni et al. [49]	2016	Canada	Benches become like porches'': The built and social environment's influence on older adults experiences' of mobility and well-being.	Social Science & Medicine	Not mentioned.
Curl et al. [50]	2016	U.K.	Developing an Audit Checklist to Assess Outdoor Falls Risk.	Proceedings of the Institution of Civil Engineers: Urban Design and Planning	This research was funded through the Medical Research Council (grant reference G1002782/1) as part of the Lifelong Health and Well-being (LLHW) Cross-Council Programme. The LLHW Funding Partners are: Arts and Humanities Research Council, Biotechnology and Biological Sciences Research Council, Engineering and Physical Sciences Research Council, Economic and Social Research Council, Medical Research Council, Chief Scientist Office of the Scottish Government Health Directorates, National Institute for Health Research/The Department of Health, The Health and Social Care Research and Development of the Public Health Agency (Northern Ireland), Wales Office of Research and Development for Health and Social Care, and the Welsh Assembly Government. The LLHW programme and funding partners had no role in the design, collection, analysis, or interpretation of data; in the writing of the manuscript; or in the decision to submit the manuscript for publication.

Table 1. Cont.

Author	Publication Year	Country	Title	Journal	Funding
Yoo and Kim [46]	2016	Republic of Korea	Perceived urban neighborhood environment for physical activity of older adults in Seoul, Korea: A multimethod qualitative study.	Preventive Medicine	This work was supported by the 2014 SNU Brain Fusion Program of the Seoul National University (SNU Project No. 0434-20140016) and the Korea Health Promotion Foundation Research Grant (15-08).
Zandieh et al. [51]	2016	England	Older Adults' Outdoor Walking: Inequalities in Neighbourhood Safety, Pedestrian Infrastructure and Aesthetics.	International Journal of Environmental Research and Public Health	This research was financially supported by Erasmus Mundus scholarship supplied by the European Union.
Lager et al. [48]	2015	The Netherlands	Understanding older adults' social capital in place: Obstacles to and opportunities for social contacts in the neighbourhood.	Geoforum	This research would not have been possible without the financial support of the Ubbo Emmius Fund.
Gardner [47]	2014	Canada	The role of social engagement and identity in community mobility among older adults aging in place.	Disability and Rehabilitation	Not mentioned.
Van Cauwenberg et al. [5]	2012	Belgium	Environmental factors influencing older adults' walking for transportation: a study using walk-along interviews.	International Journal of Behavioral Nutrition and Physical Activity	Not mentioned.

This table shows the basic information about the 31 articles included in the systematic review: author names, years of publication, country of the first authors' affiliation, article title, journal wherein the article was published, and the funding sources.

3.3. Participant Characteristics

Basic socio-demographic information of the 31 included articles is reported in Table 2, and the exclusion/inclusion criteria for the participants of each included study are reported in Table 3.

Sample size. Among the 31 included articles, 1 (3%) did not report the number of healthy older participants [60]. For the other 30 articles (97%), a total sample of 1207 healthy older adults participated to the WAI. The mean sample size was hence $n = 40.2 (\pm 44.9)$, ranging from $n = 4$ [38] to $n = 173$ [51,52] healthy older participants.

Sub-Sample for WAI. Among the 31 included articles, 10 (32%) [23,30,36,37,46,51,52,54,58,61] mentioned that the WAIs were conducted on a sub-sample of participants. The mean percentage of participants in WAI of the total participants was 40.1% (± 34.1), ranging from 6.25% [54] to 92.9% [23] of the total participants.

Gender. Among the 31 included articles, 5 (16%) [10,37,54,59,60] did not report the gender of the healthy older participants. In the other 26 included articles (84%) [5–9,23,25,30,32,35,36,38,46–53,55–58,61,62], the gender of the participants ($n = 1022$) was reported: 1 study (3%) included only female participants [56], 1 study (3%) included only male participants [38], and 24 studies (77%) included both male and female participants [5–9,23,25,30,32,35,36,46–53,55,57,58,61,62]. Among these 26 studies, 344 out of the 1022 participants (33.6%) were male.

Age. Among the 31 included articles, 11 (35%) [5,7–9,36,46,47,50,53,55,58] reported the average age of the participants, ranging from 70.5 [9] to 87.5 years [53]. Note that, in 4 studies (13%) [10,23,35,57], the average age for the participants was not mentioned, but computable, ranging from 70.3 [57] to 76.0 years [10]. Sixteen studies (52%) reported age range of participants [6,25,30,32,37,38,48,49,51,52,54,56,59–62]. Five studies (16%) reported participants age higher than 60 [25,54,60] or 65 [32,56] years old. For the other studies ($n = 11$, 35%), the smallest lower threshold of the range was 50 years old (range (50–70) [59] and the largest upper threshold was (90+) years old [30]. The smallest ranges were 4 years old (e.g., 65–69) [30,61,62]. The largest range was 31 years (59–90) [55]. In one study (3%) [59], two age ranges including healthy older adults (≥ 55 years) were reported, namely (50–70) ($n = 9$ participants) and (70+) ($n = 10$ participants). However, the number of adults older than 55 years in the (50–70) range was not reported.

Income. Among the 31 included articles, 8 studies (23%) reported information about participants' income [8,9,37,38,47,49,58,62]: 3 studies (10%) reported that the participants were "Financially capable of using computers and the internet" [37] or "Satisfied with their financial status" [38] or "All participants' incomes were provided by a government social assistance program" [9], while 5 studies (16%) provided numerical values for income, by month [58,62], or by year [8,47,49]. Regarding monthly incomes, Sun and Lau [62], used four categories: no income ($n = 51$ participants); less than 5k HKD (Hong Kong dollar) ($n = 10$ participants); (5–9.999k) HKD ($n = 9$ participants); (10k+) HKD ($n = 5$ participants). Li and Woolrych [58] presented the mean incomes of the three districts involved in WAI: 308.89£ (Dahuanglu Community); 356.08£ (Shiyoulu Community); 407.41£ (Huualongqiao Community). Regarding annual incomes, Saint-Onge and colleagues [8] used three categories: (9,999–)£ (Canadian dollar) ($n = 2$ participants); (10,000–19,999 \$) ($n = 17$ participants), and (20,000–39,999 \$) ($n = 5$ participants). Gardner [47] had also used three annual incomes categories: (10–20 k\$) ($n = 2$ participants), (20–30 k\$) ($n = 3$ participants), and (30–40 k\$) ($n = 1$ participant). Ottoni and colleagues [49] have used four categories, described as low (less than 25,000 \$; $n = 7$ participants at T1 and 2 participants at T2), medium (25,000–74,999 \$; $n = 12$ participants at T1 and 12 participants at T2), high (more than 750,000 \$; $n = 5$ participants at T1 and 3 participants at T2), and no response ($n = 4$ participants at T1 and 5 at T2).

Education. Among the 31 included articles, 13 studies (42%) reported the educational level of participants [5,7,8,36–38,47,49,51,52,58,62]. Education classification varied between the studies. Four studies (13%) used only one classification, "completed high school or higher education" [23], sub and GSCE and higher [51,52], and "higher education" [5]. A

total of 9 studies (29%) used 3 ($n = 7$, 23%) [7,8,36–38,47,49] or 4 education classifications ($n = 2$, 6%) [58,62], from no education [58,62] to PhD level [47]. On the sub-sample of participants with education assessed ($n = 298$), more than a half received secondary level of education or higher ($n = 155$, 53%).

Country of birth, nationality, and ethnicity. Among the 31 included articles, 14 (45%) [6,9,23,30,35–38,47–49,51,52,57] reported information on participant's country of birth, nationality, or ethnicity: place of birth was reported in 2 studies (6%) [30,57], and ethnicity was reported in 12 studies (39%) [6,9,23,30,36,38,47–49,51,52,57].

Anthropometric characteristics. Basics participants' anthropometric characteristics, such age height, weight, and BMI (body mass index) were not mentioned at all (0%) in any of the 31 included studies.

3.4. Walk-along Interview: Data Collection Method

3.4.1. Where?

Country. The 31 included studies used the WAI method with healthy older adults in 13 different countries: 8 (26%) in Canada [8,10,23,30,38,47,49,56], 5 (16%) in England [25,36,50–52], 2 (6%) in Finland [32,37], 2 (6%) in Ireland [54,61], 2 (6%) in the Netherlands [35,48], 2 (6%) in Singapore [6,9], 2 (6%) in Sweden [53,57], 1 (3%) in Korea [46], 1 (3%) in Denmark [55], 2 (6%) in China [58,62], 1 (3%) in Chile [60], 2 (6%) in Belgium [5,59] and 1 (3%) in Australia [7]. The majority of studies was conducted in Europe ($n = 16$, 52%) and North America ($n = 8$, 26%).

Setting. All of the included studies ($n = 31$, 100%) were conducted in an urban setting. Of these, one (3%) study addressed urban and semi-urban settings [5], and one (3%) urban and rural settings [54]. No studies were conducted solely in a rural setting.

3.4.2. When?

Date/season of data collection. Of the 31 included studies, 7 (23%) studies conducted the WAI in seasons corresponding to spring and/or summer [6,7,35,37,53,59,60], 10 (32%) studies in seasons corresponding to autumn and/or winter [5,8,9,32,36,48,50,57,58,62], 2 (6%) studies conducted between summer and autumn [51,52], 2 (6%) studies during three or four seasons [46,61]. In 10 (32%), the season during which the WAI with healthy older adults have been performed was not reported [10,23,25,30,38,47,49,54–56].

Time of day. Of the 31 included studies, 5 (16%) reported the times of day the WAIs were conducted [5,48,50,60,62]. Van Cauwenberg and colleagues [5] indicated that they conducted interviews during the day, Herrmann-Lunecke and colleagues [60] indicated that interviews were conducted in the morning on weekdays. Lager and colleagues [48] reported that participants chose to walk around 10 a.m. or 2 p.m. and Sun and Lau [62] conducted the WAI spanning weekdays and weekends, from 8:00 a.m. to 6:00 p.m. Curl and colleagues [50], reported that the WAIs were conducted on days with mild temperatures (10–15 degrees Celsius), and in which there was some light rainfall.

Data collection duration. Of the 31 included studies, 14 (45%) did not report how much time has been spent on the WAI [10,23,25,30,35–38,49,50,54–57] (see Table 4). Among the other 17 included studies (55%); data collection lasted between 5 weeks [53] and 20 months [46], with a mean of 4.8 months. Data collection lasted 2 months in 5 studies (16%) [6,8,48,58,60], 3 months in 3 studies [9,32,62], 4 months in 3 studies [5,52,59], 5 months in 2 studies [7,51], 8 months in one study [47] and 10 months in one study [61].

Table 2. Basic socio-demographic information of participants included in each study.

Author	Number of Group (n)	Number of Participants (n)	Gender (F: Female; M: Male) (n)	Age, Mean (SD) (Range), Years	Health Status	Education	Ethnicity/Birthplace	Income
Močnik et al., 2022 [9]	1	90	F: 70; M: 20	70.48	More than half of the participants self-rated their health as moderate, and almost a third rated it as good.	Not mentioned.	Chinese: 76; Malay: 6; Indian 7; Other state: 1.	All participants' incomes were provided by a government social assistance program.
Lauwers et al., 2021 [59]	3 (–50) years old (50–70) years old (70+)	50 years old: 9 (50–70): 9 (70+): 10	No specific information about older adults. All participants: F:17; M: 11	(50–70): 9 (70+): 10	Not mentioned.	No specific information: The recruitment strategy intended to reach a varied sample in terms of age, gender, education level, employment status, and cultural background.	Not mentioned.	Not mentioned.
Herrmann-Lunecke et al., 2021 [60]	3 Young adults Middle-aged adults Older adults	No specific information for older adults: 120 participants (20 participants per neighborhood).	No specific information about older adults. Half of each neighborhood group was composed of women.	Older adults were above 60 years old.	Not mentioned.	Not mentioned.	Not mentioned.	Not mentioned.
Grove 2021 [61]	1	15 (10 in WAI)	No specific information about WAI participants. All participants: F: 12; M: 3	No specific information about WAI participants. All participants:(65–69): 1 (70–74): 9 (75–79): 1 (80–84): 0 (85–89): 1 Age not identified during interview: 3	Chronic Obstructive Pulmonary Disease: 3. Alzheimer's Disease: 2. Parkinson's Disease: 1. Digestive Conditions: 2. Macular degeneration: 1. Non-specific limitations: 2. None identified: 4	Not mentioned.	Not mentioned.	Not mentioned.
Sun and Lau 2021 [62]	1	72	F: 44; M: 28	(65–69): 27 (70–74): 17 (75–79): 20 (80+): 8	Not mentioned.	Not educated: 8 Primary school: 36 School: 24 Tertiary school: 4	Not mentioned.	No income: 51 Less than HKD 5000: 10 HKD 5–9,999,000: 9 HKD +10,000: 5
Lager et al., 2021 [35]	1	12	F:10; M: 2	74.58 (8.07) [C] (65–87)	Not mentioned.	No specific information.	White: 12	Not mentioned.
Kou et al., 2021 [36]	1	20 (15 in WAI)	No specific information about WAI participants: F:8; M:12	No specific information about WAI participants: 73.89 (8.23)	Advanced lower extremity functioning: 86.5 (11.9)	No specific information about WAI participants. Primary level of education: 2 Secondary level of education: 9 Tertiary level of education: 9	White: 20	Not mentioned.

Table 2. Cont.

Author	Number of Group (n)	Number of Participants (n)	Gender (F: Female; M: Male) (n)	Age, Mean (SD) (Range), Years	Health Status	Education	Ethnicity/Birthplace	Income
Hand et al., 2021 [10]	1	The original study involved 38 participants but results from 2 women only were presented	F:2	75 and 77	Nancy ^[P] : significant health challenges/Eleanor ^[P] : no information	Not mentioned.	Not mentioned.	Not mentioned.
Saint-Onge et al., 2021 [8]	1	26	F:18; M:8	71.96 (8.0)	Self-reported Very good: 11 Good: 10 Average: 4 Bad: 1 Very bad: 0	Secondary or less: 17 College diploma: 2 University diploma: 7	Not mentioned.	USD 9999 or less: 2 USD 10,000–19,999: 17 USD 20,000–39,999: 5
Li and Woolrych 2021 [58]	3: Living in different district: Dahuanglu Community (DC) Shiyoulu Community (SC) Huualongqiao Community (HC)	64 (WAI: 21): DC: 22 (6) SC: 21 (7) HC: 21 (8)	No specific information about WAI participants. All participants— DC: F: 13; M: 9 SC: F:16; M: 5HC: F10; M:11	No specific information about WAI participants. All participants— DC: 74.91 (60–90 med: 75) SC: 72.9 (60–86 med: 73) HC: 70.0 (62–84 med: 69)	Participants ranged in terms of gender, ages, socio-economic background (low, medium, and high levels of income), health status, education, living status, and household composition.	No specific information about WAI participants. All participants— DC: No qualification: 5 Elementary education: 2 Secondary education: 5 College, university education, and scientific education: 5 SC: No qualification: 3 Elementary education: 0 Secondary education: 15 College, university education, and scientific education: 3 HC: No qualification: 0 Elementary education: 2 Secondary education: 13 College, university education, and scientific education: 6	Not mentioned.	GBP (March 2020: GPB 1 = CNY 9): No specific information about participants of WAI. All participants— DC: 308.89 (308.89–555.56 med: 333.33) SC: 356.08 (111.11–1111.11 med: 333.33) HC: 407.41 (222.22–666.67 med: 333.33)
Veitch et al., 2020 [7]	1	30	F:15; M:15	74.9 (5.4)	Not mentioned.	Low (did not complete high school): 3 Medium (year 12/trade/certificate): 4 High (university or tertiary qualification): 23	Not mentioned.	Not mentioned.
Carroll et al., 2020 [55]	1	16	F:8; M:8	73.38 (10.06) (59–90)	Not mentioned.	Not mentioned.	Not mentioned.	Not mentioned.
Hand 2020 [56]	1	14 (3 in the current study results)	F:3	Above 65 years old (no other information).	Not mentioned.	Not mentioned.	Not mentioned.	Not mentioned.

Table 2. Cont.

Author	Number of Group (n)	Number of Participants (n)	Gender (F: Female; M: Male) (n)	Age, Mean (SD) (Range), Years	Health Status	Education	Ethnicity/Birthplace	Income
Sundevall and Jansson 2020 [57]	3: Children Adolescent Elderly	Elderly: 6	F:3; M:3	F: 70.33 (4.51) [C] M: 73.67 (4.04) [C]	Not mentioned.	Not mentioned.	Lived in Landskrona all life: 3 Born in Landskrona and has also moved back: 1 Born in the region and lives in Landskrona for 25 years: 1 Born in other part of Sweden and has lived in Landskrona for several years: 1	Not mentioned.
Cao et al., 2019 [6]	1	12	F:6; M:6	(55–64): 2 (65–74): 6 (75–84): 4	Not mentioned.	Not mentioned.	Chinese: 10 Indian: 1 Other: 1	Not mentioned.
Macintyre et al., 2019 [25]	1	10	F:8; M:2	(60+)	Not mentioned.	Not mentioned.	Not mentioned.	Not mentioned.
Cassarino et al., 2019 [54]	1	112 (7 in WAI)	No specific information	No specific information.	Not mentioned.	Not mentioned.	Not mentioned.	Not mentioned.
Thandi et al., 2018 [38]	1	4	M:4	(70–86)	Functionally capable of completing daily activities. Self-reported— Multiple chronic health conditions: 1 Generally healthy; history of back pain and some shortness of breath: 1 Previous stroke: mild cognitive decline: 1 Generally healthy; history of leg pain following biking accident as a pedestrian: 1	Secondary school: 2 Graduate degree: 1 University degree: 1	White, of European background	Satisfied with their financial status.
Lee and Dean 2018 [30]	2: Wychwood and Edenbrigde-Humber valley habitants	28 (3 in WAI)	No specific information about WAI participants. All participants: Wychwood: F:14; M:0 Edenbrigde-Humber valley: F:11; M:3	No specific information about WAI participants. All participants: Wychwood: (65–69):1 (70–74):0 (75–79):4 (80–84):3 (85–89):4 (90+):3 Edenbrigde-Humber valley: (65–69):0 (70–74):0 (75–79):2 (80–84):1 (85–89):4 (90+): 6	The population sample of seniors ranged in terms of socio-economic status as well as overall physical and mental health levels	Not mentioned.	No specific information about WAI participants. All participants birthplaces— Wychwood: Canada: 11 Ireland:1 Jamaica: 2 Edenbrigde-Humber valley: Canada:12 Scotland:1 Slovenia:1	Not mentioned.

Table 2. Cont.

Author	Number of Group (n)	Number of Participants (n)	Gender (F: Female; M: Male) (n)	Age, Mean (SD) (Range), Years	Health Status	Education	Ethnicity/Birthplace	Income
Hand et al., 2018 [23]	1	14 (13 in WAI)	No specific information about WAI participants. All participants: F:11; M:3	No specific information about WAI participants. All participants: 75.92 (8.29) ^[C]	Self-reported: experiencing very good or excellent health	Completed high school or higher education.	Caucasian	Not mentioned.
Suopajarvi 2018 [37]	1	16 (10 in WAI)	Not mentioned	(61–87) (2011)	All lived independently.	No specific information about WAI participants. All participants—Basic education: 2 Intermediate education level: 10 University education: 4	No specific information about WAI participants. All participants: All except two of them had lived for most of their lives in Oulu	Financially capable of using computers and the internet
Nordin et al., 2018 [53]	2 RCF A RCF B	The staff and relatives who were at the RCFs during data collection received information and were invited to participate in the unstructured observations and walk-along interviews. In total, there were 83 people included; Residents: 54 Staff members: 25 Relatives: 4 Older adults: 58	Older adults: 52 RCF A: F:20; M: 6 RCF B: F:17; M:9	RCF A: 87 (74–96) RCF B: 88 (71–100)	RCF A Communication, poor: 3.85%; good: 96.15 Orientation, poor: 19.24%; good: 80.76% Mobility, poor: 26.93%; good: 73.07% Emotion, poor: 26.93%; good: 73.07% Socialization, poor: 11.54%; good: 88.46% RCF B Communication, poor: 15.9%; good: 84.61% Orientation, poor: 11.54%; good: 88.46% Mobility, poor: 23.08%; good: 76.92% Emotion, poor: 34.62%; good: 65.38% Socialization, poor: 19.24%; good: 80.76%	Not mentioned.	Not mentioned.	Not mentioned.
Zandieh et al., 2017 [52]	2: Low- and high-deprivation areas	173 (19 in WAI) Low-deprivation area: 93 (9 in WAI) High-deprivation area: 80 (10 in WAI)	Low-deprivation area: F: 7; M: 2 High-deprivation area: F: 6; M:4	Low-deprivation area: (65–74): 4 (75+): 5 High-deprivation area: (65–74): 5 (75+): 5	Able to walk, independent in daily life activities, and mentally healthy. Self-reported Low-deprivation area Good: 9 Poor: 0 High-deprivation area Good: 9 Poor: 1	Low-deprivation area—GCSE and higher: 9 Sub-GCSE: 0 High-deprivation area—GCSE and higher: 2 Sub-GCSE: 8	Low-deprivation area—White British: 8 BME groups: 1 High-deprivation area: White British :5 BME groups: 5	Not mentioned.
Luusua et al., 2016 [32]	2: Young adults, older adults	16 (5 older adults)	F:3; M:2	(65+)	Not mentioned.	Different educational, personal, and employment backgrounds.	Not mentioned.	Not mentioned.

Table 2. Cont.

Author	Number of Group (n)	Number of Participants (n)	Gender (F: Female; M: Male) (n)	Age, Mean (SD) (Range), Years	Health Status	Education	Ethnicity/Birthplace	Income
Ottoni et al., 2016 [49]	2 2012: T1 2014: T2	50. T1: 28 T2: 22	T1— F:17; M: 11 T2— F:12; M:10	T1— (~75): 21 (75+): 7 T2— (~75): 14 (75+): 8	Not mentioned.	T1— Secondary school or less: 2 Trade school: 8 University or graduate school: 18 T2— Secondary school or less: 3 Trade school: 6 University or graduate school: 12 No response: 1	T1— European Descent 26 First nation: 1 West Indian: 1 T2— European: 21 West Indian: 1	T1— Low (less than USD 25,000): 7 Medium (USD 25,000–74,999): 12 High (USD +75,000): 5 No response: 4 T2— Low: 2 Medium: 12 High: 3 No response: 5
Curl et al., 2016 [50]	1	20	F:17; M: 3	77 (6.71)	Fallers	Not mentioned.	Not mentioned.	Not mentioned.
Yoo and Kim 2016 [46]	2: Older adults Service providers	Older adults: 46 (19 in WAI)	No specific information about WAI participants. All participants: F:28, M: 18	75.4 (6.4)	Good: 13 Average: 21 Bad: 12	Not mentioned.	Not mentioned.	Not mentioned.
Zandieh et al., 2016 [51]	2: Low- and high-deprivation areas	173 (19 in WAI) Low-deprivation area: 93 (9 in WAI) High-deprivation area: 80 (10 in WAI)	Low-deprivation area— F: 7; M: 2 High-deprivation area— F: 6; M:4	Low-deprivation area— (65–74): 4 (75+): 5 High-deprivation area— (65–74): 5 (75+): 5	Able to walk, independent in daily life activities, and mentally healthy. Self-reported Low-deprivation area Good: 9 Poor: 0 High-deprivation area Good: 9 Poor: 1	Low-deprivation area— GCSE and higher: 9 Sub-GCSE: 0 High-deprivation area— GCSE and higher: 2 Sub-GCSE: 8	Low-deprivation area— White British: 8 BME groups: 1 High-deprivation area— White British: 5 BME groups: 5	Not mentioned.
Lager et al., 2015 [48]	1	7	F:7	(65–70): 2 (70–75): 1 (75–80): 1 (85–90): 3	Not mentioned.	Not mentioned.	White: 7	Not mentioned.
Gardner 2014 [47]	1	6	F:3; M:3	82.5 (4.32)	Participants varied in their levels of education and income, lived in a variety of housing types, reflected a range of functional abilities, and used various forms of mobility within their neighborhoods.	Highschool: 2 Some highschool: 3 PhD: 1	White Canadian: 3 White Austrian: 1 White Irish: 1	USD 10–20,000: 2 USD 20–30,000: 3 USD 30–40,000: 1
Van Cauwenberg et al., 2012 [5]	1	57	F: 27; M:30	73.4 (5.4)	Not mentioned.	Higher education: 27	Not mentioned.	Not mentioned.

[P] indicates a pseudonym. [C] indicates that the value was calculated by the reviewers. WAI: walk-along interview; HKD: Hong Kong dollar; GBP: British Pounds; CNY: Yuan; RCF: residential care facilities; GCSE: general certificates of secondary education or its equivalents; BME: black and minority ethnic.

Table 3. Exclusion/inclusion criteria of participants of each included study.

Author	Exclusion/Inclusion Criteria
Močnik et al., 2022 [9]	Not mentioned.
Lauwers et al., 2021 [59]	The recruitment strategy intended to reach a varied sample in terms of age, gender, education level, employment status, and cultural background. However, the large geographical scale and time limitation of the study led to convenience sampling, based on the willingness of the people we met in the organizations. Knowing the mixed use of language in the Brussels Capital Region (most spoken: French, English, and Dutch), only participants skilled in Dutch, French, or English with a minimum age of 18 years were included.
Herrmann-Lunecke et al., 2021 [60]	Participants were required to speak Spanish and to have lived in the neighborhood for at least the last two years.
Grove 2021 [61]	Not mentioned.
Sun and Lau 2021 [62]	Living in the study areas and familiar with the designated routes, aged 65 or above, and can walk and use public transport without aids.
Lager et al., 2021 [35]	The Dutch retirement age of the time (65) was chosen as the threshold.
Kou et al., 2021 [36]	Not mentioned.
Hand et al., 2021 [10]	Residents were eligible to participate in the larger study if they: (a) had lived in one of the neighborhoods for at least 1 year, (b) were not working or were engaged in part-time paid employment, (c) were able to converse in English, and (d) were able to access the community, either alone or with assistance.
Saint-Onge et al., 2021 [8]	Individuals were eligible to participate if they were (1) tenants of one of the three study sites; (2) able to walk four 10 min sessions, and (3) able to communicate in either French, English, or Spanish. They were excluded if they reported having an intellectual, visual, or auditory impairment that could significantly impact walking safety and ability.
Li and Woolrych 2021 [58]	Not mentioned.
Veitch et al., 2020 [7]	Required to be English-speaking.
Carroll et al., 2020 [55]	Irrespective of their physical ability or potential impairment.
Hand 2020 [56]	Selection criteria were age 65 years or more, able to participate in an interview in English, not working full-time, and able to move about the community in some way.
Sundevall and Jansson 2020 [57]	Not mentioned.
Cao et al., 2019 [6]	This study included those aged 55–64 because Singapore is aging rapidly, and this age group's opinions are valuable for future developments. To be recruited, participants needed to be able to speak either English or Mandarin Chinese and be living in Yuhua East, or living in a nearby neighborhood but walking to the facilities in Yuhua East on a daily or weekly basis.
Macintyre et al., 2019 [25]	Any adults aged 60 or over in 2018 were considered eligible to participate if they lived or spent a large amount of time (i.e., a minimum of one or more hours every two weeks) in Old Moat when the study occurred. Participants were excluded from the study if they had a diagnosis of dementia, since this could affect their ability to participate in the interviews. Participants who were able to complete walk-along interviews were prioritized for recruitment, although participants who preferred to participate in a sitting down photo elicitation interview were also recruited.
Cassarino et al., 2019 [54]	Not mentioned.
Thandi et al., 2018 [38]	Inclusion criteria were broad—they had to self-identify as men aged 65 or older, be able to communicate in English, live in the community, and be able to move about within and outside their homes.
Lee and Dean 2018 [30]	The only selection criteria were that participants had to live in the chosen neighborhoods, Wychwood and Edenbridge-Humber Valley, and be over the age of 65 years.

Table 3. Cont.

Author	Exclusion/Inclusion Criteria
Hand et al., 2018 [23]	We recruited 14 residents age 65 years or more living in two neighborhoods with diverse characteristics in a mid-sized Canadian city. Individuals were eligible to participate if they had lived in one of the target neighborhoods for at least 1 year, could participate in an interview in English, were not working full-time, and were able to venture into their community.
Suopajarvi 2018 [37]	All except two of them had lived for most of their lives in Oulu; however, this was not a criterion for selecting study participants.
Nordin et al., 2018 [53]	Not mentioned.
Zandieh et al., 2017 [52]	Inclusion criteria were being aged 65 or over, residing in of one of the selected wards, being able to walk, being independent in daily life activities, and being mentally healthy.
Luusua et al., 2016 [32]	Not mentioned.
Ottoni et al., 2016 [49]	We include participants who reside in one of three adjacent neighborhoods: Vancouver’s West End, Yaletown, and Downtown.
Curl et al., 2016 [50]	Older adults (aged 65 years and over) who had experienced a fall in the previous 12 months. We defined “older people” as those aged 65 or older. We used the Scottish Walkability Assessment Tool (SWAT) as a starting point for our audit checklist. We used a convenience sample, recruited from those who had already participated in a focus group about falling outdoors, and based on having experienced a fall during the previous year and their willingness to participate in further research.
Yoo and Kim 2016 [46]	Not mentioned.
Zandieh et al., 2016 [51]	Older adults (65 years and upward), residents of a low- or high-deprivation area, those able to walk, those independent in their daily life activities, and the mentally healthy were eligible to participate in this research. Ability to speak English was not an eligibility criteria.
Lager et al., 2015 [48]	Not mentioned.
Gardner 2014 [47]	Over the age of 75, living alone (as most older adults in this age category live alone) and having resided in the study neighborhood for a minimum of three years.
Van Cauwenberg et al., 2012 [5]	To be included, participants had to be over 65 years old, dwelling in the community, and able to walk independently for at least 30 min.

Table 4. Data collection duration and WAI duration.

Author	Number of Participants	Data Collection Duration	WAI Duration per Participant		Total Duration of the WAI (Number of Participants × Duration per Participant)	
			Range	Mean	Range	Mean
Močnik et al., 2022 [9]	90	From 1 December 2017 to 21 February 2018 (3 months)	Not mentioned	Not mentioned.		
Lauwers et al., 2021 [59]	Total: 28 50 years old: 9 (50–70): 9 (70+): 10	From March 2019 to June 2019 (4 months)	Not mentioned	90 min (1 h 30 min)		2520 min (42 h)
Herrmann-Lunecke et al., 2021 [60]	No specific information for older adults: 120 participants (20 participants per neighborhood)	From September 2018 and November 2018 (2 months)	Not mentioned	Not mentioned		
Grove 2021 [61]	15 (10 in WAI)	From December 2017 to September 2018 (10 months)	Not mentioned	13 min (0 h 13 min)		130 min (2 h 10 min)
Sun and Lau 2021 [62]	72	From January 2019 to March 2019 (3 months)	Not mentioned	Not mentioned.		
Lager et al., 2021 [35]	12	No specific information about the duration of data collection. Summer of 2012 and Spring of 2013.	Not mentioned	Not mentioned.		
Kou et al., 2021 [36]	20 (15 in WAI)	No specific information about the duration of data collection.	Not mentioned	56 min, SD = 10 (0 h 56 min)		840 min (14 h)
Hand et al., 2021 [10]	The original study involved 38 participants but results from 2 women only were presented	No specific information about the duration of data collection.	- Nancy: 50 min (0 h 50 min) - Eleanor: 35 min (0 h 35 min)	Not mentioned.		
Saint-Onge et al., 2021 [8]	26	From 11 September to 25 October 2017 (2 months)	60–150 min (1 h–2 h 30 min)	Not mentioned.	1560–3900 min (26–65 h)	
Li and Woolrych 2021 [58]	64 (WAI: 21) DC: 22 (6) SC: 21 (7) HC: 21 (8)	From December 2019 to January 2020 (2 months)	Not mentioned	Not mentioned.		
Veitch et al., 2020 [7]	30	From October 2017 to February 2018 (5 months)	6–35 min (0 h 06–0 h 35 min)	16 min (0 h 16 min)	180–1050 min (3 h–17 h 30 min)	480 min (8 h)
Carroll et al., 2020 [55]	16	No specific information about the duration of data collection.	30 min to more than 120 min (0 h 30 min to more than 2 h)	Not mentioned	480 min to more than 1920 min (8 h to more than 32 h)	

Table 4. Cont.

Author	Number of Participants	Data Collection Duration	WAI Duration per Participant		Total Duration of the WAI (Number of Participants × Duration per Participant)	
			Range	Mean	Range	Mean
Hand 2020 [56]	14 (3 in the current study results)	No specific information about the duration of data collection.	45–120 min (0 h 45 min–2 h)	Not mentioned.	630–1680 min (10 h 30 min–28 h)	
Sundevall and Jansson 2020 [57]	Elderly: 6	No specific information about the duration of data collection.	30–84 min (0 h 30–1 h 24 min)	Not mentioned.	180–504 min (3 h–8 h 24 min)	
Cao et al., 2019 [6]	12	From August 2018 to September 2018 (2 months)	9 min to more than 120 min (0 h 09 min to more than 2 h)	Not mentioned.	108 min to more than 1440 min (1 h 48 min to more than 24 h)	
Macintyre et al., 2019 [25]	10	Not mentioned	30–100 min (0 h 30–1 h 40 min)	Not mentioned.	300–1000 min (5 h–16 h 40 min)	
Cassarino et al., 2019 [54]	112 (7 in WAI)	No specific information about the duration of data collection.	Not mentioned	Not mentioned.		
Thandi et al., 2018 [38]	4	No specific information about the duration of data collection.	30–60 min (0 h 30 min–1 h)	Not mentioned.	120–240 min (2–4 h)	
Lee and Dean 2018 [30]	28 (3 in WAI)	No specific information about the duration of data collection.	Not mentioned	Not mentioned.		
Hand et al., 2018 [23]	14 (13 in WAI)	No specific information about the duration of data collection.	30–120 min (0 h 30 min–2 h)	Not mentioned.	390–1560 min (6 h 30 min–26 h)	
Suopajarvi 2018 [37]	16 (10 in WAI)	No specific information about the duration of data collection.	60–90 min (1 h–1 h 30 min)	Not mentioned.	600–900 min (10–15 h)	
Nordin et al., 2018 [53]	The staff and relatives who were at the RCFs during data collection received information and were invited to participate in the unstructured observations and walk-along interviews. In total, the 83 people included Residents: 54; Staff members: 25; Relatives: 4; Older adults: 58	Data were collected across a 5-week period during early spring (1 month)	Not mentioned	Not mentioned.		
Zandieh et al., 2017 [52]	173 (19 in WAI) Low-deprivation area: 93 (9 in WAI) High-deprivation area: 80 (10 in WAI)	From 7 July to October 2012 (4 months)	30–60 min (0 h 30 min–1 h)	Not mentioned.	570–1140 min (9 h 30 min–19 h)	

Table 4. Cont.

Author	Number of Participants	Data Collection Duration	WAI Duration per Participant		Total Duration of the WAI (Number of Participants × Duration per Participant)	
			Range	Mean	Range	Mean
Luusua et al., 2016 [32]	16 (5 older adults)	From December to February (the year is not mentioned) (3 months)	Not mentioned	Not mentioned.		
Otoni et al., 2016 [49]	Total: 50 T1: 28 T2: 22	No specific information about the duration of data collection.	Not mentioned	Not mentioned.		
Curl et al., 2016 [50]	20	No specific information about the duration of data collection.	Not mentioned	25.1 min, SD = 10.92 (0 h 25 min)		502 min (8 h 22 min)
Yoo and Kim 2016 [46]	Older adults: 46 (19 in WAI)	From April 2014 to November 2015 (20 months)	Not mentioned	Not mentioned		
Zandieh et al., 2016 [51]	173 (19 in WAI) Low-deprivation area: 93 (9 in WAI) High-deprivation area: 80 (10 in WAI)	From July 2012 to November 2012 (5 months)	30–60 min (0 h 30 min–1 h)	Not mentioned.	570–1140 min (9 h 30 min–19 h)	
Lager et al., 2015 [48]	7	From September 2012 and February 2013 (2 months)	30–90 min (0 h 30–1 h 30 min)	Not mentioned.	210–630 min (3 h 30–10 h 30 min)	
Gardner 2014 [47]	6	Data was collected over an 8-month period during.	120–240 min (2–4 h)	Not mentioned.	1080–1440 min (18–24 h)	
Van Cauwenberg et al., 2012 [5]	57	From November 2010 to February 2011 (4 months)	30 min approximately	Not mentioned.	1710 min (28 h 30 min) approximately	

3.4.3. With Whom?

Participant recruitment. Of the 31 included articles, the most frequently used recruitment technique ($n = 16$, 50%) was through visits to local organizations and/or groups of older adults (card club, local activity center, computer courses for older adults, seniors' residence, others), and information to older adults about the participation process and/or the project through information material (advertisements, letters, posters) and/or information sessions [8,9,25,30,32,35,37,47,48,51–55,59,61]. In one study (3%) [60], recruitment was performed through bulletin boards and public posters placed in stores and/or street walls in the study area. In 4 studies (13%) [6,7,57,62], direct interception by the interviewer or research team was conducted in the study areas and/or facilities and open spaces. Recruitment through a sub-sample of participants from a previous study was mentioned in 4 studies (13%) [36,38,49,50]. In 6 studies (19%), no information was provided [5,10,23,46,56,58].

Six studies (19%) also reported the used of the “snowball sampling” technique [8,25,30,35,48,54], which involves participants volunteering to encourage their friends and family to participate [25].

Compensation for participants. Of the 31 included studies, 4 (13%) studies [9,23,38,49], reported stated that a reward for their time and participation was given to participants. In 3 of the 4 studies mentioned, a \$10 gift card [38], \$20 gift card [49], and \$25 gift card [23] were given. Močnik and colleagues [9] only noted that participants received a small token of appreciation for their participation.

3.4.4. How?

- Before walk-along interview. Preparing every aspects of the WAI:

Interviews and/or questionnaires. Of the 31 included articles, 21 (68%) conducted an interview and/or questionnaire before conducting the WAI [5,7–10,23,30,32,35,37,38,48–52,54,56,58,59,61]. The purpose of these preliminary interviews was to gather background information about the participants, learn about their views of the site, and/or how to get a general sense of the place where the WAI would be conducted. One (3%) study [36], reported that a questionnaire was conducted with the participants, however, the authors did not mention whether it was before or after the WAI.

Interviewer. Of the 31 included studies, 23 (74%) studies mentioned who conducted the WAI. In 20 studies (65%), the authors reported that the WAI was conducted by one researcher [5–8,10,23,25,30,32,35,37,38,47,48,55,56,58–61]. In one (3%) study [9], the WAIs were conducted by one to two researchers. In 1 (3%) study, the WAI was conducted by a trained interviewer [36], and in 1 (3%) study the WAI was conducted by an interviewer and a trained note-taker [49].

In 8 (26%) studies, no information regarding who was in charge of conducting the WAI was provided [46,50–54,57,62].

Interviewer training. Of the 31 included studies, 5 (16%) reported that the interviewers/researchers were trained or had training in conducting the WAI [5,7,36,59,61]. In the study of Grove [61], the researcher had training and experience in interviewing techniques and participatory research. Two studies (6%) reported that pilot WAIs were conducted in a different study area [57] or in the same study area [62].

Choice of the route. Route choice can be classified according to the typology of WAI presented by Evans and Jones [19], WAI ranges from “natural walks” to “guided walks”; the first type of WAI refers to studies in which the researcher walks a route determined by the participant; the second refers to an interview in which the route is determined by the researcher [19].

Of the 31 included articles, 15 (48%) used “natural walks”, in which researchers together with participants walk along a route chosen by the participant [6,8–10,23,35,36,47–49,51,52,55,59,61], 2 (6%) studies used a more structured approach, “guided walks”, with destinations and routes already predetermined by the researcher [32,62], 3 (10%) studies indicated that the choice

of the route/destination has been joint between the participant and the researcher [5,25,60]. In 11 (35%) studies, no information was provided [7,30,37,38,46,50,53,54,56–58].

Route selection criteria. In 20 (65%) of the included studies, the criteria for selecting the route or destinations for the WAI were described:

1. Walks that are part of the usual routine, usually for utilitarian and/or leisure purposes ($n = 7$, 23%) [8,35,38,48,49,55,59]. Of these, 6 routes chosen by the participant [8,35,48,49,55,59], and 1 no information was provided [38];
 2. Toward places where problems, barriers, or facilitators exist ($n = 2$, 6%) [51,52]. For both studies, the participant chose the route;
 3. Walk in a park ($n = 1$, 3%) [7]. No information was provided about who chose the route;
 4. Walking for transportation ($n = 2$, 6%) [5,62]. One route chosen by the researcher and the participant [5], and a route chosen by the researcher [62];
 5. Toward places that had undergone changes over time ($n = 1$, 3%) [25]. Route chosen by researcher and participant;
 6. In a designed setting ($n = 1$, 3%) [32]. Route chosen by researcher;
 7. Toward a specific location or destination ($n = 6$, 19%) [6,10,36,38,56,60]. Of these, 4 routes chosen by the participant [6,10,36,56], 1 route chosen by researcher and participant [60] and 1 no information was provided about who chose the route [56].
- During walk-along interview:

Type of interview: individual or group. Of the 31 included studies, 13 (42%) clearly mentioned whether the WAIs were individual or group interviews. In 11 studies (35%), only individual WAIs were conducted [5,6,8,25,32,48,51,52,59,60,62]. In 2 studies (6%), both individual WAIs and also in groups of 2 to 5 participants were conducted [9,36].

One (3%) study [61] indicated that some participants were accompanied by a family member or caregiver at the time of the WAI, however this study did not indicate whether the companion participated in the WAI.

Number of interviews for participant. The number of WAIs per participant was reported in 4 studies (13%) [8,47,50,62]. A total of 2 (6%) studies [50,62] reported that a single WAI was conducted for each participant, 2 (6%) studies [8,47] reported that more than 1 WAI was conducted with each participant.

Interview questions. Of the 31 included studies, 11 (35%) reported the use of an interview guide [5,7–10,25,32,36,54,57,61]. Of these studies, 2 (6%) provided the interview guide as supplementary material [36,54] and 2 (6%) [5,10] in the main text of the article.

In 8 (26%) studies, the WAI was conducted using open-ended questions [6,48,49,51,52,55,59,62]. Cao and colleagues [6] indicated that the study allowed participants to speak as freely as they wanted, even if the conversation was beyond the purpose of the study [6]. Twelve (39%) articles did not report the use of interview guides, nor provide information regarding the subjects being addressed during the WAI [23,30,35,37,38,46,47,50,53,56,58,60].

The duration of the walk-along interview. The duration of the walk interviews per participant varied across studies (see Table 4). Among the 31 included articles, 21 (68%) studies reported the duration of the WAI. In some studies, the duration of WAI ranged from 6 to 35 min [7] and others from 2 to 4 h [47]. There are 10 (48%) studies in which WAIs were within a range of up to 60 min [5,7,9,10,36,38,50–52,61], 4 (19%) studies with WAIs within a range of up to 90 min [37,48,57,59] and 7 (33%) studies in which the interview range exceeds 90 min [6,8,23,25,47,55,56].

Distance of the walk-along interview. Of the 31 included studies, 5 (16%) reported the distance of walk interview routes [36,50,55,61,62]. Sun and Lau [62] reported that the distance traveled for each WAI ranged from 443 to 635 m. Carroll and colleagues [55] indicated that it ranged from 0.4 to 4.6 km. Curl and colleagues [50] indicated that the mean walk length was 0.82 miles ($SD = 0.45$), Kou and colleagues [36] from 1.45 to 3.70 km, and finally Grove [61] reported that the distance traveled was 300 m.

Stops or breaks along the route. Of the 31 included studies, 4 (13%) reported whether stops or breaks were taken during the WAI [6,8,9,25]. Saint-Onge [8] mentioned that the participant was offered as many breaks as necessary during the walks, providing places where these could rest along the way, and carrying a folding stool in case the resting spaces were far away. Macintyre and colleagues [25] reported that, on many occasions, it was necessary to stop and spend some time observing the places, in order to ask more detailed questions about the participants' experiences in the places before continuing the walk. Cao and colleagues [6] reported that letting participants talk as freely as they wanted, even if the conversation went beyond the purpose of the study, allowed participants to engage in various activities along the route or stop to chat.

Route tracking. Of the 31 included studies, 8 (26%) WAI routes were reported to be spatially mapped. Two methods were used: (1) routes were drawn manually on printed maps (2 studies, 6%) [6,9] and (2) using a GPS tracking unit (6 studies, 13%) [35,50–52,55,61].

Field/reflective notes. Of the 31 included studies, 11 (35%) indicated that interview notes were taken. In 4 studies (13%) [9,46,47,53] field notes were taken only during the interview, in 2 (6%) studies [8,49], the researchers took field notes during the interview and immediately afterward reflective notes, and in 5 studies (16%), the researchers took reflective notes only after the walk interview [6,10,23,57,61].

Interview recording. Of the 31 included studies, 24 (77%) reported that WAI recordings were performed. Eighteen (58%) studies [5–8,10,23,25,30,35,46,47,50–52,54,56,57,61], used an audio recorder 3 studies (10%), a video camera [36,55,60], and 3 studies (10%) both an audio recorder and also by video camera [32,37,38].

Of these 24 studies, 3 (10%) studies [7,36,61] reported who carried the recorder and/or video camera. In the study by Kou and colleagues [36], the participant wore the chest-mounted video camera. In the study by Veitch and colleagues [7], the participant carried the voice recorder. In the study by Grove [61], the interviewer carried the audio device which was hidden during the interviews so as not to attract the participant's attention and to make the participant feel more comfortable [61].

Photographs during the walk-along interview. Of the 31 included studies, 8 (26%) studies, WAIs were also documented by photographs [5,6,9,38,47,57,59,61]. Of these 8 studies, 4 (13%) studies reported who took the photographs. Two studies reported that the interviewer took the photographs [6,9], 1 study reported that the participant took the photographs [38] and 1 study [59] reported photographs were taken by both the interviewer and the participant.

- After the walk-along interview:

Meeting with participants. Of the 31 included articles, 2 (6%) studies [32,59] reported that the researchers met with the participants after the walk-along interviews. In the study by Luusua and colleagues [32], immediately after the guided walks, participants were also interviewed about their overall experience [32]. Lauwers and colleagues [59], reported that after all the WAI completion, all participants were invited to a workshop to thank them for their participation and to present and reflect on the results of the interim project [59].

- Mixed-method approach

Of the 31 included articles, 7 (23%) studies, reported using WAI as the only method [6,47,53,55,57,60,62], 9 (29%) studies reported combining WAI with sedentary interviews [5,7–9,32,35,36,48,49], 5 (16%) studies combined WAI with geospatial GPS Global Positioning System tracking methods [10,23,51,52,56], 6 (19%) studies combined WAI with focus group or workshops [30,37,50,54,58,59], 2 (6%) studies with mapping [46,61], Yoo and Kim [46] also combined WAI with focus group, and 2 (6%) studies combined WAI with photovoice [25,38].

4. Discussion

WAIs have proven to be a very efficient way of accessing a local community's connections to its environment [19], they are especially useful for studying spatial perceptions and

practices in the physical and social environment [24]. For these reasons, a large number of works have used the WAI over the years and propose various methodological explorations of the tool [26]. However, few works offer the different methodological modalities and variants of the WAI e.g., [19,24], and to the best of our knowledge, there are no published works on the methodological modalities and variants of the WAI applied to research on aging and its relationship to the environment. Therefore, the present review sought to fill this gap from a methodological perspective of data collection.

The objective of this systematic literature review was to identify and synthesize the available evidence on the use of the WAI method to identify correlations of the perceived neighborhood environment and the walking activity of healthy older adults. As a first step, this review allowed us to describe the ways in which WAIs have been used with healthy older adults, focusing specific attention to the methodological aspects related to data collection of this method. In other words, how and in what settings the WAI method has been implemented with healthy older adults. The analysis of the included studies also revealed the strengths and limitations that the authors themselves have acknowledged in using this method, and suggested perspectives for the improvement of data collection.

In total, we found 31 published articles that fall within our selection criteria. We will discuss our findings through five main themes: 1. study characteristics, 2. participants' characteristics, 3. description of the data collection method used, 4. strengths and limits of the included studies and 5. propositions for further studies. For the analysis, we will sub-categorize in the following order: first, general information about the study selection; second, we will detail which study protocol authors refer to when using the one of the terms referring to WAI; third, we will present strengths and limits identified by the authors themselves. Finally, we will conclude with the limits of the review and perspectives when using WAI with healthy older adults.

4.1. Study Characteristics

Of the 31 included articles, about three-quarters ($n = 23$, 74%) were published in the last 5 years, reflecting the increasing use of this method in an older adult population. It is also worth noting that this growing interest is not limited to this target population. Indeed, a search of Web of Science databases using keywords related to WAI only (Ts = ("Marche commentée" OR "Marche commentee" OR "Parcours commentés" OR "Commented routes" OR "Routes commented" OR "Commented walk" OR "Commented Path" OR "Walk-along interview" OR "Go-along interview")) yielded 194 records of which 155 (80%) have been published in the last 5 years. More largely, since the use of WAI method and other spatial qualitative methods to assess walking accessibility is increasing not only for older people, we believe that our systematic review could serve as a basis for future studies that wish to use the WAI method with older adults or another population group.

4.2. Participants' Characteristics

The description of socio-demographic characteristics of participants differed between the included articles. A total of 26 articles (84%) reported the gender of the participants [5–9,23,25,30,32,35,36,38,46–53,55–58,61,62], of these, one study (3%) included only male [38], and another one only female [56] participants. In these 26 studies, the vast majority of participants were female (66.4%). Surprisingly, gender comparison was not conducted. There are suggestions that there are gender differences in the impact of age on walking [63]; therefore, we believe that this aspect needs to be considered in further studies, in addition to clearly reporting the gender of their participants.

The age of participants included varied widely between those studies, from older than 55 years old [6]—our inclusion criteria—to over 90 years old [30]. Differences as well as continuities in young-old, old-old, and the oldest old adults have to be thoroughly studied, considering the long span of years covered and the significant decline in mobility and physical health mobility [64]. Included studies that tested different age groups of participants did not discuss the potential effects of age on the WAI methods used. At

this point, we believe that comparing the use of the WAI method could be of interest to better appreciate potential differences in WAI implementation to help to extract relevant information for each specific age population.

Income ($n = 8$, 23%) [8,9,37,38,47,49,58,62], and education levels ($n = 13$, 42%) [5,7,8,23,36–38,47,49,51,52,58,62] were poorly reported in the included studies, and classifications varied between those. Socio-economic status is observed to be a mediator in transport-related walking frequency [65], and influence recreational walking among older adults [66]. Therefore, assessment of older participant's socio-economic status is needed for future studies when conducting WAI.

Finally, basic anthropometrics characteristics (height and weight) of the participants was not reported in any included studies, so that body mass index was not reported or calculable. At point, however, it is important to mention that overweight and/or obesity is recognized to significantly affect gait stability [67,68], and to increase energy cost of walking [68]. Although these mobility difficulties are observed when walking under rather low challenging conditions, such as walking on a flat, straight, unobstructed, and short corridor in indoor environment without any distractions e.g., [69–75], they are exacerbated under more challenging gait conditions, including walking around curves [76], climbing stairs [77], stepping over obstacles [78,79], or walking while talking [80]. These conditions could presumably significantly increase the risk of loss of balance, trips, and falls in individuals with overweight or obesity [75,81,82]. What is worthy of note is that the above-mentioned challenging gait conditions combine walking with other physically and cognitively demanding tasks that specifically approximate WAI data collection conditions in which a researcher and participant walk together in real outdoor environments on various/irregular road surfaces while the researcher interviews the participant. With these thoughts in mind, we do believe that it is of particular interest to adapt the WAI data collection method according to the characteristics of the participants. More largely, taken together, these findings suggest that socio-demographic and anthropometric characteristics, as well as health-related fitness (i.e., cardiorespiratory endurance, muscular endurance, muscular strength, body composition, and flexibility) and the physical activity level of interviewees should be taken into account to adapt and ensure optimal WAI data collection conditions in an older adult population.

4.3. Walk-along Interview Protocol Data Collection

4.3.1. Environmental Characteristics

As the results show, all of included studies were conducted in urban settings (of these, one (3%) study addressed urban and semi-urban settings [5], and one (3%) urban and rural settings [54]), and 78% of these studies were conducted in Europe ($n = 16$, 52%) and North America ($n = 8$, 26%), therefore, the data collected in WAI and presented in this systematic review have a strong European and North American influence. It is also interesting to note that the countries where the studies were conducted are very similar to the World Health Organization's projections for the countries with the highest proportions of older people in 2050 (e.g., Canada, China, and the U.K.) (see Figures 3 and 4).

4.3.2. When the WAI Takes Place? Seasons, Weather, and Time of Day

The results show that 68% of the included studies reported the seasons of the periods of the year in which WAI was conducted [5–9,32,35–37,46,48,50–53,57–62]. However, very few studies mentioned the influence of weather/temperature during data collection [9,32,35,36,48]. Močnik and colleagues [9], who conducted WAI in the winter season (1 December 2017 to 21 February 2018), indicated that due to the tropical, hot, and humid weather conditions in Singapore, they took additional measures, such as having enough time to stop and rest during the walk, as well as, reminding participants to wear comfortable clothing and footwear for the walk. Kou and colleagues [36] noted that they were unable to perform a WAI due to inclement weather. Lager and colleagues [35] noted that the WAIs were conducted in “good weather conditions [i.e., no snow, ice, or rain, and

not too cold or too hot] and also noted that walks in less favorable weather conditions may have provided additional insights into the experience of older adults and, in particular, the obstacles to traversing the neighborhood space” [35]. Ambient temperature can become a factor affecting participants’ willingness to walk [19]. Talking while walking and simultaneously navigating the urban environment can be challenging for people with balance disorders and visual or mobility impairments [83] without adding adverse weather conditions. However, we are aware that weather and seasonal conditions influence the walking movements of older adults [84–86], so if additional measures are taken when conducting WAIs, rich information could be obtained to understand the influence of weather/temperature on the relationship of the older adults and their environment. In addition to the weather, the time of day at which the WAI was conducted also has an influence since the frequency of social activity may vary depending on the place where the interview is conducted [11].

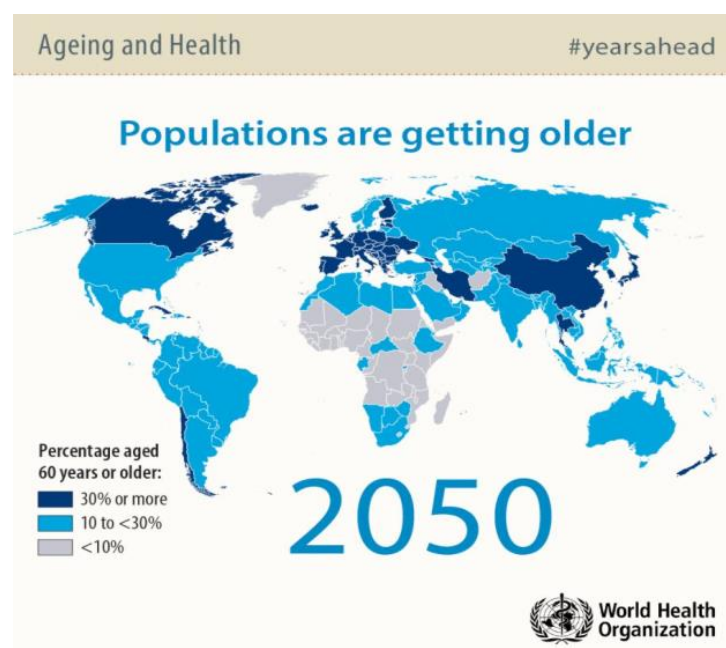


Figure 3. Population over 60 years old in 2050 (projection of the World Health Organization).

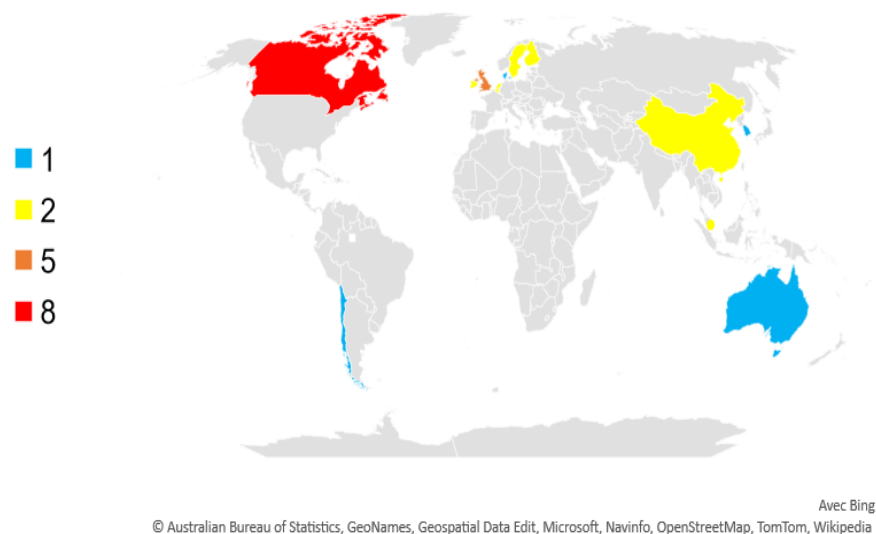


Figure 4. World map of the country distribution where the WAI was conducted.

4.4. Data Collection

4.4.1. Interviews and/or Questionnaires before WAI?

Interviews/questionnaires prior to conducting the WAI were a procedure used in a majority of studies ($n = 21$, 68%). Lager and Colleagues [35] indicated that the aim of the pre-WAI was to elicit experiences, feelings, and memories of the participant's daily life in the neighborhood. Saint-Onge and colleagues [8] noted that the pre-interview served to establish a relationship between the interviewer and the interviewee. Before the completion of the WAI, Grove [61] conducted a semi-structured interview together with a mapping exercise in which participants were required to identify places important to them and their usual routes, which helped to "set the stage" for the live interview that followed [61]. Furthermore, in the study of Sun and Lau [62], where the researchers were the ones who defined the route for the WAI before the WAI occurred, they provided a route map and specific information about crossings, turns, and directions to the participants [62]. The interview/questionnaire before the WAI seems to be a fruitful procedure to be able to connect with the participant, get to know his/her characteristics better, and approach the WAI based on these characteristics.

4.4.2. Who Is the Interviewer?

The results indicated that WAIs were mainly carried out by a researcher/interviewer ($n = 22$, 71%). However, very few studies ($n = 7$, 23%) [5,7,36,57,59,61,62] mentioned whether the interviewer/researcher was trained or if pilot tests had been conducted to carry out the WAI. We believe that this aspect is important to take into account when conducting WAIs; pilot testing is an excellent example. Kou and colleagues [36] conducted three pilot walk-through interviews prior to the start of the study only in order to test the interview protocol and the quality of the audio and visual recording; these pilot tests were not included in the subsequent data analysis.

4.4.3. Interview Guide?

Although only 35% ($n = 11$) of the included articles reported the use of an interview guide, only 4 included it as part of the supplementary material or in the main text [5,10,36,54]. Sundenvall and Jansson [57] reported that they conducted "funnel-shaped interviews" with open questions and more specific questions, first opting for open questions, giving the opportunity to interviewees to narrate in their own words and according to their interest, then continuing with more specific questions.

4.4.4. Typology of WAI, Two Ways to Choose the Route

The route decision for the WAI is an important aspect to take into account. According to the typology of WAI presented by Evans and Jones [19], WAI ranges from "natural walks" to "guided walks". In 48% ($n = 15$) of the included studies in this review [6,8–10,23,35,36,47–49,51,52,55,59,61], the participants set the route and thus also the distance, while in 6% ($n = 2$) [32,62], the route decision was made by the researcher/interviewer. In the study by Luusua and colleagues [32], the researchers did define the route for the WAI, and the WAI was conducted along a path in a park, resulting in a relatively strict interview choreography, characterized by the restriction of the participant's body movements [32]. Other dynamics for route choice were also observed. Macintyre and colleagues [25] included a plan of possible interview routes, which could be adapted according to the individual characteristics of the participants. Herrmann-Lunecke and colleagues [60] defined the routes previously with the residents in neighborhood meetings. In the study by Van Cauwenberg and colleagues [5], the participant and the researcher walked to and from the destination along two different routes, the first route, chosen by the participant and the second return route that was chosen by the researcher based on the availability of different routes. The use of two routes seems to be an interesting option when conducting the WAI, as using two different routes increases the number of different environmental

stimuli encountered during the WAI and provides the participant with environments that they did not walk through [5].

At this point, it is important to note that no study has described the physical characteristics (e.g., slope, presence of sidewalks, presence of stairs, etc.) of the routes along which the WAI was conducted. We believe that this is a very important factor to consider since it is now well established that the physical characteristics of the terrain do influence the walkability of elderly people [87,88].

4.4.5. Duration and Distance of WAI, and Stops/Breaks?

Neither the duration of the route nor the distance of the route was precisely reported in the included studies. On the one hand, indeed, information on the distance traveled during the WAI is in 5 out of the 31 included studies (16%) [36,50,55,61,62]. Furthermore, the ranges are highly variable; for example, in the study by Carroll and colleagues [55], the distance varied between 0.4 km and 4.6 km per participant. On the other hand, the duration of the WAI was reported in 21 of the 31 included studies (68%) [5–10,23,25,36–38,47,48,50–52,55–57,59,61]. As seen for the distance, the time ranges are variable. For example, Carroll and colleagues [55] reported that the WAI duration ranged from 30 min to more than 2 h per participant. No details about the characteristics of the interviews that lasted 30 min and those that lasted more than 2 h were reported. Cao and colleagues [6] reported that the duration of their interviews was between 9 min and over 2 h per participant. These authors observed “that shorter period of walk-along interviews can only elicit participants’ limited feedback towards the surroundings, while those that take more than an hour can provide a more holistic picture of the older adults themselves and their ageing experiences, this confirms Kusenbach [24]’s conclusion that a productive time window for a go-along is about an hour to 90 min” [6] (p. 19).

Although there are two types of WAI (“nature walks” and “guided walks”) [19], in which the choice of the route (which determines the distance and duration of the walk) is established by the participant or by the researcher/interviewer, we suggest that regardless of the type of WAI, the duration of the interview could be determined largely by the participant’s characteristics, as well as his or her health-related fitness (i.e., cardiorespiratory endurance, muscular endurance, muscular strength, body composition, and flexibility) and physical activity level. The above-mentioned characteristics could make it difficult to propose a similar WAI duration with all participants or to comply with the “productive time window” [6,24]. For these reasons, we strongly believe that stops and/or breaks do play an important role in WAIs, especially with the older adults. While there are only 4 studies (13%) that reported having scheduled stops/or breaks [6,8,9,25] either to chat or to rest, two of them [8,25] reported that having conducted them allowed the interviewer to ask more questions and the participant to speak more freely. More largely, if we search for the meanings of WAI, the distance and duration should not only be conceived as objective aspect interacting with socio-demographic and anthropometric characteristics; the subjective aspect of them should also be taken seriously to ensure optimal WAI data collection conditions in an older adult population.

4.4.6. WAI Recording: Route Tracking, Field/Reflective Notes, and Visual/Audio Recording

Even though the mapping of routes using a GPS tracking unit or manual drawing in the WAI is not very common in the studies in this review ($n = 8$, 26%) [6,9,35,50–52,55,61], we consider that it could be very useful for subsequent analyses, to geographically identify the route and the distance traveled by each participant.

Furthermore, while field notes during the interview are a very practical tool to record in real time the events during the interview [47], field notes/reflexive notes after the interview seem to be more interesting if combined with an audio or video/photo recorder for the WAI. For instance, Sundenvall and Jansson [57] recorded WAIs using audio recordings and photographs of the locations that participants described using during the interviews,

supplemented with notes taken directly after each interview on aspects that the audio recording could not capture, such as actions. In addition, video recording of the interview seems to be an interesting tool, as it allows reconsidering the movements and places embodied during the analysis [37] and leaves a rich trace of the brief encounters with the participants in the study [32].

4.5. The Mixed-Methods Approach

The mixed-methods approach can be a great alternative for studying older people in relation to their environment as it helps to better understand the relationships between older people and their living environment [53]. Zandieh and colleagues [51] adopted a mixed-methods approach (Geographic Positioning System (GPS) technology, questionnaire, WAI), which helped to enrich the quantitative study on “perceived neighbourhood built environment attributes and outdoor walking levels” with qualitative information on “how perceived neighbourhood built environment attributes may, in the opinion of older residents, influence outdoor walking levels”, which helped to triangulate the information [51].

4.6. Strengths/Limits and Propositions

WAI as a qualitative method is greatly put forward as a strength by the authors of the included studies [5,7,25,32,36,37,47,48,52,56,61,62]. They underline the importance of the collection of context-specific data [36] such as the (physical, mental, social, and emotional) person-environment interplay [7,23,52,59], place-attachment [61] or micro-spaces [56]. Curl and colleagues [50] even go as far as to provide a checklist “[f]or built environment professionals, including urban designers and planners, as well as highways and civil engineers, landscape architects, municipal authorities and city centre managers, it forms an aide memoire of the elements that are critical within the outdoor environment to minimise the risk of falls by older people” (Guidance notes: Assessment of the local Outdoor Environment).

Due to time-intensive data collection, qualitative research methods are more adapted to smaller samples [6]. This raises the challenge of a representative sampling of research participants [8,9,62], and the exact recruitment terms are not specified in one-third of the studies (10/31). So, rather restrictive conditions of participation (having lived in the neighborhood for a minimum of a year (4/21) or the fact that only one language for communication allowed (7/21) reduce accessibility to the studies and foreclosed the possibility of presenting a more holistic sample, especially for the “hard-to-reach”. A total of 10 out of 21 studies conditioned their participants to be aged 65 years and more. Clearly, delimiting chronological age when researching with/on/about older adults is a handy tool. However, we might miss the main challenge of the aging process, such as the transition moments and push-and-pull factors that enhance sustainable mobility patterns and walkability?

On the other hand, to the best of our knowledge, a very limited number of published studies have conducted the WAI in rural settings [54,89,90]. As an example, we can mention the recent work by King and colleagues [89], who conducted WAI, in-depth interviews, and observation to study the food experiences of older adults living in rural areas in Australia, and the work by Mackay and colleagues [90] who studied rural tourism on multigenerational family farms in New Zealand. Note that the studies by King and colleagues [89] and Mackay and colleagues [90] were not included in the present systematic review as they do not meet the inclusion criteria of the review. A relevant point to note is that all studies included in the present review ($n = 31$, 100%) were conducted in urban settings, while only one of these studies [54] conducted the WAI in both urban and rural settings in Ireland. In this study, Cassarino and colleagues explored the cognitive and sensory dimensions of older adults’ outdoor walking preferences, in which 41% of their participants rated their place of residence as rural (village or countryside).

It is recognized that the differences between urban and rural environments are mainly related to the morphology of urban forms (i.e., characteristics of the street network, volume, and height of buildings, etc. [91]) and their functional configurations (i.e., presence of ser-

vices, mix of functions [91,92], green space [93], etc.) [91–93]. Cleland and colleagues [92] indicated that urban-rural status is an important factor in understanding associations between environment and physical activity among mid-older aged adults. These authors have, for instance, reported that perceived levels of personal safety were significantly more favorable among rural than urban residents aged 55–65 years. Bucko and colleagues [94] reported that a number of factors differed between rural and urban environments, including access to green space or recreational facilities, neighborhood safety, availability of transportation, and presence of pavements. Jo and colleagues [93] found that the proportion of dissatisfaction with all environmental factors related to walking was higher in rural residents than urban residents aged 12–81 years; the presence of dirt or much litter was the source of dissatisfaction that most influenced overall dissatisfaction in rural areas. Cassarino and colleagues [54] observed that older adults in rural areas had lower levels of walking in their neighborhood than older adults in urban areas, which could be related to accessibility to services and amenities. These authors further reported that rural and urban environments are associated with walking for different purposes: “the choice of outdoor spaces was determined by the purpose of the walk (recreation vs. transportation) and also by the level of urbanity of the place of residence: urban dwellers walked for transport in their neighbourhood but drove to green/blue spaces for recreation, with the opposite pattern for rural dwellers” [54] (p. 7).

Aging highlights multiple challenges posed by different environments, which offer more or fewer opportunities and possibilities to their inhabitants in terms of planning and development in both urban and also rural areas [91]. In this context, it seems appropriate to apply the WAI method in every type of walking-related environment, including hence more suburban and rural areas, to have a better understanding of the experience of aging and its interaction with its environment [30,56]. While such differences might be significant, critical social sciences argue about the need to get over this dual “rural/urban” categorization, calling for more studies [95] or presenting administrative new classifications to meet such a reality as INSEE in France [96]. The gender of the participants, on the other hand, was clearly reported in 26 studies, with 24 involving male and female participants (one study involved only males [38] and another one only females [56]). Nevertheless, no gender comparison was conducted, although it is now recognized that male and female individuals appeared to have different gait behavior on flat ground walking [97]. Walking time for leisure is also different between males and females and changes with age [63]. Therefore, it might be relevant for future studies to investigate potential differences between male and female individuals.

Finally, the need for additional, geographically more varied studies remains, as the setting-geographical location, urban/rural [5], season, weather and the hour of the day—highly influences the results of the study [9,32,35,36]. This was partly identified by the authors themselves [35].

4.7. Scoping Limits and Perspectives of the Review

There are some limitations associated with the present systematic review that should be taken into consideration when discussing the findings. Limitations to this systematic review include the search strategy as only four databases were consulted. In addition, the number of articles included is relatively low ($n = 31$), as well as the number of participants (1102 identified as older adults included in these studies). Furthermore, articles not published in English were excluded, so it is possible that other outstanding articles may have been missed. This is unfortunately common practice; however, this could be rectified in future review articles. In addition, the fact that there are many different terms attached to the WAI method, may have limited the research results. Considering that only a limited number of studies clearly define the research protocol, we will suggest a guideline when using WAI with older healthy adults.

Research combining qualitative-participatory methods such as WAI appears to be an emerging area within the study of aging and environments, as the majority ($n = 23$,

74%) of the studies included in this review were published within the last 5 years. The use of WAI can provide a valuable contribution to the development of knowledge about the neighborhood/urban environment relationship and older adults as it can capture situated details about places that are not verbalized during an interview or otherwise discerned and can explore interpretations, helping to generate a deep understanding of person-place relationships [23], the strength of this particular approach lies in its assumed ability to provide access to participants' attitudes, knowledge, and perceptions regarding the surrounding environment [11]. Based on the results of this systematic review, published studies are encouraging us to provide suggestions that could help students, researchers, professionals, and communities to better plan and implement WAI with older healthy adults.

4.8. How to Prepare a “Walk-along Interview”?

Future studies should focus on the following recommendations regarding the data collection method: (1) socio-demographic (age, gender, socio-economic status), and basics anthropometrics (height, weight, BMI) characteristics assessment of the participants should be reported; (2) interviewer preparation in qualitative methods or pilot testing is necessary before beginning the study [5,7,57]; (3) conducting an interview/questionnaire before doing the WAI could represent useful and necessary procedure to have a first contact with the participant [61]; (4) consider weather conditions when conducting WAIs to take precautionary measures [9,35], as well as; (5) the season as an important factor in the analysis, as winter may be associated with less engagement of the person with the outdoor environment [98,99] and heat and sun exposure may also be factors that hinder walking [100]; (6) having an interview guide for WAI [5,8,54]; (7) and combining the two typologies of WAI (namely “nature walks” and “guided walks”) [19], by selecting two different routes [5], can be an interesting technique to apply, as they can reveal more information of the participant's relationship with their environment; (8) duration and distance are two aspects that should be detailed in the studies and considered in the analyses; (9) stop/rest locations for the participant, may provide a time to ask more detailed questions about participants' experiences [25]; as well as; (10) the use of tools such as video cameras/photography in the WAI may provide valuable visual documentation of the participants' everyday life contexts and actions, and serve as excellent stimuli and reminders during data analysis [31,47]. However, we propose the WAI to be audio-taped [11,38] (lavalier microphones are the less intrusive way), (11) use reflexive notes to complete data collection [8,49]. Finally, (12), the mixed-methods approach [10,23,25,54,56], the combination of qualitative, quantitative, geospatial, or survey research methods, can provide useful insights into person-place relationships.

5. Conclusions

To conclude, WAI does provide different sets of opportunities and challenges. Opportunities are to implement paradigm shifts in theory to the data collection processes. This systematical review provides an overview of data collection aspects related to the use of WAI with healthy older adults. The current findings of this review add substantially to our understanding about WAIs as a main tool that will serve as a base for future studies notably for researchers, students, and the professional community.

The WAI method can also be used with other populations, e.g., autistic people [101], and should be addressed in future research, hence helping stakeholders and decision-makers to better understand the needs of the older urban dwellers, their pedestrian behavior, and their walking capacity. Finally, considering neighborhood perceptions of its inhabitants allows cities to become more inclusive and more sustainable.

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