International Journal of Sustainable Development Research
2023; 9(4): 79-88
http://www.sciencepublishinggroup.com/j/ijsdr
doi: 10.11648/j.ijsdr.20230904.13
ISSN: 2575-1824 (Print); ISSN: 2575-1832 (Online)

Review Article

Enhancing Wellbeing in Aging Communities Through Environmental Design Elements: An Integrative Review of Literature in English, Chinese and Italian

Zhang Dongqing[1, 2, *], Nicoletta Setola[1], Chen Yi[2], Eletta Naldi[1]

[1]Department of Architecture, University of Florence, Florence, Italy
[2]College of Architecture and Urban Planning, Tongji University, Shanghai, China

Email address:

dongqing.zhang@unifi.it (Zhang Dongqing)

[*]Corresponding author

To cite this article:

Zhang Dongqing, Nicoletta Setola, Chen Yi, Eletta Naldi. (2023). Enhancing Wellbeing in Aging Communities Through Environmental Design Elements: An Integrative Review of Literature in English, Chinese and Italian. *International Journal of Sustainable Development Research*, *9*(4), 79-88. https://doi.org/10.11648/j.ijsdr.20230904.13

Received: November 16, 2023; **Accepted**: December 7, 2023; **Published**: December 18, 2023

Abstract: Within the context of fostering age-friendly environments, the application of environmental design to enhance the quality of life for elderly individuals has emerged as an important component in the fields of healthy aging and well-being. In order to better guide sustainable health and age-friendly design, it is necessary to understand the development of environmental design for aging in community from a comprehensive perspective. This paper focuses on the research of hot issues and design elements for elder people in residential communities by studying English, Chinese and Italian literature in the past 30 years. The systematic review method is used to sort out the research in English, Chinese and Italian databases, and the keywords are analysed by Citespace software. This analytical process facilitated the identification of clusters and high-frequency words, affording a nuanced comprehension of commonalities and distinctions across research on aging in various senior living environments. From this extensive study of literature, 36 papers have been meticulously selected for in-depth examination. Results demonstrated the current mostly concerned design elements are summarized from five aspects: accessibility, space, aging design, social contact needs and neighbourhood atmosphere. The conclusions about review of hot issues and trends in environmental design in aging in community can contribute to thinking of future direction of healthy aging and sustainable well-being.

Keywords: Aging-in-Community (AIC), Elderly Well-Being, Environmental Design Elements, Literature Review, Citespace

1. Introduction

Over 90% of older adults prefer to aging in their own homes or community instead of institutional care [40]. Gerontologist Blanchard introduced the aging-in-community (AIC) concept and defined AIC as “a grassroots movement of like-minded citizens who come together to create systems of mutual support and caring to enhance their well-being, improve their quality of life, and maximize their ability to remain, as they age, in their homes and communities”. Aging in community is a broader term for aging in place (AIP), the difference between them is that AIC puts the emphasis not only on keeping elderly people at home but also connected through social networks and community-based supports and services, so they can stay even safer at home.

In China, the seniors have long history and traditions to live together with their family members, with at least one adult child, which is a living arrangement with mutual assistance [41]. At a relatively young age, healthy seniors usually look after grandchildren and help with household chores. The elderly care situation in China is mainly the "9073" model. That is, 90% of the elderly are cared for by their families, 7% have community home-based care services, 3% have institutional pension services [42]. Community care for the elderly is a way to better realize the wish of the elderly of AIP,

and is an important direction to improve the environment and quality of life of the elderly in most aging residential area in China now [15].

In order to promote healthy aging and improve the lives of the elderly, the United Nations has proposed a global cooperation project on the Decade of Healthy Aging (2021-2030), involving four areas: Age-friendly environments, Combatting ageism, Integrated care, Long-term care [43]. Most scholars believe that among the above-mentioned fields, a friendly environment for the elderly is the primary factor, which is a key factor in promoting healthy aging. Both the World Health Organization and American Association of Retired Persons emphasized that the basic requirements of community for elderly include: the built environment (open spaces, facilities and structures; transport; housing; social participation, respect and social inclusion; civic participation and employment; communication and information; community support; health services.

At present, there are few studies on the summary of design points of aging in community from the perspective of literature review. Therefore, this article uses citespace software to analyze the literature and guidelines related to aging in community in the past 30 years, which can fill in the gaps in relevant theories and provide designers, architects, strategy makers and other practitioners with a more comprehensive and macro view.

2. Methods

A literature review is an overview of previously published work on a specific topic. The purpose of literature survey is to familiarize and understand the research status and trends of the subject in research field. Due to the large number of literatures related to pension and community, it is difficult to comprehensively summarize the key points and development process of this research field by using systematic review methods. The Citespace software measures literature (collections) in a specific field and performs citation analysis through the drawing of a visual map. After that, according to the quantitative results, key literatures were selected to provide scientific basis for summarizing environmental design points in the field of aging in community within a period of 30 years.

2.1. Citespace Mechanism

Citespace provides two indicators, module value (Q value) and average contour value (S value), based on the network structure and the clarity of clustering, which can be used as a basis for us to judge the effect of map drawing. Generally speaking, the Q value is mainly in the [0,1) interval, and Q>0.3 means that the divided community structure is significant. When the S value is 0.7, the clustering is highly efficient and convincing. If Above 0.5, clustering is generally considered reasonable. According to the collection and calculation of English and Chinese literature, the Q value and S value are both above 0.6, so the clustering is reasonable, and the data results are credible. The detailed analysis standards are as follows.

2.2. Statistics Collection

The search keywords include four main aspects: 1) Elderly related - English: elderly/old-age/active ageing/mental health/barrier free, Chinese: elderly/old-age/active aging/mental health/barrier free; 2) Space and environment related - English: neighbourhood/community/built environment/public space/elderly space/shared space, Chinese: neighbourhood/community/built environment/public space/retirement space/shared space; 3) Community communication related - English: mutual help/cross-generational/multi-generational co-housing/lifetime housing/age-friendly, Chinese: intergenerational mutual help/cross-generational/multi-generational co-living/full-age housing/age-friendly; 4) Design index related—English: ageing design/healthy design/built environment evaluation/spatial effects/index/guide, Chinese: ageing design/healthy design/built environment evaluation/spatial influencing factors/design specification/design guideline.

2.3. Statistics Selection

The selecting principles are as follows: 1) English documents include Google Scholar, SAGE journal full-text database, Web of Science database, ProQuest ®Dissertation full-text database, Pubmed full-text database, University of Florence library SBA database, Taylor & Francis Online, Elsevier Science Direct full-text database, etc; Chinese documents are from Chinese core journals, CSSCI, and the annual conference proceedings of national first-level societies; 2) The main users of the research are the elderly; 3) The research focus is space, in terms of the physical environment. Literatures that only discuss social culture, medical care, family relations and living habits (diet), environmental pollution, vegetation, etc. are excluded; 4) The research objects involve the public space of residential communities, and specific types of facilities (such as housing, gymnasiums, nursing homes, medical facilities) are excluded.

3. Results

According to the selecting criteria, 99 English literatures and 506 Chinese literatures were obtained, which were analysed by Citespace software to obtain research hot issues and high-frequency keywords. On this basis, taking specific guidelines and research about design points as standard, 36 English and Chinese literatures are selected for intensive research, and the design points of current AIC are obtained.

3.1. Software Analysis Outcomes

3.1.1. English Literature Reviews

Using the Clarivate database Web of Science as the search engine, an advanced search based on community pension-related topics and abstract keywords, the literature time is limited to December 31, 2022. Excluding English papers written by Chinese authors, some conferences, newspapers, and irrelevant themes, a total of 99 foreign

English documents related to AIC are obtained. Figure 1 and figure 2 show the clustering results of keywords and timeline results. Each cluster consists of multiple closely related words. The smaller the label number, the more keywords are included in the cluster, which is the most popular research cluster. Currently, the most popular research issues in the field of aging in community are health, built environment, active aging, urban green space and physical activity, etc. According to the statistical results, the top 30 keywords are extracted in the following table 1, the high-frequency words in clustering are extracted in the following table 2.

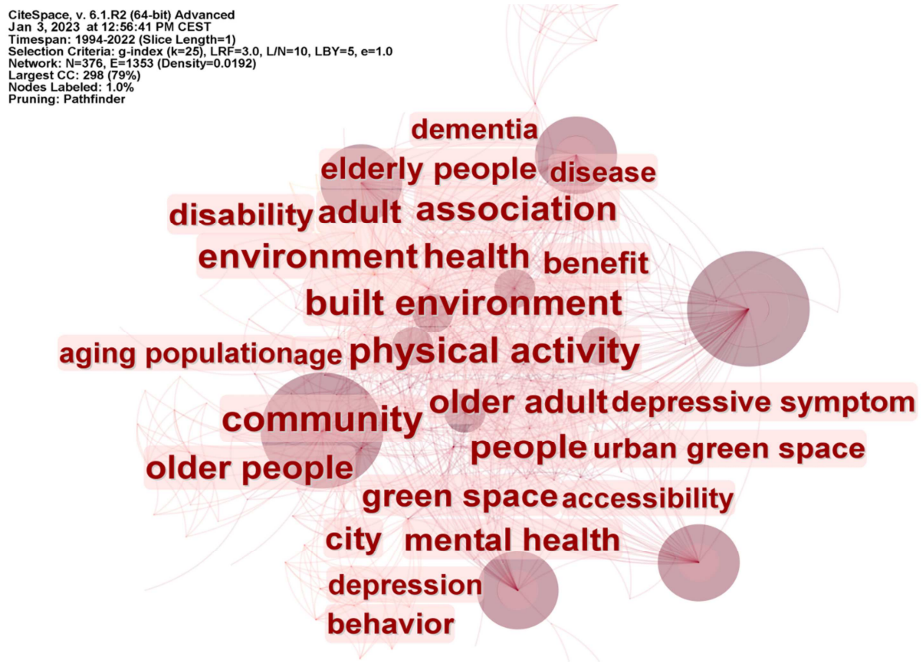

Figure 1. *Keyword cluster analysis results of architectural engineering in the field of aging in community (English Literature from 1994 to 2022).*

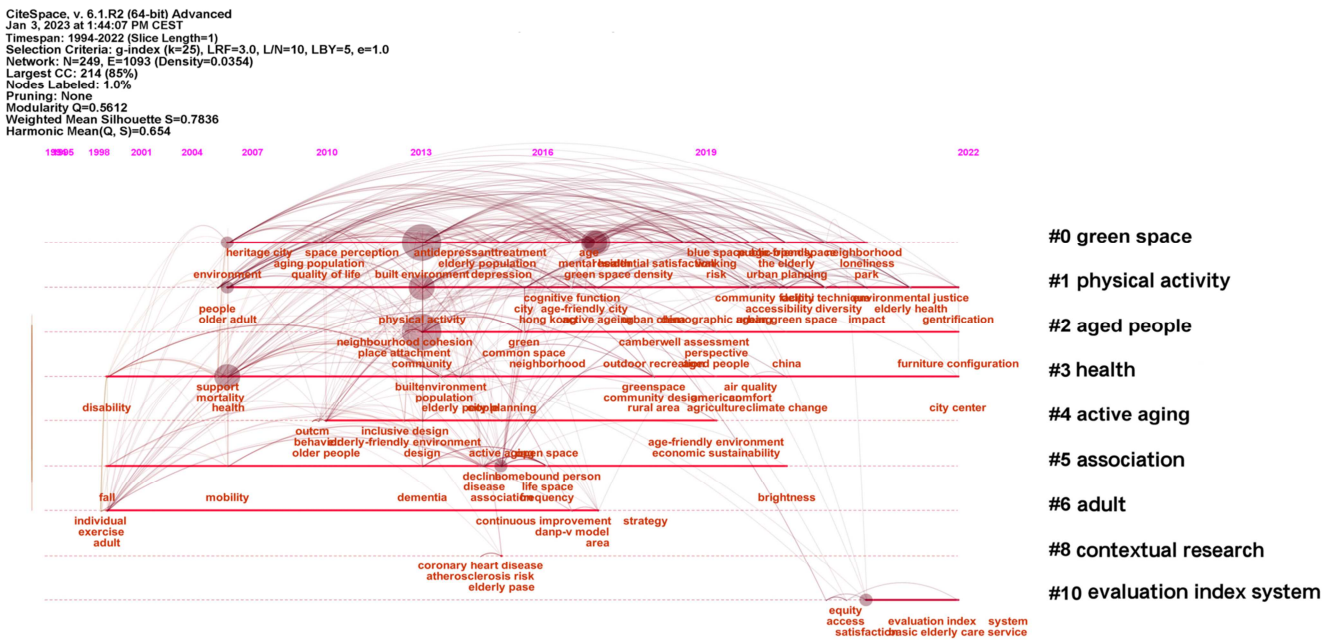

Figure 2. *Timeline analysis results of architectural engineering in the field of aging in community (English Literature from 1994 to 2022).*

Table 1. *Top 30 Keywords of architectural engineering in the field of aging in community (English Literature from 1994 to 2022).*

No.	Frequency	Year of first appearance	Keyword	No.	Frequency	Year of first appearance	Keyword
1	20	2013	community	16	6	2014	elderly people
2	19	2013	physical activity	17	5	2016	city
3	16	2013	built environment	18	5	2010	quality of life
4	13	2006	health	19	5	2020	accessibility

No.	Frequency	Year of first appearance	Keyword	No.	Frequency	Year of first appearance	Keyword
5	12	2006	people	20	5	2006	mortality
6	12	2006	older adult	21	4	2013	design
7	10	2017	green space	22	4	2010	behaviour
8	10	2006	environment	23	4	1999	disability
9	10	2015	association	24	4	2021	impact
10	9	2017	mental health	25	4	2017	benefit
11	8	2016	Hong Kong	26	3	2017	active aging
12	7	2017	age	27	3	2010	aging population
13	7	2010	older people	28	3	2013	dementia
14	6	2020	urban green space	29	3	2020	community facility
15	6	1999	adult	30	3	2017	aging in place

Table 2. *High-frequency words in clustering of architectural engineering in the field of aging in community (English Literature from 1994 to 2022).*

No.	Keyword cluster	High-frequency words (frequency)
1	green space	built environment (17), green space (10), environment (10), mental health (9), age (7), benefit (6), quality of life (5), depression (4), aging population (3), context (2), blue space (2), public open space (2), walking (2), risk (2), loneliness (2), the elderly (2), urban planning (2), park (2), attribute (2), elderly population (2)
2	physical activity	physical activity (19), older adult (13), people (12), Hong Kong (8), city (7), urban green space (6), accessibility (5), impact (4), community facility (3), space (2), diversity (2), urban china (2), urban (2), age-friendly city (2), gentrification (2)
3	aged people	community (20), perspective (2), aged people (2), neighbourhood (2), dense living (2), environmental design (2), furniture configuration (2)
4	health	health (14), elderly people (7), mortality (5), disability (4), population (2), social network (2), support (2), climate change (2)
5	active aging	older people (8), design (4), behaviour (4), active aging (3)
6	association	association (12), dementia (3), mobility (3), disease (3), fall (2), activity scale (2), decline (2)
7	adult	adult (6), area (2), exercise (2)
8	contextual research	elderly phase (2), contextual research (2)
9	evaluation index system	satisfaction (3), equity (2), access (2), evaluation index system (2), compound function (2)

3.1.2. Chinese Literature Reviews

Using CNKI, the Chinese academic journal online publication library, as the search engine, the number of documents in the field of aging in community in China's architectural engineering disciplines has surged after 2001. After an advanced search based on community pension-related topics and abstract keywords, the literature time is limited to December 31, 2022, excluding some conferences, newspapers, and seriously irrelevant literature, a total of 506 Chinese literature related to AIC are obtained. Figure 3 and figure 4 show the clustering results of keywords and timeline results. From this, it can be seen that presently, the popular research issues in the field of aging in community in China are community elderly care, elderly care facilities, aging, home care, and the combination of medical and elderly care. The hotspots displayed by the keyword clustering map are limited and cannot be presented one by one. According to the statistical results, the top 30 keywords are extracted in the following table 3, the high-frequency words in clustering are extracted in the following Table 4.

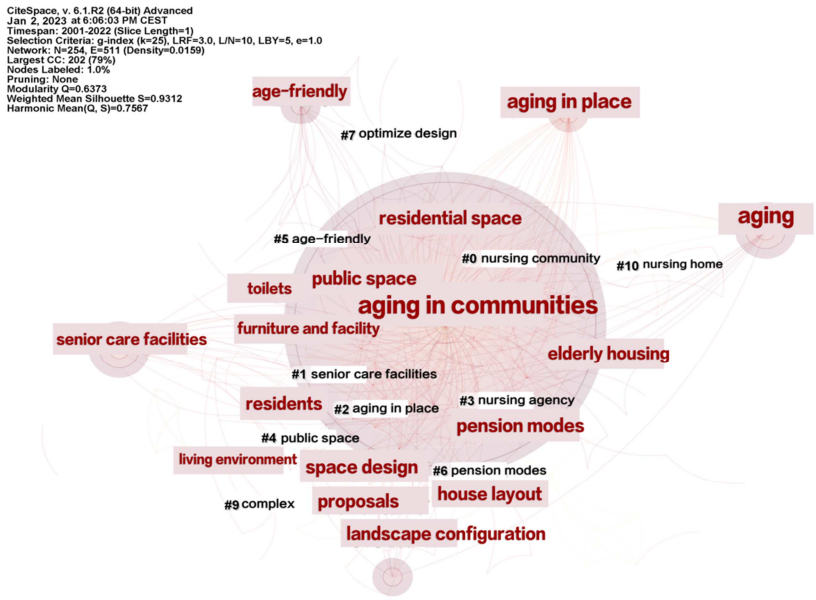

Figure 3. *Keyword cluster analysis results of architectural engineering in the field of aging in community (Chinese Literature from 2001 to 2022).*

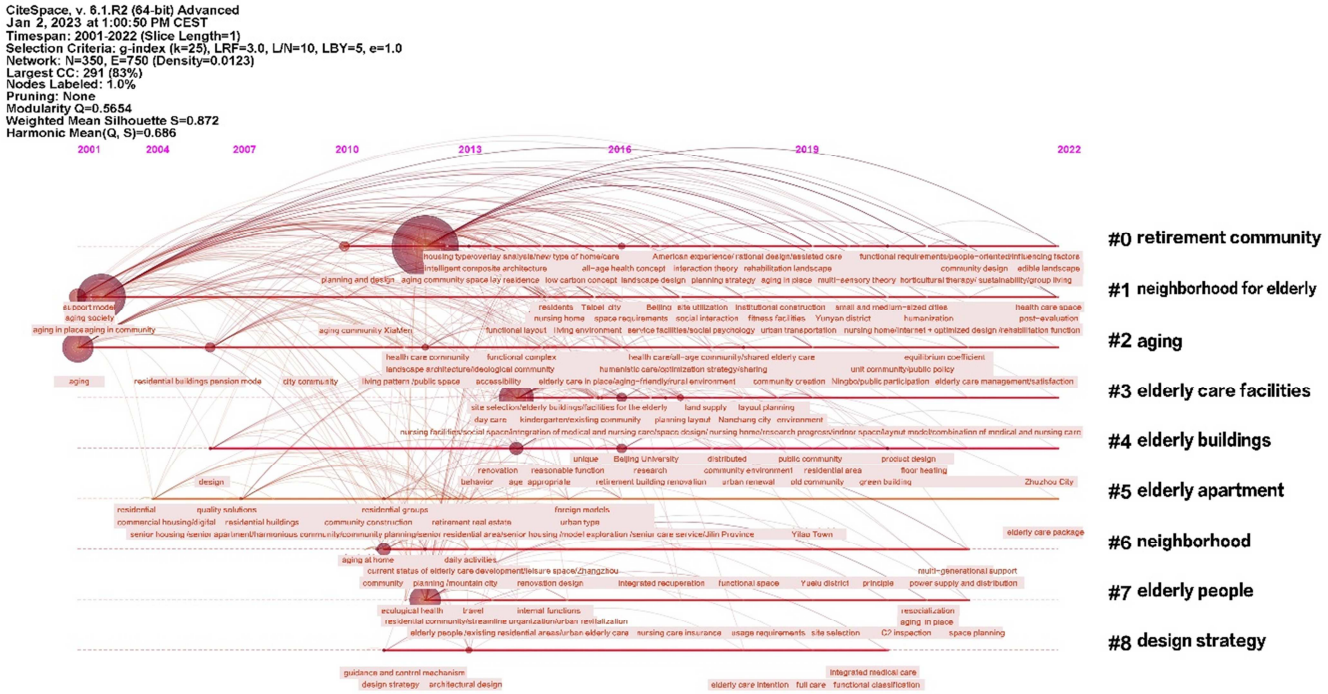

Figure 4. *Timeline analysis results of architectural engineering in the field of aging in community (Chinese Literature from 2001 to 2022).*

Table 3. *Top 30 Keywords of architectural engineering in the field of aging in community (Chinese Literature from 2001 to 2022).*

No.	Frequency	Year of first appearance	Keyword	No.	Frequency	Year of first appearance	Keyword
1	131	2012	retirement neighbourhood	16	11	2016	landscape design
2	82	2002	community-based elderly care	17	11	2006	design
3	56	2001	aging care	18	9	2015	elderly services
4	50	2014	aging facilities	19	9	2012	planning
5	40	2012	elder people	20	9	2007	elderly apartment
6	29	2001	aging at home	21	9	2017	interior design
7	24	2014	adaptive aging	22	9	2011	neighbourhood planning
8	22	2006	pension mode	23	7	2004	housing for elderly
9	19	2011	neighbourhood	24	7	2011	design strategy
10	18	2010	planning and design	25	7	2015	aging at place
11	17	2016	combination of medical	26	6	2016	optimization strategy
12	13	2016	nursing home	27	6	2016	aging
13	13	2011	older people	28	6	2015	living environment
14	12	2012	public space	29	6	2020	old-aged neighbourhood
15	12	2013	architectural design	30	5	2019	urban renovation

Table 4. *High-frequency words in clustering of architectural engineering in the field of aging in community (Chinese Literature from 2001 to 2022).*

No.	Keyword cluster	High-frequency words (frequency)
1	retirement community	retirement community (131), planning and design (18), landscape design (11), planning strategy (4), space layout (4), horticultural therapy (4), health preservation concept (3), all ages (3), American experience (2), community design (2), building mass (2), rehabilitation landscape (2), residence (2), aging in place (2), sustainability (2), functional requirements (2), low carbon (2), professional nursing (2)
2	neighborhood for elderly	neighborhood for elderly (82), home-based old-age care (29), living environment (6), elderly communities (4), service facilities (4), old-age care institutions (3), optimal design (3), intergenerational integration (2), toilets (2), space requirements (2), functional layout (2), occupants (2)
3	aging	aging (56), old-age care model (22), public space (12), home care for the elderly (7), optimization strategy (6), suitability for the elderly (6), humanistic care (5), community building (3), residential mode (3), barrier-free (3), functional compound (3), landscape garden (3), urban community (3), health care community (2), residential area (2)
4	elderly care facilities	elderly care facilities (50), combination of medical care and elderly care (17), space design (9), existing communities (5), planning and layout (5), elderly buildings (4), day care (4), old communities (3), functional configuration (2), medical rehabilitation (2), environment (2), communication space (2), interior space (2), pension station (2)
5	elderly buildings	aging (24), elderly buildings (13), design (11), old residential areas (6), urban renewal (5), renovation (4), residential areas (4), community environment (2), green buildings (2)
6	elderly apartment	elderly care service (9), elderly apartment (9), community planning (9), elderly residence (7), elderly residence (5), elderly real estate (3), mixed community (2), elderly residential area (2), residential group (2)

No.	Keyword cluster	High-frequency words (frequency)
7	neighborhood	neighborhood (19), Pension (13), Planning (9), Residential Pension (2), Functional Space (2)
8	elderly people	elderly people (40), existing residential areas (3), use needs (2), space planning (2), residential communities (2)
9	design strategy	architectural design (12), design strategy (7)

3.2. Extraction of Design Points

Compared with the analysis and statistics of software in a larger range of research hotspots, intensive reading of literature is implemented to specific design measures. The selecting criteria are: 1) National or regional guidelines or indicators of aging community and elderly building; 2) Qualitative or quantitative research related to factors influencing elderly living environment; 3) Literature related to the summary of design points. Based on this, a total of 36 relevant design guidelines and research documents were obtained, including 12 English literature and 14 Chinese literature, 10 Italian literature.

After studying the intensive literature, the overview of environmental design points of AIC is as follows: WHO pointed out in the 2007 Global Age-Friendly Cities Guide that an age-friendly city needs to have the elderly social participation and the respect and tolerance of the whole society. The classification of urban outdoor space includes: environment, green belts and walkways, outdoor rest areas, sidewalks, roads, bicycle lanes, security, services, buildings, and public toilets; architectural design includes: accessibility, interior design, and original residence pension, community integration, housing choice, living environment [9].

In 2000, the American Association of Retired Persons (AARP) defined an age-friendly community as: including affordable and suitable housing, complete community functions and services, and diverse transportation options, etc.[1]. The list of spatial design for elderly homes/community centers in the Architect's Guide to Aging Design compiled by the American Council of Architects in 1985 includes: site analysis, building entrances (lobby, reception area, offices, house maintenance, vertical traffic, activities), etc.), renovation of existing buildings (aging, barrier-free, medical space, etc.) [2];

In the report released by the British community and local government agencies, the content of the elderly-friendly community is divided into the following aspects: 1) resident empowerment 2) public facilities and services 3) architecture and natural environment 4) social network and well-being 5) housing policy [4]. Western scholar Solange Núñez-González et al. concluded in a systematic review of the impact of the built environment on mental health that research papers on aging between 2010 and 2019 focused on the built environment, including: interaction with the natural environment, housing types, indoor design, community green spaces and water bodies, outdoor activities, neighbourhood relations, transportation [7]. ARUP [37] pointed out in the study of ten aging cities in Europe that the focus of shaping aging cities is: social level (demographics, living conditions), built environment (elderly communities, elderly housing), traffic (traffic types, accessible sex), the digital environment (smart devices, social networks).

There are a lot of research on elderly-friendly cities, health and well-being, and intergenerational mutual assistance in Italy. Professor Carmela Gargiulo mentioned in the community and neighbourhood services for the elderly that accessibility, barrier-free access, nearby services, walking environment, community belonging, new forms of using public spaces, etc. These are factors that affect the physical and mental health of the elderly [35]. Three current research directions that are more relevant to building age-friendly cities are: the first aim is to promote the accessibility of adjacent services and open spaces (built and unbuilt); the second aim is to focus on the behaviour of the elderly, such as walking habits, use of amenities, perception of safety, etc.; the third is aimed at increasing the accessibility of major services, especially medical services, public transportation, etc. [36].

In the book Detailed Explanation of Architectural Design of Elderly Care Facilities, Chinese scholar Zhou Yanmin and others start from three aspects of site planning and design: architectural layout, road traffic, and activity venues. The public space in the building includes medical space, rehabilitation space, and public activities, public toilets, public bathrooms, dining spaces, elevators, and lobby spaces [21]; Jiang Lihua and Huang Jiacheng proposed that the construction of a livable community for the elderly should focus on the spiritual environment (communication environment, perception environment), physical environment (fitness environment, Ornamental environment) [14]. The first-level evaluation elements proposed by Hou Keming for the space evaluation system of elderly care institutions include living room space, architectural space, site space, and urban space [13].

According to the existing research, the discussion of the residential community and public space for the elderly includes two levels: the design of the physical environment and the shaping of the spiritual environment, and the focus of the design of the physical environment is on transportation, building indoor and outdoor spaces, and equipment, facilities, etc. The summary of the design points are shown in Table 5 below.

Table 5. *Summary of AIC environmental design points.*

Classfication	Domains	Design points	Contains and Explanation	Reference
physical activity	accessibility	street and travel environment	sidewalks, floor coverings, street greening, lighting, street furniture, corner spaces	[1-5, 7-10, 14, 18, 23, 26, 28, 30, 34, 35, 37]
		access to nearby facilities	whether shops/medical facilities are within walking distance of residents, the convenience of	[1, 3, 4, 8-10, 14, 17, 18, 20, 26, 27, 29, 31-33, 35, 37]

Classfication	Domains	Design points	Contains and Explanation	Reference
			using nearby facilities such as transportation; the intensive complex layout of facilities, and the distance to relatives and children's homes	
		barrier free	entrance and exit, outdoor steps, outdoor ramps, handrails, stairs, elevators, public corridors, parking lots	[1-5, 9, 13, 17-22, 30, 35, 36]
		site	sunshine, orientation, layout, residential density, functional integration, ground material, facility type, natural greening	[2-5, 7, 8, 13, 16-19, 21, 23, 28, 37]
	space and environment	comfort	noise, air, lighting, ventilation, temperature, cleanliness	[3, 4, 6, 9, 12-14, 20-22, 26, 30]
		safety	number of escape exits, escape signs, anti-skid measures, alarm bells, monitoring	[1-4, 9, 14, 19, 20, 22, 24, 26, 30, 31, 34, 35]
		aesthetics	Logo, color, furniture form, interface decoration, material	[4, 7, 11-13, 17, 19, 20, 24]
		interest	mobility design, lamps/furniture modeling	[19, 24]
		ergonomics	furniture, seating configuration, armrests, range of wheelchair movement	[6, 9, 19-21, 24, 26, 28-30]
	aging design	equipment and facilities	special services for the elderly, intelligent teaching, toilets for the disabled, medical and health equipment, self-rescue facilities, and emergency calls	[1-3, 6, 9, 11, 13, 22-24, 26, 28, 29, 31, 32, 35, 37]
		flexibility and diversity	various functions can be set, the walls or partitions can be moved, and the spatial form can be changed	[2, 3, 6, 9, 10, 14, 15, 17, 18, 20-22, 30]
	social contact needs	social participation	organize group activities (activities are easy to complete and do not require special skills), voluntary service, decision-making mechanism with multi-subject participation, intergenerational communication	[1, 4, 7, 9, 15, 16, 18, 26-29, 31, 32, 37]
psychological perception		open communication	views from windows, indoor and outdoor connectivity, visual communication	[15-17, 20, 28]
		community culture	a community/local historical and cultural environment, a home atmosphere	[4, 7, 9, 10, 12, 14, 15, 20, 21, 24, 26-29, 31, 32]
	neighbourhood atmosphere	release of information	installation status of broadcasting/bulletin boards/counters, construction of social networks, ways for seniors to obtain information	[4, 9, 20, 21, 37]
		moderate privacy	privacy of special space	[6, 11, 20, 27]

4. Discussion

From the analysis results of Citespace, the top 30 keywords in English literature include 17 hot issues related to environment, health, and design, 14 of which were proposed after 2010, and other keywords are related to the elderly, aging, welfare, and dementia. The high-frequency words related to the design of AIC are as follows: 1) Green Space includes public space, built environment, blue space, etc. to improve the quality of life of the elderly and relieve their loneliness and anxiety; 2) Physical Activity includes creating an environment suitable for walking and activities with better community facilities and green space; 3) Active Aging includes designing a good community environment by building social Web and offering health to meet requirements of elder people.

The top 30 keywords in Chinese literature include 23 hot issues related to environment, health, and design, 17 of which were proposed after 2010, and other keywords are related to pension models, the elderly, elderly care and other related research hot issues. The high-frequency words related to the design of AIC are as follows: 1) Retirement Community includes by planning, architecture and landscape design, to create a sustainable, low-carbon and healthy community environment; 2) Neighborhood for Elderly includes offering home care, service facilities, caring institutions, living requirements, etc.; 3) Aging includes public space, humanistic care, barrier-free, landscape design and multi-functional blocks, etc.; 4) Elderly Care Facilities and Buildings include medical care, space design, day care, communication, old community renovation, green building and residential groups, etc.; 5) Neighborhood and Design Strategy includes planning, architectural and interior space design, etc..

Judging from the statistical data of English and Chinese keywords and high-frequency words, English literature has fewer hot issues related to environment, health, and design in the past three decades than Chinese literature. Compared with developed countries, China has entered the aging society much later, and the current research is still focusing on the construction of basic elderly care facilities and the improvement of related service. The high-frequency words in the English literature focus on green space, physical fitness, and active aging, while the high-frequency words in the Chinese literature focus on planning, community and

architectural design, and service facilities.

From the summary of the design points of intensive reading literature, the design points of the current community elderly care is to improve the quality of both physical and mental environments. At the physical level, by improving auxiliary facilities, the goal is to give the elderly greatest degree of freedom and alleviate their physical decline; At the mental level, by establishing social networks and other ways to allow elder people to participate more in social life. In the existing guidelines and environmental factors related to AIC, the primary focus domain of physiological activities is accessibility, which is related to the decline of physical functions and limited range of activities of the elderly. A good walking environment determines the extent to which the elderly can participate in social life. Its design points include streets and travel environment design, the convenience to adjacent facilities, and barrier-free facilities. The second domain is the space and environment. Creating a safe, healthy and comfortable space environment is needed by people of all ages. The design points include site planning, comfort, safety, aesthetics and interest. The third domain is aging design, including furniture, smart devices, service facilities, which is specially designed for the elderly group, and is more inclined to furniture and product design. In terms of psychological perception, the current design focus is to meet the needs of leisure social interaction and neighborhood belonging, which is related to the shrinking family structure, the improvement of community functions, and people's higher requirements for spiritual life in their later years. The design points include carrying out various activities, designing a more open and inclusive communication environment, increasing the participation of the elderly from the aspects of community culture and social network, in order to realize a better AIP.

At present, the assistance at these two levels is aimed at the elderly as a single service object, nearly all the products and service are designed for the elderly, such as elderly activity centers, day care centers and other specialized elderly care institutions. From the perspective of alleviating the loneliness of the elderly, the isolated minority groups themselves do not want to be treated alone. Today, when the whole world is calling for the reduction of age discrimination, the practice of improving the physical and mental health of the elderly should be consistent with the whole-age design and cross-generational design, combined with mutual assistance and communication between generations. Cross-generational behavior should not only exist in activities, organizations and initiatives, but create a space conducive to cross-generational communication through the design of the physical environment, such as creating more shared spaces for the elderly and children in the community, so that the elderly can feel needed, integrating their spiritual needs into daily community life.

5. Conclusion

In general, through the literature review and analysis related to AIC, it can be seen that:

1) Citespace software analyses the keywords and high-frequency words of current English research hot issues, including community, built environment, health, physical activity, active aging, etc., and the Chinese research hot issues include retirement community, planning and design, architectural space, elderly care facilities, barrier-free, etc.;

2) From intensive reading literature related to guidelines and specific influencing factors, the current design points related to AIC are mostly concentrated in accessibility, space and environment, aging design, social contact needs, and neighbourhood atmosphere;

3) The future design of community for elderly health and well-being can not only target a single group of the elderly, but combine the cross-generational population design and create more shared spaces to meet the spiritual needs of the elderly.

ORCID

Zhang Dongqing: 0009-0005-9362-9493
Nicoletta Setola: 0000-0002-0632-5354
Eletta Naldi: 0000-0001-5732-4776

Conflicts of Interest

The authors declare no conflicts of interest.

References

[1] AARP, Livable Communities: An Evaluation Guide [Z]. 2005, AARP Public Policy Institute: Washington, DC: 1-6.

[2] American Institute of Architects and American Institute of Architects Foundation. Design for Aging: An Architect's Guide [M]. New York: AIA Press Inc., 1985.

[3] F Manzi, M Del Riccio, E Naldi, N Setola, C Dellisanti, C Lorini, G Bonaccorsi. Elements of the built environment that can promote physical activity in elderly: an umbrella review [J]. European Journal of Public Health, 2020, 30(5): ckaa165.236.

[4] Harding, E. Towards lifetime neighbourhoods: designing sustainable communities for all [J]. 2007: 8.

[5] Hatice Sonmez Turel, Emine Malkoc Yigit, Ipek Altug. Evaluation of elderly people's requirements in public open spaces: A case study in Bornova District (Izmir, Turkey) [J]. Building and Environment, 2007, 42(5): 2035-2045.

[6] Moos, Rudolf H., Lemke, Sonne. Community Mental Health and Behavioral-Ecology: A Handbook of Theory, Research, and Practice [M]. Boston: Springer US Inc., 1982, P357-371.

[7] Solange Núñez-González, J. Andrés Delgado-Ron, Christopher Gault, Adriana Lara-Vinueza, Denisse Calle-Celi, Riccardo Porreca, Daniel Simancas-Racines, "Overview of "Systematic Reviews" of the Built Environment's Effects on Mental Health", Journal of Environmental and Public Health, vol. 2020.

[8] Suzanne Audrey, Harriet Batista-Ferrer. Healthy urban environments for children and young people: A systematic review of intervention studies [J]. Health & Place, 2015, 36: 97-117.

[9] World Health Organization. Global age-friendly cities: a guide [M]. Switzerland: WHO Press, World Health Organization, 20 Avenue Appia, 1211 Geneva 27, 2007.

[10] Yvonne L. Michael, Mandy K. Green, Stephanie A. Farquhar. Neighborhood design and active aging [J]. Health & Place, 2006, 12(4): 734-740.

[11] Cai Z Y, Liu C J, Wei X Y, et al. Characteristics Research of "Institutionalization" of Indoor Space in Care Facility for the Elderly in China Taking Three Elderly Care Facilities in Nanjing as an Example [J]. Chinese Hospital Architecture and Equipment, 2021, 22(05): 78-84.

[12] Chen Y, Chen C M, Liu Z Y, et al. The methodology function of CiteSpace mapping knowledge domains [J]. Studies in Science of Science, 2015, 33(02): 242-253.

[13] Gong Y F, Yu J M. Indoor Space and Environment Design Based on Visual Characteristics of the Elderly Taking Jinzhou Comprehensive Elderly Service Center as an example [J]. Housing Science, 2019, 39(01): 21-24.

[14] Hou K M. Spatial Evaluation and Optimal Design of Pension Facilities [M]. Nanjing: Southeast University Press, 2020.

[15] Jiang L H, Huang J C. The Demand of the Aged and Livable Community Construction [J]. Journal of East China University of Science and Technology (Social Science Edition), 2011, 26(06): 87-92+113.

[16] Li Q L, Li B, Li H. The Living Behavior Mode in Elderly Facilities [J]. Journal of Architecture, 2014(S1): 108-114.

[17] Lu W, Zhou B, Liu H, et al. Study on Spatial Constitution of Institutional Senior Housing Take Institutional Senior Housing in Dalian and Shenyang as Examples [J]. Journal of Architecture, 2010(S2): 81-85.

[18] Lv Y, Cao X F, Zhang J. Research on Construction Strategies of Public Space Shared by the Old and Young in Friendly Community [J]. City and House, 2019, 26(11): 50-56.

[19] Xu Y S, Zhou D, Liu K J. Research on the Elderly Space-time Behavior Visualization and Community Healthy Livable Environment [J]. Journal of Architecture, 2019(S1): 90-95.

[20] Tang D W. Research on Architectural Programming of Community Senior Care Facility Based on the Supply and Demand Mechnism of the Senior Care Service [D]. Tsinghua University, 2019.

[21] Zeng S Y. An Analysis and Comparison of Environmental Evaluation Scales for Elderly Care Facilities in America and Japan [J]. Journal of Architecture, 2009(69): 191-210.

[22] Zhao X Z. Elderly Care Facilities and Residential Buildings for the Elderly: An Introduction to Residential Buildings for the Elderly at Home and Abroad [M]. Beijing: China Architecture & Building Press, 2010: 98-117.

[23] Zhou Y M. Housing for the Elderly [M]. Beijing: China Architecture & Building Press, 2011: 98-117.

[24] Zhou Y M. Design and Interpretation of Elderly Care Facility [M]. Beijing: China Architecture & Building Press, 2018: 88-95.

[25] Zhou Y M, Qin L. Summary of Design Experience of Japanese Elderly Care Facilities [J]. World Architecture Guide, 2015, 30(03): 30-33.

[26] Bosia, Daniela; Yu Zhang; Thiebat, Francesca; Savio, Lorenzo. Age-friendly cities: spazio pubblico e spazio privato. [J]. TECHNE: Journal of Technology for Architecture & Environment, 2017, 14: 321-329.

[27] Cappellato Valeria, Mercuri Eugenia. Invecchiamento attivo tra opportunità e rischi: il caso di una città metropolitana. [J]. Vita e Pensiero, 2022, 249-265.

[28] L. Carrera. Gli anzi-ani e la domanda di città. [J]. SocietàMu-tamentoPolitica, 2020, 11(21): 203-211.

[29] Stefania Giada Meda. No Country for Old Men? Italian Families Facing the Challenges of an Aging Society. [J]. Journal of Comparative Family Studies, 2014, 45(2): 275-292.

[30] Tommaso Zanini. Pianta architettonica progetto per il CSA di reggio emilia. [J]. Assistenza Anziani, 2006, 7: 22-25.

[31] Barbabella F, Cela E, Di Matteo C, Socci M, Lamura G, Checcucci P, Principi A. New Multilevel Partnerships and Policy Perspectives on Active Ageing in Italy: A National Plan of Action. [J]. Public Health. 2020, 17(24): 9585.

[32] D'Amen, B.; Socci, M.; Di Rosa, M.; Casu, G.; Boccaletti, L.; Hanson, E.; Santini, S. Italian Adolescent Young Caregivers of Grandparents: Difficulties Experienced and Support Needed in Intergenerational Caregiving—Qualitative Findings from a European Union Funded Project. [J]. Public Health 2022, 19, 103.

[33] Zang P, Xue C Q L, Lu Y, et al. Neighbourhood adaptability for Hong Kong's ageing population [J]. Urban Design International, 2019, 24(3): 187-205.

[34] Gharaveis, A. (2020). A systematic framework for understanding environmental design influences on physical activity in the elderly population. Facilities. https://doi.org/10.1108/F-08-2018-0094

[35] Carmela Gargiulo, Gerardo Carpentieri, Federica Gaglione, Sabrina Sgambati, Floriana Zucaro. Le ageing cities tra passato e futuro. Strategie, metodi e proposte per migliorare l'accessibilità degli anziani ai servizi urbani [M]. Napoli: Federico II University Press., 2021, P357-371.

[36] Carpentieri, G., Guida, C., & Masoumi, H. E. Multimodal accessibility to primary health services for the elderly: A case study of Naples, Italy [J]. Sustainability. 2020, 12(3): 781.

[37] Arup, Help Age International, Intel, Systematica, (2015). Shaping Ageing Cities: 10 European case studies. Disponibile al link: https://ifa.ngo/publication/demographics/shaping-ageing-cities-10-european-case-studies/

[38] Brenna E. Il ruolo della famiglia nell'assistenza agli anziani in Europa e in Italia. Un'analisi basata sui dati Share [J]. Politiche sanitarie 2021; 22(1): 1-11 doi 10.1706/3572.35550.

[39] Schaff, G., Vanrie, J., Courtejoie, F. et al. Architecture and ageing: lessons learned from a cohousing project. Journal of Housing and the Built Environment (2023). https://doi.org/10.1007/s10901-023-10039-9

[40] Binette, J., & Vasold, K. (2018). Home and community preferences: A national survey of adults age 18-plus. AARP Research. https://www.ncoa.org/wp-content/uploads/8-3-12-US-of-Aging-Survey-Fact-Sheet-National-FINAL.pdf [Google Scholar].

[41] Chen, Jieming, and Qi Chen. "Socioeconomic statuses across generations and coresidence in China." The Journal of Chinese Sociology 3 (2016): 1-21.

[42] Zhu, Hao. "Spatial matching and policy-planning evaluation of urban elderly care facilities based on multi-agent simulation: Evidence from Shanghai, China." Sustainability 14.23 (2022): 16183.

[43] Keating, Norah. "A research framework for the United Nations Decade of Healthy Ageing (2021–2030)." European Journal of Ageing 19.3 (2022): 775-787.