

A REVIEW ON INTERGENERATIONAL COHOUSING: A POSSIBLE LIVING OPTION FOR ELDERLY AND YOUTH

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Abstract. The increasing preoccupation of individuals with their daily lives and jobs poses a challenge in connecting with older generations. To address this issue, the concept of co-living arrangements can serve as a strategy to instill concern for the elderly in the minds of younger members of society. This study aims to explore the viability of intergenerational co-living as a housing preference for the elderly. The research evaluates the advantages and disadvantages of cohousing from two perspectives: the physical environment and social interactions. While mixed-age approaches aim to integrate different generations for mutual support and assistance, the study suggests that planning and design strategies should also consider the aging process of the elderly. It proposes that an intergenerational community can be a viable alternative to age-specific care housing, care models, and private home living. The main objective of this review is to understand how the design of a living space can influence the residents' lifestyle, creating an environment that fosters various emotions and positively impacts the human mind through supportive interactions and engaging activities for both the elderly and the youth, while respecting individual privacy. The study explores different types of co-living arrangements, including cohousing, home-sharing, and housing association-supported intergenerational living. Through analysis, four major attributes are identified as key factors contributing to the feasibility of co-living and intergenerational living in today's context: social support, social isolation, sense of community, and sense of security. The research findings conclude with design recommendations based on these attributes and opportunities, offering valuable insights for the successful implementation of co-living and intergenerational living spaces that create a supportive and thriving environment for residents of all ages.

Keywords: *Co-living community, residential environment, cohousing, health, well-being, space, architecture, intergenerational experience.*

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Received: 25 March 2023;

Accepted: 5 August 2023;

Published: 8 December 2023.

1. Introduction

Co-living concept is an initiative to develop a platform for older people and young people to share experiences. The demographic changes brought about by the growing aging population in India is creating increasing pressure on housing and social care

How to cite (APA):

Nayak, S.R., Dash, S.P., Amin, P.S., & Priyashantha, K.G. (2023). A review on intergenerational cohousing: A possible living option for elderly and youth. *New Design Ideas*, 7(3), 535-556.

provision. Co-living can be broadly defined as an alternative housing model which seeks to promote social contact through the living environment which could be achieved in different ways. It could be on a small individual scale, where an older person is matched with a younger person in order to provide support and companionship. It refers to a housing arrangement where individuals or sometimes small groups live together in a shared space. Co-living spaces are typically designed to provide private bedrooms or units along with shared common areas. The primary focus of co-living is on creating a more social and collaborative living environment (Carrere *et al.*, 2020). It refers to a type of intentional community where individuals or families live in private homes or units within a larger shared property. As stated by Dash & Thilagam (2022), the key characteristic of cohousing is the emphasis on creating a strong sense of community and shared resources among residents. Typically, cohousing communities are designed to promote social interaction and cooperation while also respecting individual privacy. "Intentional communities" are formed when a group of people buy a site or an existing building together and create a self-managed combination of private dwellings and communal spaces, or when existing housing is adapted to allow for communal living. (Quinio & Burgess, 2019).

Like India, many other developing countries in the world is witnessing the rapid aging of its population. This is compounded by the relative lack of appropriate housing options for later life and the fact that older people are particularly exposed to loneliness and isolation. The transformation of urbanization, modernization, and globalization has led to shifts in the economic framework, the deterioration of traditional societal values, a decline in social cohesion, and the weakening of social institutions like the extended family. The younger generation's traditional sense of duty and obligation towards the older age is eroding. The older generation is caught between the decline in traditional values on the one hand and the absence of an adequate social security system on the other.

Co-living has been proposed as one remedy to address loneliness and this lack of diversity in available housing options, an alternate housing option that could address concerns of loneliness and isolation in particular, as well as address vulnerability among an increasing age group. (Quinio & Burgess, 2019). Recently, increasing numbers of scholars are paying attention to older people's living needs, especially those related to their housing environment and social lives. Due to the aging of the population and a constant increase in life expectancy, 'aging in place' has emerged as a necessary and valuable guiding strategy in addressing and meeting the needs of elderly people. Aging in place is described as "continuing to live in the community with a degree of freedom rather than residential care" (Davey *et al.*, 2004). "cohousing" has gained significant public attention and is viewed as a potential living alternative for those who want to age in place (Wang & Pan, 2021). Change in family patterns, impact of the western cultures, interpersonal relationships and change in the mindsets of young generations urge towards the need to propose a co-living space to bring both youngsters and elderlies together (Figure 1). There has been researches on the potential benefits of intergenerational co-living spaces, which bring together individuals of different age groups in a shared living environment. Such spaces may offer opportunities for mutual support, learning, and socialization between individuals of different generations. As per Chitgopkar et al (2020), Intergenerational co-living contributes to the emotional well-being of residents by providing a supportive and diverse community. Older adults may experience a sense of purpose and fulfillment through their interactions with younger residents, while younger residents can benefit from the wisdom and life experiences of older adults. It fosters a

sense of community and mutual support. As stated by Dash & Thilagam (2022), older residents can offer guidance, wisdom, and mentorship to younger residents, while younger residents can provide technological expertise, assist with day-to-day tasks, or offer a fresh perspective. Co-housing model is characterized by participatory design, where residents actively engage in the planning and development of the community. It combines private homes with shared facilities, emphasizing the importance of social connections and community-oriented living. Residents in co-housing communities share responsibilities and participate in decision-making processes, fostering a sense of collective ownership and collaboration. Sustainability and environmental considerations are often prioritized, and diverse age groups and backgrounds are welcomed, encouraging intergenerational interactions and mutual support. Overall, co-housing offers a unique living arrangement that promotes community, shared resources, and a sense of belonging within a supportive and sustainable environment. However, concerns have also been raised about potential conflicts and challenges in creating a cohesive community.



Figure 1. Depicts the attributes contributes towards the need of co-living spaces
(Source: Collated by Authors)

Past research on co-living spaces for both elderly and younger individuals suggests that these spaces can offer benefits in terms of socialization, community building, and access to support services. However, more research is needed to fully understand the potential challenges and benefits of co-living spaces in different contexts and for different populations.

This study investigates whether the intergenerational cohousing model (mixed-age cohousing) can be a possible supportive living option for aging in place. The research aims towards addressing the four major aspects related to the ageing of elderlies as mentioned below:

- a) *Understanding the concept of aging in place in a cohousing environment:* It could provide knowledge not only for increasing the home-environment adaptation of older residents but more importantly, the findings of this study can enrich the meaning of ‘aging in place and provide more explanations for cohousing community living (elderly and youth). A needs-based approach to aging populations undervalues the worth of older people and their contributions to society. Obviously, living longer is a positive thing, but people must ensure to live stronger, with purpose, and with a sense of belonging. Intergenerational cohousing and senior cohousing are the two types of cohousing that are most closely associated with older people. This study focuses mainly on intergenerational cohousing. When discussing older people’s needs and their current living status, it is important to understand the term ‘aging in place’ (Wang & Pan, 2021a). It is important to describe daily duties, environmental barriers, functional limits, and housing preferences among residents, especially for older

persons, when discussing which sort of house design in a cohousing community can result in a better and independent lifestyle. The older generation's everyday activities and participation are greatly influenced by their home environment. (Wang & Pan, 2021b)

- b) *Investigating the spatial program that supports the needs of all ages:* “Affordability” for instance, communal housing with private living units and some shared spaces not only reduces the cost of living but also encourages social interaction between residents. To be able (economically) to live in adequate housing is an essential right of everyone, and affordability is also a tool for the creation of a strong supportive community with mechanisms of mutual support and self-help. And for instance, communal housing with private living units and some shared spaces not only reduces the cost of living but also encourages social interaction between residents an important element of home shares is that the householder does not need or receive personal care or medical care from the home sharer. Older householders benefit from an element of practical support and companionship, enabling them to stay in their homes for as long as possible. For householders, the primary aim of home-sharing is to improve well-being (specifically mental health), reduce loneliness and isolation, and to receive practical help with household tasks to maintain independence at home. For home sharers, the primary aim is to provide access to affordable housing and better-quality accommodation.
- c) *Developing a socially responsible environment:* Architecturally the environment should prevent social isolation and conflicts between generations and at the same time promote a sense of community and encourage social interaction and to accommodate services and facilities (both public and commercial) that are required in the local neighborhood. In this way, development can act as a catalyst in an area, whilst providing for its own residents in a financially sustainable way. This will take different forms in each context. This works best when a development connects into the social neighborhood first, which can be achieved through a collaborative design process with local people. In this way, schemes can benefit from local knowledge and gain local acceptance ensuring the viability of services and facilities. (Epimakhova, 2016).
- d) *Addressing the attributes of Universal design:* It is crucial that pathways and spaces in the built environment have a universal character and be physically accessible to every user with various physical, cognitive, and age-related abilities and important attributes of a healthy community is designing compact, high-density, mixed-use, and walkable environments. These features make the environment physically accessible to everyone. Another dimension of accessibility is that physical access of the built environment refers also to services available at an acceptable distance that could be freely reachable by everyone. It is crucial that pathways and spaces in the built environment have a universal character and be physically accessible to every user with various physical, cognitive, and age-related abilities. The principles of universal design are forward to make the environment and other design products usable by everyone. universal Design is also targeted on the prevention of errors and accidents. This feature makes the environment safe for usage by everyone. The issue of protecting the living environment from crime is another essential dimension of quality in the built environment. Wood described the importance of a strong sense of

community and territorial identification to strengthen the behavior and attitudes of residents to protect their community. One of the methods to increase the responsibility for the built environment and evoke a protective attitude of residents for their community is to make it adaptable which means an environment that is able to respond to the individual needs of every user and to accommodate future changes in these needs. (Epimakhova, 2016).

Based on the four aspects addressed above and the background study, the focus of the research is towards addressing the following research questions:

How can intergenerational cohousing be a positive living option to support aging in place for older people?

1. How architecture can play a role in improving the quality of lifestyle of the senior aging population.
2. What are the effective strategies that can be applied to achieve it? How a common platform can be created through design for developing intergenerational relationships between a senior aging population with youth?
3. How built environment can contribute towards sharing knowledge and experiences of both generations?

2. Methodology

2.1. Search

The literature review commences by conducting keyword searches on several platforms such as Scopus, Wiley online library, Research Gate, Google Scholar, Elsevier, Lens.org, and PubMed. Selected articles published between 2010 and 2022 are included without any geographical limitations. The search was conducted focusing on exploring the literature regarding the feasibility and benefits of intergenerational co-living as a supportive living option for the elderly. To organize the retrieved articles, an advanced search function is utilized, employing search keywords like “co-living”, “elderly”, “youth”, and “intergenerational aspects”. The search results are then conducted using two-phase process, involving the use of "OR" and "AND" operators to link two sets of search outcomes. Finally, the findings are presented through narrative evidence. The review intends to extract the various attributes of cohousing living and the detrimental factors that influence the design of intergenerational cohousing for the youth and elderly which is analyzed through VOS viewer analysis (Priyashantha *et al.*, 2022) and findings.

The study involved 3 stages: Collection of data: finding of research papers through various sites, Sorting of data and the research outcomes. Of the 48 articles identified, we selected full-text 26 articles. 10 studies analyzed the impact of cohousing on the elderly. Around 10 had a positive association with the co-housing concept. In addition, 10 studies analyzed one or more psychosocial determinants of health (such as social support, sense of community, and physical, emotional, and economic security), and most found a positive association that could be used to study the spaces that need to be built for cohousing community. Through these determinants, quality of life, well-being, and health could be improved.

During the sorting process in excel, the number “0” “1” and “2” were used. Where “0” refers to excluding the papers, “1” refers to including the paper, “2” refers to maybe might be useful or not”.

2.2. Screening

The following information were extracted from each study: Authors, author id, title of the paper, year, source title, issue, Doi links, affiliations, abstract, keywords, publisher, language, document type, publication type, open access (yes or no), source, pdf (yes or no). The authors used PRISMA-2020 model towards the screening of the papers for review which is conducted for inclusion in the review, based on predefined inclusion and exclusion criteria. This involves reviewing the titles and abstracts of all identified studies, and then reviewing the full text of potentially relevant studies (Figure 2). The PRISMA model (Shamseer *et al.*, 2015) provides a structured and comprehensive framework for reporting systematic literature review that ensure transparency and completeness in reporting the review process, including the identification, screening, eligibility assessment, and inclusion of studies. This comprehensive reporting enables the researcher to evaluate the review's methodology and assess the validity of its findings. This model helped to scrutinize the papers which are exclusively related to intergenerational aspects and cohousing features and to review the past researches conducted addressing this issue which is the focus of the paper.

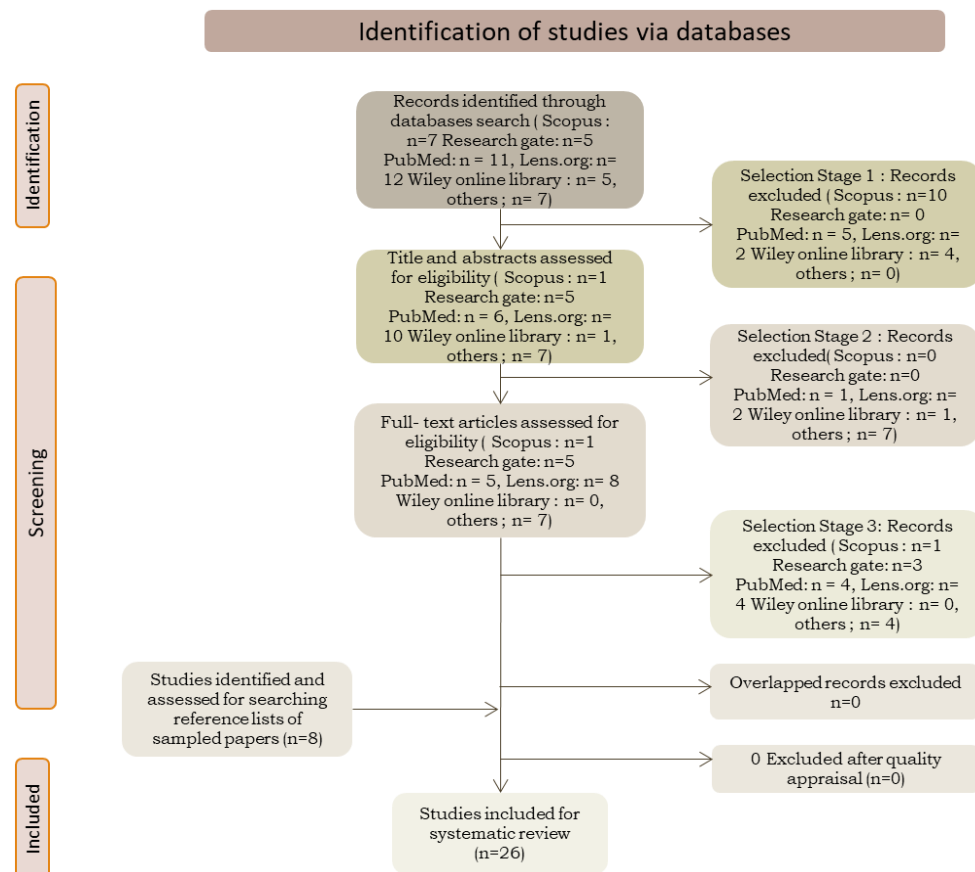


Figure 2. PRISMA 2020 article selection process (Source: Authors)

When selecting papers for a systematic literature review on intergenerational cohousing, several criteria are considered to ensure the relevance and quality of the included studies. These criteria typically focus on the topic, study design, data sources,

and publication status. Firstly, the papers should specifically address intergenerational cohousing, examining the social, environmental, and economic aspects of this housing model. Studies that explore the benefits, challenges, design considerations, and outcomes of intergenerational cohousing are particularly relevant. Secondly, the study design of the papers should meet certain standards preferably primary research studies, such as empirical studies, qualitative or quantitative research, case studies, or evaluations. This ensures that the selected papers provide original data and insights into intergenerational cohousing. Thirdly, the data sources used in the papers are to be reliable and credible. Papers that utilize data from multiple sources, such as surveys, interviews, observations, or architectural plans, can offer a more comprehensive understanding of intergenerational cohousing. It is essential to include papers that draw on diverse perspectives, including residents, professionals, and experts in relevant fields. Lastly, the papers to be published or available in reputable academic journals, conference proceedings, or recognized research databases. This criterion ensures that the included papers have undergone a peer-review process, indicating a certain level of quality and validity. By applying these criteria, the selection process aims to include studies that contribute to the existing knowledge on intergenerational cohousing, offer reliable data and insights, and meet the standards of academic rigor. This helps ensure that the systematic literature review provides a comprehensive and reliable overview of the topic.

2.3. Search outcomes

This research focused at 48 studies conducted by 96 authors in 8 countries. They have been published in 25 journals. There were 120 keywords and 490 references in total (Table 1).

Description	Results
Timespan	2010:2022
Countries	8
Journals Articles	25
References	490
Authors	96
Author's keywords	120

Table 1. Primary information of the selected articles (Source: Authors)

The computer program used to build and display this bibliometric networks is called VOS viewer. The networks were built based on relationships between citations, bibliographic coupling, co-citations, and co-authorship and included articles, researchers, or individual publications. It provides text mining capabilities that can be used to create and display co-occurrence networks of significant terms. From a body of scientific literature (<https://www.vosviewer.com/>). In order to relativize the links between the keywords and learn crucial information about the research field, the network visualization must be normalized. So, the VOS Viewer constructs a network in a two-dimensional

space by default and uses the association strength normalization. The strongly linked keywords are denoted by nodes in that area (Van Eck & Waltman, 2014).

The density visualization that results from the examination of keyword co-occurrence is presented as a further analysis. It was employed to accomplish the study's second goal, which was to identify the gaps in empirical research. According to the VOS viewer documentation, the default color scheme for the item density visualization map's keyword density at each place ranges from blue to green to red. The more objects are in close proximity to a spot, the redder it is, and the heavier it is. The closer a point's color is to blue, the fewer objects are nearby and the lighter the weights. Green indicates an average item in a point (Priyashantha *et al.*, 2022). Therefore, a VOS viewer was used to analyze the final data abstracted from PRISMA 2020 methodology.

3. Results and findings

In our study, we utilized the minimal keyword occurrences feature of VOS viewer software to identify the most commonly appearing terms across the included studies. This feature allowed us to determine the frequency of keywords and select those that appeared frequently enough to be considered significant (the 14 keywords mentioned in Table 2). To accomplish this, we progressively increased the frequency of a keyword, starting from one and continuing until we reached a threshold level that captured a broader range of keywords. This process was carried out systematically, and the results were documented in Table 2.

Table 2. Co-occurrences of keywords (Source: Authors)

Keywords	Co-occurrences	Total
Older people	5	42
Ageing	4	27
Loneliness	5	27
Co-living	1	6
Living arrangements	1	6
Intergenerational	1	6
Elderly care	2	10
Senior co-housing community	1	5
Home care	1	6
Housing	2	18
Group living	1	11
Assisted living facilities	1	11
Homes	1	11
Dwellings	1	11

At a minimum keyword occurrence of 1, we found 97 threshold keywords that met our criteria. We chose this level because we believed it provided a sufficient understanding of the study's focus areas, while still being considered for analysis and interpretation. These 97 threshold keywords were significant in capturing the essence of the studies included in our analysis. Among these threshold keywords, we identified 16

keywords that appeared most frequently. Figure 3 displays these 16 keywords, along with their correlations, providing a visual representation of their relationships. Additionally, Table 3 presents the frequency of these 16 keywords, illustrating their prominence across the included studies. By employing the minimal keyword occurrences feature of VOS viewer software, we were able to identify the most common and significant keywords in the analyzed literature. This approach allowed us to gain insights into the focus areas and recurring themes within the studies, providing a foundation for further analysis and discussion.

Furthermore, to determine the number of keywords to be included in the map, we initially selected 137 keywords. However, due to redundancy issues where some keywords had similar meanings, we limited the final number of keywords to 100. To make this selection, we considered the overall link strength of each keyword. Therefore, we chose the 100 keywords with the highest link strength, ensuring that the most influential and informative keywords were included in the map.

Table 3. Minimum keywords occurrence (Source: Authors)

Minimum keywords occurrences	Threshold keywords level
1	137
2	21
3	7

3.1. VOS Viewer Analysis

Cluster formation in VOS viewer: The figure given above shows the relationship between each node. The nodes in Figure 4 are in 5 clusters: RED, GREEN, BLUE, YELLOW AND PURPLE. The keywords for each of these cluster are given in the Table 4.

Table 4. Keyword co-occurrences network visualization (Source: Authors)

Cluster	Common theme	Keywords
1 RED (2 items)	Loneliness	Ageing
2 GREEN (2items)	Older people	Housing , senior cohousing communities
3 BLUE (2 items)	Co-living	Group living , assisted living facilities
4 YELLOW ORANGE (4 items)	Home care	Dwelling , living arrangements
5 PURPLE (3 items)	Elderly care	Intergenerational , homes

The keywords are grouped in such a way that they represent the similar topics.

- A. **Red Cluster – Loneliness:** Ageing - Ageing is always accompanied by a decline in wellbeing, which leads to increased economic, health, and social insecurity among the elderly (Rajkumari, 2021). The natural process of ageing has always piqued the interest of the civilized world. The care of the elderly in society has become one of the central topics of our modern welfare state. People who are 60

years of age or older are common in countries with huge populations, such as India. In India, the number of people over 60 has tripled over the past 50 years and is expected to continue growing (Akbar *et al.*, 2014).

- B. *Green Cluster – Older people:* Housing – The main goal of the housing component of design was to provide a variety of options for residents with a variety of needs. The year of cohousing project creation, country of cohousing project, age target, and co-ownership tenure were cohousing project characteristics. (Carrere *et al.*, 2020). Senior cohousing communities - Senior living communities come in all shapes and sizes, and are generally classified based on the levels of care they provide. Some communities have an age restriction.
- C. *Blue Cluster – Co-living:* Group living – Individuals' knowledge flows more easily among themselves in mixed-age groups representing different perspectives, skills, and skill levels, which can result in increased levels of knowledge. If the social aspect was the dominant reason for people to choose a cohousing system, then the benefits of mixed age groups and mutual support from different generations were the main reasons why older people choose an intergenerational cohousing. (Wang & Pan, 2021a).
Assisted living facilities - A home for older people or people with disabilities who can live fairly independently but need some help with everyday tasks such as preparing meals, bathing, and dressing.
- D. *Yellow Orange Cluster – Home care:* Dwelling - Cohousing typically consists of 10- 15 individual dwellings and one common dwelling for sharing daily activities. Living arrangements – Spaces like shared spaces- Public rooms, co-living homes rooms, formal spaces, informal spaces.
- E. *Purple Cluster – Elderly care:* Intergenerational – Intergenerational housing is a progressive concept based on the idea that seniors should not be segregated from other generations and that people of all ages benefit from connecting with one another in daily life. The patterns of intergenerational living on a bigger scale in many cultural contents can be found in a traditional village, where spatial and social structures stimulate beneficial coexisting of all generations. (Epimakhova 2016). Homes - The place where one lives permanently, especially as a member of a family or household.

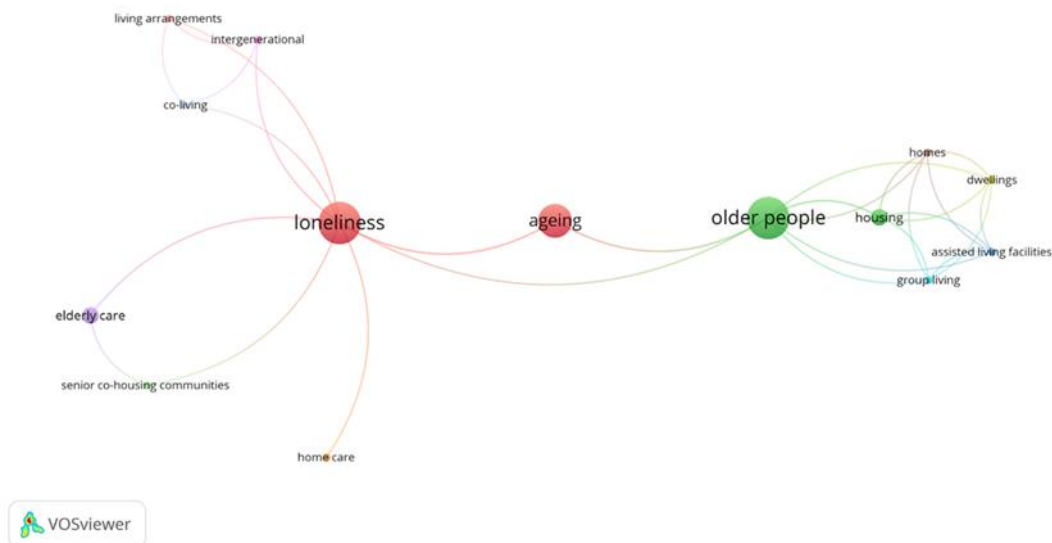


Figure 3. Keyword classified into clusters (Source: Authors)

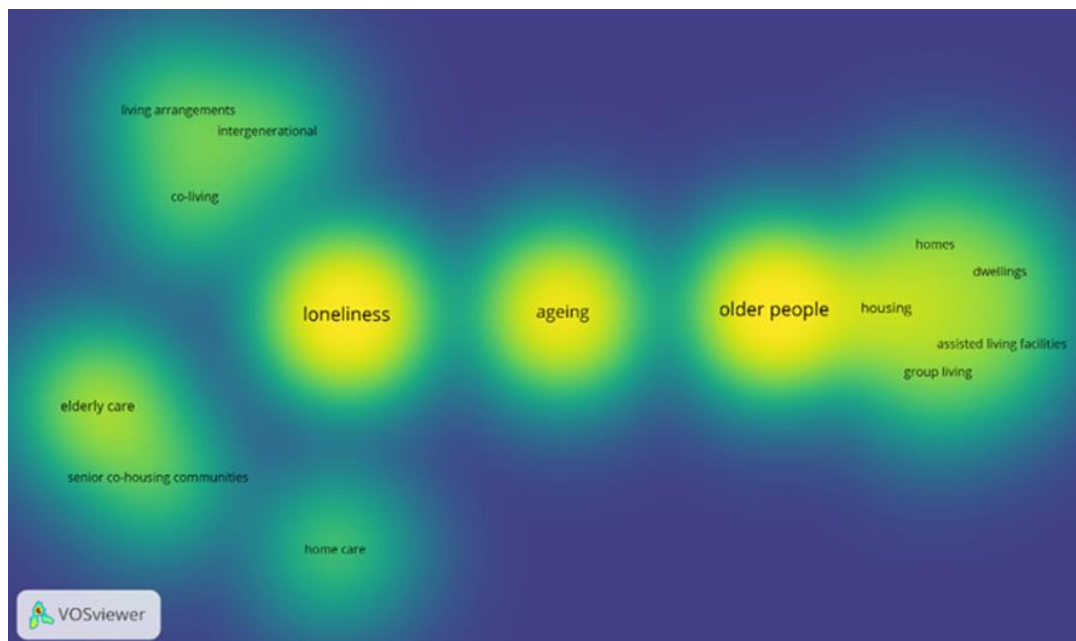


Figure 4. Keyword density visualization map (Source: Authors)

3.2. Areas where empirical research is lacking

The following section addresses the second objective of the study. *Older people* is the most commonly used keyword in studies, as seen in Table 4, indicating that it has been extensively researched. The density visualization map created by the VOS viewer shows it in the node with the yellow background (Figure 4). According to the Vos viewer manual, a node in the yellow background indicates sufficient research for established knowledge. However, keyword nodes with a light green background indicate that there has been less study on those keywords. Thus, all other keywords in Figure 3 are in the green background, indicating insufficient research. The co-living, intergenerational arrangements, group living, elderly care can be viewed as insufficient for established knowledge.

3.3. Reporting bias assessment

The PRISMA guidelines required the assessment of biases due to missing the results in reporting. No systematic assessment was performed for this task; however, we followed systematic and objective software tools and PRISMA guidelines to avoid bias in reporting the results.

4. Discussion

Based on the aforementioned analysis, we have identified four key attributes that play a pivotal role in making the concept of co-living and intergenerational living not only viable but also highly relevant in today's society (Figure 5).

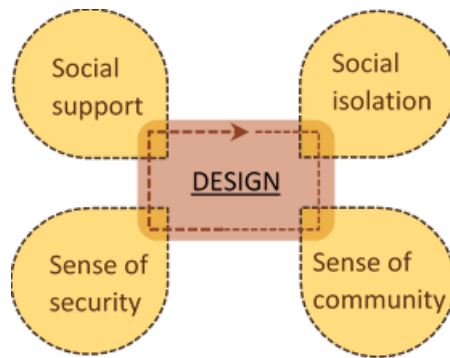


Figure 5. Factors considered in research papers for the future design of co-living spaces
(Source: Authors)

4.1. Social support

Social support was assessed through 15 studies using a mixed methods design including two with a comparison group, nine qualitative; (Glass, 2013; Glass & Vander Plaats, 2013) emotional support such as having close friendships, listening or providing support when someone had a personal problem; and recreational support, provided through different social activities organized by residents themselves. (Bamford, 2005; Epimakhova, 2016; Fromm, 2000; Labit, 2015; Pedersen, 2015; Philippsen, 2014; Tchoukaleyska, 2011; Tyvimaa, 2011; Williams, 2005; Markle *et al.*, 2015; Jolanki & Vilkkö, 2015).

From the studies, it is found that social support plays a crucial role in intergenerational housing due to its positive impact on residents' well-being and quality of life. It fosters a sense of belonging, connection, and mutual aid, addressing feelings of isolation and loneliness. Intergenerational housing also facilitates the exchange of skills and knowledge, promoting personal growth and enrichment. Through social support, practical assistance can be provided to address age-related challenges, establishing a reciprocal support system. Furthermore, social support enhances community engagement and social integration, fostering a collective identity and shared purpose within the intergenerational housing community. Overall, social support is indispensable for creating a supportive and thriving environment in intergenerational housing.

4.2. Social isolation

The three studies that looked at social isolation found that cohousing residents were less lonely using quantitative, mixed-methods, and qualitative techniques (Glass, 2013; Glass & Vander Plaats, 2013; Tyvimaa, 2011). None of them included a comparison group as part of the analysis. According to the 26-research focusing on the elderly population, living an active lifestyle helped residents avoid social isolation and loneliness, which are common issues for seniors. The architectural design of both indoor and outdoor common areas improved social interaction and was also described as an effective method of reducing social isolation, particularly among older residents who were ill and feeble. Since privacy was regarded as being important, it was not always perceived as being advantageous. (Carrere *et al.*, 2020).

The presence of social isolation poses significant challenges within intergenerational housing, emphasizing the necessity of social support. By addressing social isolation, it is found that the intergenerational housing can cultivate a sense of

belonging, connection, and mutual aid among its residents. Feelings of loneliness resulting from social isolation can have detrimental effects on the well-being and overall quality of life of individuals in the community. Hence, the establishment of social support systems within intergenerational housing becomes crucial in mitigating social isolation. These systems facilitate opportunities for meaningful social interactions, emotional support, and active participation in communal activities. Through the cultivation of social connections and the reduction of isolation, intergenerational housing can foster a thriving and inclusive environment for all its residents.

4.3. Sense of community

Four qualitative studies, six mixed-method studies—one of which included a comparison group—and one research utilising quantitative methods all served as sources of evidence. (Anon, 2019; Epimakhova, 2016; Fromm, 2000; Glass, 2013; Markle *et al.*, 2015; Jolanki & Vilkkö, 2015). Numerous researches, both on senior and intergenerational projects, demonstrated the positive effects of the cohousing concept on participants' sense of community. Being a part of a cohousing community boosted one's sense of belonging, but it might also be difficult and draining to keep up. The studies documenting positive outcomes revealed some perceptions of community-building pathways. For instance, according to two studies, people consciously picked the cohousing model in search of a sense of community. Additionally, they described how important it is for residents to be involved at all stages of the cohousing development process as a critical source of community building, including participation in the initial phases of co-ownership projects, self-management of common areas and facilities, and day-to-day community and mutual support. (Carrere *et al.*, 2020). Establishing a sense of community is crucial in intergenerational housing, as it nurtures a supportive and united atmosphere. Creating a strong community within intergenerational housing offers numerous advantages. It fosters social connections, cooperation, and understanding among residents of various age groups. The sense of community motivates residents to participate in shared activities, develop friendships, and build a support network. It amplifies feelings of belonging, safety, and collective identity. A robust sense of community in intergenerational housing stimulates collaboration, communication, and the exchange of knowledge and experiences across generations. This not only enhances the residents' lives but also contributes to their overall well-being, forging a harmonious and flourishing intergenerational living environment.

4.4. Sense of security

The effect of cohousing on a person's sense of security was looked at in 9 studies. (Bamford, 2005; Fromm, 2000; Glass, 2013; Glass & Vander Plaats, 2013; Manjari, 1997; Pedersen, 2015; Tchoukaleyska, 2011; Tyvimaa, 2011; Jolanki & Vilkkö, 2015). They all claimed there was a beneficial link. Three qualitative research, one quantitative study, and five mixed-methods studies were used to gather the evidence. Both senior and intergenerational projects reported feeling more secure. According to the studies, cohousing boosts inhabitants' sense of security by improving both their physical and social environments. Additionally, it lessened the feeling of economic uncertainty among locals. The physical characteristics that were emphasized were well-lit, open areas, secure playgrounds, and a vibrant, welcoming neighborhood. Social ties and trust, communal coping, and social support among neighbors were the social aspects that contributed to

feelings of secure. (Carrere *et al.*, 2020). Ensuring a sense of security is essential in intergenerational housing, as it establishes an environment that is safe and protected. Developing a strong sense of security within intergenerational housing offers numerous advantages. It provides residents with peace of mind and a sense of being protected. A feeling of security fosters trust, reduces anxiety, and improves overall well-being. It creates a supportive atmosphere where residents can freely interact, collaborate, and participate in communal activities without fear or hesitation. By prioritizing security measures and creating a secure environment, intergenerational housing guarantees the safety and comfort of all residents. This sense of security contributes to a harmonious and thriving intergenerational living setting, enabling individuals from different age groups to thrive and flourish with confidence.

Furthermore, there were few related findings from the review which are summarized below. These findings show some further opportunities and certain limitations of bringing the co-living concept into practice for designers.

- a. *The support given to older homeowners by younger people renting a room in their home:* Older persons having spare rooms can rent or sublet the space for a low or no rent in exchange for companionship and/or some assistance. matching systems that take both parties' needs and preferences into account.

Benefits: Mutual and direct benefits to both parties - The tenant receives reasonable accommodation, the homeowner receives some support they need, and both sides gain from a new friendship that lessens feelings of loneliness and isolation.

Limitations: Instead of directly benefiting the larger community or fostering a sense of extended community family, these benefits are only available to specific individuals. It may be difficult to discover matches for these because they may not be suitable for many people's needs. It is challenging to carry out on a wider scale. Early identification of an elderly person's need for assistance has been noted as one of the major obstacles. (Rethinking Intergenerational Housing, n.d.).

- b. *Students given accommodation within specialist homes in exchange for supporting older residents:* In order to offer students some help, existing care facilities offer low-rent or free housing. Students engage with one another more often than is necessary.

Benefits: Students obtain accommodation that is affordable, and seniors gain companionship and support. Students are assisted by trained care staff, allowing them to get assistance if problems develop. While students can gain life experience and skills, elderly individuals face less isolation and loneliness.

Limitations: Small numbers of young people mean the balance is heavily in favor of support for older people, rather than providing significant assistance to students. These tackle only specific groups of people and have limited wider benefits for the community. Limited to students.

- c. *A community of private homes clustered around a shared space and community facilities that is managed by the community:* A number of recent housing developments are constructed as communities within the individual, independent residences, yet they are organized around certain shared space and services. They promote more interpersonal connection and are independent. They frequently contain a mixture of people from various generations. Can behave like extended families in more prosperous places.

Benefits: Utilizing shared resources helps lower living expenses. Increased social possibilities and informal assistance from neighbors lessen emotions of loneliness

and isolation. Residents' input on community decisions enhances the sense of belonging, boosts self-worth, and strengthens connections.

Limitations: Despite the fact that living expenses have decreased, some low-income individuals may still find them to be unaffordable. The availability of support is constrained and voluntary; hence, some persons might not be able to acquire it.

5. Recommendations

The analysis of intergenerational housing reveals four key aspects. Firstly, social support, encompassing emotional and recreational support, plays a crucial role in enhancing residents' well-being and quality of life. It fosters a sense of belonging, connection, and mutual aid, addressing feelings of isolation and loneliness. Secondly, social isolation poses challenges within intergenerational housing, emphasizing the necessity of social support to cultivate a supportive environment. Thirdly, establishing a strong sense of community is vital as it fosters social connections, cooperation, and understanding among residents, enhancing overall well-being. Lastly, ensuring a sense of security through improved physical and social environments contributes to residents' peace of mind and trust, creating a harmonious and thriving intergenerational living environment.

From the review it is also found that the future design recommendations for inclusive co-living spaces that cater to both young and elderly individuals should prioritize the unique needs and preferences of both age groups because it ensures a holistic and accommodating living environment for all residents. By considering the distinct requirements of each age group, designers can create spaces that promote well-being, independence, and intergenerational harmony. From the review it is also found that intergenerational and co-housing arrangements create opportunities for mutual support and learning between older and younger residents. Younger individuals often value social interaction, connectivity, and spaces that facilitate collaborative activities. They may benefit from amenities such as communal areas for socializing, fitness facilities, and recreational spaces. Designing spaces that cater to their preferences encourages engagement and a sense of community. On the other hand, older individuals may have specific needs related to accessibility, safety, and support. Considerations like mobility aids, universal design principles, and easy access to healthcare services are essential to ensure their comfort and well-being. Providing private spaces for relaxation and quiet reflection can also be beneficial. The second aspect addressed in the past research focusses on social isolation aspect which can be addressed by prioritizing the unique needs and preferences of both age groups allows for a balanced and inclusive environment. It acknowledges the importance of intergenerational interaction, where residents can learn from one another, share experiences, and foster meaningful relationships. By considering the diverse needs of both young and elderly individuals, designers can create co-living spaces that promote social connection, autonomy, and a sense of belonging for all residents, contributing to a thriving and harmonious intergenerational community. In summary, intergenerational and co-housing arrangements provide numerous benefits for both elderly and youth, including social connection, mutual support, learning opportunities, health benefits, cost-sharing, and enhanced community engagement. These models of living promote intergenerational understanding, well-being, and a sense of belonging for residents of all ages. The

following design recommendations for co-living and intergenerational spaces are derived from the literature review which could further be taken forward towards empirical research:

a. Site selection: Site selection is crucial for intergenerational co-living because it directly impacts the success and functionality of the community which is derived from literature. The choice of location for an intergenerational co-living development should consider several factors to ensure a supportive and inclusive environment for residents of different age groups. Based on the above-analyzed research papers, essential criteria for selecting a site for a multigenerational community were identified (Figure 6):

- i. Link to current infrastructure
- ii. Walkability
- iii. Connection to public transportation
- iv. Mixed-use
- v. Connection to nature
- vi. Located in areas with local facilities, public transport, and amenities, to connect with providing good social connectivity with society.

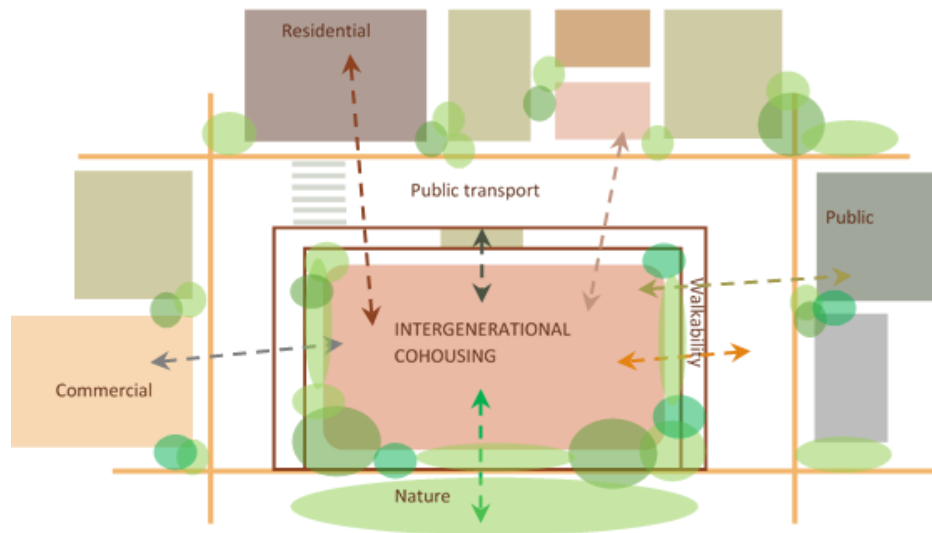


Figure 6. Designing intergenerational co-living: Site level Considerations (Source: Authors)

b. Spatial considerations:

- i. *Shared spaces:* To accommodate activities and interactions, various sizes and types of shared spaces should be used. To interact and also to participate in different social activities, people who live independently need shared spaces. The way these places are designed will determine how they are utilized. Shared gardens, public rooms, and breakout areas are the few. In order to promote ties between residents and the community, a project must have necessary types of shared space. Depending on the scale, the public room and common garden spaces will function best when connected to, or able to accommodate, services and facilities, whilst the breakout spaces must be casual, compact, and low maintenance (Figure 7).

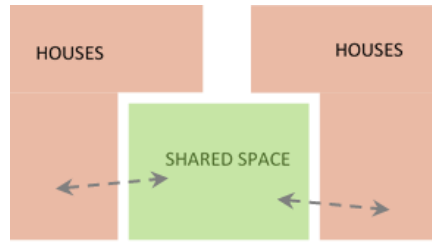


Figure 7. Shared Spaces (Source: Authors)

- ii. *Informal spaces:* (For elderly) There should be access to healthcare services, daily necessities (pharmacy, grocery stores, etc.), episodic services, public transit, caregiving, and housekeeping. The list of available spaces should be made up of areas for working at home, locations for socializing, places for hobbies and physical activity, and areas for family get-togethers. For youth- spaces for leisure like pool, relaxing spaces and exercising areas like gym, playground etc. can be provided.
- iii. *Formal spaces:* Spaces required for daily living like living room, bedroom, washroom, kitchen, interactive spaces etc. has to be considered while designing.
- iv. *Universal spaces:* In the built environment, spaces and paths should have a universal character and be physically accessible to every user with various physical, cognitive, and age-related abilities. The goals of universal design are to ensure that everyone can use the environment and other design products. (Figure 9).
- v. *Flow of spaces:* Designing spaces considering its uses and various activities performed. Residents can better understand the areas of their influence on spaces when there is a clear hierarchy of spaces with different levels of spatial definition and access. (Figure 8).

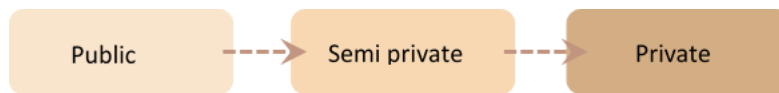


Figure 8. Flow of Spaces (Source: Authors)

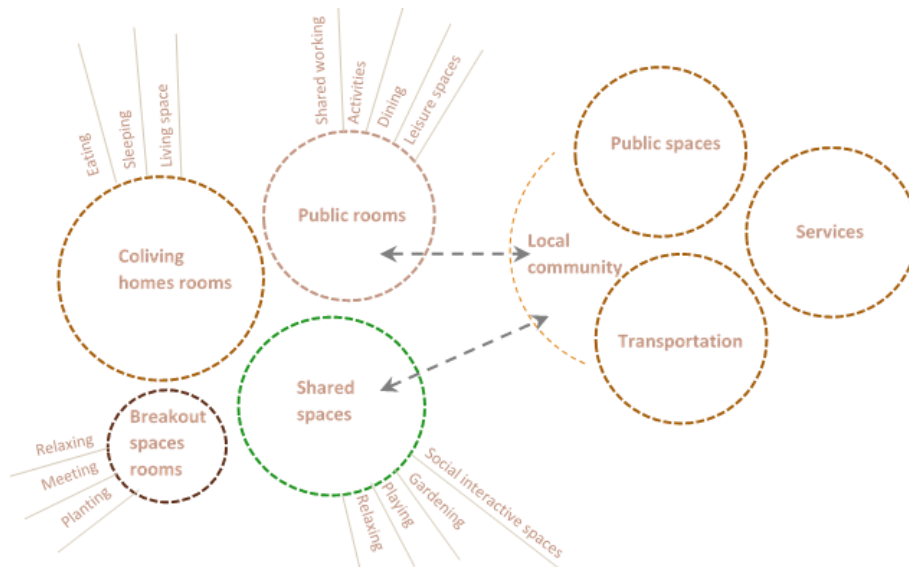


Figure 9. Connection between the spaces (Source: Authors)

c. *Design Considerations:*

- i. *Efficiency:* It "involves compressing or compromise between functions" to employ the least amount of space to meet inhabitant demands without wasting or unusable space, or to produce single areas that can be used for multiple of various purposes simultaneously or at different times (Domer *et al.*, 2014, p. 162). Reduced circulation space, larger living rooms, and enhanced linkages between them could produce modestly sized but well-designed homes at an affordable price. (Epimakhova, 2016b).

The ability to use a space for many functions, such as a room that can be used as both an office and a guest bedroom or a hallway that also doubles as a closet, is another example.

Additionally, minimizing encourages future growth that is energy-efficient because it lessens the resources required for construction, the energy contained in those materials, the energy required to maintain and cool them, and the setting's overall environmental impact. These reasons served as the movement's impetus "The United States' Small House Society promotes the building of small, energy-efficient homes to encourage sustainable living. A project is a fascinating use of this principle "My Micro NY, which offered flats with just 285 square feet of floor space. Everyone in the flats is set up for daily use, including working, sleeping, eating, and other activities. Moreover, it is suggested that the apartments are transformed during night and during day in different layouts. The project is an innovative solution for life in an urban, high-density environment. (Epimakhova, 2016).

- ii. *Adaptable:*

This involves the space's capacity to accommodate a range of user preferences and evolving habitation needs. In addition to being a response to changing requirements over time, the built environment's ability to accommodate a diverse population's needs is essential for fostering a sense of ownership and control among residents as well as evoking a sense of identification with a place. Creating a polyvalent space and designing an open-neutral plan are the two strategies to make a place adaptable. According to B. Leupen (2006, p.23), the nature of polyvalent space involves a possibility to change functions and activities between rooms. That's why the spatial relationship of rooms between each other is very important. (Epimakhova, 2016). Designing an open neutral plan, in which an architect creates a generic empty space and offers future tenants the option to fill it out anyway they choose, is another technique to make a space flexible to changing demands. (Epimakhova, 2016).

- iii. *Externalization:* Means the relocation of some functions from an individual apartment to a shared community area or space. The concept of externalization is expressed as communal living or home-sharing, when residents share some common amenities including guest accommodations, a laundry room, kitchen, and fitness center and have less personal or private space. Because the size of a living unit is lower in this situation and the expense of common spaces is shared by all residents of a community, the cost of an apartment or renting is decreased. (Epimakhova, 2016).

The careful evaluation of these design criteria and potential solutions plays a crucial role in identifying optimal sites for the intergenerational co-living community.

Additionally, this process aids in establishing comprehensive design guidelines and enhancing the effectiveness of the design solutions employed.

6. Conclusion

This research looked at three different types of co-living: cohousing, home-sharing, and housing association-supported intergenerational living, and identified a number of common themes and outcomes. It sheds light on the wide range of benefits associated with co-living, through both group-based structures, such as cohousing communities, and individual intergenerational support. The benefits were often mutual and interrelated, addressing issues such as loneliness and vulnerability among older people, and high accommodation costs related to the scarcity of housing. Whether it allows them to stay in their own home, share communal facilities or live in a cohousing community, co-living models enable older people to receive support and companionship, make active choices in their later life, be surrounded by younger generation with whom they can share activities, or get some help on light tasks in daily life. From the review of literature, four major attributes have been identified that contribute to making the concept of co-living and intergenerational living feasible in today's context. Social support plays a crucial role in intergenerational housing, fostering a sense of belonging, connection, and mutual aid. It also facilitates the exchange of skills and knowledge, promoting personal growth and enrichment. Addressing social isolation is essential in intergenerational housing to mitigate feelings of loneliness and create a supportive environment. Establishing a sense of community nurtures a supportive and united atmosphere, fostering social connections, cooperation, and understanding among residents of different age groups. Ensuring a sense of security within intergenerational housing establishes an environment that is safe and protected, providing peace of mind and trust among residents. Based on the research, future design recommendations for co-living spaces should prioritize the unique needs and preferences of both young and elderly individuals to create a holistic and accommodating living environment. Design considerations should include site selection, spatial considerations (shared spaces, informal spaces, formal spaces, universal spaces), and design principles like efficiency, adaptability, and externalization. By considering these factors, co-living spaces can promote well-being, independence, and intergenerational harmony, fostering a thriving and harmonious intergenerational community.

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