Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

JOURNAL OF TOURISM, HOSPITALITY AND ENVIRONMENT MANAGEMENT (JTHEM)
www.jthem.com

ACTIVE TRAVEL AND BUILT ENVIRONMENT OF ELDERLY: A REVIEW

Li JinHua[*1], Siti Hajar Misnan[2]

[1] Department of Urban and Regional Planning, Universiti Teknologi Malaysia, Johor Bahru, Malaysia.
Email: 68033877@qq.com
[2] Department of Urban and Regional Planning, Universiti Teknologi Malaysia, Johor Bahru, Malaysia.
Email: shajar@utm.my
[*] Corresponding Author

Article Info:

Article history:
Received date: 01.10.2021
Revised date: 01.11.2021
Accepted date: 15.11.2021
Published date: 01.12.2021

To cite this document:

Li, J. H., & Misnan, S. H. (2021). Active Travel and Built Environment of Elderly: A Review. *Journal of Tourism Hospitality and Environment Management, 6* (26), 281-299.

DOI: 10.35631/JTHEM.626026.

Abstract:

The built environment is considered to be a key factor to promote the active travel (AT) of the elderly in neighbourhood. This study seeks to comprehensively identify the built environmental factors influencing active travel and to show how those environmental factors impact active travel the old adults. It reviewed the literature on neighbourhood-built environmental correlated with AT among older adults. The study found that most of the research concentrated on walking, which was associated with density, land use mix, connectivity access to services, friendly infrastructure， aesthetics， destination， safety. The results showed that the research was concentrated in developed areas and countries, developing countries were seldomly involved. Related research was mainly carried out in urban areas especially in the metropolitan area. The weather has been reported as an important factor in the elderly's travel but was not widely tested before. Information technology has a wide-ranging impact on the activities of urban residents and the increase of online leisure activities can also reduce the daily non-essential travel time of residents. In future research, more attention needs to be paid to developing areas, small city, and rural communities. ICT changed the way people live, the interaction with other humans, and physical space, it also needs to pay more attention in this field.

Keywords:

Built Environment, Active Travel, Older Adult, ICT

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Introduction

Being physically active had many benefit for the elderly, such as reducing the burden of complications from chronic diseases (Mitchell, 2012) and positively impact on people's mental health (Koohsari et al., 2019; Y. Wang, Chau, Ng, & Leung, 2016). The World Health Organization recommended that adults aged 65 and above should take at least 150 minutes of moderate-intensity physical activity every week, or at least 75 minutes of vigorous -intensity physical activity every week, or the equivalent combination of moderate-intensity and vigorous-intensity activity. However, some research found that physical activity（PA）within older adults was low in many countries (Berkemeyer et al., 2016; Ester Cerin, Nathan, van Cauwenberg, Barnett, & Barnett, 2017; Keadle, McKinnon, Graubard, & Troiano, 2016). Insufficient physical activity in adults (less than 150 min of intermediate walking per week) increased the risk of death and non-communicable diseases such as cardiovascular disease, stroke, diabetes, and some types of cancer (Dadpour, Pakzad, & Khankeh, 2016). For the elderly, the best way was to incorporate physical activity into daily life, such as cycling, walking or combining with public transport rather than by car (Carl, 2016). Active travel meant traveling by means of physical activity, like walking or cycling (Cavill, Davies, Cope, & Corner, 2019), which help the elderly to enhance their healthy physical activity level. These are usually short journeys, like sending children to school, walking to the shops, riding bicycles to work, or walking to the station to catch a commuter train. Active travel accounted for nearly half of total physical activity of the elderly (Ester Cerin et al., 2017), which can increase physical activity, improve health and have certain effects on society, economy and environment.

A proposed approach was improving urban environments to facilitate physical activity from active travel for commuting and recreation (Sallis et al., 2016; Zhou, 2014). Walking is convenient, which is easier for most people and does not require special equipment. Compared with passive medical technology treatments, individual-oriented interventions are costly and unsustainable, while urban planning methods to improving urban environments can provide higher yields as these can be applied to the whole community and provide longer-term support for behavioral change (Cavill et al., 2019). According to the Centers for Disease Control (CDC) of America, regular physical activity is one of the most important things that an elder can do for their health. An increasing body of evidence indicated that the attribute of neighborhood community can promote active lifestyles or encourage different forms of physical activity such as walking or biking (Ogilvie, Mitchell, Mutrie, Petticrew, & Platt, 2008). For example, the closer individuals are to destinations that include public services, entertainment, bus stops, grocery stores, etc., the more likely they are to increase physical activity through active travel (Barnett et al., 2016; Lachapelle & Pinto, 2016; Yang, Griffin, Khaw, Wareham, & Panter, 2017).

The social-ecological model of active living proposed by Sallis et al., (2006) was the beginning of research in active travel and environmental related fields. Many researchers from public health, transportation and urban planning were focused on the effect of environment to walking and cycling. The most frequently examined environmental features were parks/ open spaces/ recreational destinations, pedestrian-friendly features, greenery and aesthetically pleasing scenery, and traffic/pedestrian safety(Ester Cerin et al., 2017).

Many characteristics of the built environment function as motivators or obstacles to walking and cycling activities of the elderly. The beautiful green spaces (Zandieh, Martinez, Flacke,

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Jones, & Van Maarseveen, 2016), greater street connectivity (Maisel, 2016), closely to the facilities (Procter-Gray et al., 2015), mixed use of land for residential, commercial, office, public space and sports facility (H.E. et al., 2011) can significantly increase active travel. On the other hand, the traffic and crime safety were related to insufficient walking time (T. A. Chen et al., 2013). Previous work indicated that older adults were highly influenced by their local environments (Hirsch, Winters, Ashe, Clarke, & McKay, 2016; Zandieh et al., 2016). With increasing age, physical function will change, which may reduce the confidence or ability of the elderly to deal with themselves and the built environment. Therefore, for the elderly, the same built environment restrictions, such as uneven roads, may be more challenging than young people (Zandieh et al., 2016). Social Attributes, physical environmental characteristics and natural environment are environmental facilitators to walking, biking and other forms of active travel described by older adults.

Thus, this study seeks to comprehensively identify the built environmental factors influencing active travel and to show how those environmental factors impact on active travel the old adults.

Literature review

This review focused on environmental factors related to active travel of the elderly and also physical activity. The literatures were searched from Web of Science, Science Direct and Google Scholar that were published between years 2010 and 2020, with the following key words: built environment, active travel, physical activity, elderly, walking, cycling.

The basic inclusion criterion was the relations between the built environment of neighborhoods and active travel among the elderly. This paper includes forty-three (43) articles and reviewed the building environment and related active travel.

Characteristic of Selected Papers

Forty-three articles met the selection criteria for this review. And table 1 presented the characteristics of selected papers. Most articles reported findings from Europe followed by Asia, North America, Oceania and South America. Mainland China was represented by a single article which has a huge population of the elderly in the world (Zhang, Li, Liu, & Li, 2014). The vast majority, more than 80% of the research was concentrated in urban areas, and only 3 articles were in suburban or rural areas(Kikuchi et al., 2018; H. S. Lee & Park, 2015; Maisel, 2016). There were 3 articles with a small sample size of less than 100, 10 articles with a sample size of 100 to 300, and 30 articles with a sample size of more than 300. For the data collection in environmental attributes, 17(29.53%) used the objective method and 25(58.14%) adopt the questionnaire. Active travel was gauged using valid self-report measures in 83.72% of the cases. Just 6 adopt the objective methods. Only four articles from Canada and American, and two Belgian articles studied cycling for transport (Hirsch et al., 2016; Takahashi, Baker, Cha, & Targonski, 2012; Van Cauwenberg et al., 2012; Van Holle et al., 2014). Physical environment, including walkability, density, diversity, connectivity were the most frequently examined.

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Table 1: The Characteristic of Articles

characteristic(sample 43)	number	%
geographical region		
Asia	14	32.56
Europe	15	34.88
North America	8	18.60
Oceania	4	9.30
South America	2	4.65
Mainland China	1	2.33
Geographical setting		
Urban	35	81.40
Urban, suburban and/or rural	3	6.98
Not reported	5	11.63
Sample size		
⩽ 100	3	6.98
101-300	10	23.26
301-500	11	25.58
501-1000	6	13.95
1001 - 2500	9	20.93
> 2500	4	9.30
Environmental attributes measured		
objective (GIS)	17	39.53
subjective (questionnaire)	25	58.14
Active travel measures		
objective (GPS or accelerato	6	13.95
subjective (questionnaire)	36	83.72
Environmental variables		
Walkability	12	27.91
Residential density	19	44.19
connectivity	14	32.56
Diversity/land use mixed	16	37.21
access to destinations(distar	13	30.23
Pedestrian & cycling infrastructure	6	13.95
Aesthetics	11	25.58
Safety and traffic	16	37.21
weather	1	2.33
ICT	0	0.00
Active Travel domains		
walking	43	100.00
cycling	4	9.30
electric bike	0	0.00

Physical Environment Indicators

In 2006， Ewing & Cervero (2010) put forward the five D variables, which were widely used in physical activity and travel research, containing development density, street network design or connectivity, land use diversity, destination accessibility, and distance to transit (Tian, 2017). However, Travers et al. (2017) found that physical environment had nothing to do with the physical activity or walking of adults aged 65 and above.

Density, it mainly refers to residential density, referring to the number of buildings per unit area. One of the advantages of high-density life is that it can free people from cars and make them active. Some studies have pointed out that compared with poor environmental quality such as low density and mixed use of low land in suburban or rural areas, residents tend to choose active transportation modes in urban centers and carry out leisure sports activities, which are more likely to meet the recommended standards for sports activities (Doescher et al., 2014; Rosso, Auchincloss, & Michael, 2011). Researchers found that higher population density and street density were more likely to walk for transportation and recreational walking of the elderly (Pelclova, Fromel, Blaha, Zajac-Gawlak, & Tlucakova, 2012; Weber et al., 2016). Liao et al., (2017) discovered that people who living in metropolitan areas were more likely to engage in walking as a mode of transportation, comparing with those who lived in non-metropolitan areas. In urban and suburban areas, increasing the residential density can improve the physical activity of the elderly which is a cost-effective way, since covering relatively small areas would affect more people (Kikuchi et al., 2018; Siu et al., 2012). However, it is believed that higher density was not always associated with more active travels (Jennifer, 2015). Zang et al. (2018) considered that commercial area and density were negatively correlated with walking time for the elderly. The effect of density on active living is incredibly complex.

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

The term of diversity refers to the mixed of land use in one's neighborhood which can calculate the mixed degree of different functional land in the residence area. Through city planning, it emphasizes mixed land use by incorporating retail, commercial, and institutional destinations in residential areas at walkable scales so as to support physical activity. Various studies confirmed that land use diversity can significantly increase the frequency of adult and elderly's walking activity (Christiansen et al., 2016; King, Bentley, Thornton, & Kavanagh, 2015; Li et al., 2008; Matisziw et al., 2016; Zang et al., 2018). And this positive impact was also robust in some long-term dynamic observations (P. Chen, Zhou, & Sun, 2017). H.E. et al., (2011) pointed that the mixed use of land for residential, commercial, office, public space, sports facility and entertainment can significantly increase walking. The popularity of public transportation points and the diversity of recreational destinations were positively correlated with the overall walking for transport of the elderly (Ester Cerin et al., 2013). Analyses showed that only in highly-walkable neighborhoods, the higher social diversity of the neighborhood environment were related to more transport walking (Van Holle et al., 2016). Otherwise, results also pointed out that the land use mix in the neighborhood or workplace have no significance to physical activity (Nathan et al., 2012a; L. Wang, Liao, & Zhao, 2016) or negative to active travel of the elderly (Lu, Chen, Yang, & Gou, 2018; van Heeswijck et al., 2015).

The connectivity refers to measuring neighborhood length, area, intersection density, and street density (Jiang, Zhen, Wang, & Zhao, 2019). It is found that the better the connectivity of the neighborhood street, the shorter the distance between the departure point and the destination, the more beneficial to increase the pedestrian walking or riding of adults or children (Helbich et al., 2016) and elderly leisure and transportation walking opportunities(Troped et al., 2017). Elderly were more than twice as likely to engage in any walking activity when they perceived greater street connectivity (Maisel, 2016). Besides, once adults have better perception of neighborhood street connectivity, the probability of walking or riding will be high (Liao, Wang, Hsu, & Chang, 2015; Siu et al., 2012). However, Rodríguez, Aytur, Forsyth, Oakes, and Clifton (2008) pointed out that street connectivity is negatively correlated with active travel and leisure walking. This is consistent with the result of Mecredy, Pickett, and Janssen (2011), who found that there may be a negative relationship between street connectivity and physical activity.

Accessibility refers to the difficulty of reaching the attractive point of travel, which can be divided into regional accessibility and local accessibility. It is considered that the regional accessibility represent opportunities for work, shops, schools, parks or other attractions that can be reached within a given travel time (Y. Yu & Hu, 2017). Local accessibility referred to the distance from home to the nearest store (Ewing & Cervero, 2010). Studies have shown that the distance to the facilities was closely related to the active travel of the elderly (Procter-Gray et al., 2015). Proximity to services and amenities may promote all walking/cycling behaviors (Gauvin et al., 2012; Van Cauwenberg et al., 2012) and may help maintain an active lifestyle (E. Cerin et al., 2013), which can significantly associated with a low risk of health problem of the older female (T. A. Chen et al., 2013). Having destinations for utilitarian and/or recreational walking promoted community-dwelling older adults' physical activity (Z. Wang & Shepley, 2018). Walking or cycling to a bus or subway station can encourage residents to form an active life and ways to increase the likelihood of walking or riding to other destinations (Lachapelle & Pinto, 2016). Depend on the GPS, studies pointed out that the better the accessibility between the place of residence and the bus or subway station, the more beneficial it is to increase the daily walking/riding commuting or travel opportunities of commuters and seniors (Barnett et

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026
al., 2016; Yang et al., 2017). Research result shows that the closer the distance to the destination, the better the accessibility, and the more beneficial to increase walking or cycling. But there may also be negative effects (Toftager et al., 2011). Meanwhile, perceived accessibility was positively correlated with the level of physical activity of residents, which meant the better the residents perceive the public transportation site or destination accessibility, the more likely they are to increase walking or cycling (Kondo et al., 2009). It is found that among the elderly women in rural areas, there was the strongest positive correlation between the distance from the park and the recommended walking level (Lee & Park, 2015). And the best access to amenities such as commerce and parks, high population density and high street connectivity were most likely to promote walking among older women in urban areas (Siu et al., 2012). While it was negatively related to cycling for transportation (Van Cauwenberg et al., 2012). Study also found that the distance to the park may not always be related to recreational physical activity, which may be due to the stimulation of social trust and cohesion between neighbors (Cauwenberg et al., 2017). Nathan et al. (2012b) considered that food retail, financial services, general retail and the mix of commercial destination types within the neighbourhood have nothing to do with the walking of the elderly.

Perceived aesthetics is defined as the visual attraction or pleasure of the environment. The design and maintenance of parks, neighborhoods, and streets, as well as the perception of these places, are based on factors such as aesthetic appeal, which can influence the physical activity of those who enjoy visiting and spending time in attractive places. The beautiful green spaces were positively related to total outdoor walking levels of the elderly (Zandieh et al., 2016). According to Huang, Kung, and Hu (2018), “Parks, greenery, and squares” were significantly associated with the recommended amount of physical activity among the elderly. Attractiveness was very important in increasing personal physical activity, and the diversity of architecture was found to be positively correlated with the walking time of people aged 65–74 and 85 (Zang et al., 2018). Cauwenberg et al. (2017) hold the same opinion that provision of high-quality parks may promote more walking among mid-older aged adults who already walk for recreation. Most senior citizens said they preferred to provide diverse and green outdoor space (Cassarino, Bantry-white, & Setti, 2019). This is in line with the research of Zhang, Li, Liu, and Li (2014), who considered that green space may be effective in promoting walking for the elderly. E. Cerin et al. (2013) also held the opinion that environmental aesthetics may promote recreational walking. Meanwhile, there is a positive correlation between the aesthetic environment and the objective GIS measure of Accessibility Index with transportation physical activity (Nyunt et al., 2015). Elder adult preferred to visit larger green spaces rather than the small urban green spaces and they are very fond of regularly maintained urban green space, and believed that the excessive growth of green space had a negative impact on the area (Macintyre et al., 2019).

Safety

In the past research, there are two main safety issues related to build environment: perception of crime and perception of traffic hazard. If residents believed that the crime rate in the communities was high, they do not assumed walking or participating in sports activities in local public places such as parks (Salvo, Lashewicz, Doyle-Baker, & McCormack, 2018). For the senior, safety is obviously essential for their active living, physical activity, and aging-in-place at home. Since the ability of the elderly will decline with age, they may like to seek a high level of protection from the surrounding environment. Adequate neighborhood lighting and even

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026
crosswalks, pedestrian signals and sidewalk surfaces were important for older residents (Z. Wang & Shepley, 2018).

Many studies have shown that safety was closely related to the active travel of the elderly (Ester Cerin et al., 2013; H. Lee, 2016; Zandieh et al., 2016). In rural communities, only perceived crime safety was associated with any walking and walking for recreation of the elderly (Maisel, 2016). For urban women, safety was an important environmental variable that meets the physical activity recommendations (Lee & Park, 2015). Feelings of unsafety was negatively related to walking for transportation and recreational walking/cycling (Van Cauwenberg et al., 2012). Traffic and crime safety in old-unemployed males and proximity to service facilities and traffic and crime safety in middle-employed females were significantly associated with a low risk of insufficient walking time (T. A. Chen et al., 2013). Neighborhood safety-related aspects can moderate the relationship of overall walking for transport with the prevalence of public transit points, but it was positive only in safe places (Ester Cerin et al., 2013). Existence of crosswalks in the neighborhood, street lights, recreational facilities, safe places during the day and having dogs were all important predictors of walking for transportation (Corseuil Giehl, Hallal, Brownson, & D'Orsi, 2017). In high-poverty areas and low-poverty areas, the inequality in perceived neighborhood safety, pedestrian infrastructure and aesthetics showed that this may affect the difference in outdoor walking level of participants (Zandieh et al., 2016).

Weather

Weather phenomenon refers to various natural phenomena occurring in the atmosphere, for instance, the comprehensive expression of the spatial distribution of various meteorological elements, such as air temperature, humidity, cloud, fog, air pressure, rain, snow, thunder, wind, frost, flash, hail, haze, etc. The relationship between weather and physical activity was clear in the research of Humpel et al. (2004). Tucker and Gilliland (2007) also found that physical activity differs by seasonality, which can be identified that extreme or poor weather was its barrier in most cases. Witham et al. (2014) reported the association among physical activity, enjoyable scenery and climate. Some data showed that older men and women were more physically active and less sedentary during summer as compared to winter (Arnardottir et al., 2017). It reported that weather was an important factor affecting the active travel behavior and travel choices of individual (Böcker et al., 2013). However, it has not been widely tested for some particular groups in the previous research. Weather conditions can be used to study the influence of built environment on walking and buses.

Information and Communication Technology (ICT)

The development of information and communication technology (ICT), especially the internet, was bringing us into a new era (Sariyildiz, 2000). Human life is changing at an unprecedented speed. ICT as the main axis of the development of the Third Millennium are affecting the way people live, and how people are interacted with other humans and the physical space. Nowadays, society entered into a new technological-cultural field that foundations of people's thinking about space and urban space challenged due to the growing presence of the information and communication technologies in everyday life.

Information technology had a wide-ranging impact on the leisure activities of urban residents and the increase in online leisure activities has also reduced the daily non-essential travel time of residents, indicating that they have an alternative effect on residents' travel (Zhao, Zhen, & Long, 2013).Some studies found that using ICT to work at home will reduce the commuting

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

travel (Zhen, Wei, Yang, & Cao, 2009). Others found that people who live and work in urban areas were more likely to shop at e-stores, while residents who spend a lot of time going to frequent stores were more likely to buy books through the Internet (Zhen, Du, Cao, & Mokhtarian, 2018). The extensive use of Internet is related to the reduction of total travel time, but the change of travel time and travel times is directly related to Internet activities. Online shopping was positively correlated with travel for shopping, and online personal communication was negatively correlated with travel for communication (Lachapelle & Jean-Germain, 2019). The growth of e-shopping increased delivery trips, but its impact on personal shopping travel was complex because it depended on the type of products (Qing, Cao, & Zhen, 2019). During the pandemic period of cov-19, the e-shopping increased very fast, especially the daily good that buying in the vegetable market or super market in the past (K. Wang, Hao, & Qin, 2020). On the other hand, online shopping for the elderly has increased significantly (F. Yu, 2020). According to the QuestMobile2020, mobile Internet monthly active users in China increased by approximately 15.71 million annually, of which 61% are middle-aged and elderly people.

It is very difficult to simply say how the ICT affect travel, as the topic is almost new and very complex. And there is very little empirical research on this topic. However, it is obvious that this influence is not direct, but indirectly produced through social and economic trends. These trends will cause changes in the behavior of the individuals in society, culture and economy. Therefore, more researches should be conducted.

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Table 2: Summary of Literature Review (1 of 4)

NO.	Author	County	Built Environment Variables	Active Travel Variables	Outcome
1	Zandieh et al. 2016	United Kingdom	• Safety • Pedestrian infrastructure • Aesthetics	Walking	Inequalities in perceived neighbourhood safety, pedestrian infrastructure and aesthetics in high- versus low-deprivation areas and demonstrate that they may influence disparities in participants' outdoor walking levels.
2	Hirsch et al. 2016	Canada	• Density • Diversity • Destinations	Walking, Cycling	Traditional buffers may not accurately portray the geographic space or neighborhood resources experienced by older adults. Pedestrian and bicycling activity spaces elucidate the importance of destinations for facilitating active transportation.
3	Liao et al. 2017	China, taiwan	• Density • Access • sidewalks • safety • Aesthetics • Connectivity	walking	The presence of sidewalks (PS) and the presence of a destination (PD), were positively associated with 150 min of walking for recreation. Different personal and perceived environmental factors were associated with walking for recreation and transportation.
4	Huang et al. 2018	China, taiwan	• Urbanization Level • Parks, greeneries, squares • Playgrounds and sport venues	physical activity	Urbanization, the built environment, and the median income of townships were positively correlated to the physical activity of the older adults. Parks and green spaces were associated with achieving the recommended amount of physical activity.
5	Travers et al. 2017	Australia	• Accessibility • Land Use Mix • Safety From Traffic • Safety From Crime • Pleasantness	physical activity walking	We found no association between walkability of the built environment and walking behavior of participants.
6	Zang et al. 2018	China, hongkong	• Land use mix • Density • street connectivity • Aesthetic	walking moderate/vigorous physical activity	Built environment characteristics such as the availability of commercial and recreational space influence the physical activity of Hong Kong's older adults.
7	Laatikainen et al. 2019	Finland	• Walkway density • residential density • connectivity • density of recreational sport places	walking	We found income and education having a direct effect on walking for transport in older adults. Walkway density, residential density, connectivity, and the density of recreational sport places within respondents' home ranges had an independent effect on older adults walking for transport regardless of individual demographic or psychological features. Residential and public transit stop density were found having largest direct effect to older adults walking.
8	Wang et al. 2018	USA	• destinations • land-use mix • population density • residential density • neighborhood design • Safety	physical activity	Having destinations for utilitarian and/or recreational walking promotes community-dwelling older adults' physical activity. Safety is obviously critical to older adults' physical activity. Urban older adults were found to be more utilitarian walking than suburban areas.
9	Portegijs et al. 2017	Finland	• walkability • land use mix • population density • connectivity	light/moderate/ regular physical activity	The results show that higher numbers of perceived environmental facilitators and better walkability were associated with higher physical activity levels, but not consistently across physical activity measures and time points.
10	Lu et al. 2018	China	• design • diversity • density • distance to transit • destination accessibility	transportation walking, recreational walking, moderateto vigorous physical activity	Transportation walking was positively associated with the number of bus stops and the presence of Mass Transit Railway (MTR) stations. Recreational MVPA was positively related to the number of recreational facilities. However, land-use mix was negatively related to transportation walking, recreational walking, and recreational MVPA.
11	Katherine et al. 2016	UK	• walkability	walking	Including way finding and legibility, user conflict, kerb paving quality, and lighting appeared to have little impact on older adults' decisions about where to walk.
12	Cauwenberg et al. 2017	Australian	• park quality and • perceptions of the neighborhood environment	recreational physical activity	synergistic relationships between park proximity and social trust and cohesion with mid-older aged adults' recreational walking.
13	Macintyre et al. 2019	UK	• green spaces	physical activity	Adults viewed the small urban green spaces as belonging to people other than themselves, and preferred to visit larger green spaces. In addition, they had a strong preference for urban green spaces which are maintained regularly, and felt that overgrown green spaces have a negative impact on the area.
14	Holle et al. 2016	Belgian	• Neighborhood walkability	moderate-to-vigorous physical activity	Highly-walkable neighborhoods, higher social diversity of the neighborhood environment was associated with more transport walking;

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Table 2: Summary of Literature Review (2 of 4)

NO.	Author	County	Built Environment Variables	Active Travel Variables	Outcome
15	Kikuchi et al. 2018	Japan	• Walkability • residential density • street connectivity • land use mix	walking, moderate to vigorous physical activity	Neighborhood walkability mitigated the 5-year reduction of walking and total MVPA among older adults, especially in urban areas.
16	Bödeker et al. 2018	Germany	• walkability • Household density • Connectivity • Land use mix • retail floor area ratio	walking	older adults ' self-defined neighborhoods are significantly larger, less home-centered, and more walkable than commonly used buffers.
17	Koohsari et al. 2019	Japan	• walkability	walking and depression	Walkable environment characterized by a high population density and prox- imate local destinations to be supportive for a better mental health among older adults, in particular for women.
18	Liao et al. 2019	China	• walkability	physical activity, sedentary behavior,	No significant associations were found between Walk Score® and other lifestyle health behaviors or health outcomes. While Walk Score ® was not associated with recommended levels of physical activity, it was positively related to prolonged sedentary time in the context of a non-Western country. The different associations between the walk score and health lifestyle behaviors and health outcomes in different contexts should be noted.
19	Arnardottir et al. 2017	Iceland	• seasonal	physical activity walking sedentary behavior	Our data showed that older community-dwelling Icelandic men and women were more physically active and less sedentary during the summer as compared to the winter; however, the differences in the variables were relatively small.
20	Cassarino et al. 2019	Ireland	• Outdoor Spaces	walk(recreation and transportation)	most participants indicated a preference for outdoor spaces that offer variety and greenery,
21	Dollman et al. 2016	Australian		walking	Participants living alone were less likely to be physically active regardless of region.
22	Maisel et al. 2016	American	• Residential density • Land use mix - diversity • Land use mix - access • Street connectivity • Walking facilities • Aesthetics • Traffic safety • Crime safety	Job walking, Transportation walking, Recreation walking	Within rural neighborhoods, household income was signifi- cantly related to recreational walking. Participants were more than twice as likely to engage in any walking activity when they perceived greater street connectivity. In rural communities, only perceived crime safety was associated with any walking and walking for recreation.
23	Winters et al. 2015	Canadian	• walkability	walking	The higher Street Smart Walk Score was associated walking. In addition, older adults living in neighbourhoods categorised as Walker ' s Paradise were over three times more likely to meet guidelines than those living in Car-dependent/Very car dependent neighbourhoods. We found no evidence that household income moderated the effect of Walk Score on walking outside.
24	Procter-Gray etal. 2015	American	• access to amenities	utilitarian and recreational walking	Utilitarian walking is strongly influenced by neighborhood environment, but intrinsic factors may be more important for recreational walking.
25	Holle et al. 2015	Belgian	• walkability	walking	Walkability was positively associated with recreational walking in those with high self-efficacy, however, there were no significant main effects for transport walking.
26	Marui et al. 2016	Brazil	• Density • Land-use mix • Street connectivity • sidewalks • paved streets • Public open spaces	walking	Higher population density , with a higher street connectivity , a higher sidewalk proportion , and paved streets ; highest tertile were more likely to walk for transportation. Regarding walking for leisure, only 2 predictors were associated, area income and street density.
27	Hyung-Sook Lee 2016	Korea	• Neighborhood quality • Neighborhood safety	walking	SEM revealed that neighborhood quality and safety had significant positive relationships with the TPB variables and indirectly influenced intention and walking of the elderly
28	Hyung-Sook Lee et al. 2015	Korea	• Distance to Parks, shops, • walking trails • Safety • Aesthetical	walking	The results found that significantly more urban females, 42.6% engaged in the " recommended " amount of walking activity com- pared to 29.0% of rural females. for rural women, proximity to parks was the strongest positive association with attain- ing the recommended level of walking followed by street trees. For urban women, crime safety was an important environmental variable to meet physical activity recommendations.

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Table 2: Summary of Literature Review (3 of 4)

NO.	Author	County	Built Environment Variables	Active Travel Variables	Outcome
29	Gallagher et al. 2014	American	• density • destinations • design • access streets • traffic safety • crime safety • comfort	walking	There are gender differences in the impact of the built environment on elderly's walking behavior. Density , and design were associated with walking in men. Significant design characteristics included sidewalks and crime . In women, destinations were associated with walking.
30	Zhang et al. 2014	China	• walkability • residential density • land use mix diversity • street connectivity • access to services • walking facilities • safety • aesthetics	walking	The results suggest that abundant sidewalks, dense bus stops, easily accessible commercial establishments, and ample green land space are potentially effective to enhance walking among the elderly, albeit to varied degrees. The compact urban form, which is considered as walkability in the western context, may not necessarily play a positive role in Zhongshan's context.
31	Tsai et al. 2013	Finland	• Traffic, Terrain, • Distances and Entrance	walking	Persons living alone (57% of the participants) reported environmental mobility barriers more often than those
32	Nathan et al. 2012	Australian	• Access to destinations	walking	Older adults with access to general services within 400m and 800m , and social infrastructure within 800m were more likely to engage in some weekly walking. Access to medical care services within 400m and 800m reduced the odds of sufficient walking. Access to food retail, general retail, financial services, and the mix of commercial destination types within the neighbourhood were all unrelated to walking of the elderly.
33	Van Cauwenberg et al. 2012	Belgium	• Access to services • Walking facilities • Safety • Aesthetics	Walking, cycling	Perceived short distances to services and satisfaction with public transport were significantly positively related to all walking/cycling behaviors. Feelings of unsafety was negatively related to walking for transportation and recreational walking/cycling. In females, it was also negatively related to cycling for transportation.
34	Holle et al. 2014	Belgium	• Walkability • residential density • street connectivity • land use mix diversity	walking/ cycling	Findings showed a positive relationship between neighborhood walkability and weekly minutes of older adults' self-reported walking for transportation.
35	Pelclová et al. 2012	Poland and Slovakia	• Residential density • Land use-mix - proximity • Accessibility • Street connectivity • Infrastructure for walking/cycling • Neighborhood aesthetics • Traffic and crime safety	walking for leisure, walking for transportant walking/ cycling	Respondents living in high residential density neighborhoods (OR 1.87), living in flats (OR 2.09) and in location with ≤ 100,000 inhabitants (OR 1.63) were more likely to meet recommendation within walking for transportation. Owning a dog was associated with meeting recommendation within walking for leisure
36	Chen et al. 2013	Japan	• density • proximity to service facilities • land use mix-access • street connectivity • places for walking • good view • traffic and crime safety	walking	Traffic and crime safety in old-unemployed males and proximity to service facilities and traffic and crime safety in middle-employed females were significantly associated with a low risk of insufficient WT Proximity to service facilities in old-employed males, number of service facilities, places for walking, and good view in middle-employed females, and density of dwelling and proximity to service facilities in old-unemployed females were significantly associated with a low risk of non-HE.
37	Cerin et al. 2013	China	• destinations • diversity • safety • pedestrian infrastructure	Walking for transport	The prevalence of public transit points and diversity of recreational destinations were positively related to overall walking for transport. The presence of a health clinic/service and place of worship, higher diversity in recreational destinations, and greater prevalence of non-food retails and services, food/grocery stores, and restaurants in the neighborhood were predictive of more within-neighborhood walking for transport. Neighborhood safety-related aspects moderated the relationship of overall walking for transport with the prevalence of public transit points, this being positive only in safe locations. Pedestrian-infrastructure attributes acted as moderators of associations of within-neighborhood walking for transport with prevalence of commercial destination categories.
38	Takahashi et al. 2012	American	• walkability	bicycle and walking	The hypothesis that there would be a relationship between the built environment, as measured by the Walk Score®, and the frequency of walking in an older adult population in Rochester, MN, is not supported by the findings of this study.

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Table 2: Summary of Literature Review (4 of 4)

NO.	Author	County	Built Environment Variables	Active Travel Variables	Outcome
39	Gauvin et al. 2012	Canada	• distance between their home and services and amenities	walking	closer proximity to services and amenities was associated with greater likelihood of frequent walking at all times throughout the 3-year period.
40	Siu et al. 2012	Portland	• distance • land use mix • connectivity • population density	walking utilitarian and for leisure purpose	we found that urban areas with the best access to transit services, close proximity to amenities such as businesses and parks, high street connectivity, and high population density were most likely to promote walking in older women.
41	Cerin et al. 2013	China	• Residential density • land use • Physical barriers • connectivity • traffic • Infrastructure for walking • Aesthetics • Safety • connecting to services • Easy access of residential entrance • Sitting facilities	walking	Access to and availability of different types of services and destinations, provision of facilities for resting/sitting in the neighbourhood, and easy access to/from residential buildings may help maintain an active lifestyle by facilitating walking for transport in the neighbourhood. 3. Access to services, indoor places for walking, environmental aesthetics, low traffic, and absence of physical barriers may promote recreational walking
42	Corseuil et al. 2017	Brazil	• infrastructure • safety for walking and cycling, • aesthetics • traffic and crime safety • recreational facilities and social support	walking	The presence of sidewalks was related to both walking for transportation and for leisure. Existence of crosswalks in the neighborhood, safety during the day, presence of street lighting, recreational facilities, and having dog were significant predictors of walking for transportation. Safety during the day and social support were significantly associated with walking for leisure.
43	Nyunt et al. 2015	Singapore	• Residential density • Land use mix—diversity • Street connectivity • Land use mix—access • Infrastructure • Aesthetics • Traffic safety • Safety from crime	walking for transportation	The subjective measures of residential density, street connectivity, land use mix diversity and aesthetic environment and the objective GIS measure of Accessibility Index have positively significant independent associations with transportation physical activity, after adjusting for demographics, socio-economic and health status.

Conclusion

This study gave an overview of the built environment factor that influence active travel. It found that physical environment, social environment, natural environment and ICT environment can impact active travel of elderly. However, few studies were conducted in developing countries and rural areas. Meanwhile, weather and ICT were seldomly tested as factors affecting individual's travel behavior and travel choices, especially for the elderly. Thus, more researches need to be conducted in the future.

Reference

Arnardottir, N. Y., Oskarsdottir, N. D., Brychta, R. J., Koster, A., Domelen, D. R. Van, Caserotti, P., … Harris, T. B. (2017). Comparison of Summer and Winter Objectively Measured Physical Activity and Sedentary Behavior in Older Adults : Age , Gene / Environment Susceptibility Reykjavik Study. *International Journal of Environmental Research and Public Health*, *14*(10). https://doi.org/10.3390/ijerph14101268

Barnett, A., Cerin, E., Zhang, C. J. P., Sit, C. H. P., Johnston, J. M., Cheung, M. M. C., & Lee, R. S. Y. (2016). Associations between the neighbourhood environment characteristics and physical activity in older adults with specific types of chronic conditions: The ALECS cross-sectional study. *International Journal of Behavioral Nutrition and Physical Activity*, *13*(1). https://doi.org/10.1186/s12966-016-0377-7

Berkemeyer, K., Wijndaele, K., White, T., Cooper, A. J. M., Luben, R., Westgate, K., … Brage, S. (2016). The descriptive epidemiology of accelerometer-measured physical activity

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026
in older adults. *International Journal of Behavioral Nutrition and Physical Activity*, *13*(1), 1–10. https://doi.org/10.1186/s12966-015-0316-z

Biljecki, F., Ledoux, H., & van Oosterom, P. (2013). Transportation mode-based segmentation and classification of movement trajectories. *International Journal of Geographical Information Science*, *27*(2), 385–407. https://doi.org/10.1080/13658816.2012.692791

Carl, P. (2016). Health Matters: There's never been a better time to promote active travel. Retrieved from Public Health England website: https://publichealthmatters.blog.gov.uk/2016/08/30/health-matters-theres-never-been-a-better-time-to-promote-active-travel/

Cassarino, M., Bantry-white, E., & Setti, A. (2019). Cognitive and Sensory Dimensions of Older People ' s Preferences of Outdoor Spaces for Walking : A Survey Study in Ireland. *International Journal of Environmental Research and Public Health*, *16*(8), 1340. https://doi.org/http://dx.doi.org/10.3390/ijerph16081340

Cauwenberg, J. Van, Cerin, E., Timperio, A., Salmon, J., Deforche, B., & Veitch, J. (2017). Is the association between park proximity and recreational physical activity among mid-older aged adults moderated by park quality and neighborhood conditions? *International Journal of Environmental Research and Public Health*, *14*(2), 1–11. https://doi.org/10.3390/ijerph14020192

Cavill, N., Davies, A., Cope, A., & Corner, D. (2019). *Active Travel & Physical Activity Evidence Review*. Retrieved from https://www.sportengland.org/media/13943/active-travel-full-report-evidence-review.pdf

Cerin, E., Macfarlane, D., Sit, C. H. P., Ho, S. Y., Johnston, J. M., Chou, K. L., … Ho, K. S. (2013). Effects of built environment on walking among Hong Kong older adults. *Hong Kong Medical Journal*, *19*(3), 39–41.

Cerin, Ester, Lee, K. yiu, Barnett, A., Sit, C. H. P., Cheung, M. chin, Chan, W. man, & Johnston, J. M. (2013). Walking for transportation in Hong Kong Chinese urban elders: A cross-sectional study on what destinations matter and when. *International Journal of Behavioral Nutrition and Physical Activity*, *10*, 1–10. https://doi.org/10.1186/1479-5868-10-78

Cerin, Ester, Nathan, A., van Cauwenberg, J., Barnett, D. W., & Barnett, A. (2017). The neighbourhood physical environment and active travel in older adults: A systematic review and meta-analysis. *International Journal of Behavioral Nutrition and Physical Activity*, *14*(1), 1–23. https://doi.org/10.1186/s12966-017-0471-5

Cerin, Ester, Saelens, B. E., Sallis, J. F., & Frank, L. D. (2006). Neighborhood environment walkability scale: Validity and development of a short form. *Medicine and Science in Sports and Exercise*, *38*(9), 1682–1691. https://doi.org/10.1249/01.mss.0000227639.83607.4d

Chen, P., Zhou, J., & Sun, F. (2017). Built environment determinants of bicycle volume. *Journal of Transport and Land Use*, *10*(1), 655–674. Retrieved from http://www.jstor.org/stable/26211749

Chen, T. A., Lee, J. S., Kawakubo, K., Watanabe, E., Mori, K., Kitaike, T., & Akabayashi, A. (2013). Features of perceived neighborhood environment associated with daily walking time or habitual exercise: Differences across gender, age, and employment status in a community-dwelling population of Japan. *Environmental Health and Preventive Medicine*, *18*(5), 368–376. https://doi.org/10.1007/s12199-013-0334-x

Christiansen, L. B., Cerin, E., Badland, H., Kerr, J., Davey, R., Troelsen, J., … Planning, R. (2016). *International comparisons of the associations between objective measures of*

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

the built environment and transport-related walking and cycling: IPEN Adult Study. *3*(4), 467–478. https://doi.org/10.1016/j.jth.2016.02.010.International

Corseuil Giehl, M. W., Hallal, P. C., Brownson, R. C., & D'Orsi, E. (2017). Exploring Associations between Perceived Measures of the Environment and Walking among Brazilian Older Adults. *Journal of Aging and Health*, *29*(1), 45–67. https://doi.org/10.1177/0898264315624904

Dadpour, S., Pakzad, J., & Khankeh, H. (2016). Understanding the Influence of Environment on Adults ' Walking Experiences : A Meta-Synthesis Study. *International Journal of Environmental Research and Public Health*, *13*(7), 731. https://doi.org/10.3390/ijerph13070731

Doescher, M. P., Lee, C., Berke, E. M., Adachi-Mejia, A. M., Lee, C., Stewart, O., … Moudon, A. V. (2014). The Built Environment and Utilitarian Walking in Small U.S. Towns. *Preventive Medicine*, *69*, 80–86. https://doi.org/10.1016/j.cortex.2009.08.003.Predictive

Ewing, R., & Cervero, R. (2010). Travel and the built environment. *Journal of the American Planning Association*, *76*(3), 265–294. https://doi.org/10.1080/01944361003766766

Gauvin, L., Richard, L., Kestens, Y., Shatenstein, B., Daniel, M., Moore, S. D., … Payette, H. (2012). Living in a well-serviced urban area is associated with maintenance of frequent walking among seniors in the VoisiNuAge study. *Journals of Gerontology - Series B Psychological Sciences and Social Sciences*, *67 B*(1), 76–88. https://doi.org/10.1093/geronb/gbr134

H.E., C., F.C., B., N.J., M., M.W., K., M.L., D., P., H., … B., G.-C. (2011). How important is the land use mix measure in understanding walking behaviour? Results from the RESIDE study. *International Journal of Behavioral Nutrition and Physical Activity*, *8*. https://doi.org/10.1186/1479-5868-8-55 LK - http://resolver.ebscohost.com/openurl?sid=EMBASE&issn=14795868&id=doi:10.1186%2F1479-5868-8-55&atitle=How+important+is+the+land+use+mix+measure+in+understanding+walking+behaviour%3F+Results+from+the+RESIDE+study&stitle=Int.+J.+Behav.+Nutr.+Phys.+Act.&title=International+Journal+of+Behavioral+Nutrition+and+Physical+Activity&volume=8&issue=&spage=&epage=&aulast=Christian&aufirst=Hayley+E.&auinit=H.E.&aufull=Christian+H.E.&coden=&isbn=&pages=-&date=2011&auinit1=H&auinit

Helbich, M., Emmichoven, M. J. Z. van, Dijst, M. J., Kwan, M. P., Pierik, F. H., & Vries, S. I. d. (2016). Natural and built environmental exposures on children's active school travel: A Dutch global positioning system-based cross-sectional study. *Health and Place*, *39*, 101–109. https://doi.org/10.1016/j.healthplace.2016.03.003

Hirsch, J. A., Winters, M., Ashe, M. C., Clarke, P. J., & McKay, H. A. (2016). Destinations That Older Adults Experience Within Their GPS Activity Spaces: Relation to Objectively Measured Physical Activity. *Environment and Behavior*, *48*(1), 55–77. https://doi.org/10.1177/0013916515607312

Huang, N. C., Kung, S. F., & Hu, S. C. (2018). The relationship between urbanization, the built environment, and physical activity among older adults in Taiwan. *International Journal of Environmental Research and Public Health*, *15*(5), 1–20. https://doi.org/10.3390/ijerph15050836

Jennifer, K. (2015). Higher-density living can make us healthier, but not on its own. Retrieved from University of Sydney website: http://theconversation.com/higher-density-living-can-make-us-healthier-but-not-on-its-own-34920

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Jiang, Y., Zhen, F., Wang, W., & Zhao, M. (2019). Influence of urban built environment on residents'physical activity. *Progress in Geography*, *38*(3), 357–369. https://doi.org/10.18306/dlkxjz.2019.03.006

Keadle, S. K., McKinnon, R., Graubard, B. I., & Troiano, R. P. (2016). Prevalence and trends in physical activity among older adults in the United States: A comparison across three national surveys. *Preventive Medicine*, *89*, 37–43. https://doi.org/10.1016/j.ypmed.2016.05.009

Kikuchi, H., Nakaya, T., Hanibuchi, T., Fukushima, N., Amagasa, S., Oka, K., … Inoue, S. (2018). Objectively measured neighborhood walkability and change in physical activity in older Japanese adults: A five-year cohort study. *International Journal of Environmental Research and Public Health*, *15*(9). https://doi.org/10.3390/ijerph15091814

King, T. L., Bentley, R. J., Thornton, L. E., & Kavanagh, A. M. (2015). Does the presence and mix of destinations influence walking and physical activity? *International Journal of Behavioral Nutrition and Physical Activity*, *12*(1), 1–12. https://doi.org/10.1186/s12966-015-0279-0

Kondo, K., Lee, J. S., Kawakubo, K., Kataoka, Y., Asami, Y., Mori, K., … Akabayashi, A. (2009). Association between daily physical activity and neighborhood environments. *Environmental Health and Preventive Medicine*, *14*(3), 196–206. https://doi.org/10.1007/s12199-009-0081-1

Koohsari, M. J., McCormack, G. R., Nakaya, T., Shibata, A., Ishii, K., Yasunaga, A., … Oka, K. (2019). Urban design and Japanese older adults' depressive symptoms. *Cities*, *87*(September), 166–173. https://doi.org/10.1016/j.cities.2018.09.020

Lachapelle, U., & Jean-Germain, F. (2019). Personal use of the Internet and travel: Evidence from the Canadian General Social Survey's 2010 time use module. *Travel Behaviour and Society*, *14*(October 2018), 81–91. https://doi.org/10.1016/j.tbs.2018.10.002

Lachapelle, U., & Pinto, D. G. (2016). Longer or more frequent walks: Examining the relationship between transit use and active transportation in Canada. *Journal of Transport and Health*, *3*(2), 173–180. https://doi.org/10.1016/j.jth.2016.02.005

Lee, H. (2016). Examining neighborhood influences on leisure-time walking in older Korean adults using an extended theory of planned behavior. *Landscape and Urban Planning*, *148*, 51–60. https://doi.org/10.1016/j.landurbplan.2015.12.011

Lee, H. S., & Park, E. Y. (2015). Associations of neighborhood environment and walking in Korean elderly women: A comparison between urban and rural dwellers. *Asian Women*, *31*(4), 1–21. https://doi.org/10.14431/aw.2015.12.31.4.1

Li, F., Harmer, P. A., Cardinal, B. J., Bosworth, M., Acock, A., Johnson-Shelton, D., & Moore, J. M. (2008). Built Environment, Adiposity, and Physical Activity in Adults Aged 50–75. *American Journal of Preventive Medicine*, *35*(1), 38–46. https://doi.org/10.1016/j.cortex.2009.08.003.Predictive

Liao, Y., Huang, P. H., Hsiang, C. Y., Huang, J. H., Hsueh, M. C., & Park, J. H. (2017). Associations of older Taiwanese adults' personal attributes and perceptions of the neighborhood environment concerning walking for recreation and transportation. *International Journal of Environmental Research and Public Health*, *14*(12). https://doi.org/10.3390/ijerph14121594

Liao, Y., Wang, I. T., Hsu, H. H., & Chang, S. H. (2015). Perceived environmental and personal factors associated with walking and cycling for transportation in Taiwanese adults. *International Journal of Environmental Research and Public Health*, *12*(2), 2105–2119. https://doi.org/10.3390/ijerph120202105

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026
Lu, Y., Chen, L., Yang, Y., & Gou, Z. (2018). The association of built environment and physical activity in older adults: Using a citywide public housing scheme to reduce residential self-selection bias. *International Journal of Environmental Research and Public Health*, *15*(9), 1–13. https://doi.org/10.3390/ijerph15091973

Macintyre, V. G., Cotterill, S., Anderson, J., Phillipson, C., Benton, J. S., & French, D. P. (2019). I would never come here because ive got my own garden": Older adults' perceptions of small urban green spaces. *International Journal of Environmental Research and Public Health*, *16*(11). https://doi.org/10.3390/ijerph16111994

Maisel, J. L. (2016). Impact of older adults' neighborhood perceptions on walking behavior. *Journal of Aging and Physical Activity*, *24*(2), 247–255. https://doi.org/10.1123/japa.2014-0278

Matisziw, T. C., Nilon, C. H., Wilhelm Stanis, S. A., LeMaster, J. W., McElroy, J. A., & Sayers, S. P. (2016). The right space at the right time: The relationship between children's physical activity and land use/land cover. *Landscape and Urban Planning*, *151*, 21–32. https://doi.org/10.1016/j.landurbplan.2016.03.006

Mecredy, G., Pickett, W., & Janssen, I. (2011). *Street Connectivity is Negatively Associated with Physical Activity in Canadian Youth*. 3333–3350. https://doi.org/10.3390/ijerph8083333

Mitchell, A. B. (2012). *The Relationship Of Self-reported Health Status And Perceived Neighborhood Built Environment With The Amount Of Self- Reported Walking Among Urban Community Dwelling Older Adults*. University of Pennsylvania.

Nathan, A., Pereira, G., Foster, S., Hooper, P., Saarloos, D., & Giles-Corti, B. (2012a). Access to commercial destinations within the neighbourhood and walking among Australian older adults. *International Journal of Behavioral Nutrition and Physical Activity*, *9*(1), 1. https://doi.org/10.1186/1479-5868-9-133

Nathan, A., Pereira, G., Foster, S., Hooper, P., Saarloos, D., & Giles-Corti, B. (2012b). Access to commercial destinations within the neighbourhood and walking among Australian older adults. *International Journal of Behavioral Nutrition and Physical Activity*, *9*(133), 1–8. https://doi.org/10.1186/1479-5868-9-133

Nyunt, M. S. Z., Shuvo, F. K., Eng, J. Y., Yap, K. B., Scherer, S., Hee, L. M., … Ng, T. P. (2015). Objective and subjective measures of neighborhood environment (NE): Relationships with transportation physical activity among older persons. *International Journal of Behavioral Nutrition and Physical Activity*, *12*(1), 1–10. https://doi.org/10.1186/s12966-015-0276-3

Ogilvie, D., Mitchell, R., Mutrie, N., Petticrew, M., & Platt, S. (2008). Personal and environmental correlates of active travel and physical activity in a deprived urban population. *International Journal of Behavioral Nutrition and Physical Activity*, *5*, 1–12. https://doi.org/10.1186/1479-5868-5-43

Pelclova, J., Fromel, K., Blaha, L., Zajac-Gawlak, I., & Tlucakova, L. (2012). Neighborhood environment and walking for transport and recreation in Central European older adults. *Acta Gymnica*, *42*(4), 49–56. https://doi.org/10.5507/ag.2012.023

Procter-Gray, E., Leveille, S. G., Hannan, M. T., Cheng, J., Kane, K., & Li, W. (2015). Variations in Community Prevalence and Determinants of Recreational and Utilitarian Walking in Older Age. *Journal of Aging Research*, *2015*. https://doi.org/10.1155/2015/382703

Qing, Z., Cao, X., & Zhen, F. (2019). Relationship between Online Shopping and Store Shopping in the Shopping Process : Empirical Study for Search Goods and Experience

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Goods in Nanjing ,. *Transportation Research Record*. https://doi.org/10.1177/0361198119851751

Rodríguez, D. A., Aytur, S., Forsyth, A., Oakes, J. M., & Clifton, K. J. (2008). Relation of modifiable neighborhood attributes to walking. *Preventive Medicine*, *47*(3), 260–264. https://doi.org/10.1016/j.ypmed.2008.02.028

Rosso, A. L., Auchincloss, A. H., & Michael, Y. L. (2011). The urban built environment and mobility in older adults: A comprehensive review. *Journal of Aging Research*. https://doi.org/10.4061/2011/816106

Sallis, J. F., Cerin, E., Conway, T. L., Adams, M. A., Frank, L. D., Pratt, M., … Owen, N. (2016). Physical activity in relation to urban environments in 14 cities worldwide: A cross-sectional study. *The Lancet*, *387*(10034), 2207–2217. https://doi.org/10.1016/S0140-6736(15)01284-2

Sallis, J. F., Cervero, R. B., Ascher, W., Henderson, K. A., Kraft, M. K., & Kerr, J. (2006). An ecological approach to creating active living communities. *Annual Review of Public Health*, *27*, 297–322. https://doi.org/10.1146/annurev.publhealth.27.021405.102100

Salvo, G., Lashewicz, B. M., Doyle-Baker, P. K., & McCormack, G. R. (2018). Neighbourhood built environment influences on physical activity among adults: A systematized review of qualitative evidence. *International Journal of Environmental Research and Public Health*, *15*(5). https://doi.org/10.3390/ijerph15050897

Sariyildiz, S. (2000). *ICT Influence on Spatial Planning, Building and the Built Environment Abstract*. 61–63. Delft Technical University Faculty of Architecture.

Schipperijn, J., Ried-Larsen, M., Nielsen, M. S., Holdt, A. F., Grøntved, A., Ersbøll, A. K., & Kristensen, P. L. (2015). A longitudinal study of objectively measured built environment as determinant of physical activity in young adults: The European Youth Heart Study. *Journal of Physical Activity and Health*, *12*(7), 909–914. https://doi.org/10.1123/jpah.2014-0039

Siu, V. W., Lambert, W. E., Fu, R., Hillier, T. A., Bosworth, M., & Michael, Y. L. (2012). Built environment and its influences on walking among older women: Use of standardized geographic units to define urban forms. *Journal of Environmental and Public Health*, *2012*. https://doi.org/10.1155/2012/203141

Takahashi, P. Y., Baker, M. A., Cha, S., & Targonski, P. V. (2012). A cross-sectional survey of the relationship between walking, biking, and the built environment for adults aged over 70 years. *Risk Management and Healthcare Policy*, *5*, 35–41. https://doi.org/10.2147/rmhp.s30221

Tian, G. (2017). *Travel And Built Environment : Evidence From 23 Diverse Regions Of The United States*. University of Utah.

Toftager, K.-J., Toftager, M., Ekholm, O., Schipperijn, J., Stigsdotter, U., Bentsen, P., … Kamper-Jørgensen, F. (2011). Distance to Green Space and Physical Activity: A Danish National Representative Survey. *Journal of Physical Activity and Health*, *8*, 741–749. Retrieved from https://pdfs.semanticscholar.org/eb76/26c2d6e4dc17edb0316b86fb4e6fe787e924.pdf

Travers, C., Dixon, A., Laurence, A., Niblett, S., King, K., Lewis, P., & Owen, N. (2017). Retirement Health and Lifestyle Study : Australian Neighborhood Environments and Physical Activity in Older Adults. *Environment and Behavior*, *50*(4), 426–453. https://doi.org/10.1177/0013916517707294

Troped, P. J., Tamura, K., McDonough, M. H., Starnes, H. A., James, P., Ben-Joseph, E., … Laden, F. (2017). Direct and Indirect Associations Between the Built Environment and

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Leisure and Utilitarian Walking in Older Women. *Annals of Behavioral Medicine*, *51*(2), 282–291. https://doi.org/10.1007/s12160-016-9852-2

Van Cauwenberg, J., Clarys, P., De Bourdeaudhuij, I., Van Holle, V., Verté, D., De Witte, N., … Deforche, B. (2012). Physical environmental factors related to walking and cycling in older adults: The Belgian aging studies. *BMC Public Health*, *12*(1), 142. https://doi.org/10.1186/1471-2458-12-142

van Heeswijck, T., Paquet, C., Kestens, Y., Thierry, B., Morency, C., & Daniel, M. (2015). Differences in associations between active transportation and built environmental exposures when expressed using different components of individual activity spaces. *Health and Place*, *33*, 195–202. https://doi.org/10.1016/j.healthplace.2015.03.003

Van Holle, V., Van Cauwenberg, J., De Bourdeaudhuij, I., Deforche, B., Van de Weghe, N., & Van Dyck, D. (2016). Interactions between neighborhood social environment and walkability to explain belgian older adults' physical activity and sedentary time. *International Journal of Environmental Research and Public Health*, *13*(6). https://doi.org/10.3390/ijerph13060569

Van Holle, V., Van Cauwenberg, J., Van Dyck, D., Deforche, B., Van de Weghe, N., & De Bourdeaudhuij, I. (2014). Relationship between neighborhood walkability and older adults' physical activity: Results from the Belgian Environmental Physical Activity Study in Seniors (BEPAS Seniors). *International Journal of Behavioral Nutrition and Physical Activity*, *11*(1), 1–9. https://doi.org/10.1186/s12966-014-0110-3

Wang, K., Hao, Y., & Qin, R. (2020). High Quality Development of Agriculture，Transaction System Change and Promotion of Consumption of Online Agricultural Products — Influence of Novel Coronavirus Pneumonia on Fresh E-commerce Development. *Research on Economics and Management*, *41*(4), 21–31.

Wang, L., Liao, S., & Zhao, X. (2016). Exploration of Approaches and Factors of Healthy City Planning. *Urban Planning International*, *31*(4), 4–9.

Wang, Y., Chau, C. ., Ng, W. Y., & Leung, T. M. (2016). *A review on the effects of physical built environment attributes on enhancing walking and cycling activity levels within residential neighborhoods*. *50*, 1–15. https://doi.org/10.1016/j.cities.2015.08.004

Wang, Z., & Shepley, M. M. C. (2018). Can aging-in-place be promoted by the built environment near home for physical activity: a case study of non-Hispanic White elderly in Texas. *Journal of Housing and the Built Environment*, *33*(4), 749–766. https://doi.org/10.1007/s10901-017-9584-z

Weber, M., Giehl, C., Hallal, P. C., Corseuil, C. W., Schneider, I. J. C., & Orsi, E. (2016). Built Environment and Walking Behavior Among Brazilian Older Adults : A Population-Based Study. *Journal of Physical Activity and Health*, *13*(6), 617–624. https://doi.org/10.1123/jpah.2015-0355

Yang, L., Griffin, S., Khaw, K. T., Wareham, N., & Panter, J. (2017). Longitudinal associations between built environment characteristics and changes in active commuting. *BMC Public Health*, *17*, 1–8. https://doi.org/10.1186/s12889-017-4396-3

Yu, F. (2020). *What does mean the substantial increase in online shopping for the elderly?* Retrieved from https://new.qq.com/omn/20200805/20200805A07U7S00.html

Yu, Y., & Hu, Y. (2017). Progress of International Research on Health Impact of the Built Environment of Communities. *Architectural Journal*, (2), 33–38.

Zandieh, R., Martinez, J., Flacke, J., Jones, P., & Van Maarseveen, M. (2016). Older adults' outdoor walking: Inequalities in neighbourhood safety, pedestrian infrastructure and aesthetics. *International Journal of Environmental Research and Public Health*, *13*(12), 1–24. https://doi.org/10.3390/ijerph13121179

Journal of Tourism, Hospitality and Environment Management
JTHEM
EISSN: 0128-178X
Volume 6 Issue 26 (December 2021) PP. 281-299
DOI 10/35631/JTHEM.626026

Zang, P., Xue, C. Q. L., Lu, Y., & Tu, K. (2018). Neighbourhood adaptability for Hong Kong's ageing population. *Urban Design International*, *24*(3), 187–205. https://doi.org/10.1057/s41289-018-0074-z

Zhang, Y., Li, Y., Liu, Q., & Li, C. (2014). The Built Environment and Walking Activity of the Elderly: An Empirical Analysis in the Zhongshan Metropolitan Area, China. *Sustainability*, 1076–1092. https://doi.org/10.3390/su6021076

Zhao, L., Zhen, F., & Long, S. (2013). THE IMPACTS OF INFORMATION TECHNOLOGY ON LEISURE ACTIVITIES AND TRAVEL IN NANJING: A STRUCTURAL EQUATIONS MODELING APPROACH. *Human Geography*, *28*(1), 56–61. https://doi.org/10.13959/j.issn.1003-2398.2013.01.012

Zhen, F., Du, X., Cao, J., & Mokhtarian, P. L. (2018). The association between spatial attributes and e-shopping in the shopping process for search goods and experience goods : Evidence from Nanjing. *Journal of Transport Geography*, *66*(November 2017), 291–299. https://doi.org/10.1016/j.jtrangeo.2017.11.007

Zhen, F., Wei, Z., Yang, S., & Cao, X. (2009). The impact of information technology on the characteristics of urban resident travel: Case of Nanjing. *Geography Research*, *28*(5), 1307–1317.

Zhou, X. (2014). *Investigating The Association Between The Built Environment And Active Travel Of Young Adults Using Location Based Technology*. University of Illinois at Urbana-Champaign.