



**PLANNING MALAYSIA:**

*Journal of the Malaysian Institute of Planners*

**VOLUME 20 ISSUE 5 (2022), Page 363 – 376**

## **DETERMINING ELDERLY-FRIENDLY FEATURES BASED ON AN AGE-FRIENDLY CITY APPROACH: AN EMPIRICAL ANALYSIS ON LOCAL PERSPECTIVE IN TAIPING AND IPOH, MALAYSIA**

**Kushairi Rashid<sup>1</sup>, Thuraiya Mohamed<sup>2</sup>, Siti Norhawa Azyze Ellah Azyze<sup>3</sup>,  
Hafiszah Ismail<sup>4</sup>**

*<sup>1, 2, 3</sup> Department of Built Environmental Studies and Technology,  
Faculty of Architecture, Planning and Survey,  
UNIVERSITI TEKNOLOGI MARA, PERAK BRANCH, MALAYSIA*

*<sup>4</sup> Centre of Studies for Estate Management,  
Faculty of Architecture, Planning and Survey,  
UNIVERSITI TEKNOLOGI MARA, SELANGOR, MALAYSIA*

### **Abstract**

The elderly come from diverse backgrounds and experiences. Thus, they need strategies that can assist them in cherishing a pleasant and respected life, especially in the city. However, the state of age-friendly and elderly-friendly remains a subject for exploration, especially in Malaysia. This study was conducted to determine critical elderly-friendly city features and propose quick-win strategies to adapt Malaysian cities with ageing populations. The study primarily aims to develop an age-friendly city framework consisting of key city features based on Malaysia's local perspective. Quantitative deductive research applied structured surveys as the primary research strategy. Ipoh and Taiping, two cities with the highest elderly in Malaysia, were selected for the study. The Confirmatory Factor Analyses identified 24 key features as necessary, therefore considered to form the Malaysia Cities for Ageing Population Framework (MCAP). It endeavours that the study findings can become a steppingstone to further develop an age-friendly city for the ageing population, rejuvenate the city centre through better spatial planning and utilise available city features to maximise social capital building.

**Keyword:** elderly-friendly, age-friendly city, elderly population, city features, Malaysia

<sup>1</sup> Lecturer at Universiti Teknologi MARA, Perak Branch Email: kusha575@uitm.edu.my

## **RESEARCH BACKGROUND**

The world is ageing, with the number of the elderly expected to double globally, from 841 million in 2013 to more than 2 billion in 2050 (Hamid, 2015). Amount of people aged above 65 years globally is expected to double, from only 8% (524 million) in 2010 to 16% (1.5 billion) in 2050 (Kim et al., 2014). Within the next decade, the growth of the aged population will be fastest in developing countries.

In 2035, Malaysia is predicted to become an ageing country (Tan et al., 2016), with 15% of the population in the elderly group. The elderly population of Malaysia significantly increased from only 0.5 million in the 1970s to almost 2.3 million in 2010. Currently, out of the 28.5 million Malaysians, 2.2 million are elderly. Therefore, 1 out of every 13 people is an elderly person in Malaysia, and this trend is expected to increase each year (Aini et al., 2016) gradually.

Most Malaysians are unaware of the negative impacts of ageing on physical planning, mainly in terms of designing and accommodating the needs for housing, community engagement, health and well-being. Many scholars urge local authorities to develop future cities or urban areas that better integrate the elderly into the city environment through spatial planning (Abd Samad & Mansor, 2013; Aini et al., 2016; Hamid et al., 2012; Ismail et al., 2015; Knopf, 2007; Metz, 2000; Mohit & Ali, 2016; Tan et al., 2016).

Since the 1980s, World Health Organization (WHO) has developed frameworks to guide cities in providing an environment for the ageing population. The Active Aging Framework, launched in 2002 (Freestone, 2014), was framed based on security (dealing with vulnerability), activity (participation), health, and continuity of education, placing great emphasised on the older citizen's capability to access services and facilities. Then, the Age-Friendly City Guide was introduced while is based on eight key themes developed by engaging with the elderly from 35 cities (WHO, 2002; 2007).

The first three themes of the Age-Friendly City Guide emphasise outdoor spaces and buildings, transportation, and housing to improve personal mobility, safety from injury, security from crime, health behaviour and social participation. Respect and social inclusion, social participation and civic participation and employment are three themes that resonate with the social environment, culture, participation, and mental well-being (WHO, 2007). Meanwhile, communication and information, community support and health services consider social settings and health and social service factors.

The Age-Friendly Cities Guide (WHO, 2007) has been widely replicated in cities across the globe with the variation in scale, locality, actors and strategies involved. Adopting the guide requires integrating local socio-culture and aspirations (Rashid et al., 2021). Although changes were made to the guide, however, it was identified no apparent differences in the themes and city features application (Plouffe & Kalache, 2010). As age-friendly cities continue to grow,

variations of strategies, guidelines and standards of the guide are anticipated to continue widening due to deviation of community needs. Consequently, a precise mechanism to achieve the state of an age-friendly city environment remains a subject for exploration.

The issue poses questions on the suitability of adopting age-friendly city features developed in other countries to fit Malaysia's local context. Therefore, the paper's purpose is to determine city features for the elderly based on the age-friendly city approach that could be suitable for the Malaysian context. Considering the elderly population in Malaysia is increasing dramatically, the critical city features identified should be able to be applied as quick-win development strategies that are not only individually significant but also have collective influence.

## **RESEARCH DESIGN AND METHODOLOGY**

The paper is based on a two-phase study on critical features of an age-friendly city in Malaysia. The initial stage of the study is centred on identifying city features documented by various forms of reports across the globe in implementing an age-friendly city. The results of the initial stage were documented in Rashid et al. (2021) as the main inputs for the second stage. On the contrary, the purpose of the second stage is to determine the suitability of the list of city features to be implemented in Malaysia based on local perspective. A deductive approach study in which a structured survey was selected as the research strategy.

The site for the main study was selected after population distribution, and the analysis observed that Perak has the highest population of elderly compared to other states in Malaysia. Accordingly, further municipal and city-level studies suggest Ipoh and Taiping are the two towns with the highest percentage of elderly in the state.

The second stage of the study involved applying two main methods: an expert survey and a structured interview using a questionnaire. The expert survey took place between 19 July and 26 July 2020, involving 40 respondents that are mainly community leaders, representatives of technical agencies, and academicians based in Perak. The study adopted a closed-ended questionnaire to assess each city's importance in an age-friendly town using an ordinal scale (5 Likert – scale items). Respondents were also encouraged to suggest important city features but were omitted. Feedback was analysed using an arithmetic mean to determine the degree of importance and finalise the key attributes.

The following stage is aimed to validate the key features based on local perspectives and subsequently form a framework for an elderly-friendly environment or Malaysia Cities for Ageing Population Framework (MCAP). The selection of samples was chosen using nonprobability and convenience sampling

techniques. The data gathering process was conducted from 21 August to 2 September 2020, and the study managed to gather a total of 315 respondents, which was more than the required sample size. Calculation of the elderly of 65 years and above using data from the Department of Statistics of Malaysia (Mahidin, 2020) identified the age group from a total population of 94,593. Therefore, the sample size required to achieve a 90% confidence level and 5% acceptable error is 270 respondents (Krejcie & Morgan, 1970).

The primary study survey questionnaire comprises three sections. The first section (Section A) is to obtain input from the respondents. Some basic details consist of five (5) simple questions requiring answers from respondents such as name, address, identification number (IC), category of respondents and phone number. The second section (Section B) attempts to define the age-friendly city baseline information in Ipoh and Taiping, where respondents responded based on their observations and perspective with a nominal scale. The third section (Section C) evaluates each city feature's importance in forming an elderly-friendly city in Ipoh and Taiping City using nominal and ordinal scales (5 Likert – scale items).

The critical city features and age-friendly framework are developed by conducting descriptive and confirmatory factor analyses. The descriptive analyses were mainly performed to determine the average mean and standard deviation (Start, 2006; Cohen et al., 2007; Greener, 2008), followed by Consistency Analyses (Cronch Alpha Result) to test the reliability. Cut-off points applied to determine the CFA's fitness include Bartlett's sphericity test, which should be  $p < 0.05$  or smaller, and Kaiser-Meyer-Olkin value which should be 0.6 or above (Pallant, 2020). Initially, data screening was performed to identify possible outlier existence (Pallant, 2020). To further strengthen the findings of CFA, the Anti-image Correlation (Measures of Sampling Adequacy) and Communalities Value (CV) were analysed. Next, the anti-image correlation values (CV) where feature with value less than 0.5, was removed to improve the collective significant of the framework (Dillon & Goldstein, 1984).

## **RESULT**

### **Expert Survey**

Of the 40 respondents, 23 were community leaders, and 17 were from technical agencies and academia. The average age of the community leaders is 58 years, while technical experts involved younger respondents with average age were 40 years. The reliability test using Cronbach's Alpha ( $\hat{\alpha}$ ) was identified to have more than 8.0, with values closer to 1 indicating better internal consistency of the items (Sekaran, 2003). Therefore, respondents' valuation of the city features involved were significant consistent.

Descriptive analysis observed an average score between 4.63 for a crime-free environment, while the lowest score was employment assistance with a score of 4.09. The analyses identified 25 features as significant. For inclusion in the framework, only the top three features with an average score of more than 4 (important) were selected as cut-off scores. The list includes four instead of three features from Dimension 3 or Housing that were determined to receive the same average score values.

**Table 1: Average Scores for City Features During Expert Study**

	Average	Scale
<b>Theme 1: Building and Outdoor Spaces</b>		
1. Age-friendly business environment (e.g.: provide suitable toilets and seating, shopping without the need for transportation)	4.28	Important
2. An age-friendly pedestrian system that includes railing and non-slippery surface	4.23	Important
3. Sufficient and accessible public toilets for all ages, mainly the elderly	4.45	Important
<b>Theme 2: Transportation (T)</b>		
4. Public transport service to key destinations (e.g.: hospitals, health centres, public parks and shopping centres)	4.25	Important
5. Training for transportation staff	4.23	Important
6. Roads that are well maintained	4.23	Important
<b>Theme 3: Housing (H)</b>		
7. Residential design for elderly	4.31	Important
8. Housing assist in living (e.g.: facility care, support services in meal and cleaning and home maintenance)	4.47	Important
9. Fund to own or rent a residential unit	4.28	Important
10. Elderly housing options (e.g. private retirement village, nursing home, independent living unit)	4.28	Important
<b>Theme 4: Social Participation (S)</b>		
11. Access to facilities	4.44	Important
12. Availability of age-friendly events and activities in the neighbourhood or city centre (e.g. senamrobik, taici)	4.25	Important
13. Guide service on social participation (e.g.: age-friendly schools, colleges, universities and events)	4.22	Important
<b>Theme 5: Respect and Inclusion (R)</b>		
14. Opportunities for older adults to participate in decision-making bodies (e.g: community councils or communities)	4.34	Important
15. Intergenerational cultural program/ celebration	4.56	Important
16. Provide service assistance to the elderly and respect	4.34	Important

<b>Theme 6: Civic Participation and Employment (C)</b>		
17. Employment assistant services for the elderly	4.09	Important
18. Staff training to conduct elderly program	4.25	Important
19. Volunteering option for the elderly	4.09	Important
<b>Theme 7: Communication and Information (I)</b>		
20. Communication database and record of the elderly living alone	4.31	Important
21. Information and communication methods with the elderly (e.g.: only essential and clear information to keep in touch, simple and familiar words)	4.34	Important
22. Real-time alert system - System that links the elderly with emergency service	4.47	Important
<b>Theme 8: Community Support and Employment (E)</b>		
23. Crime-free in the elderly living environment	4.63	Important
24. Emergency planning for disaster (e.g.: food and supply and medical kit)	4.59	Important
25. Health and support social services	4.50	Important

## **MAIN STUDY**

### **Respondent Profile**

The primary study involved 300 respondents comprising 50% from Taiping, followed by 48.3% from Ipoh, while only 1.7% from other areas. With most respondents being locals, the study strongly believes that local cultural and social aspirations are transpired in determining key city features for an elderly-friendly city. The highest respondents for Ipoh were caregivers, with 54.67%, while older people were 43.33%. Similarly, for Taiping, the highest respondents were caregivers or 57.24% of the total respondents' caregivers, while 42.76% were elderly aged 65. Although caregivers were slightly higher, their opinions were based on the experience of the elderly for whom they cared for. WHO adopted a similar approach for developing Global Age-friendly Cities: A Guide (WHO, 2007).

**Table 2: Respondent Profile**

<b>Respondent Category</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>IPOH</b>		
Caregivers of elderly	82	54.67
Elderly aged 65 years and above	65	43.33
TOTAL	150	100
<b>TAIPING</b>		
Caregivers of elderly	83	57.24
Elderly aged 65 years and above	62	42.76

TOTAL		145	100
	<b>OTHERS</b>		
Caregivers of elderly		5	100
Elderly aged 65 years and above		0	0
TOTAL		5	100
	<b>SUM</b>		
Caregivers of elderly		173	56.67
Elderly aged 65 years and above		127	43.33
TOTAL		300	100.00

### Baseline Information

The baseline study identified majority of respondents found it essential to stay in their current locality as they grow old. The level of participation in the socio-spatial environment is high, with 53.3% of the respondent using local recreation facilities between 1-5 times or 6-10 times per week, indicating good livelihood. However, the number of those who did not visit local recreation facilities was also high, 32%. In terms of health, Ipoh and Taiping respondents were healthy and active; only 36% were involved, although they had common diseases such as diabetes, high blood pressure etc. Observations on data regarding internet access show a balance between accessibility and inaccessibility to the communication medium. The study identified that 47% had good access, while the combination of no and unfamiliar brought the total to 53%, indicating the acceptable degree of access to the internet and digital information.

**Table 3:** Baseline Information of Respondent

	Frequency	(%)
<b>How important for you to stay in Ipoh/Taiping as you grow old?</b>		
Not Important	7	2.33
Important	163	54.33
Very Important	130	43.33
TOTAL	300	100
<b>Health Condition Status</b>		
Healthy and active	170	56.67
Active but has common diseases (diabetes, high blood pressure etc.)	108	36.00
Inactivity and limited movement	20	6.67
Inactive and bedridden	2	0.67
TOTAL	300	100
<b>Participation: Recreation</b>		
1 –5 times	78	26.0
6 –10 times	76	25.3

11 –20 times	33	11.0
20 –30 times	17	5.7
0 (Not Visited)	96	32.0
TOTAL	300	100
<b>Participation: Internet Access</b>		
Yes	142	47.33
No	85	28.33
Not familiar with smart devices or computers	73	24.33
TOTAL	300	100.00
<b>Participation: Classes / Workshops / Educational Programs</b>		
Yes	38	12.67
No	262	87.33
TOTAL	300	100

### **Descriptive Analysis**

As evident from Table 4 below, the average score of 17 features was four (4) and above, while the other eight (8) features were averagely moderate with a score of 3 and above. However, the average score for all 25 features is 4.13. In addition, the standard deviation result shows all the features lie between the ranges of 0.59 to 1.14, indicating that the distribution is near normal.

### **Confirmatory Factor Analyses (CFA)**

The CFA performed produced a KMO value of 0.874, which is higher than the minimum cut-off point of 0.5 and the p. value of Barlett's test was highly significant at 0.000. Thus, observation of the Anti-image Correlation (Measures of Sampling Adequacy) and Communalities Value (CV) identified that 24 of 25 features meet the minimum cut-off point. The feature B1 - Age-Friendly Business Environment was removed to produce a significantly fit model (Refer to Table 4).

### **DISCUSSION**

The two stages of empirical analysis aim to determine elderly-friendly city features based on local perspective. The analysis approach was designed to observe the importance of city features individually and collectively as a whole framework. As such, descriptive analyses were initially conducted and preceded by Confirmatory Factor Analyses (CFA). The descriptive studies identified all features in each theme were ranked important, suggesting consistent findings with the expert survey. Further, analyses using CFA discover that 24 of 25 elements are significant.

Under Business, two features – premises equipped with railing and non-slip floor surfaces and a public toilet for the elderly – were above the minimum



cut-off extraction value, with feature B1-Age Friendly Business Environment not significant. Therefore, the feature was removed from the framework. The result suggests that the building's physical features, i.e. railing, surface and toilet, are more critical than marketing features such as offers and discount vouchers. Transportation-based features in theme 3 were all identified as relevant. For the public transportation system to be more elderly-friendly in Malaysia, public transport needs to provide better access to key destinations and train staff to be elderly cautious (Morris, 2016; Plouffe & Kalache, 2010; Society & Studies, 2007).

Transport intervention is essential to support the elderly to live independently by providing a regular, safe, and affordable transport system to be physically active and socially connected. Since private vehicle dependency among the elderly in Malaysia is high (Na'asah Nasrudin & Abdullah, n.d.), improvement of current road conditions and the public transportation system need to be weighted equally. Regularly maintained road includes roadside verge clearing and grass cutting, cleaning of silted ditches and culverts, patching, and pothole repair, which indeed provide a safer driving environment for the elderly.

**Table 4:** Evaluation of each feature based on importance in Ipoh and Taiping

	Features	Importance		Communalities	
		Mean	S.D	Initial	Extract
<b>B1</b>	Age-friendly business environment	4.21	0.73	1.000	0.455*
<b>B2</b>	An age-friendly pedestrian system that includes railing and non-slippery surface	4.48	0.59	1.000	0.648
<b>B3</b>	Sufficient and accessible public toilets for all ages, mainly the elderly	4.28	0.71	1.000	0.625
<b>T4</b>	Public transport service to key destinations	4.43	0.67	1.000	0.584
<b>T5</b>	Training for transportation staff	4.19	0.73	1.000	0.711
<b>T6</b>	Roads that are well maintained	4.52	0.62	1.000	0.720
<b>H7</b>	Residential design for elderly	4.24	0.72	1.000	0.715
<b>H8</b>	Housing assist in living	4.04	0.81	1.000	0.619
<b>H9</b>	Fund to own or rent a residential unit	3.99	0.80	1.000	0.746
<b>H10</b>	Elderly housing options	4.02	0.78	1.000	0.599
<b>S11</b>	Access to facilities	4.09	1.01	1.000	0.696
<b>S12</b>	Availability of age-friendly events and activities in the neighbourhood or city centre	3.98	0.80	1.000	0.725
<b>S13</b>	Guide service on social participation (e.g.: age-friendly schools, colleges, universities and events)	3.83	0.91	1.000	0.705
<b>R14</b>	Opportunities for older adults to participate in decision-making bodies	3.73	0.93	1.000	0.797
<b>R15</b>	Intergenerational cultural program/ celebration	3.84	0.93	1.000	0.730
<b>R16</b>	Provide service assistance to the elderly and respect	4.32	0.65	1.000	0.528

<b>C17</b>	Employment assistant services for the elderly	3.43	1.14	1.000	0.615
<b>C18</b>	Staff training to conduct elderly program	3.83	0.97	1.000	0.702
<b>C19</b>	Volunteering option for the elderly	3.56	1.08	1.000	0.765
<b>I20</b>	Database of the elderly living alone	4.13	0.95	1.000	0.684
<b>I21</b>	Elderly-friendly information and communication tools	4.15	0.83	1.000	0.729
<b>I22</b>	The elderly emergency system that connects the elderly with emergency services	4.33	0.76	1.000	0.706
<b>E23</b>	Crime-free in the elderly living environment	4.59	0.63	1.000	0.688
<b>E24</b>	Emergency planning for disaster	4.56	0.64	1.000	0.775
<b>E25</b>	Health and support social services	4.53	0.65	1.000	0.797

Notes: B – Dimension 1: Building and Outdoor Spaces, T – Dimension 2: Transportation, Dimension 3: H – Housing, S – Dimension 4: Social Participation, R – Dimension 5: Respect and Inclusion, C - Dimension 6: Civic Participation and Employment, I – Dimension 7: Communication and Information, E – Dimension 8: Community Support and Employment.

Results for Theme 3 indicate that the Malaysian elderly has a substantial value on housing and support to allow them to age in place comfortably. Although the features' results were almost comparable, funds to own or rent a residential unit have a higher correlation score. An array of literature has well documented the preferences of the elderly in Malaysia to age in place compared to living in nursing facilities (Aini et al., 2017; Ismail et al., 2020; 2015; Tobi et al., 2017) mainly due to social and cultural preferences. As such, approaches such as age-friendly communities, lifetime homes and lifetime neighbourhoods should be explored and applied in Steels (2015). In this line, local governments can play their roles by influencing development by using planning and development policies to ensure a sufficient supply and application of age-friendly housing design.

In the theme of Social Participation, Access to Social Facilities; access, availability, and privilege; and guide events, activities and entertainment and participation in education formed key features. Social involvement and support are strongly connected to good health and well-being (Feng, 2017). Participation in society allows the elderly to exercise competence, enjoy respect and esteem, and maintain supportive and caring relationships (Stones & Gullifer, 2016). Similarly, the features in the theme Respect and Inclusion were identified to reconcile similar elements. Instilling respect and inclusion requires more intangible than physical features related to opportunity and assistance to participate in the community. Beyond the context of the research findings, parts of inclusion have existed in the form of inclusion of the elderly with a family member through facilitating the development of larger residential units, facilitating the building of adaptable housing, development of retirement villages and aged care facilities with city areas (Benjoe, 2018; Demirkan, 2007; Quintal & Thompson, 2007; South Australia, 2012).

For the theme of Civic Participation and Employment, the result suggests that an elderly-friendly city should provide an opportunity for the elderly to contribute to their communities after retirement. This contribution could be through unpaid and voluntary work in a city setting, augmentation strategies, recruitment services for the elderly, training for staff dealing with the elderly and a range of volunteering options for the elderly. Locally, such features align with the Strategic Plan under the Ministry of Human Resource Malaysia 2020-2025 (*Pelan Strategik Kementerian Sumber Manusia 2020 hingga 2025*).

The communication and information theme comprises a founding database of elderly living alone, elderly-friendly information and communication tools and an elderly emergency system. Such features at the community level connect events and practical information to manage life and receive the support and services the elderly require for themselves and those they care for. Although the importance of the features was highlighted in various documents (Agents et al., 2018; Southway Housing Trust, 2017; Steels, 2015), implementation in Malaysia may face significant challenges due to low technology literacy among the elderly. However, the desire to use the technology must be developed by providing simple and easy-to-use technology (Abdullah et al., 2011).

For the theme Community Support and Health Services, the features in the category received high mean scores, with the average score being more than 4.0. The tenet of the themes and the entailed features lay in the community effort to shape a conducive environment for the elderly (Ismail et al., 2020; Steels, 2015). Health and support services are vital to independently maintaining good health although ageing. The elderly could achieve good health by facilitating community service, especially during an emergency for the elderly and by creating a safer living environment through neighbourhood design. Besides that, an excellent conducive elderly environment community service should also be extended, including crime prevention and disaster management services.

## **CONCLUSION**

Malaysia is predicted to become an ageing country by the year 2035, with 15% of the population in the elderly group. Developing a solution to meet the diverse needs and building capacity for elderly groups, such as housing, community engagement, health, and well-being, should be the primary consideration in any development plan in Malaysia. As the elderly are the vulnerable community segment and requires a unique physical and social environment, a comprehensive framework for developing inclusive cities emerged under various taglines such as 'healthy cities', 'liveable cities', 'lifetime neighbourhoods' and 'active ageing'. However, a precise mechanism to achieve the state of an age-friendly city environment remains a subject for exploration. Therefore, best practices based on the Malaysia local perspective context could have ensued.

The study proposed quick-win strategies to adapt Malaysian cities to the ageing population. Malaysia was identified to have a shorter time to prepare its cities for the ageing population. Therefore, it is critically important to determine the immediate needs of the elderly. Although the study has identified the critical city features based on a local perspective, the list needs to be revived to include multidimensional perspectives that include policymakers, city planners, developers and other professionals to build a mutually enhancing environment for the elderly. Thus, the complexity of cities consisting of multi-ethnicity, social classes, and administrative elements requires more studies to produce comprehensive development strategies.

### ACKNOWLEDGEMENT

The researchers thank the Valuation and Property Services Department, Malaysia (INSPEN) and Fundamental Research Grant Schemes (FRGS), Ministry of Higher Education for funding research on elderly and promoting sustainable living. In addition, special thanks are also accorded to Universiti Teknologi MARA Perak Branch.

### REFERENCES

- Abd Samad, S., & Mansor, N. (2013). Population Ageing and Social Protection in Malaysia. *Malaysian Journal of Economic Studies*, 50(2), 139–156.
- Abdullah, M. Y., Salman, A., Razak, N. A., Noor, N. F. M., & Malek, J. A. (2011). Issues affecting the use of information and communication technology among the elderly: A case study on JENii. 2011 IEEE *10th Malaysia International Conference on Communications*, 29–32.
- Agents, I., Ar, I., Ke, O., Oe, O., Cohen, L., Manion, L., Morrison, K., Cottini, E., Lucifora, C., Cottini, E., Data, Q., Ebbinghaus, L., England, A., Faso, B., Guest, B. G., Fleming, P., Hancock, B., Namey, B. E. E., Trotter, R. T., ... York, N. (2018). *Future of an Ageing Population*. 8(1), 342–386. <https://doi.org/10.1177/216507991206001003>
- Aini, A. M., Azriyati, W. N., Aziz, W. A., & Zulkifli, N. F. (2017). Middle Adults' Housing Expectations for Old-age: A Study of Urban Area of Greater Kuala Lumpur. In *Journal of Design and Built Environment*.
- Aini, A. M., Murni, N., & Abdul Aziz, W. N. A. W. (2016). Housing Aspirations of the Elderly in Malaysia: A Comparison of Urban and Rural Areas. In *Journal of Design and Built Environment* (Vol. 16, Issue 2).
- Benjoe, K. (2018). Creating age friendly communities. *Planning Institute Australia*, A.1. [http://sfx.scholarsportal.info.proxy.bib.uottawa.ca/ottawa?url\\_ver=Z39.88-2004&rft\\_val\\_fmt=info:ofi/fmt:kev:mtx:journal&genre=unknown&sid=ProQ:ProQ%253Acanadiannewsmajor&atitle=Creating+age+friendly+communities&title=Leader+Post&issn=08392870&date=2013-10](http://sfx.scholarsportal.info.proxy.bib.uottawa.ca/ottawa?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=unknown&sid=ProQ:ProQ%253Acanadiannewsmajor&atitle=Creating+age+friendly+communities&title=Leader+Post&issn=08392870&date=2013-10)
- Demirkan, H. (2007). Housing for the aging population. *European Review of Aging and Physical Activity*, 4(1), 33–38. <https://doi.org/10.1007/s11556-007-0016-z>

- Dillon, W. R., & Goldstein, M. (1984). *Multivariate analysis: Methods and applications*. New York: Wiley. 608 p.
- Feng, J. (2017). The influence of built environment on travel behavior of the elderly in urban China. *Transportation Research Part D: Transport and Environment*, 52, 619–633. <https://doi.org/10.1016/j.trd.2016.11.003>
- Freestone, R. (2014). Progress in Australian planning history: Traditions, themes and transformations. *Progress in Planning*, 91, 1–29. <https://doi.org/10.1016/j.progress.2013.03.005>
- Hamid, T. (2015). Population Ageing in Malaysia. *Population Ageing In Malaysia: A Mosaic of Issues, Challenges and Prospects*, 92.
- Hamid, T. A., Momtaz, Y. A., & Ibrahim, R. (2012). Predictors and Prevalence of Successful Aging among Older Malaysians. *Gerontology*, 43(4), 366–370. <https://doi.org/10.1159/000334671>
- Ismail, H., Halil, F. M., Abidin, A. W. Z., & Hasim, M. S. (2020). Ageing in Place or Late Life Move? The Malaysian elderly generation housing options. *Asian Journal of Behavioural Studies*, 5 (18), 1–17.
- Ismail, H., Muhamad Halil, F., Zainan Abidin, A. W., & Hasim, M. S. (2020). The Elderly (Senior) Housing Preferences among Generations in Malaysia. *Environment-Behaviour Proceedings Journal*, 5(13), 145. <https://doi.org/10.21834/e-bpj.v5i13.2102>
- Ismail, N. W., Siti, H., Abdul, W., Aizan, T., & Abdul, T. (2015). Does Population Aging Affect Economic Growth in Malaysia? 10(September), 205–210.
- Kim, D., Lee, J. H., & Ha, M. (2014). Exploring perceptions of designers and medical staff in south korea about design elements for the elder-friendly hospital. *Journal of Interior Design*, 39(4), 15–32. <https://doi.org/10.1111/joid.12034>
- Knopf, A. (2007). Partnering for healthy aging in a small town. *Northwest Public Health*, 24(2), 16–17. <http://search.ebscohost.com/login.aspx?direct=true&db=rzh&AN=105880594&site=ehost-live>
- Mahidin, M. U. (2020). Current Population Estimates, Malaysia, 2020. Department of Statistics, Malaysia. [https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=155&bul\\_id=OVByWjg5YkQ3MWFZRTN5bDJiaEVhZz09&menu\\_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09#:~:text=Malaysia's population in 2020 is, to 3.0 million \(2020\).](https://www.dosm.gov.my/v1/index.php?r=column/cthemByCat&cat=155&bul_id=OVByWjg5YkQ3MWFZRTN5bDJiaEVhZz09&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09#:~:text=Malaysia's population in 2020 is, to 3.0 million (2020).)
- Martin, D., Long, O., & Kessler, L. (2019). Planning for Aging in Place: Incorporating the Voice of Elders to Promote Quality of Life. *Journal of Housing for the Elderly*, 33(4), 382–392. <https://doi.org/10.1080/02763893.2019.1593280>
- Metz, D. H. (2000). mobility of older people and their quality of life. 7, 149–152.
- Mohit, M. A., & Ali, M. S. (2016). Neighbourhood satisfaction and quality in middle-income housing in Kuala Lumpur city, Malaysia. *Planning Malaysia*, 14(5).
- Morris, K. (2016). Making Cities Better for Aging: Lessons from U.K. Age-Friendly Cities. *Urban and Regional Policy Paper*, 42, 1–6.
- Na'asah Nasrudin, H. M. N., & Abdullah, Y. A. (n.d.). Public Awareness towards Sustainable Transportation in Shah Alam, Malaysia.

- Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS*. Routledge.
- Plouffe, L., & Kalache, A. (2010). Towards global Age-Friendly cities: Determining urban features that promote active aging. *Journal of Urban Health, 87*(5), 733–739. <https://doi.org/10.1007/s11524-010-9466-0>
- Quintal, D., & Thompson, S. (2007). *Gated Communities: The search for security. State of Australian Cities*. The University of New South Wales. Retrieved April, 7, 2011.
- Rashid, K., Mohamed, T., Azyze, S. N. A. E., Hazim, Z., Aziz, A. A., & Hashim, I. C. (2021). Determining the features of age friendly for city development. *Planning Malaysia, 19*.
- Society, E. A., & Studies, T. (2007). Journal of the Eastern Asia Society for Transportation Studies, Vol. 7, 2007. *Transportation, 7*(2006), 1433–1445.
- South Australia. (2012). *Age-friendly Neighbourhoods Guidelines and Toolkit for Local Government*. Government of South Australia. <http://www.sahealth.sa.gov.au/wps/wcm/connect/>
- Southway Housing Trust. (2017). *Age Friendly Strategy 2017 to 2020*.
- Steels, S. (2015). Key characteristics of age-friendly cities and communities: A review. *Cities, 47*, 45–52. <https://doi.org/10.1016/j.cities.2015.02.004>
- Stones, D., & Gullifer, J. (2016). 'At home it's just so much easier to be yourself': older adults' perceptions of ageing in place. *Ageing & Society, 36*(3), 449–481.
- Tan, O., Leng, S., Khan, S., Vergara, R. G., & Khan, N. (2016). Policies and Protections for Ageing Society In Malaysia. 2016. <https://doi.org/10.5171/2016>.
- Tobi, S., Fathi, M., & Amaratunga, D. (2017). Ageing in place, an overview for the elderly in Malaysia. *AIP Conference Proceedings, 1891* (October). <https://doi.org/10.1063/1.5005434>
- World Health Organization. (2002). Active ageing: A policy framework. World Health Organization. In *World Health Organisation* (Vol. 11). <https://doi.org/10.1080/tam.5.1.1.37>
- World Health Organization. (2007). *Global age-friendly cities: A guide*. In Community Health. World Health Organization. [http://www.who.int/ageing/publications/Global\\_age\\_friendly\\_cities\\_Guide\\_English.pdf](http://www.who.int/ageing/publications/Global_age_friendly_cities_Guide_English.pdf)

Received: 28<sup>th</sup> September 2022. Accepted: 1<sup>st</sup> December 2022