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CHALLENGES IN THE OPERATION AND MAINTENANCE OF ASSETS AND FACILITIES IN ELDERLY CARE CENTRES IN MALAYSIA

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Abstract

Abreast with the rapid growth of older people every year, the number of elderly care centres has increased tremendously to cater to the demands of older people to spend their time after retirement in Malaysia. Effective operation and maintenance activities in an elderly care centre can optimise the service life of assets that indirectly lead to well-maintained facilities and provide the occupants with a safe, comfortable, and efficient living environment. Throughout the asset life cycle, operation and maintenance are the most extended phases, with various core activities that determine the financial health of an organisation. Nevertheless, this area remains relatively underexplored in the existing literature, particularly concerning the challenges posed by Malaysia's ageing population by 2030. Accordingly, this study seeks to investigate the issues of operation and maintenance of assets and facilities in elderly care centres. The method used to collect the data is through site observations and interviews in three elderly care centres, one in Perak and two in Selangor. These findings reveal three significant challenges the operators face: safety inside the accommodation, high operation and maintenance costs, and lack of a structured approach to managing the assets and facilities. Finally, the paper ends with implications of the findings that provide directions for future research.

Keywords: Elderly Care Centre, Retirement Village, Elderly Pondok, Operation and Maintenance, Facility Management

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INTRODUCTION

The ageing population is a global phenomenon that shows people today are living longer and healthier, thanks to the triumph of medical, technological advancement, and economic development. Like other developing countries, Malaysia is expected to become an ageing nation in 2030, with 15% of the population aged 60 and above (Md Nor & Ghazali, 2021). According to the Department of Statistics Malaysia (2022), the composition of the population aged 65 years and over (old age) increased from 7.0% in 2021 to 7.3% in 2022, encompassing 2.4 million people, indicating that Malaysia is experiencing population ageing. This phenomenon has been seen as an opportunity for public and private agencies to provide various service facilities and infrastructure for the well-being of older people (Syed Akil & Abdullah, 2014). Elderly care centres are vital since older people require advanced care, safety, and a secure living environment. The mushrooming numbers of these facilities show that many sectors are aware of the importance of providing advanced care for older people.

In Malaysia's context, the guideline published by the Federal Department of Town and Country Planning Malaysia is named Physical Planning Guideline for the Elderly (PLANMalaysia, 2018). The primary purpose of the guideline is to guide physical planning for agencies such as federal and state authorities, local authorities, public agencies, students, private agencies, and non-governmental organisations in planning, developing, and designing elderly dwellings. Based on the guideline, there are three (3) dwelling concepts for older people. The first concept is the Elderly Care Centre, which consists of two categories: Day Care Centre and Residential Care Centre. The second concept is a Retirement Village, and the third is Ageing in Place.

This study focuses on the first dwelling concept, which is the Elderly Care Centre, and its second category, which is the Residential Care Centre. These centres are divided into three categories: low care, where the residents are independent; medium care, for the residents who require monitoring and medical supervision; and high care, for the bedridden residents. The services of these centres were delivered either in a nursing home or elderly Pondok (PLANMalaysia, 2018). A nursing home is defined internationally as a facility with a domestic-styled environment that provides 24-hour functional support and cares for persons who require assistance with Activities of Daily Living (ADLs) and often have complex health needs and increased vulnerability (Sanford et al., 2015).

Meanwhile, the elderly Pondok provides religious teaching and learning with residential facilities for Muslim ageing communities. In Malaysia, the elderly Pondok system has become popular because the operators incorporate educational and spiritual elements into the residential activities and facilities for older people (Ismail, Alaudin, Abdul Talib and Salleh, 2021). In their comparative studies, Sufian and Mohamad (2013) pointed out the concept and

practice of the Pondok system, which is similar to the retirement village practised in Australia and the United Kingdom. Hence, the Pondok is also known as a Muslim retirement village or 'Pondok Pengajian Warga Emas' (Abdul Mutalib, Kamaruzaman and Abdulah, 2023; Majid, Hamidi, and Denan, 2018; Sufian and Mohamad, 2013). The facilities in this kind of elderly care centre have attracted the needs and interests of the elderly, particularly Muslim retirees who are independent and want to continue to fill their time for Islamic discourse, congregational prayer, and socialising among their age group (Ismail et al., 2017).

Several studies have argued and concluded that the operators/providers of elderly care centres need well-developed strategies to overcome many issues such as lack of standard of facilities (Areff & Lyndon, 2018; Salleh, Abdul Talib, Ismail & Alauddin, 2021; Ismail et al., 2021), different maintenance practices (Chua, Au-Yong, Ali & Hasim, 2018), non-typical application of operation management because it involves more than one organisation such as health care and institutional care (Rintala, Karppinen & Koivuniemi, 2021), lack of planning to sustain for a long time (Ismail et al., 2021; Chen & Zhou, 2022), and low quality of care (Schweighart, O'Sullivan, Klemmt, Teti & Neuderth, 2022). Specifically on elderly Pondok, there are many issues found in the literature, such as a lack of standard of facilities management (Nordin et al., 2017; Ismail et al., 2021), not suitable for active ageing homes (Ali, Au-Yong & Chua, 2019), no nursing or medical facilities provided (Areff & Lyndon, 2018) and lack of sustainable invention (Salleh et al., 2021).

Moreover, the prevailing literature on operation and maintenance to optimise building performance with little emphasis on elderly care centres, as it primarily focuses on commercial buildings (Siti Nurathirah & Salmiah, 2019), educational buildings (Zakiyudin, Fathi, Rambat, Tobi & Rejab, 2014), hospital buildings (Olanrewaju, Fang & Tan, 2018), government public building (Yusof, 2013), and high rise-residential building (Au-Yong, Tem & Chua, 2023). The limited literature on elderly care centres suggests significant gaps in the body of knowledge in this area. Thus, the objectives of this exploratory study are two-fold: 1) to identify the assets and facilities in elderly care centres and 2) to explore issues operators face in their operation and maintenance. This paper presents the outcomes of the exploratory study on the operation and maintenance of assets and facilities, which is part of the ongoing research on "Investigation of the Economic Aspects of the Operation and Maintenance of Elderly Care Centres".

LITERATURE REVIEW

Operation and Maintenance of Assets and Facilities in the Elderly Care Centre

According to the Malaysia Government Building Scheduled Maintenance Guidelines (Malaysian Public Works Department, 2019), an asset is defined as any land or buildings and infrastructure, plants, machinery, equipment and

system, drawings, and technical data, any books, reports, and records, including all operating and maintenance manuals, any spare parts, tools, and other assets to enable the Contractor/caretaker to provide the services. In contrast, a facility is a collection of assets built, installed, or established to serve an entity's needs. These assets are categorised as immovable and movable assets. The immovable assets, known as fixed assets that are permanent in place, difficult to remove, or efforts to dismantle involve the need for relevant technical or legal expertise, including inherited immovable assets. Meanwhile, movable assets comprise inventory, plant, machinery, vehicles, equipment, and spare parts for any equipment and furnishing supplied with buildings or other infrastructure (Malaysian Public Works Department, 2019).

Implementing asset management in an organisation can increase economic productivity (Sara, Saputra & Utama, 2021) and is the best way to save long-term costs. Accordingly, Malaysia has established a system called MySPATA to standardise, manage and monitor government ministries' immovable assets, which are accessible for all the agencies involved to monitor the Government's case efficiently and effectively (Nasir, Azri & Ujang, 2022). However, no specific manual or guideline for non-government assets refers to private ownership property.

Zawawi, Ismail, Kamaruddin, and Kurdi (2014) mentioned that effective operation and maintenance of assets and facilities can help the building systems deliver services to consumers. Both operation and maintenance are a part of the building life cycle costs, where 80-90 per cent of the building costs are on operation, maintenance, and financing (Shankar Kshirsagar, El-Gafy, and Sami Abdelhamid, 2010). Unsurprisingly, Musarat et al. (2023) have stated that the operation and maintenance phase accounts for most of a building's lifecycle costs. The operation usually involves the activities that operate daily, weekly, monthly, quarterly, or yearly. Maintenance includes activities to prolong service and prevent sudden breakdowns, which may involve various types of maintenance such as planned, unplanned, preventive, corrective, predictive, reactive, or emergency. Operation and maintenance are the areas that need to be focused on to achieve long-term goals for the economy, energy efficiency, and resource conservation.

Referring to the Malaysian Guideline on Operation and Maintenance 2021, five scopes of asset operation can help maintain the premises' cleanliness, safety, aesthetics, and sustainability. They are housekeeping management, pest control management, security control management, landscape management, and utility management (Malaysian Public Works Department, 2021). The maintenance and repair work scope is divided into planned and unplanned maintenance involving civil and structure, mechanical, electrical, information and communication technology (ICT), finishing, and architecture. According to Chua et al. (2018), planned maintenance involves proactive or preventive

maintenance, where maintenance activities are scheduled in advance based on a predetermined plan. In contrast, unplanned maintenance is reactive and occurs in response to unforeseen issues. It comprises emergency maintenance and corrective maintenance. Ideally, incorporating preventive measures can reduce the frequency of unplanned maintenance, thus minimising downtime and optimising resource utilisation.

Rintala et al. (2021) pointed out that the operation and maintenance of elderly care homes differ from typical buildings. This is because the services for elderly residents involve a range of activities carried out by various organisations, including healthcare and institutional care, mainly provided by private entities. Despite its importance, limited literature on asset and facilities management practices exists, particularly on operation and maintenance for private sectors, including elderly care centres. Hence, identifying the assets and facilities in the elderly care centre is the first step for this study to discover the challenges the management and operator face in the critical phase of the asset-building life cycle: operations and maintenance.

RESEARCH METHODOLOGY

The study is qualitative in nature, and to gather such qualitative data, a case study methodology was adopted to collect rich and profound data and an in-depth analysis of the phenomenon in question (Yin, 2018). The qualitative data was gathered via semi-structured interviews and site observations in three selected elderly care centres. All three centres are categorised under the Residential Care Centre with low care. The main entry requirements for the centres are health and independence. Informed consent for participation in the research was obtained from all subjects involved in the case study. Site observations were carried out for all three cases, with permission granted and operational officers accompanying the process.




Generally, the first case study is *Pondok* Umumi, located in Gerik, Perak (C1). The *Pondok* was established in 2018 and is comprised of 17 units of single-storey semi-detached houses. Currently, 43 residents are registered and managed by five staff members, including a chief executive officer, teachers, admin staff, and general officers.

The second case study is *Pondok* Unais, established in 2018 and located in Dengkil, Selangor (C2). The type of building is double-storey freestanding and consists of 103 individual rooms. Seven staff members manage the centre: three administrative staff, three teachers, and one guard and there are 96 elder residents living at this *Pondok*.

The last selected case is also located in Selangor, specifically in Bangi, known as Darul Insyirah (C3). The centre was officially established in 2013 and has two branches: Darul Insyirah Aisyah and Darul Insyirah Khadijah. For this study, Darul Insyirah Aisyah was chosen, and it is a double-storey freestanding

corner lot building in the landed housing area. The centre is managed by 18 staff consisting of six administrative staff, nine nurses, and three general officers to manage 40 residents in both branches. The summary of the case study background is shown in Table 1.

Table 1: Background of Case Studies

Name	Year Established	Total Residents	Type of building
Pondok Umumi (C1)	2018	43	Single-storey semi-detached houses 
Pondok Unais (C2)	2018	96	Double-storey freestanding building 
Darul Insyirah Aisyah (C3)	2013	40	Double-storey freestanding corner lot house 

The selected case studies were chosen based on accessibility to first-hand data, allowing for the feasible collection of primary information through direct interviews and site observations. This approach enabled the gathering of comprehensive and relevant data necessary for the study. Additionally, the research is funded by a private grant, ensuring the availability of resources needed to conduct thorough and effective fieldwork to identify the current issues.

To achieve the first objective of this study, site observation was adopted to identify the assets and facilities available in those elderly care centres. The site observation of the assets and facilities is guided by a checklist of facility components, which incorporates the Physical Planning Guideline for the Elderly (PLANMalaysia, 2018) to enhance the reliability and consistency of the assessment process. Subsequently, the data for this study was also collected using semi-structured interviews with the staff in charge of the operation and maintenance. The interview questions consist of three parts: 1) to know the background of the case study, 2) to identify the management of the study area, and 3) to determine the challenges that the management and operator face in operating and maintaining the assets and facilities. The average time to complete the interview, including the site observation, was about 60 minutes. The transcribed answers from the interviews were analysed to identify the underlying issues faced by operators of the elderly care centre. The interview has insightful strengths, providing an explanation and personal views. The findings are discussed and supported by the literature in the next section.

ANALYSIS AND DISCUSSION

The findings are divided into two parts. Firstly, the findings from the site observation. Secondly, the findings from semi-structured interviews with the operators of the elderly care centres.

Assets and Facilities in the Elderly Care Centres

The finding shows that assets and facilities related to religious activities are provided in all centres, such as prayer rooms and classrooms for Islamic discourse. The need for facilities and environments suitable for the practice of worship has become why older people prefer to live in elderly care centres in their golden age, especially with the Pondok system. As mentioned by Abd. Majid, Ismail, Abu Bakar, Abd. Razak and Usman (2020), the design of the Pondok institution ensures that accommodations, study areas, and places for worship are easily accessible for elderly residents. The findings from the site observation reveal eight main categories of facilities at the three elderly care centres, as summarised in Table 2.

Table 2: Facilities at Elderly Care Centres

NO.	FACILITIES	COMPONENT	C1	C2	C3
A	Administration & Management Building	Administration office	✓	✓	✓
		Management office	✓	✓	✓
		Worker's quarters	✓	✓	✓
		Individual rooms	✓	✓	✓
		Toilet	✓	✓	✓
		Guest house/ room	×	✓	×
B	Integrated Facilities	Elderly activity space	✓	✓	✓
		Reading room	✓	✓	✓
		Lounge area	×	✓	✓
		Office and store	✓	✓	✓
		Multi-purpose room	✓	✓	×
		Kitchen and dining room	✓	✓	✓
		Prayer room/ area	✓	✓	✓
		Laundry facilities	×	✓	✓
		Toilet and bathroom	✓	✓	✓
		Leisure place	✓	×	×
		Parking lot	✓	✓	✓
		Corridor	✓	✓	×
C	Health	Treatment room	×	✓	×
		Transportation for treatment	×	×	✓
		Consultation room	×	✓	×
		Medical services	×	✓	×
		Counselling	✓	✓	✓
		Physiotherapy	×	✓	✓
D	Recreation	Community garden, park, gazebo, sheltered resting area	✓	✓	×
		Gap generation area	✓	×	×

NO.	FACILITIES	COMPONENT	C1	C2	C3
E	Safety	Guarded	x	✓	✓
		Guardhouse	x	✓	x
		Emergency button	x	x	✓
		CCTV	x	✓	✓
		Fire safety facilities	x	✓	✓
		Lift/ Stairlift	x	✓	✓
F	Religious	Mortuary	x	x	x
		Prayer room	✓	✓	✓
		Study room	✓	✓	✓
G	Access	Ramps	x	✓	x
		Staircase	x	✓	✓
		Entrance foyer	x	✓	✓
H	Support Facilities	Trash area	x	✓	✓
		<i>Wakaf</i> area	✓	x	✓
		Fence	✓	✓	✓
		Streetlight	✓	✓	✓
		Entrance & exit pathway	✓	✓	✓
		Soft & hard landscape	✓	✓	x
		Ambulance/ hearse parking	x	✓	x
		Signboard	✓	✓	x
		Information board	x	✓	x
		Bench or seat	x	✓	x
		Mailbox	x	✓	✓
		Trash bins by category	x	✓	x

CHALLENGES IN OPERATING AND MAINTAINING ASSETS AND FACILITIES

The three most challenging issues mentioned by staff in charge of the operation and maintenance of the three elderly care centres are safety inside the accommodation, high operation and maintenance costs and lack of a structured approach to managing the assets and facilities.

Safety issues inside the accommodation

The safety of older people is always a priority for the care centre. Safety inside the accommodation becomes a challenge for the operators even though the entry requirements for the three elderly care centres are healthy and independent.

The safety concerns vary in each case based on the facilities provided. In C1, the operator supplies fire extinguishers as elderly residents cook using gas stoves. In C2, the concern is about residents' ability to seek help if an accident occurs, so the operator plans to install emergency buttons in each room. In C3, the focus is on supporting mobility with handrails. No major incidents have been reported so far, and the operators can still monitor residents' movement and conditions effectively.

All three elderly care centres have an Islamic discourse daily, which is compulsory for the residents. Thus, the operator monitors the attendance of every elderly to the classes and will look out for the resident's condition. However, older people are often synonymous with physical fragility, various illnesses, and disabilities (Mafauzy, 2000). Accordingly, operators always look forward to providing more safety measures by considering older people's privacy and physical strength, such as installing an alarm system or sensor to detect smoke and accidents or sending a signal to alert operators. As suggested by Su, McDonnell, and Li (2021), when addressing health challenges in safety, the operator may be involved in implementing technology-based solutions. This includes artificial intelligence-powered disease surveillance systems, smart home-based monitoring systems, wearable biometric sensors, and teleconsultation services.

Furthermore, safety issues have been affecting the health of elderly residents since the outbreak of the COVID-19 pandemic. The operators are aware that the pandemic not only threatens the well-being of elderly residents but also causes the discontinuation of their businesses (Hasmuk et al., 2020). This issue has been mentioned in the room layout in the elderly care centre, where the number of beds significantly affects the risk of disease infection (Hasmuk et al., 2020; Su et al., 2021; Zhu et al., 2022). Based on the findings, C1 and C2 provided one room for each older person, except C3, where one room accommodated four older people. However, prioritising safety with special attention, additional measures for protection, and social support provided by the caregiver and the safe surrounding environment can help the operator amid global crises other than COVID-19. Thus, it upholds the statement of the World Bank (2020) that aged care homes should ensure the residents' health and safety and the quality of aged care services.

High operation and maintenance cost

The findings highlighted three operation costs concerning the operators: 1) utility, 2) maintenance and 3) catering.

Firstly, operators are concerned about rising utility costs due to inefficient equipment needing repairs. Maintenance is typically reactive, responding to occupant complaints or emergencies. Nasir, Azri, and Ujang (2022) support these findings, highlighting unplanned maintenance practices in Malaysia that are triggered mainly by public complaints. On top of that, the high utility costs are caused by the lighting, air-conditioners, electricity, and water usage, which are operated almost 24 hours a day.

Secondly, all three centres face high maintenance costs, each with distinct concerns. C1, located in a hilly area, struggles with drainage issues during the rainy season. The system often gets blocked by soil, requiring costly cleaning and maintenance. A lack of expertise to manage upgrades has prolonged the issue.

As Sohn, Brody, Jun-Hyun, and Ming-Han (2020) noted, effective stormwater drainage systems can minimise property loss and expenses. In C2, leaking water pipes behind walls caused severe damage, only noticed once discoloured walls and ceilings appeared, which led to high repair costs. Mydin, Mohd Naw, and Che Munaaim (2017) emphasise the need for early preventative measures to avoid structural damage like cracking.

Similarly, C3 faces leaks from an ageing roof over ten years old. Poor maintenance has led to additional costs, with Au-Yong, Siaw, Chen, and Wahab (2022) pointing out the importance of effective management to ensure building functionality. As Le, Domingo, Rasheed, and Park (2018) suggested, regular inspections and repairs could reduce corrective maintenance costs.

The third issue is catering services. Catering services are a significant operational cost in C3, where meals are provided daily. Thus, the management welcomes donations in that centre through basic food aid to reduce costs. This reflects their effort to provide age-appropriate nutrition. In contrast, residents in C1 and C2 can cook or buy food, but the management has no control over their nutrition, which may lead to health problems like diabetes or gout. The management raises awareness through talks and activities to address this issue. Nutrition is one of the top five needs for older people, along with physical health and self-care (Schweighart et al., 2022). Catering services are becoming an attraction and a crucial factor when older people choose a place to stay.

In a nutshell, the operation and maintenance costs pose challenges for operators of the elderly elderly care centres who want to keep their best services for elderly residents. The operation and maintenance phase accounts for most of a building's lifecycle costs (Musarat et al., 2023). This issue is faced globally; for instance, nursing homes in Japan have been facing financial challenges leading to closures and, in some cases, bankruptcy (Japantimes, July 2023). This matter impacts not only the elderly residents who rely on the facilities but also the broader community and healthcare system. From the findings, the operators of the elderly care centres are already aware of which operation and maintenance activities cost the most and are looking for a cost-effective and sustainable approach.

Lack of structured approach in managing the assets and facilities

The findings reveal that operators manage assets and facilities without a structured approach. Only C3 keeps proper records of its assets. The assets and facilities at C2 and C3 care centres are monitored by individuals who are given the position of operational officer who handles procurement for maintenance works. In contrast, C1 relies on a manager to supervise due to staff shortages. The interviewees cite a lack of expertise, management training, and facilities management knowledge, with financial constraints as the primary obstacle. Funding for asset operation and maintenance mainly comes from public

contributions and is managed by senior executives such as the secretary, head of administration, and operational officer before being approved by the founder.

These findings are consistent with existing literature highlighting that private elderly care centres face challenges in obtaining government funds (Noor, Isa & Nor, 2020), making hiring facility managers a low priority (Ismail et al., 2021). This also hampers the integration of sustainable practices (Salleh et al., 2021). Nonetheless, facilities management can highlight the benefits of asset and facility management, including human capital development, business growth, and sustainability (Awang, Mohammed, Md. Salleh, Johari, & Khair, 2017).

Clearly, the operation and maintenance phase involve many routine activities, a long time, and high costs. Efficient operation and maintenance within an institution can optimise service delivery performance (Che-Ghani, Myeda & Ali, 2023). The Malaysian Public Works Department (2021) guidelines on operation and maintenance management emphasise the importance of focusing primarily on maintaining and extending the lifespan of assets and facilities. This approach aims to ensure that assets and facilities remain in optimal condition and deliver high performance, enabling the successful delivery of services. Hence, the operator can adopt facilities management practices to gain customer satisfaction, increase work productivity, ensure stability in the business environment, boost profits, and achieve the organisation's core objectives (Abdul Wahab, Nizam Kamaruzzaman & Khairolden, 2012).

CONCLUSION

This study has identified the assets and facilities provided at elderly care centres with eight main categories of facilities: 1) administration and management, 2) integrated facilities, 3) health, 4) recreational, 5) safety, 6) religious, 7) access, and 8) support facilities. In addition, the three significant issues related to the operation and maintenance of the assets and facilities are safety, high operation and maintenance costs, and lack of a structured approach to managing assets and facilities. The findings of this study will add to the stream of literature on the operation and maintenance of assets and facilities in elderly care centres in Malaysia. The analysis concludes that there is a need for facilities management practices and strategies to maintain the assets and facilities effectively. Hence, future studies may be appropriate to develop strategies to assist the operators in achieving optimal operation and maintenance to improve facility performance that ultimately caters to the needs and enhances resident satisfaction.

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REFERENCES

- Abd Majid, M., Ismail, S., Abu Bakar, S., Abd. Razak, A. Z., & Usman, A. H. (2020). *Self Needs of Senior Citizens towards Migration to Pondok (Pesantren)*. 7(19), 5733–5740.
- Abdul Mutalib, M., Kamaruzaman, N. A.-F., & Abdulah, N. A. (2023). Elderly Education and Lifelong Learning: Legal and Shariah Perspectives. *Malaysian Journal of Syariah and Law*, 11(2), 230–242.
- Abdul Wahab, M., Kamaruzzaman, S.N. & Khairoiden, M. (2012). The Significance of Strategic Planning and Management in Facilities Management. *The Professional Journal of Royal Institution of Surveyors Malaysia*. Vol 47, No.2. 23-29
- Ali, A. S., Au-Yong, C. P., & Chua, S. J. L. (2019). A Case Study on the Building Condition of Elderly Homes and Its Maintenance Recommendations. *Malaysian Construction Research Journal*, 29 (3), 31-46.
- Areff, N. A., & Lyndon, N. (2018). Elder's Decision of Moving to Pondok Living Arrangement in Malaysia. *e-BANGI Journal*, 13(2). 51-72
- Au-Yong, C. P., Chen, A. S. E., & Wahab, M. A. (2022). Establishing Effective Operation and Maintenance that Enhances the Energy Performance of Green Office Buildings in Malaysia. *International Journal of Real Estate Studies*, 16(S1), 104-113.
- Au-Yong, C. P., Tem, J. Y., & Chua, S. J. L. (2023). The Relationship between the Maintenance Management Problems and the Maintenance Performance of High-Rise Residential Buildings. *International Journal of Real Estate Studies*, 17(2), 90-101.
- Awang, M., Mohammed, Abd. H., Md. Salleh, M. N., Johari, N. H., & Khair, N. (2017). Facilities Management - Future Prospect in Malaysia. *Sains Humanika*, 9 (1–5). 1-9.
- Che-Ghani, N. Z., Myeda, N. E., & Ali, A. S. (2023). Efficient operation and maintenance (O&M) framework in managing stratified residential properties. *Journal of Facilities Management*, 21(4), 609–634.
- Chen, S., & Zhou, J. (2022). The Reflections on the Governance of Nursing Homes during the Epidemic. *International Conference on Real Estate, Population and Green Urbanism (REPGU 2022)*, 31–38.
- Chua, S. J. L., Au-Yong, C. P., Ali, A. S., & Hasim, M. S. (2018). Building Maintenance Practices towards the Common Defects and Resident's Satisfaction of Elderly Homes. *Journal of Design and Built Environment*, 2018(1), 62–71.

- Department of Statistics Malaysia. (2022). *Current Population Estimates, Malaysia, Population by Age Group*. Press Release. Retrieved July 23, 2023, from <https://v1.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=dTZXanV6UUdyUEQ0SHNWOVhpSXNMUT09>
- Hasmuk, K., Sallehuddin, H., Tan, M. P., Cheah, W. K., Ibrahim, R., & Chai, S. T. (2020). The Long-Term Care COVID-19 Situation in Malaysia. *International Long-Term Care Policy Network*, 1-20.
- Ismail, K., Alauddin, K., Abdul Talib, Y., & Salleh, N. (2021). Conceptualisation of Cultural Sustainability for Elderly Pondok Village (EPV). *IOP Conference Series: Earth and Environmental Science*, 881(1). <https://doi.org/10.1088/1755-1315/881/1/012024>
- Ismail, N. S. A., Abdullah, N., Hassan, K., Samsudin, S., Ahmad Zakuan, U. A., Yusof, R., & Mohamed Zaki, N. (2017). Kesejahteraan Hidup Warga Emas: Perancangan Berasaskan Gender. *Malaysian Journal of Society and Space*, 13(3), 75–85. <https://doi.org/10.17576/geo-2017-1303-08>
- Japantimes (2023, July). Survey finds that 27% of nursing homes in Japan face bankruptcy due to price hikes. Retrieved September 30, 2023, from <https://www.japantimes.co.jp/news/2023/07/08/business/nursing-homes-bankruptcy-survey/>
- Le, A. T. H., Domingo, N., Rasheed, E., & Park, K. S. (2018, September). Building Maintenance Cost Planning and Estimating: A Literature Review. In *Proceedings of the 34th Annual ARCOM Conference*, 697-706.
- Mafauzy, M. M. (2000). The Problems and Challenges of the Aging Population of Malaysia. *The Malaysian Journal of Medical Sciences*, 7(1), 1-3.
- Majid, N. H. A., Hamidi, M. H., & Denan, Z. (2018). Retirement Village for Malay Muslims. *Asian Journal of Environment-Behaviour Studies*, 3(9), 137-150. *Studies*, 3(9), 137-150.
- Malaysian Public Works Department. (2019). *Government Building Scheduled Maintenance Guidelines (GBSMG)*. [http://epsmg.jkr.gov.my/images/c/c4/Government_Building_Scheduled_Maintenance_Guidelines_\(GBSMG\).pdf](http://epsmg.jkr.gov.my/images/c/c4/Government_Building_Scheduled_Maintenance_Guidelines_(GBSMG).pdf)
- Malaysian Public Works Department. (2021). *Garis Panduan Pengurusan Operasi dan Penyelenggaraan (GPOP)*. Bahagian Perundingan Pengurusan Aset. <https://jpak.jkr.gov.my/documents/garispanduan/GARIS%20PANDUAN%20PENYENGGARAAN%20OPERASI%20DAN%20PENYENGGARAAN%20TAHUN%202021.pdf>
- Md Nor, N. N. F & Ghazali, S. (2021). Malaysia Towards an Ageing Country. *Malaysian Journal of Society and Space*, 17(3), 234–245.
- Musarat, M. A., Alaloul, W. S., Cher, L. S., Qureshi, A. H., Alawag, A. M., & Baarimah, A. O. (2023). Applications of Building Information Modelling in the Operation and Maintenance Phase of Construction Projects: A Framework for the Malaysian Construction Industry. *Sustainability*, 15(6), 5044. <https://doi.org/10.3390/su15065044>
- Mydin, M. A. O., Nawawi, M. N. M., & Munaaim, M. A. C. (2017). Assessment of waterproofing failures in concrete buildings and structures. *MCRJ Special Issue*, 2(2), 166-179.

- Nasir, A. A. I. M., Azri, S., & Ujang, U. (2022). Asset Management in Malaysia: Current Status. *IOP Conference Series: Earth and Environmental Science*, 1064(1). <https://doi.org/10.1088/1755-1315/1064/1/012035>
- Noor, S., Isa, F. M., & Nor, L. M. (2020). Ageing Care Centre Women Entrepreneur: A Silver Bullet for Ageing Tsunami in Malaysia. *Sains Humanika*, 12(1), 51–62.
- Nordin, N. M. F. B. N., Hasbollah, H. R. B., Ibrahim, M. A. H. Bin, Marican, N. D. B., Halim, M. H. B. A., Rashid, A. F. B. A., & Yasin, N. H. B. M. (2017). Nursing Home Facilities in Malaysia (premise, shared facilities & individual accommodation: Space requirement): A literature review. *AIP Conference Proceedings*, 1891(October). <https://doi.org/10.1063/1.5005442>
- Olanrewaju, A., Fang, W. W., & Tan, S. Y. (2018). Hospital Building Maintenance Management Model. *International Journal of Engineering and Technology*, 2(29), 747-753.
- PLANMalaysia, Jabatan Perancangan Bandar dan Desa, Kementerian Wilayah Persekutuan. (2018). *Garis Panduan Perancangan Fizikal Bagi Warga Emas*. (GP031-A) https://mytownnet.planmalaysia.gov.my/ver2/gp/GPP_WARGA_EMAS.pdf
- Rintala, A., Karppinen, H., & Koivuniemi, J. (2021). Operations Management in Improving Elderly Home Care. *International Journal of Services and Operations Management*, 24(3), 331-362.
- Salleh, N. A., Abdul Talib, Y., Ismail, K., & Alauddin, K. (2021). Challenges in Maintaining Facilities in Elderly Pondok Village Environment. *IOP Conference Series: Earth and Environmental Science*, 881(1). <https://doi.org/10.1088/1755-1315/881/1/012039>
- Sanford, A. M., Orrell, M., Tolson, D., Abbatecola, A. M., Arai, H., Bauer, J. M., ... & Vellas, B. (2015). An international definition for “nursing home”. *Journal of the American Medical Directors Association*, 16(3), 181-184.
- Sara, I., Saputra, K. A. K., & Utama, I. W. K. J. (2021). The Effects of Strategic Planning, Human Resource and Asset Management on Economic Productivity: A Case Study in Indonesia. *The Journal of Asian Finance, Economics and Business*, 8(4), 381-389.
- Schweighart, R., O’sullivan, J. L., Klemmt, M., Teti, A., & Neuderth, S. (2022). Wishes and Needs of Nursing Home Residents: A Scoping Review. *Healthcare (Switzerland)*, 10(5), 1–29. <https://doi.org/10.3390/healthcare10050854>
- Shankar Kshirsagar, A., El-Gafy, M. A., & Sami Abdelhamid, T. (2010). Suitability of Life Cycle Cost Analysis (LCCA) as Asset Management Tools for Institutional Buildings. *Journal of Facilities Management*, 8(3), 162-178.
- Siti Nurathirah, C. M. N., & Salmiah, A. (2019). Performance of Building Maintenance in Operation & Management at Commercial Buildings. *International Journal of Modern Trends in Business Research*, 2(6). 15-28.
- Sohn, W., Brody, S., Jun-Hyun, K., & Ming-Han, L. (2020). How Effective are Drainage Systems in Mitigating Flood Losses? *Cities* 2020,107, 102917. <https://doi.org/10.1016/j.cities.2020.102917>
- Su, Z., McDonnell, D., & Li, Y. (2021). Why is COVID-19 more deadly to nursing home residents? In *QJM: An International Journal of Medicine*, 114(8), 543–547

- Sufian, A., & Mohamad, N. A. (2013). "Pondok" System as a Model for Retirement Village in Malaysia: A Legal Perspective. *ALAM CIPTA, International Journal of Sustainable Tropical Design Research and Practice*, 6(2), 23–37. <http://irep.iium.edu.my/34135/>
- Syed Akil, S. M., & Abdullah, S. (2014). Challenges in Managing Elderly Care Centres in Malaysia. *International Journal of Arts & Sciences*, 07(03), 1944–6934.
- World Bank. (2020, November). *Malaysia Development Experience Series, A Silver Lining - Productive and Inclusive Aging for Malaysia International Bank for Reconstruction and Development*, Retrieved July 30, 2023, from <https://documents1.worldbank.org/curated/en/287981606116408851/pdf/A-Silver-Lining-Productive-and-Inclusive-Aging-for-Malaysia.pdf>
- Yin, R. K. (2018). *Case Study Research and Applications: Design and Methods* (6th Edition). Thousand Oaks, CA: Sage Publication.
- Yusof, Y. (2013). *The Effectiveness of Public Sector Asset Management in Malaysia*. Doctoral dissertation, Queensland University of Technology.
- Zakiyudin, M. Z., Fathi, M. S., Rambat, S., Tobi, S. U., & Rejab, N. (2014). An overview of building maintenance management in Malaysia. In *7th IRERS IBIMA International Conference*. <https://www.researchgate.net/publication/265178898>
- Zawawi, Z. A., Ismail, F., Kamaruddin, N., & Kurdi, M. K. (2014). The Core Services of the Facilities Management Based Company in Malaysia. In *MATEC Web of Conferences* (Vol. 15, p. 01016). EDP Sciences.
- Zhu, X., Lee, H., Sang, H., Muller, J., Yang, H., Lee, C., & Ory, M. (2022). Nursing Home Design and COVID-19: Implications for Guidelines and Regulation. *Journal of the American Medical Directors Association*, 23(2), 272-279.

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