

PROMOTING MALAYSIA MEDICAL TOURISM THROUGH MyCREST ORIENTED RETROFITTED HOSPITALS

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ABSTRACT

Globally, Malaysia is recognized among the best destinations for medical tourism. According to Malaysia Healthcare Travel Council (MHTC), about 1,050,000 medical tourists across the globe visited Malaysia in 2017, generating over RM1 billion revenue for Malaysia. Nevertheless, previous studies have affirmed that majority of the existing hospitals used for medical tourism in Malaysia have not been evaluated with Green Building Assessment Tools (GBATs) such as the Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST). This places uncertainty in the long term effect on sustainable ecosystems and eventual improvement in the medical tourist experience. Therefore, the aim of this conceptual paper is to develop MyCREST Oriented Retrofitting Framework (MORF), to reduce the environmental impact of existing hospitals, enhance the comfort, productivity, and health of the medical tourists in Malaysia. To achieve the aim, this research conducted a Systematic Literature Review (SLR) of about 100 articles published in reputable journal within the last 3 decades (1987 – 20018). Also, the overarching MyCREST Reference Guide was evaluated via document analysis. This enabled the critical reflection and holistic understanding of the nexus between MyCREST embedded retrofitted hospitals and Malaysia medical tourism. As a result, a five-phase MORF: Hospital Project Set up and Pre-Retrofit Survey, Carbon Foot Print Auditing, MyCREST Oriented Retrofit, Implementation and Commissioning, and Validation and Verification was developed. The findings of this research will enhance the sustainable performance of existing hospitals, and enlighten the MHTC, construction experts, and other stakeholders on the importance of sustainable hospitals towards attracting more medical tourists to Malaysia.

Keywords: Malaysia, Medical Tourism, MyCREST, Retrofitting, Sustainable Hospitals

INTRODUCTION

Medical tourism also known as medical travel or global healthcare is the process in which a patient or medical tourist travels to another destination to seek quality and sometimes cheaper medical services compared to their home country (Pan & Chen 2014). In Malaysia particularly, medical tourism has attracted several medical tourists, generating huge revenue for the economy. Moreover, the national economic blueprint has identified health care travel as one of the National Key Economic Areas (NKEA) set to drive Malaysia towards a high-income nation by the year 2020. In other to achieve this target and remain relevant in the competitive tourism market, experts posit that it is pivotal to inculcate the triple bottom line: economic, social, and environmental principles of sustainability into Malaysia medical tourism, especially in the retrofitting of existing hospitals. Retrofitting a building involves changing its systems or structure after its initial construction and occupation, in order to reduce energy consumption and carbon dioxide (CO₂) emission; and improve occupants' quality of life and overall building performance (Ma, Cooper, Daly, & Ledo 2012). Although there are efforts by stakeholders to

construct new sustainable or green hospitals in Malaysia; the NewStraitsTimes (2018), a local online newspaper reiterated that majority of the existing hospitals in Malaysia have not been assessed with Green Building Assessment Tools (GBATs) such as Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST). As a result, majority of the existing hospitals in Malaysia are not certified sustainable or “green.”

The effect of conventional hospitals on the environment and the health of medical tourist cannot be ignored. According to Ohueri, Enegbuma, & Kenley (2018); Ohueri et al. (2019), conventional buildings consume substantial amount of water, energy, material resources, and many more. In the same vein, Sahamir & Zakaria (2014) posit that conventional hospitals generate huge amount of hazardous and non-hazardous waste materials and are responsible for environmental pollution. This corresponds with the statement made by the Chairman of Green Building Index Accreditation Panel (GBIAP) that the healthcare sector is working hard to save people from diseases attributed to environmental factors but in parallel are unintentionally contributing to the world’s carbon footprint. Having ascertained that spending several months in conventional hospitals threaten the health of patients, medical tourists prefer to visit sustainable hospitals due to the social, economic, and environmental benefits. Accordingly, in order to attract more medical tourists to Malaysia, it is paramount to retrofit the existing hospitals to meet the GBAT benchmark and perform efficiently. Therefore, the aim of this conceptual paper is to develop a MyCREST Oriented Retrofitting Framework (MORF) to reduce the environmental impact of existing hospitals; and enhance the comfort, productivity, and health of the medical tourist in Malaysia.

REVIEW OF LITERATURE

Medical tourism is a growing phenomenon in the tourism industry that represents a new market segment due to changing times and consumer perception. Medical tourism is referred to as a practice of travelling for medical care beyond one’s own community to receive medical treatments which includes cosmetic, fertility, elective surgery, dental, and transplantation (Horsfall & Hanefeld 2016). Although the major reason for medical tourism travel is to obtain medical services, some of the medical tourists also use this time for holiday and leisure. According to Noree, Hanefeld, & Smithc (2016), patients who seek medical treatment in Thailand frequently visit the kissed beaches and gold spired temples believing that the green surroundings offer patients a natural way of healing after complex surgeries. Similarly, a survey conducted by KPMG and FICCI noted that apart from excellent medical facilities, India also have ancient temples and beaches for patients’ relaxation after treatment. Besides, the medical tourism industry is of enormous economic benefits to both developed and developing countries. In a report by VISA and Oxford Economics, medical tourism industry was valued at USD\$100 Billion as of 2016, making it one of the biggest growing tourism sectors (Fetscherin & Stephano 2016). In developing countries such as India, South Africa, Mexico, and Malaysia, quality medical services are offered at a relatively low cost compared to some developed countries, thereby generating major revenue stream (Singh & Sumant 2016).

In Malaysia particularly, medical tourism sector is controlled by the Malaysian Healthcare Travel Council (MHTC) which is under the purview of Ministry of Health. According Rani, Suradi, & Omar (2016), MHTC was established in 2009 to oversee the progress of medical tourism in Malaysia. With the effort of stakeholders including MHTC; and the unique situation of Malaysia such as proximity to major South East Asian cities, low crime

rate, and relatively low cost of living, the Malaysian tourism has gained international recognition. As viewed by JCI (2019), thirteen (13) medical centers and hospitals in Malaysia have been accredited by the Joint Commission International (JCI). Additionally, the International Medical Travel Journal (IMTJ) awarded Malaysia the Health & Medical Tourism Destination of the Year for three consecutive years from 2015 to 2017 (MHTC 2018). This has attracted medical tourist to Malaysia, and in turn generated large revenue for the government. As reported by MHTC (2018), Malaysia hospital revenue stood at RM1.3 billion from over one million healthcare travelers as at 2017. As stated by NTP (2017), the government aim to generate over RM2.8 billion in revenue by 2020, targeting medical tourists from Indonesia, Myanmar, China, and Vietnam, etc. To meet this ambitious goal, and retain Malaysia's status in an extremely competitive medical tourism market, stakeholders have been working tirelessly.

For instance, the Malaysian government have enhanced visa regulations to suit medical tourists and their travel partners. According to Sarwar, Manaf, & Omar (2012), patients arriving Malaysia on emergency visa on arrival can be allowed to convert their visa status and extend the period from one month up to six months. Also, several programs have been organized by Malaysian Ministry of Health, to enlighten the medical staff on how to treat medical tourists to attract more medical tourists. Apart from that, several scholarly articles have proposed strategies for promoting Malaysia medical tourism. For example, Thomas, Beh, & Nordin (2011), recommended the partnership between public and private sectors, and the combination of western and traditional medicine for efficient health care delivery in Malaysia. In the same vein, Sultana, Haque, Momen, & Yasmin (2014), investigated factors affecting the attractiveness of medical tourism destination and came up with factors such as: cost, service quality, treatment types, and marketing strategy. Also, Darwazeh (2011), suggested that the replacement of conventional hospitals with sustainable ones will significantly increase the number of medical tourists visiting Malaysia.

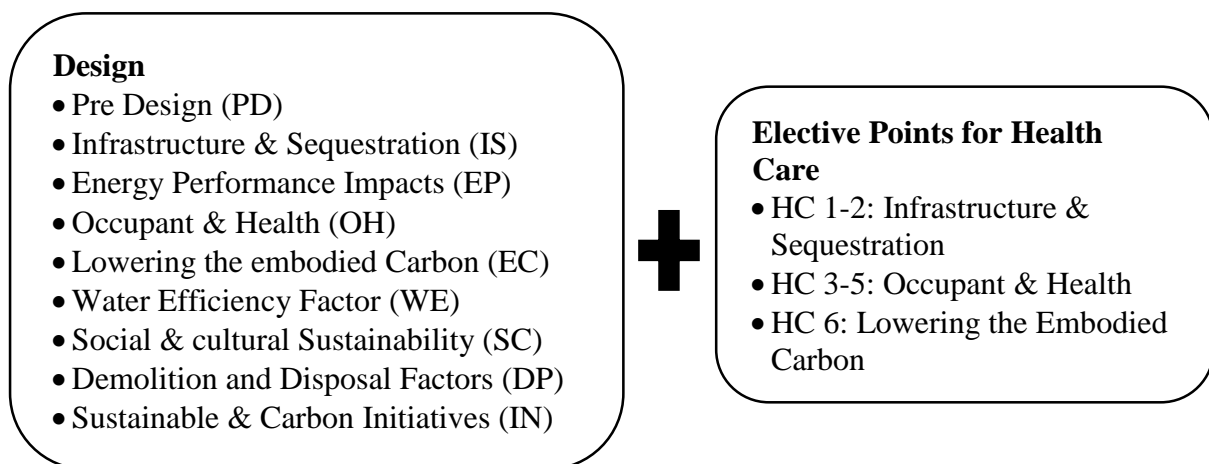
Conventional hospitals contribute to the depletion of the environment considering the fact that they operate 24 hours, 7 days a week. Hospitals alone make up about 5% of the built environment, and are among the highest polluters of the environment. In the US for example, hospitals are among the highest energy consuming commercial buildings (Sahamir & Zakaria 2014). In Brazil, hospitals account for 10.6 percent of the country's total annual energy consumption (WHO 2009). In Malaysia, hospitals use substantial amount of energy and material resources, and generate huge streams of waste. As postulated by Kaiser, Eagan, & Shaner (2001), medical waste incinerators are ranked among the top four sources for dioxin and anthropogenic mercury emissions globally. These substances can easily spread through air, land, and water. Given that these toxic emissions are prone to cause respiratory diseases and other illnesses within the population; hospitals are in that sense actually undermining the health of the communities that they are trying to serve. In order to the reduce the complex, and long-lasting impacts of the built environment on our ecosystem, the construction experts and stakeholders initiated the concept of sustainable or green building construction (Kibert 2008). The idea of sustainability stems from the concept of sustainable development.

Brundtland (1987) defined sustainable development as development which meets the needs of the present generation without compromising the ability of future generation to meet their own needs. Green or sustainable building refers to building projects that are developed using resource-efficient and environmentally responsible processes throughout the building's

life-cycle (EPA 2016). Before a building is certified green, it has to be assessed using a Green Building Assessment Tool (GBAT), to ascertain whether it meets specified sustainability standards. In Malaysia, several green building assessment tools (GBATs) have been introduced to promote sustainable building development. Among the prominent GBAT in Malaysia is the Green Building Index (GBI) which is based on the six (6) main criteria of Energy Efficiency, Indoor Environment Quality, Sustainable Site Planning & Management, Materials & Resources, Water Efficiency, and Innovation (GBI 2019). Others include: Green Performance Assessment System (GreenPASS), Green Real Estate (GreenRE), etc. However, the abovementioned GBATs in Malaysia have been heavily disparaged. For instance, CleanMalaysia (2018), suggested that GBI is characterized with several shortcomings such as lack of energy management strategies, lack of technical understanding, high energy consumption of GBI rated office building, etc. Besides, none of the other GBATs such as GreenPASS, PH JKR, and GreenRE provided a holistic sustainable assessment of the building throughout its whole life cycle (Hamid et al. 2014).

Due to the gap that exist between the aforementioned GBATs in Malaysia, the Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST) was implemented in 2016, through the joint knowledge of Kementerian Kerja Raya Malaysia (KKR), Jabatan Kerja Raya Malaysia (JKR), and Construction Industry Development Board Malaysia (CIDB) (JKR & CIDB 2016). One of the main objectives of MyCREST is to provide a standard green building assessment model which addresses building performance beyond those captured by the existing rating systems in Malaysia. MyCREST aims at quantifying and reducing built environments impact in terms of carbon emission and environmental implication, with a more holistic approach towards integration of socio-economic aspects of sustainability to the built environment and urban development in Malaysia (JKR & CIDB 2016a). MyCREST certification award focuses on three phases (Design, Construction, and Operation and Maintenance), offering the fundamental rating tools/scorecard. The design category of MyCREST consist of nine categories and numerous sub categories. It also has an elective category of Healthcare for hospitals, as shown in figure below

Figure 1: MyCREST Design Plus (+) Healthcare Structure



(JKR & CIDB, 2016b)

The MyCREST Healthcare Category put hospitals into consideration for assessment. The Health Care structure focuses on Infrastructure & Sequestration, Occupant & Health, and

Lowering the Embodied Carbon. Thus, this study tends to integrate the MyCREST Health Care concept into a framework to retrofit existing hospitals in Malaysia for a more sustainable performance. This is pivotal because the concept of sustainable hospital in Malaysia has not been widely discussed in both academic research and hospital practices. In fact, Majority of the existing hospitals in Malaysia are not certified as Green. The Malaysian Reserve (2017), reported that only one hospital out of the numerous existing hospitals in Malaysia have been certified as sustainable using Green Building Index (GBI). However, there are about ten sustainable hospitals still under construction and are already registered under the GBI hospital scheme. Based on literature review, no existing hospital in Malaysia have been evaluated with Malaysian Carbon Reduction and Environmental Sustainability Tool (MyCREST), despite its importance in reducing greenhouse gas emission, especially Carbon dioxide (CO₂). This places uncertainty in the long term effect on sustainable ecosystems and eventual improvement in the medical tourist experience. Therefore, the need to retrofit existing hospitals based on MyCREST Health Care Category, to reduce their environmental impact, and promote the comfort, productivity, and health of the medical tourist cannot be over emphasized.

According to Ma et al. (2012), retrofitting of existing buildings offer fundamental opportunities to improve energy and environmental performance, reduce water use, improve comfort and quality of space in terms of natural lighting, air quality, and guarantees healthy living and working condition of occupants. Regardless of the benefits, existing buildings globally are continued to be retrofitted at a very low rate of approximately 2.2% per year (Jagarajan, Asmoni & Lee 2015). In Malaysia, the retrofitting of existing buildings has received less attention compared to the construction of new green buildings. According to Nazria et al. (2015), there is lack of consideration in retrofitting existing buildings as a means to contribute to sustainability in Malaysia. As a result, 98% of the total building stock in Malaysia are still conventional buildings, constituting to environmental degradation and occupants' low quality of life. Retrofitting of buildings could be in various aspects such as energy-efficient lighting and controls, management systems and controls, building services, replacing roofs, installing PV solar cells, changing floors, insulation, and operable windows or better glazing system etc. (Kok, Miller, & Morris 2012). Although some stakeholders focus on the cost efficient technology for retrofitting existing buildings; Ma et al. (2012) postulated that financial benefit is not the single criteria for choosing retrofit technologies. The optimal solution is a trade-off among a range of energy related and non-energy related factors, such as energy, economic, technical, environmental, regulations, social, etc.

In other to encourage retrofitting of existing buildings, experts have proposed numerous strategies. For example, Guo, Belcher & Roddis (1993) developed a software tool that integrates knowledge and database approaches to solve commercial building lighting retrofit problems. Dascalaki & Santamouris (2002) used computer simulation to analyze the energy conservation potential of selected retrofit options for five commercial building types in four different European climatic zones. Rey (2004) developed a multiple criteria methodology for evaluating office building retrofit strategies. Rey's methodology takes into account environmental, socio-cultural and economic criteria simultaneously. However, the aforementioned studies focused on a particular aspect of building retrofit, instead of the whole building retrofits. Thus, Fluhrer, Maurer & Deshmukh (2010) discussed the use of deep retrofits for existing commercial building stock. In a more recent study, Ma et al. (2012) proposed a systematic approach for sustainable building retrofits. The study proposed by Ma et al. (2012) is applicable to any type of building that requires to be retrofitted. It encompasses: 1. strategic planning and models/tools selection; 2. Building energy auditing; 3. Building

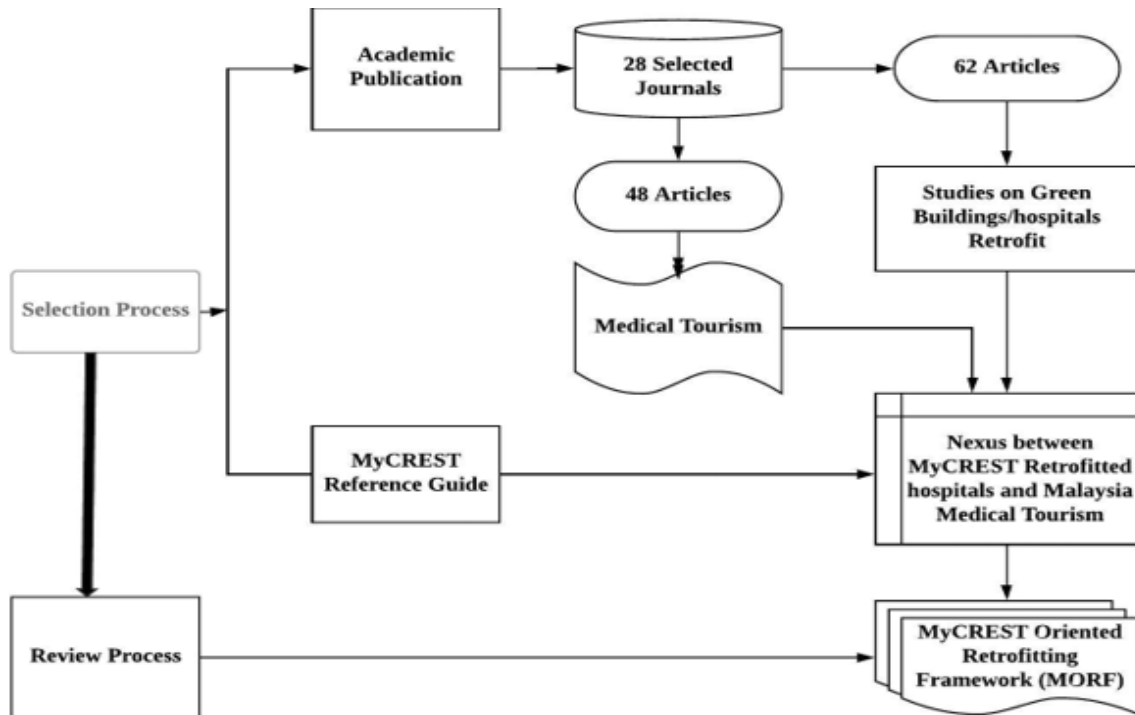
performance assessment and diagnostics; 4. Quantification of buildings' energy conservation benefits; 5. Economic analysis; and 6. Risk assessment.

In Malaysia, experts posit that the aspect of sustainable retrofitting of existing hospitals remain unexplored. However, there have been studies on promoting sustainable hospitals in Malaysia. For instance, Sahamir & Zakaria (2014) investigated the green assessment criteria for public hospital building development in Malaysia. Nawawi et al. (2013), provided recommendation for green hospital designs in the context of tropical climate of Malaysia and its people. Darwazeh (2011), developed a framework for establishing a sustainable medical facility, etc. Nevertheless, none of the above studies developed a GBAT embedded framework for retrofitting exiting hospitals in Malaysia. Thus, this study develops a MyCREST Oriented Retrofitting Framework (MORF) to reduce the negative impact of conventional hospitals on the occupants' health such as Sick Building Syndrome, low productivity, low quality of life, etc. Particularly, this study adapted the framework developed by Ma et al. (2012), due to the detailed approach it proposes towards integrating GBAT into a framework for retrofitting existing buildings. In addition, MyCREST was selected due to the holistic approach it proposes in promoting economic, social and environmental sustainability, throughout the buildings life cycle. The section below highlights the method adopted in actualizing the research aim.

RESEARCH METHODOLOGY

To achieve the aim of this study, a critical literature review was conducted to cover the scope of this research which include Medical tourism, sustainable retrofitting, and GBAT such as MyCREST. First and foremost, a Systematic Literature Review (SLR) was conducted to evaluate articles published in 28 reputable journals within the last 3 decades. SLR is a method in which a body of literature is aggregated, reviewed, and assessed while utilizing pre-specified and standardized techniques (Dablander 2018). Successful implementation of SLR requires: adequate planning and review; organization and preparation for synthesis; data extraction & organization; data synthesis and reporting, etc. (Alsolami 2018). For a more dependable and rigorous review results, this study selected about 100 articles published in peer-reviewed high impact journals in the field of Medical tourism and sustainable building, published within 1987 to 2018. The selection process of academic publications in this study draws on the methodology adopted in other review articles, such as the one conducted by He et al. (2017). Specifically, the list of publications was obtained using databases, namely, Google scholar, Scopus, and Web of Science (WoS), which provided a comprehensive search on the subject area. Afterwards, the overarching MyCREST Reference Guide was examined via document analysis, to understand the categories needed to be fulfilled before a hospital can be certified with MyCREST Award Label. Document analysis is a systematic procedure for reviewing or evaluating documents both printed and electronic (computer-based and Internet-transmitted) (Triad 2016). Furthermore, it involves analyzing documents and incorporating coding content into theme. The research procedure of this study is demonstrated in the figure below

Figure 2: Research Method and Procedure of This Study



The figure above illustrates the research process adopted for this study. The review of various journal articles, and comprehensive MyCREST reference guide provided a holistic understanding and critical reflection on the nexus between MyCREST oriented retrofitted hospitals and Malaysia medical tourism. This provided a theoretical foundation to the development of MyCREST Oriented Retrofitting Framework (MORF).

RESEARCH FINDINGS AND DISCUSSION

Having established the need for MyCREST Oriented Retrofitting Framework (MORF), this section discusses the development of MORF and the systematic approach it proposes to identify, determine, and implements viable retrofit measures for enhancing the sustainable performance of existing hospitals in Malaysia. The developed MyCREST Oriented Retrofitting Framework (MORF) consist of five phases as shown in Figure 3 below.

Figure 3: MyCREST Oriented Retrofitting Framework (MORF) for Existing Hospitals in Malaysia

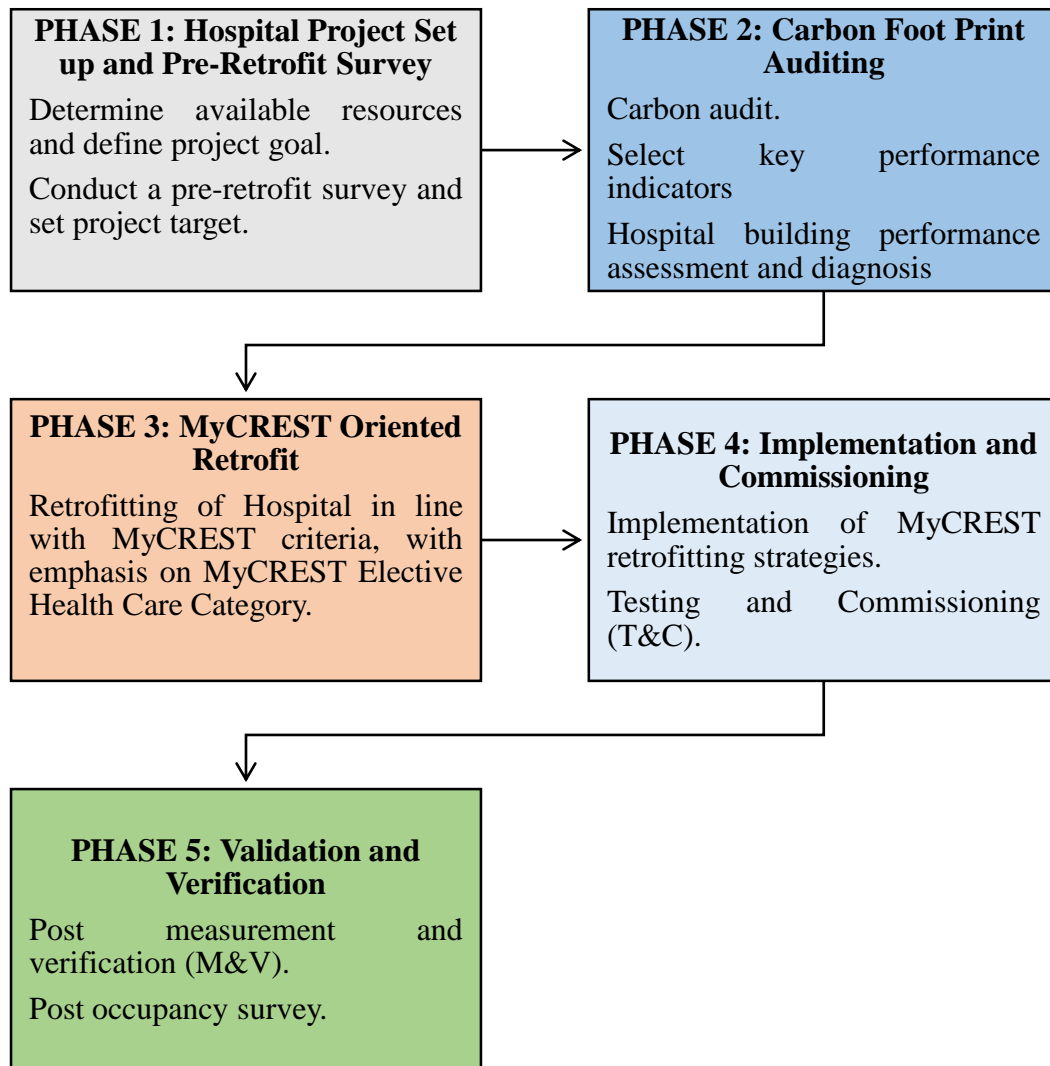


Figure 3 shows the five phases of the MyCREST Oriented Retrofitting Framework (MORF) developed in this study. As mentioned earlier, MORF was adapted from retrofitting framework proposed by Ma et al. (2012). MORF Phase one is the hospital project set up and pre-retrofit survey. In this phase, the project scope is defined based on the clients' resources and expectation. Afterwards, a pre-retrofit survey is conducted to better understand building operational problems and the main concerns of occupants. This aligns with Ma et al. (2012), study that the first aspect of retrofitting a building is to determine the available resources, and define the project goal. Phase two requires the auditing of the existing hospitals' carbon foot print. The carbon auditing is used to analyse the hospital building's carbon emission data, understand building carbon emission rate, and identify areas with energy wastes so as to propose a low carbon emission measures. Phase three requires the embedding of MyCREST criteria into the framework. The hospital building ought to be retrofitted in line with MyCREST criteria, with emphasis on MyCREST Health Care Category. This corresponds with JKR & CIDB (2016a) report that hospitals should be developed or retrofitted via MyCREST Health

Care category for more comfort and environmental benefit. Phase four includes the implementation of MyCREST strategies and commissioning of the completed retrofitted hospital. This is in accordance with Ma et al. (2012), suggestion that retrofitting of buildings entails strict implementation of the retrofitting strategies, and commissioning of the retrofitted building/hospital. Finally, the validation and verification phase is applied to measure the performance of the hospital after it has been occupied for one or two years to determine the performance, and make possible amendments, if any. According to Fusion (2010), verification strategies should be utilized and a post occupancy survey should be conducted to understand whether the building occupants and building owners are satisfied with the overall retrofit result. Adhering strictly to the workflow of this framework will improve the quality of life of both the medical tourists and the hospital staff.

CONCLUSION

Literature review revealed that majority of the existing hospitals used for medical tourism in Malaysia are not certified green and this places uncertainty in the long term effect on sustainable ecosystems and eventual improvement in the medical tourist experience. Thus, this study conducted a systematic literature review, to investigate the best strategies for retrofitting existing hospitals in Malaysia, to enable Malaysia remain relevant in the competitive tourism Market. Also, the comprehensive MyCREST Reference Guide was analyzed to understand the criteria required to retrofit a hospital building for minimal emission of carbon dioxide (CO₂). Furthermore, this study adapted the retrofitting framework proposed by Ma et al. (2012), in order to actualize the aim of this study. As a result, a five phase MyCREST Oriented Retrofitting Framework (MORF) was developed to retrofit existing hospitals in Malaysia. The five phases of MORF include: Hospital Project Set up and Pre-Retrofit Survey, Carbon Foot Print Auditing, MyCREST Oriented Retrofit, Implementation and Commissioning, Validation and Verification. MORF will enhance the sustainable performance of existing hospitals, and enlighten the MHTC, construction experts, and other stakeholders, on the importance of sustainable hospitals towards attracting more medical tourists to Malaysia. However, this study is a review paper, thus an empirical survey should be conducted to further validate the study.

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