

CHAPTER I

INTRODUCTION

A. Background of the study

The most significant industry contributes the largest carbon emission from global warming in development. More than 60% of exhaust emissions are produced by compound CO₂, SO₂, and methane gas from the construction industry. Based on reports published by the United Nations that 30% to 40% of energy is used for building. Buildings built today will be in use for decades to come. As such, a decision on their construction and energy conservation initiatives will significantly impact progress in mitigating climate change and reducing morbidity and mortality from air pollution. (Anastasia, n.d.; P et al., 2018)

Besides, hospitals consume a large amount of energy in providing health care. According to the United States

Environmental Protection Agency (EPA), 73 billion kWh of energy use in the health sector contributes more than US\$ 600 million per year to health costs. (Ti Chou, 2012) With the enormous amount of capital usage in the health sector, the construction and upkeep of large and small but varied institutions, modern energy-intensive technology, and waste generation have become a matter of public health itself. The Green Building Concept is also designed to resolve climate and global energy problems. (Dhillon & Kaur, 2015; Triwidiastuti, 2017)

The architecture of green buildings has been widely embraced, with a green building benchmark of more than 3.5 billion square feet accredited to date (Allen et al., 2015a). Besides, the shift toward property developments in Indonesia shows a growing trend in the green idea; the current implementation of the green hospital in Indonesia has developed into a new side approach to hospital management (Anastasia. 2013; Permenkes. 2018).

Green buildings, by definition, focus on minimizing environmental impacts by reducing energy use, water use, and environmental disturbances from construction sites. Also, by definition, a green hospital is a hospital that is designed, built, and maintained by considering the principle of health and a sustainable environment. Hospital structures must accommodate the optimal use of electricity, water, and materials. They are reducing the effect of systems on human health and the environment by improved siting, planning, development, service, repair, and disposal—of the entire construction life cycle (Allen et al., 2015a; Dhillon & Kaur, 2015).

Hospitals' mission is rescuing life and promoting health. Therefore, health is the most important aspect of a hospital due to its mission. People go to the hospital because they are concerned about their health and seek medical treatment. So, the hospital environment should be comfortable and healthy. Research shows that a well-design hospital building can

potentially improve the curing process. Hence, the designer is focusing on green strategies to increase the positive impact on patients and staff in the hospital (IGBC, 2020).

Standards established and objective health and well-being results have been related to natural habitats, mainly green areas. The potential mechanism underlying the health advantages of sustainable spaces has been suggested by vigorous exercise, decreasing emotional stress, depression, and anxiety, increasing interpersonal relationships and coherence, and declining exposure to natural dangers such as environmental pollution. (Dadvand et al., 2016)

It is well known and frequently stated that people spend 90% of their time indoors in the wellbeing circle of the atmosphere. As this is most of their exposure period, and the amounts of certain indoor pollutants are higher indoors than outdoor, it naturally follows that the indoor environment impacts people's well-being. On the other hand, greenhouses largely reduce environmental effects by reducing local operations on the building site and energy and water

conservation programs. The construction of green buildings also focuses on promoting human well-being. Green buildings have an impact on public health at two crucial levels: straightforwardly at the human level and develop an enhanced indoor environment, and indirectly at the demographic level by reducing power use and also by lowering emissions cause heart diseases, increasing asthma, premature mortality, and leading to global warming, that is itself linked with a cascade of adverse outcomes (Allen et al., 2015a).

Based on bibliographic research using keywords related to green hospitals and health on the Scopus database using Scopus analysis and VOS viewer software, it shows a growing trend in this topic in the last ten years (Figure 2), with the most significant trend occurring in 2017 to 2018. The top country that publishes papers related to this topic is the United States, with 301 papers (Figure 1). Besides, based on VOS viewer analysis, the keywords included in the studies are human, hospital, health care facility, health care personnel, and waste management (Figure 3).

However, not many studies mentioned green hospitals related to health aspects.

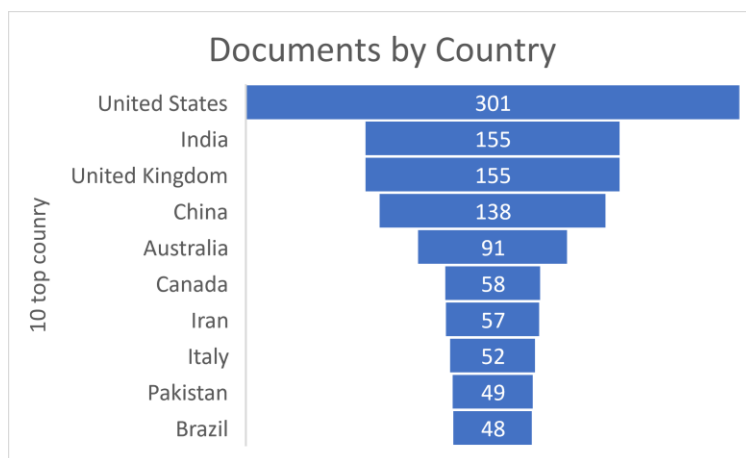


Figure 1. Scopus Analysis Publication by Country

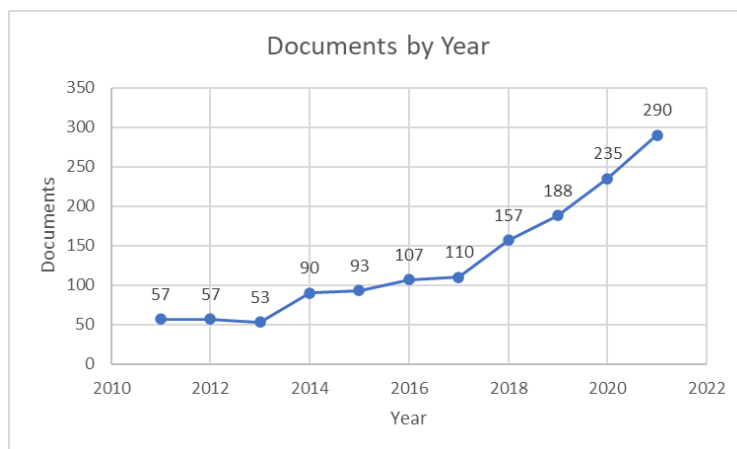


Figure 2. Scopus Analysis Publication by Year

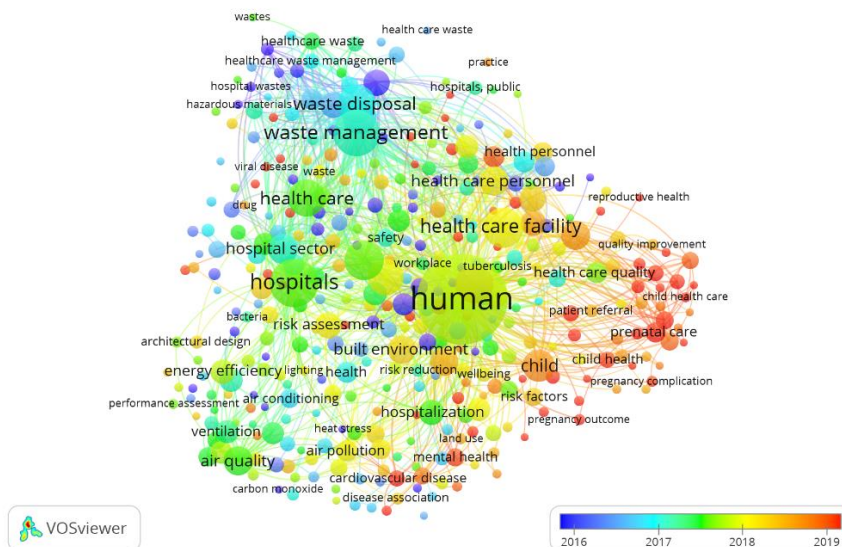


Figure 3. Overlay Publication by Year

That said, there was not enough information on how green hospital implementation can affect health aspects in hospitals and what kind of health aspects can be affected by the green hospital concept. Accordingly, this study systematically reviews articles on green hospital implementation and health aspects, provides the hospital management with an outlook on the green hospital concept, and gives information on future research in this area.

B. Problem statement

1. There is little evidence of green hospital implementation in the health aspect.
2. There is little evidence on how green hospital implementation can affect the health aspect of hospital

C. Research Aim

1. To systematically review reports of green hospital implementation in the health aspect
2. To systematically review the correlation between green hospital implementation and patient health
3. To systematically review the correlation between green hospital implementation and healthcare worker health

D. Research Benefit

1. Theoretically
 - a. The result of this review can be a recommendation and suggestion for the health facility management curriculum

- b. The result of this review can provide information about health aspects of green hospital implementation for the future research
- c. The result of this review can be developed as health an element of health aspect in green hospital implementation

2. Practically

Provide hospital management with the information regarding the implementation of the green hospitals in the health aspects.