

Study of Healthy Architecture Approach in Architectural Design at Health Care Facilities

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INDEXING

Keywords:

Healthy
architecture;
Architecture;
Health Facilities;
Environment.

ABSTRACT

The results of this study explore the application of the Healthy Architecture theory and approach in Health Facilities. The research results are expected to be a reference that can be used and easily understood by the public, architects and academics as a contribution to architectural ideas that can also be used for consideration in the architectural development of health facilities. The background issue for this research is the increasing number of health facilities needed and the challenges of the global situation faced both from an architectural and non-architectural perspective. Health facilities are also at the forefront of health service efforts, especially during a pandemic. This study uses descriptive qualitative methods in describing the implementation of the theory and approach to a healthy architecture and the implementation of designs in current and future health facilities. Healthy architecture is an approach that is applied to achieve a design that is healthy, effective and optimal for the environment and users. In implementing architecture in health facilities, implementing a healthy architecture is also expected to support the healing process of patients and support the activities of medical personnel.

Kata kunci:

Healthy
architecture;
Arsitektur;
Fasilitas Kesehatan;
Lingkungan.

Hasil penelitian ini menggali penerapan dari teori dan pendekatan Healthy Architecture di Fasilitas Kesehatan. Hasil penelitian diharapkan dapat menjadi bahan acuan yang dapat digunakan dan mudah dipahami oleh masyarakat umum, arsitek dan akademisi sebagai kontribusi gagasan ide arsitektur yang juga dapat digunakan untuk pertimbangan dalam pengembangan arsitektural fasilitas kesehatan. Isu yang melatarbelakangi penelitian ini adalah peningkatan jumlah kebutuhan fasilitas kesehatan dan tantangan situasi global yang dihadapi baik dari sisi arsitektural dan non arsitektural. Fasilitas kesehatan juga menjadi garda terdepan dalam upaya pelayanan kesehatan terutama saat terjadi pandemik. Penelitian ini menggunakan metode kualitatif deskriptif dalam menguraikan implementasi teori dan pendekatan healthy architecture dan implementasi desain di fasilitas kesehatan saat ini dan masa yang akan datang. Healthy architecture merupakan pendekatan yang diterapkan dalam upaya pencapaian hasil rancangan yang sehat, efektif dan optimal bagi lingkungan dan pengguna. Dalam penerapan arsitektur di fasilitas kesehatan, penerapan healthy architecture juga diharapkan dapat mendukung proses penyembuhan pasien dan mendukung aktifitas tenaga medis.

Article history

Received : 18 Feb 2021

Revised : 22 Feb 2021

Accepted : 28 Feb 2021

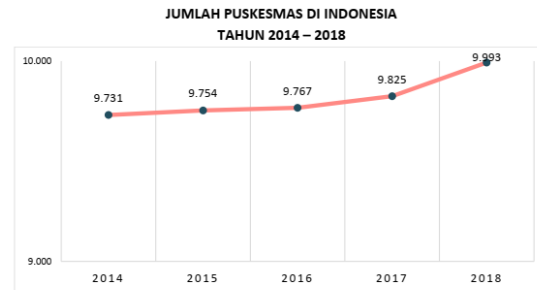
INTRODUCTION

The pandemic has become an awareness of the needs and the availability of health facilities. Health facilities are currently at the forefront of health services. The design of existing health facilities is expected to support health service activities both during a

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pandemic and normal conditions. Health facilities in Indonesia are managed by the government, individuals and the private sector. Currently, health facilities in Indonesia are experiencing population growth and increasing demand.

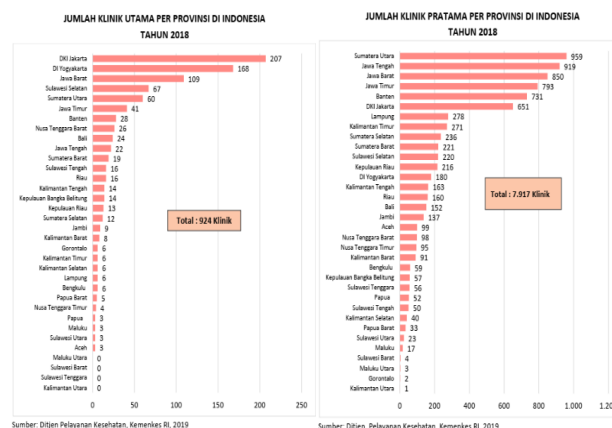


Sumber: Pusat Data dan Informasi, Kemenkes RI, 2019

Picture.1. Puskesmas in Indonesia 2014-2018

Source : Pusat Data dan Informasi Kemenkes RI, 2019

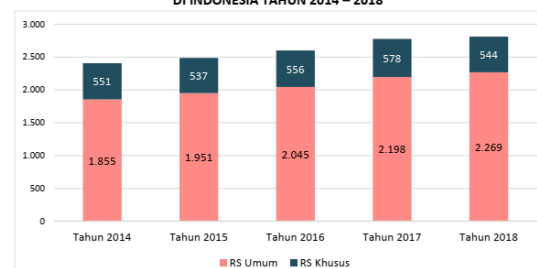
The Ministry of Health of the Republic of Indonesia in 2018 and 2019 showed an increase in the number of First Level Health Facilities (FKTP), that is Puskesmas and Clinics. The number of Puskesmas increased drastically in 2018 with a large increase of 168% and spread throughout Indonesia. Meanwhile, based on data from the Directorate General of Health Services in 2018, there were 8,841 total clinics in Indonesia, consisting of 924 Main Clinics (Klinik Utama) and 7,917 Primary Clinics (Klinik Pratama).



Picture.2. Clinic Distribution in Indonesia in 2014-2018

Source : Ditjen Pelayanan Kesehatan, Kemenkes RI, 2019

**PERKEMBANGAN JUMLAH RUMAH SAKIT UMUM DAN RUMAH SAKIT KHUSUS
DI INDONESIA TAHUN 2014 – 2018**



Picture.3. Development of Total Hospital in Indonesia in 2014-2018

Source : Ditjen Pelayanan Kesehatan, Kemenkes RI, 2019

This data shows the need and uneven distribution of clinics as well as a consistent increase in the number of hospitals in Indonesia. Based on these data, the authors conclude that there is a need to fulfil health facilities. The authors also look at the architecture in the future to the fulfilment of the health facilities. Architectural needs are defined as efforts to achieve appropriate architecture, answer challenges and design issues to optimize facilities and infrastructure to support health service activities in health facilities.

The current needs and standards for the architectural design of health facilities in Indonesia refer to the Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2016 concerning Technical Requirements for Hospital Buildings and Infrastructure and Regulation of the Minister of Health of the Republic of Indonesia Number 9 of 2014 concerning Clinics. Those regulations contain technical requirements for planning, designing architecture and the environment in health care facilities emphasizing the aspects of functionality, safety, comfort and friendly design. (Hatmoko, 2015) explains that the physical management of hospitals is required to be more effective and efficient in using existing resources. The author argues that these physical management principles have the same goals as architectural design practices in other health care facilities. Health care facilities that operate every day and without breaks demand a design that can support operational activities. Architectural designs in health care facilities are also required to accommodate health service that is vulnerable to the spread of infection. Healthy Architecture is the development of architectural science that is oriented towards people, environment, and efficiency to produce good quality architectural designs with a healthy and sustainable environment (Rice, 2019). This development of these study aligned to be applied in architectural design in health care facilities that are responsive in responding to future health issues and challenges.

RESEARCH METHOD

This research is qualitative research using the literature study method. This study examines the implementation of Healthy Architecture in health care facilities. The research was conducted to obtain explanations related to cascading object, in this case, the architecture of health facilities, based on the situations and phenomena that occur and dialogue with literature studies related to Healthy Architecture. Methods of data collection, analysis and discussion were carried out by reviewing literature studies and dialogue between data.

RESULT AND DISCUSSION

Based on the Regulation of the Minister of Health of the Republic of Indonesia Number 24 of 2016 concerning Technical Requirements for Hospital Buildings and Infrastructure, and Regulation of the Minister of Health of the Republic of Indonesia Number 9 of 2014 concerning Clinics, the authors summarize the principles of architectural design in health facilities with :

1. **Functional.** The architectural design of health care facilities must facilitate the functions and activities of health services following standards and needs.
2. **Safety.** The design accommodates human, medical, building and environmental security and safety.

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3. Comfort. The resulting design inside and outside the building can provide comfort to users and support the patient's recovery atmosphere.
4. Friendly design. The design accommodates easy accessibility and function for users, especially the elderly, disabled, and disabled.

These principles are expected to be applied throughout the architectural, interior, and landscape design of health care facilities.

Healthy architecture is the contribution of healthy architecture as a whole part of the physical building, human behaviour and environment in the building (Rice, 1019). The building will not only free from infection, disease and other deficiencies in the physical building. But also healthy for human behaviour and social needs that work in it. This description is appropriate to support the strategic steps of the architectural design in health care facilities. (The American Institute of Architects-AIA, 2014) describes 6 approaches that can be used by architects in producing good and healthy designs :

1. *Environmental Quality*, precautions and reduce pollution and harmful microbes.
2. *Natural Systems*, the act of utilizing the original nature, diversity of species and ecosystems to relieve stress, accelerate healing, encourage healthy eating patterns, and increase physical and social activity.
3. *Physical Activity*, the actions that encourage physical activity such as sports, recreation, to reduce the risk of cardiovascular disease and other health problems,
4. *Safety*, measures the prevent crime,
5. *Sensory Environments*, the existence of diversity and sensory experiences such as touch, smell, and acoustics in the environment to improve safety, security, physical and mental health as an action to improve the quality of life.
6. *Social Connectedness*, the existence of a good social environment to increase happiness.

The discussion in this subsection discusses the dialogue between architectural design principles in health care facilities and a healthy architecture approach. It is hoped that the outcomes will become the basic data used by an architect and health care facilities managers in planning and composing health care facilities environment that healthy and comfort.

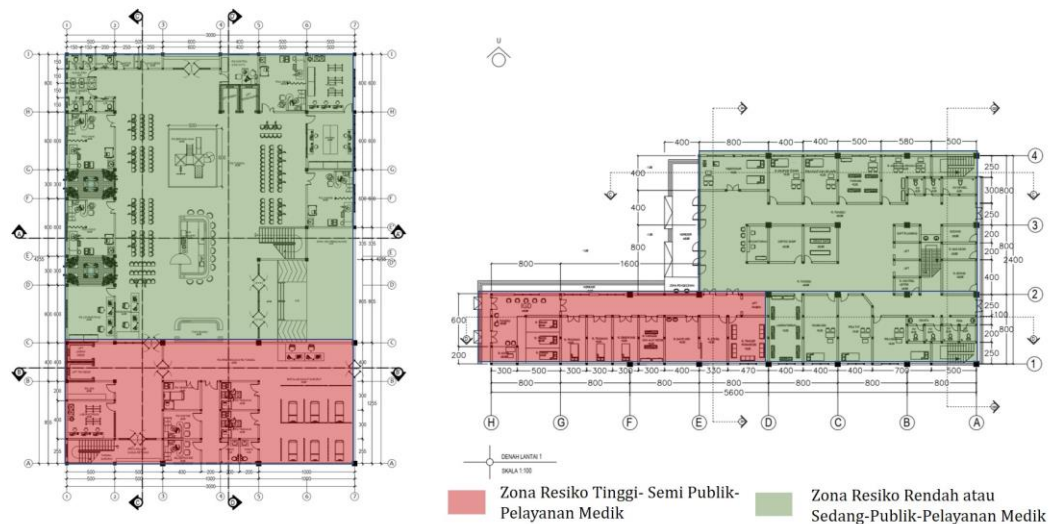
1. Functional.
Design health care facilities following the standard room program, function standards, medical standards, and size according to the type of health care facility designed. The design also complies with the needs and specific rules of the government regarding land designation rules, environmental standards and local Building and Environmental Planning (RTBL), Basic Building Coefficient (KDB) requirements, Building Floor Coefficient (KLB), Green Area Coefficient (KDH), Line Building Boundary (GSB) and Fence Line (GSP).
2. Safety
Setting up a user-safe design achieved by paying attention to:

a. *Environmental quality.* Prevent and reduce the potential spread of infections and diseases. Architectural designs that are preventive against the spread of infection and disease are carried out by :

- (1) Pay attention to zoning, mass and space.
- (2) Design with space capacity by activities, health protocols and proximity of space.
- (3) Improving buildings performance and the environment.

Pay attention to zoning, mass and space.

Hospital zoning consists of (1) zoning according to the risk of disease transmission (low, medium, high, and very high-risk zones). (2) zoning according to the level of privacy of activities (public, semi-public, and private zones). (3) zoning according to service characteristics (zone of medical and care services, support and operational zones, general and administrative support zones) (Hatmoko, 2015).



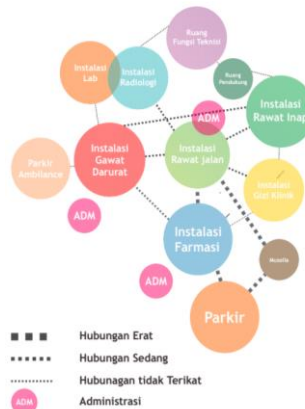
Picture.4. Illustration of Zoning Design in Clinic

Source : processed by Hilman and Vanisa, 2021

The above illustration shows the clustering of functions in the zoning and shows the relationship within. The processing of circulation and spatial between zoning is to prevent the spread of infection and disease. The design in each area must also pay attention to the requirements for the materials, details and techniques of the architectural detail.

Design with space capacity by activities, health protocols and proximity of space.

ORGANISASI RUANG



Picture.5. Illustration of Space Diagram in Clinic

Source : processed Hilman, 2021

The arrangement of mass and space refers to the zoning that has been conceptualized previously. Connecting or combining rooms with zones and showing the relationship between these spaces. This arrangement is closely related to the effectiveness of boundaries between spaces and building zoning. After examining zoning and spatial organization, the designer must also pay attention to the suitability of space capacity based on the activities and needs therein. This will have an impact on the quality and quantity of activity in that space. A space with an overload capacity will have an impact on the easy spread of infection and disease. Referring to a pandemic situation, space density is in line with the protocol for the distance between users and interior elements. Health protocols are easily accommodated by providing a design with an ergonomic element and a touchless fixture.

Improving buildings performance and the environment.

Efforts to achieve these targets are to create healthy spaces, buildings, and environments to reduce carbon footprints with construction processing, technology, and building physics that are applied in buildings. The implementation is (1) striving for building performance that saves energy, water, and materials. (2) pay attention to and treat the distribution of medical and non-medical waste properly. (3) cultivate and improve indoor quality, thermal comfort of buildings, air and visual pollution in buildings.

- b. Pay attention and provide a sense of security and safety by (1) accommodating the proper handling of medical and non-medical waste. (2) according to the structure and building construction standard. (3) prevention of fire evacuation and natural disasters. (3) system planning and security control from crime by designing a good building utility system.

3. Comfort

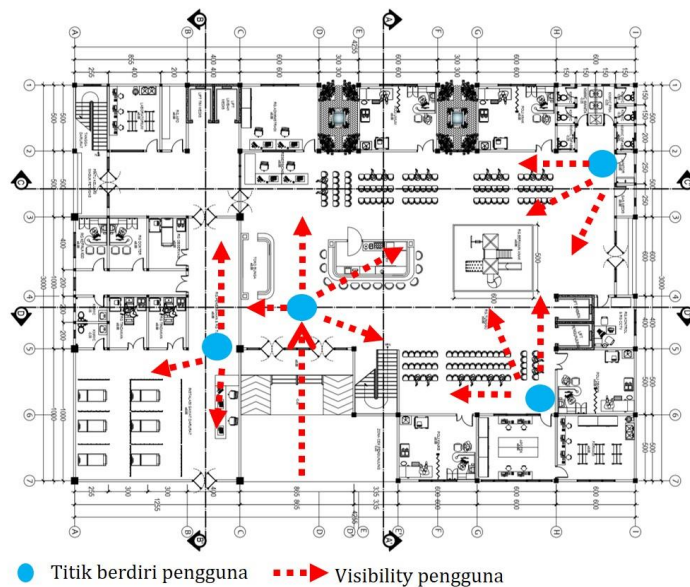
Create an atmosphere of recovery to accommodate a physical activity, Sensory Environment, and Social Connectedness. Attempts were made by processing the performance and appearance of the building's physical, interior, aesthetic elements, and interface. Technically it can be implemented by:

- a. Creates comfortable conditions of thermal, visual and sound in the building. Design implementation can be done to adjust the building orientation, open space, and air circulation. Pay attention to thermal quality in the room and adjust the building acoustics. Visual comfort can be achieved by adjusting and utilizing natural light and processing the temperature and light intensity of the lights used.
- b. The target in designing the architecture in health care facilities is to focus on supporting the patient's healing process. Design is also able to support patients, families and staff to reduce the level of stress faced. To achieve these targets, the designer can consider several aspects. First, the setting of the natural environment and psychology architecture to create a comfortable design quality and can be perceived by the senses. Second, prepare a design that supports social activities and user behaviour settings.

4. Frindly Design

Friendly design is the achievement of designs that are easy to access, use, and facilitate user activities.

- a. It has good accessibility and circulation.



Picture.6. Clinic design with user visibility

Source : processed by Jauharoh, 2021

Produce design with ease of access and good visibility, so that users have no difficulty in space orientation inside and outside the building. The designer must focus on the dimensions of circulation to make it easier for users to distribute things and move.

- b. Ergonomic design and easy to use by users, especially the elderly, children and disabilities.

Design with universal design principles. Universal design is the design of buildings, environments, and elements in public spaces that can be used by all user groups without the need for adaptation or compromise in design (Mace, 1990 in Pujiyanti, 2018). The principles of Universal design according to the Center of Universal design, NC University (1997) are Equitable Use, Flexibility in Use, Simple and intuitive use, perceptible information, tolerance of error, low physical effort, size and space for approach and use (Pujiyanti, 2018).

CONCLUSION

Health care facilities currently being frontline health services in Indonesia. There are an increasing need and distribution of health care facilities, it is felt necessary to be supported by planning and architectural design that is feasible, comfortable, and following the standards. Health care facilities that operate non-stop 24 hours demand a design that can support operational activities, effectively and efficiently. Architectural designs in health facilities are also required to reduce the spread of infections in buildings and the environment. To achieve the principles of designing health facilities that are effective, efficient and healthy. The design needs to be supported by a healthy architecture approach.

The author refers to government regulations related to technical standards for planning, design the architecture and environment in health care facilities. Summarize these regulations into keywords and design principles that can be used when designing health care facilities in Indonesia. The keywords and principles in question are functional, safety, comfort, and user-friendly design. A literature dialogue was conducted between these keywords and healthy building parameters from the American Institute of Architects-AIA. AIA describes 6 approaches that can be used in producing a healthy building design with Environmental Quality, Natural Systems, Physical Activity, Safety, Sensory Environments, and Social Connectedness.

The results of the dialogue between the two kinds of literature resulted in several recommendation points that could be implemented during the planning process and architectural design in health care facilities. The results of this study can be used as a reference for researchers, readers, practitioners and the government as a follow-up to research consisting of:

- 1) Further research related to the architecture and environment of health care facilities that implement the healthy architecture approach.

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- 2) Further research that can parse deeper to discuss the effectiveness and efficiency in the design of health facilities.
- 3) Further research can also examine the results of research by applying the Health protocol during a addictedness.

ACKNOWLEDGMENT

Researchers would like to thank 'Aisyiyah University Yogyakarta for their research funding support for 2020/2021 so that this research can run smoothly.

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