

## THE EFFECT OF HEALING ENVIRONMENT PRINCIPLES ON COVID-19 PATIENTS STRESS LEVEL (CASE STUDY AT HOSPITAL X)

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### ABSTRACT

During the COVID-19 pandemic, hospitals are required to provide unique isolation rooms for confirmed COVID-19 patients. This study aims to determine the effect of the healing environment principle on designing an isolation room without a ventilator on the patient's stress level. This research is descriptive qualitative using Focused Group discussion with COVID-19 ex-patients. The study was conducted at Hospital X in May 2021. The results showed that the things that helped reduce stress in patients were the presence of a garden outside the isolation room and good quality linen, clean fragrance, and disinfectant, which made the patient confident about the cleanliness of the room. Meanwhile, what causes stress is the noise of the exhaust fan, dull paint color, lack of privacy in the isolation room, the smell of the bathroom that is not pleasant, and the food's taste is not good. This study concludes that the balance of natural and psychological elements in the arrangement of the COVID-19 isolation area and room can affect the thoughts, feelings, and behavior of patients treated in the COVID-19 isolation room.

### KEYWORDS

healing environment, COVID-19 , COVID-19 isolation, COVID-19 isolation room

### INTRODUCTION

Hospital X in Malang Regency and other government general hospitals in the districts have a lower-middle-class market segment. So, design standards focus more on functional aspects. This is caused by many factors, including budget constraints, lack of knowledge, and bureaucratic factors. During the COVID-19 pandemic, hospitals are required to provide unique isolation rooms for confirmed COVID-19 patients. According to the Regulation of the Minister of Health of the Republic of Indonesia No. 24/2016 Regarding the Technical Requirements for Hospital Buildings and Infrastructure, the Hospital X reorganized the zoning of buildings in the hospital to the need for COVID-19 isolation rooms.

Hospital X was designated as a COVID-19 referral hospital based on Decision of The Governor of East Java Number 188/218/KPTS/013/2020 Concerning the Third Amendment to The Decision of The Governor of East Java Number 188/125/KPTS/013/2020 Concerning Hospital Determination Reference of Coronavirus Disease 2019 (COVID-19) in East Java. The hospital had 6 beds in isolation rooms with negative pressure. In order to be able to adapt the isolation room requirements, the Hospital X made several room adjustments so that currently it has a capacity of 6 negative pressure isolation rooms with ventilators, 23 negative pressure isolation rooms without a ventilator, 16 natural flow isolation rooms without a ventilator and 1 COVID-19 emergency room.

The number of COVID-19 patients treated at the Hospital X for the March 2020 - February 2021 period was 422 patients, with an average number of patients per month being 35 patients. The average duration of treatment for COVID-19 patients at Hospital X is 22 days, and each patient occupies an isolation room with or without negative pressure, depending on the severity of the patient's COVID-19 symptoms.

In general, a hospital is only a place for treatment and healing of disease. Nevertheless, hospitals are limited to providing medical treatment, healing technology, and creating a therapeutic recovery environment for patients' mental recovery. A healing environment is a therapeutic environment design that combines elements of nature, senses, and psychology. Natural elements can be felt through the senses. Human special senses can help the patient to see, hear, and feel a natural beauty that is designed. This indirectly affects the patient's psychology. Psychologically, patients will feel comfort and secure within themselves. (1)

Three approaches are used in designing the hospital's healing environment, namely nature, senses, and psychology. (2)

1. Nature; there are several types of gardens in the hospital that have several functions, namely being able to calm the mind, improve spirits, make sick people feel better, encourage stress recovery and can have a positive influence on patients, and allow all people of all ages to enjoy and interact.
2. The senses; the five senses include hearing, sight, touch, smell, and taste
3. Psychology; psychologically, patient care is given by paying attention to choices, to the needs and values that can guide the patient's clinical decisions. So that the healing environment can help the patient's recovery process, reduce pain and depression or stress.

Of the entire existing COVID-19 isolation room, the inpatient room was converted into a particular COVID-19 isolation room. The conversion of this room must be following the guidelines for a particular room for infectious diseases issued by the Ministry of Health of the Republic of Indonesia. The room's function conversion into a COVID-19 isolation room must pay attention to those standards, so that disease transmission does not occur from the room. Besides that, it must also pay attention to the application of the healing environment principle. This principle aims to ensure that patients undergoing isolation in negative pressure isolation rooms without a ventilator and natural flow isolation rooms without a ventilator will feel comfortable and speed up their healing process. The 22-days average duration of COVID-19 treatment at the isolation rooms can increase the level of stress in patients if there are no facilities that can provide comfort for them.

This study was conducted to prove that the hospital's physical environment has a significant relationship in influencing the patient's stress level during the healing process. This study aims to determine the effect of the healing environment principle on designing a negative pressure isolation room without a ventilator on the patient's stress level. The selection of the COVID-19 isolation room as the object of this research is also expected to provide a clear picture for design practitioners, the government, and the community that by applying the correct healing environment elements in the COVID-19 isolation area can help to improve the quality of hospital services.

## **MATERIALS AND METHODS**

This research uses a descriptive qualitative method. (3) The study was conducted in May 2021.

The population in this study were adult patients who had been treated in a negative pressure isolation room without a ventilator from March 2020 to February 2021 with a minimum length of stay of 14 days totaling 158 people with samples used as respondents. A total of 12 COVID-19 patients treated in the isolation room were divided into two groups based on gender.

Data collection was carried out utilizing in-depth interviews, namely by digging up information about the experiences and feelings of the respondents while being treated in the isolation room, associated with three aspects, namely nature, senses, and psychology. The interview process was carried out using a focus group discussion (FGD) system through a virtual zoom meeting on May 20, 2021. Data analysis and processing were carried out by comparing data from the literature with patient perceptions of the three healing environment aspects obtained from interviews.

Qualitative methods are used in this study because they are considered capable of analyzing the psychological reality between space as the built environment and humans as users in more depth. (4) This study requires two types of data, namely theoretical data obtained from literature studies and phenomenological data obtained from interviews of respondents treated in the COVID-19 isolation room. The literature data in this study focused on the criteria for the ideal healing environment. At the analysis stage, the literature data is compared with phenomenological data to obtain an ideal picture of the healing environment elements application in the COVID-19 isolation room at Hospital X.

## RESULTS AND DISCUSSION

The concept of a healing environment is one of the concepts of forming a caring environment that combines the patient's physical and psychological aspects of the five senses. The aim is to accelerate the patient's adaptation process so that with his physical limitations, a patient can adapt quickly, which impacts decreasing the patient's stress level due to the hospital's physical environment. Based on the interviews conducted with respondents, the application of the healing environment in this study has a relationship with the stress of patients being treated in the COVID-19 isolation room. The 12 respondents were divided into two groups, all of them explained that when they first entered the isolation room, they paid less attention to the isolation room environment because they focused on shortness of breath. Environmental conditions are ignored because of the patient's desire to be able to breathe as usual. After the patient's condition gets better and the patient can move from his bed, the patient can only feel the influence of environmental conditions that the five senses can capture on his comfort. In addition, the dominant patient feeling is being isolated, alone, far from family. So, the health providers' presence during observations, giving medicine, and providing food become entertainment for the patient because, through these activities, the patient feels getting attention.

The approach used in implementing the healing environment in the COVID-19 isolation room at Hospital X (Figure 1) is nature, senses, and psychology. After interviewing the respondents, the results were obtained from the patient's perception of the five senses, namely: hearing, sight, touch, smell, and taste, which are associated with natural elements and psychological elements in the COVID-19 isolation room.

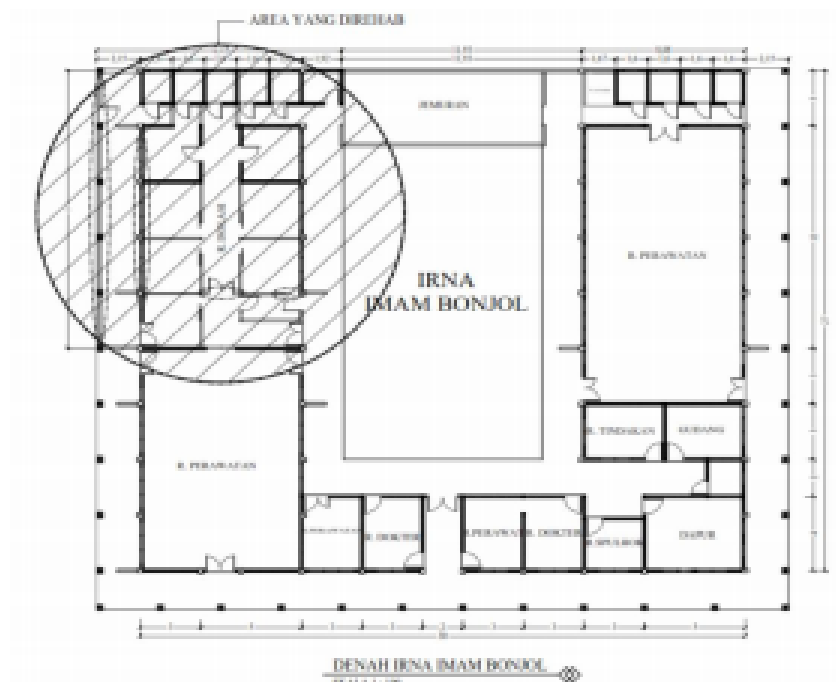


Figure 1 Plan of the COVID-19 Isolation Area at Hospital X

## 1. Hearing

The application of natural elements of the healing environment in the hearing aspect has helped reduce the stress level of patients while undergoing isolation in the COVID-19 isolation room. The sound of birds in the garden creates calm for the patient and makes the patient feel entertained. At night in the bathroom, the sound of crickets can still be heard, and the patient can understand this because the COVID-19 isolation room area is close to the paddy fields.

There are many shortcomings in the auditory aspect of the psychological elements of the healing environment. The patient is disturbed by the noise from the exhaust fan for the negative pressure room. The sound of the exhaust fan is boisterous and disturbs the patient who wants to rest and results in decreased sleep quality, increases stress levels, and hinders the patient's healing process. At the beginning of the treatment period, i.e., day 1 – day 6, the patient did not feel any significant disturbance in the sound of the exhaust fan because the patient was in a weak condition and did not pay much attention to this condition. When the patient's condition began to improve between day 7 – 14, the patient began to feel disturbed by the noise from the exhaust fan. The sound of the exhaust fan began to sound louder after 11 PM when the atmosphere in the COVID-19 isolation room was getting quiet. The sound monitor attached to other patients in the room, the gurney sound operated by nurses at night, and the sound of the room's bell remind patients about their negative experiences and traumatic events. Other patients' voices that are not blocked and talking loudly during the rest also increase the patient's stress level.

There is no entertainment such as central music or television in the room to relieve the patient's boredom of listening to music, listening to the sound of the Quran, or enjoying the sound from YouTube. Because the room is not partitioned, multimedia sounds played at high volume without a headset from other patients can be heard by other patients and increase the stress of these patients.

## 2. Vision

The application of natural elements of the healing environment in the visual aspect helps reduce the stress level of patients during isolation in the COVID-19 isolation room. The presence of plants in the garden can reduce the patient's boredom in the isolation room. Besides, the garden can also be a place for patients whose condition has started to improve to sunbathe in the morning while seeing the green color of the plants. In the park, several birds often perch on plants and trees, causing some patients to be entertained by the behavior of these birds. The large window size in the isolation room allows sunlight to enter the room and makes the patient feel healthy. It also provides a wide field of view for patients to see the garden and conditions outside the room during the day. (Figure 2, 3)



Figure 2 Park in the COVID-19 Isolation Area



Figure 3 Park in the COVID-19 Isolation Area

The aspect of vision in the psychological element has many shortcomings. The paint color in the COVID-19 isolation room is white, typical of a hospital, giving a clean impression, but some parts of the walls whose paint is peeling and dull make the COVID-19 isolation room look shabby and scary. Dull and peeling paint colors increase the patient's stress level and make the patient uncomfortable in the COVID-19 isolation room. The visual of a poorly maintained bathroom also increases the stress of the patients being treated because they will think a lot

before entering the bathroom. Artificial lighting sources that are directly visible to the patient's eyes cause glare which causes the patient to have difficulty sleeping at night and can increase stress which can hinder the patient's health recovery process. Artificial lighting that is not dimmed at night causes small animals to congregate in the lamp and disturb the patient who is willing to rest. The most significant problem which increases the patient's stress level from the aspect of vision is the absence of curtains on the large window. It reduces the patient's privacy at night because, at some points, the patient's window can be seen from outside. In addition, the absence of a dividing curtain between the beds reduces the patient's privacy. In one case, there was a patient whose condition declined and even died in the room that could be seen directly by other patients, significantly affecting the patient's psychological condition (Figure 4). The cleanliness of the bathroom also a special note for patients; two bathrooms for ten people in the room are felt to be lacking and create dirt in the form of moss/sediment on the bathroom walls, which reduces the patient's comfort when using the shared bathroom.



Figure 4 Bed in the Covid-19 Isolation Room

### 3. Touch

Applying natural elements of the healing environment on the touch aspect did not significantly affect the patient's stress level. The variety of plants is dominated by leaves and terraces located a bit far from the garden, making patients unable to touch the garden plants directly.

In the psychological element of the touch aspect, the patient focuses more on the bed's comfort and the sheets installed on the bed. The patient feels comfortable with the bed linen's cleanliness. The bed linen on the COVID-19 isolation room bed is changed every day by the staff. The hospital does not provide unique clothes/uniforms that are comfortable to wear by patients while undergoing isolation in the COVID-19 isolation room, which may improve the sense of touch for the patient.

### 4. Smell

Based on the information obtained by researchers, a natural phenomenon that affects the olfactory aspect is the presence of grasshoppers that enter the patient's bathroom, especially at night; the grasshopper carries an unpleasant aroma when the patient will use the bathroom. According to respondents, the location of paddy fields adjacent to the outer wall of the bathroom and the presence of cracks in the bathroom resulted in several grasshoppers that could enter. The shared bathroom creates an unpleasant aroma from the psychological element that

increases the patient's stress level when using the bathroom. The smell of smoke from the incinerator's combustion, which is 20 meters from the room, can sometimes still be smelled in the bathroom and disturb the patient.

The smell of disinfectant for regular room cleaning is reasonable and not disturbing. The scent of disinfectant gives a sense of security to patients because it proves that the room has been cleaned and is more sterile than before. Linen (sheets and pillows) that are regularly cleaned give the patient a clean and fragrant impression and comfort the patient at rest.

## 5. Taste

The taste aspect affects the psychological elements of the patient more. In terms of taste, the food served in the isolation room has no taste and lacks variety. Patients who do not experience serious complaints feel that they do not need the standard hospital food, which is salt-limited. They expect the food to have more taste. Moreover, patients do not have dietary restrictions that require them to limit their salt and sugar consumption.

Based on the literature study, the factors that affect the healing environment in hospitals that can be applied to the COVID-19 isolation room include:

### 1. Privacy Factor

Privacy is one of the main parameters of the healing environment that directly impacts the well-being of the patients and better performance of medical staff based on various studies. It includes visual privacy, auditory privacy for patients and staff, restroom location, and noise sources. (5) The lack of privacy among occupants of four-bed rooms compared to occupants of single-bed rooms indicates that patients perceive them as less secure and feel less able to control social interactions that occur in them compared to single-bedroom occupants. (11)

### 2. Safety Factor

Safety/security is a factor that significantly affects the healing process and controls the patient's stress level, and motivates the staff to do their best. (5) Safety and security factors include environmental visibility, and ward design is straightforward, uncomplicated, vertical circulation and the direct access is visible from the treatment room, the location of the nurse's room to the room, single or double bedroom. (7)

### 3. Accessibility Factor

Accessibility is a factor that tends to affect patients and staff. Good accessibility increases nurse response times to reach patient rooms, offers an open design layout for staff to easily access patient rooms, and supports a clear field of view for continuous observation to maintain patient safety. (8) Accessibility includes nurse entrances and routes. The statements tested for accessibility in inpatient rooms focused on walkability and understanding layout, accessibility of affordable landscapes and food areas, accessibility to room equipment, lighting, temperature, and toilets. (9)

### 4. Noise Factor

A noisy environment and atmosphere affect sleep, rest, and patient comfort. In addition, a noisy environment for staff can affect nurse performance and increase errors. (10) It focused on how much the layout minimized unwanted noise focused more on anti-noise isolation and necessary partitions between beds, location of nurse stations to patient rooms. (12)

### 5. Positive Distraction

Positive distractions are a group of factors that distract patients positively from a particular pain or condition for some time and can enhance their healing process. The positive disturbance parameters selected in the healing environment are natural lighting in the inpatient setting, patient room, and outside views. (7)

From the description above, it can be drawn some results of the discussion in four criteria or groups, namely:

1. The group of natural elements of a healing environment that is ideal and comfortable for COVID-19 patients in isolation is a park located around the COVID-19 isolation area.
2. The group of natural elements of the healing environment that is uncomfortable for COVID-19 patients in isolation is the lack of variety of plants in the garden.
3. The group of psychological elements of a healing environment that is ideal and comfortable for COVID-19 patients undergoing isolation is good quality linen, clean and fragrant, the smell of the disinfectant used to clean the room.
4. The group of psychological elements of a healing environment that is uncomfortable for COVID-19 patients undergoing isolation is noise from the noisy exhaust fan, dull paint color, lack of privacy in the isolation room, the bathroom's unpleasant smell and unpleasant taste of food.

### CONCLUSIONS AND SUGGESTION

This study explains that the balance of natural and psychological elements in the COVID-19 isolation and room arrangements can affect patients' thoughts, feelings, and behavior in the COVID-19 isolation room. The physical environment in the COVID-19 isolation room, which is associated with fear, anxiety, pressure, and uncertainty, can increase the patient's stress level. Stress conditions from patients can be minimized by applying elements of the healing environment to the COVID-19 isolation area. The concept of a healing environment is the formation of a caring environment that combines the physical and psychological aspects of the patient in it, which aims to accelerate the patient's adaptation process so that with his physical limitations, a patient can adapt faster, which results in reduced stress levels.

The conclusions from the results of the respondents' interviews include:

1. Natural elements from the park around the COVID-19 isolation area have a vital role in reducing patient boredom and stress while being treated in the COVID-19 isolation room.
2. Psychological elements become elements that increase patient stress and make patients feel uncomfortable in the COVID-19 isolation room.

The lack of policymakers attention on psychological elements could have been caused by the increase in the number of confirmed patients and the need for a COVID-19 isolation room which grew very fast. This makes policymakers have to find the fastest and most appropriate solution to be prioritized, so that there is no cross-infection of COVID-19 in hospitals. Follow-up research is needed regarding the analysis of policymakers in making decisions to provide a COVID-19 isolation area with an ideal healing environment concept for patients and hospital staff.



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