

# Effects of built environment on healing the mental health of the people—literature review

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## Abstract

**Purpose** – The coronavirus disease 2019 (COVID-19) pandemic has been reported to have a major impact on the mental health of an individual. Healing the mental stress, anxiety, depression and insomnia of an individual's immediate surroundings play a major role. Therefore, this study reviews how the built environment impacts the healing of an individual's state of mind.

**Design/methodology/approach** – Various works of literature on healing environments were analysed to create frameworks that can facilitate psychological healing through architectural elements. Articles were selected from various journals like SAGE, PubMed, *Journal of Applied and Computational Mechanics* (JACM), Routledge Taylor and Francis, *Journal of Contemporary Urban Affairs* (JCUA), ScienceDirect, and Emerald databases, news articles, official web pages, and magazines that have been referred.

**Findings** – Indicators (spatial, sensory comfort, safety, security, privacy and social comfort) are linked to sub-indicators (access, distractions and views) and design characteristics (indoor climate, interior view, outside view, privacy, communication, noise, daylighting, temperature) which help in better connection of the built environment with individual's mental health. From the above indicators, sub-indicators and design characteristics, the authors have come to a conclusion that a view to the outside with better social interaction has an in-depth effect on an individual's mental health.

**Research limitations/implications** – This study predominantly talks about healing in hospitals but quarantining of COVID-19 patients happens in residences too. So, it is important to find the healing characteristics in residences and in which typology the recovery process is high.

**Originality/value** – This paper has been written completely by the author and the co-authors and has not been copied from any other sources.

**Keywords** Built environment, COVID-19, Depression, Healing, Healthcare, Home, Mental health, Mental stress

**Paper type** Research paper

## 1. Introduction

The World Health Organization (WHO), in 2019, estimated that 7.5% of people in India were already affected by mental health disorders which are likely to increase significantly because of the pandemic. It also states that India has only one psychiatrist per 1,30,000 people. The pandemic is not simply a medical experience, it also affects the mental health of individuals by causing anxiety, mental stress, depression and many more (Moukaddam and Shah, 2020; Javed *et al.*, 2020). Due to lockdown restrictions, in order to break the chain of transmission of the virus, people are asked to stay in their homes. Quarantine and isolating oneself can bring in abnormal effects on their psychological health. To overcome the psychological health, different measures and actions ought to be taken.



According to WHO, psychological and physical health are interlinked with each other, and hence mental health is an important factor for the healthy well-being of an individual (WHO; Investing in Mental Health, 2003). In a review by Hart (2021), it is found that many patients have been affected by issues like depression and anxiety (Hart, 2021).

The psychological state of people has taken a downward turn because of the pandemic. Families and friends of patients suffering from coronavirus disease 2019 (COVID-19), doctors and many others suffer psychologically due to the pandemic (Itani *et al.*, 2021). Thereby, understanding the impact of the pandemic and the place they are quarantining is equally important for the improvement of their mental health.

Healthcare facilities (HCFs) is a place where people with health issues opt for treating illness. Because of its nature, the healthcare industry is constantly working towards overall improvements, especially during the COVID-19 pandemic. This study reviews the research articles concerning the design of HCFs and homes.

## 2. The review strategy

### 2.1 Aim

The review aims to supply a summary on “healing environments” to investigate through the review of literature on how HCFs and residences can increasingly have an effect on recovery people due to the built environment during the pandemic by having a healing environment.

### 2.2 Literature methodologies

The screening process involves different stages of the selection process for the literature review. In the initial stages, the screening was done on various online publication platforms. The set of keywords used to find the articles are HCFs, patients, homes, healing environment, COVID-19, mental issues, psychological health, depression, mental stress, anxiety and the built environment. Based on the keywords with relevance to the objective, the articles were selected after reading the title and the abstract. Articles were selected from various journals like Sage, PubMed, Routledge Taylor & Francis, ScienceDirect and Emerald databases, news articles, official web pages and magazines that have been referred. The papers were then segregated into various factors which have been laid below in literature review.

## 3. Literature review

The literature review has been undertaken by revealing its context through a framework based on the healing environments of HCFs, patients, their families, environmental factors, homes and the built environment.

### 3.1 COVID-19 and its impact on the mental health of an individual

COVID-19, the pandemic, has affected many frontline workers and their families. Mainly people working in HCFs like doctors, nurses, and many others have been involved directly with taking care of patients and have an enhanced risk of getting infected (Herron *et al.*, 2020; Singh *et al.*, 2021). They are not just worried about their own safety but also their family members, which decreases productivity and the quality of work (Singh *et al.*, 2021).

Various mental issues with respect to people have been studied in correlation with the quality of life (Nathiya *et al.*, 2021; Suryavanshi *et al.*, 2020). Maladaptive and adaptive coping strategies have been used by the healthcare workers (HCWs). From the survey by Singh *et al.* (2021), among 348 HCW, 242 were doctors and 106 were nurses. Out of that, 190 of them had insomnia, 154 had anxiety, 188 had depression. Nurses, mainly females, were affected by insomnia more than males (Singh *et al.*, 2021). Similarly, among 592 HCW, 363 subjects were females and 229 subjects were males. Out of which 264 of the subjects had anxiety symptoms, and 229 of the subjects had depressive symptoms. The rate of anxiety and depression levels is

significantly higher in females than their male counterparts (Gallopeni *et al.*, 2020). More females have been diagnosed with this kind of mental health issues which can be brought down by having different healing strategies.

In research done by Maheshwari *et al.*, 51 patients were assessed, and it was found that the worst affected parameter was the environment's quality which affects psychological health (Maheshwari *et al.*, 2021). The built environment, including low quality, less open space and noise, is associated with depression (Rautio *et al.*, 2017). Different senses of an individual can be used to assess the environment by understanding the space (Mazuch and Stephen, 2005). Interior design elements like the room's colour, materials, also have an effect on an individual's mental health based on their behaviour (Kim, 2020).

With the research done by Lahiri *et al.* (2021), based on the questionnaire survey, out of 1,081 responses in total, 13.32% had a moderate degree of clinical insomnia, and 1.85% had a severe degree of insomnia (Lahiri *et al.*, 2021). Compared to the younger age group, the middle age group had a higher degree of insomnia during COVID-19 (Lahiri *et al.*, 2021). Mild anxiety and mild stress had effects on insomnia. It was majorly because of isolation due to COVID-19, afraid of not getting the supplies (Lahiri *et al.*, 2021). In paediatric groups, the mental stress is because of loss of educational routine, isolation and depression which was braced by mental health systems and emergency departments (Golberstein *et al.*, 2020; Cloutier and Marshaal, 2020).

### 3.2 Built environment

Healing is an individual process and personal experience (Marshall, 2008; Firth *et al.*, 2015). The quality of life is based on aspects like mobility, disability, physical activity, aggressive behaviour, mental stress, anxiety, depression, social engagement, garden usage, disorientation, sleep disorders, sense of privacy and sense of control. The above aspects can be enhanced or diminished by having proper site optimization, Outdoor environment, place of residence, Unit configuration, Daylight, and artificial lighting, arrangement of furniture, fixtures and equipment (Joseph *et al.*, 2016).

*3.2.1 Patients' comfort and care.* Homelike environments can decrease the physical and emotional pain of the patient (Kligler *et al.*, 2011; DuBose *et al.*, 2018). In addition, an environment that provides elements for recreational activities and visual art creation seems to help patients to maintain their health (Reynolds and Prior, 2006; DuBose *et al.*, 2018). It provides an exclusive and dependable place for patients which provides control to them (Fenner, 2011; DuBose *et al.*, 2018).

Physical characteristics of a space, the feelings and familiarity that space creates and connection with nature. The motif of a homely nature, with the depiction of similar rooms within the home. It is also identified that having a space for their family members will increase healing (MacAllister *et al.*, 2016).

*3.2.2 Access to views and nature.* Mental stress and anxiety can be reduced by having a connection to the outside world and having indoor plants (Park and Mattson, 2009; Lechtzin *et al.*, 2010; Linebaugh, 2013; DuBose *et al.*, 2018). Contact to the surface world will provide a better quality of life (DuBose *et al.*, 2018). Indoor courtyards and atrium spaces with green areas increase positive emotions and reduce negative emotions. For providing a pleasant view of nature, garden spaces can be designed with proper access and sitting spaces for better interaction, a positive distraction that connects the external environment (Zhang *et al.*, 2018; Hesselink *et al.*, 2020). The development of the water, the blue spaces within the built environment increases a healing and relaxing nature (Lengen, 2015).

*3.2.3 Daylighting.* By providing natural lighting in a patients' room, it had increased positive thoughts (Timmermann *et al.*, 2014; DuBose *et al.*, 2018). Exposure to natural lighting may be a vital phenomenon for a healing environment. East facing windows give better natural lighting which helps in reducing mental stress and thus supports healing (DuBose *et al.*, 2018).

People from extreme northern latitudes experience “sunlight starvation syndrome” which weakens muscles, chronic irritation, fatigue, etc. (Schweitzer *et al.*, 2004). M Schweitzer *et al.* also talks about the colour, intensity of the light at different times of the day and also during different seasons. While talking about natural and artificial lighting, she said most artificial lights lack ultraviolet (UV) light, a biologically crucial component of sunlight that “has been found to stimulate blood circulation. Early morning sunlight decreases the timeline of stay in hospitals for those people. Less mental stress and pain have been seen when patients receive more daylighting (Zhang *et al.*, 2018).

**3.2.4 Noise control.** If space is designed with noise acoustics, or if space is located far away from noise-producing elements, it will decrease interfering noise and also mental stress of people in that space (Linebaugh, 2013; Park and Mattson, 2009; DuBose *et al.*, 2018). Soothing music in a space is also one of the mending tools for calming mental health (Kreitzer *et al.*, 2009; Smith and Jones, 2013; DuBose *et al.*, 2018; Zhang *et al.*, 2018). In hospitals, the noise level is generally high and creates a negative impact on patients by increasing their perception of pain and sleep deprivation (Schweitzer *et al.*, 2004). An increase in blood pressure and heart rate, reduction in patient satisfaction can be because of an increase in noise in the surroundings (Schweitzer *et al.*, 2004).

**3.2.5 Privacy.** M Schweitzer *et al.* said that having a private single-bedded room is generally preferred in terms of privacy for better functionality, decrease medical errors by professionals, reduce the spread of infection and provide comfortable interaction with the family members. It provides better patient satisfaction (Schweitzer *et al.*, 2004; Mahmood and Tayib, 2019).

**3.2.6 Sense of control.** Individual’s having the control of the space with the help of built features will have a psychological impact on their care (DuBose *et al.*, 2018). Studies by many researchers have shown that when pictures in hospitals are more of homely nature with connection to the outside world will give more control to people (Kligler *et al.*, 2011; DuBose *et al.*, 2018). Sense of control can depend on direct and indirect control over the built environment. It reduces mental stress when an individual can physically manipulate the environment by having direct control over the arrangement of furniture, lighting and temperature, etc. (Becker, 1985; Beemer *et al.*, 2019). Lack of interaction can also bring negative outcomes in a person’s mental health. So, having a better interaction among and within patients and staff will have indirect control over the space (Kawachi, 2001; Thoits, 2011; Beemar *et al.*, 2019).

**3.2.7 Safety.** The safety of the residents may be identified based on healthcare-associated infection (HAI), patient fall-related injuries and medication errors. By bringing in the outdoor environment, having better room configuration, having proper arrangement and location of furniture, having a bath/toilet grab bar and proper non-slip flooring will increase the resident safety factor in the environment (Joseph *et al.*, 2016).

**3.2.8 Social support.** The actions of the patients will depend on the people that are surrounding them. HCFs can be designed in such a way that it will increase the social interaction among patients (Keysor *et al.*, 2006; DuBose *et al.*, 2018). Having better practical and emotional support between friends, relatives and professionals will increase healing (Hesslink *et al.*, 2020).

**3.2.9 Colour.** It is the first thing to notice and has the ability to alter the apparent size and warmth of a room, evoke memories, induce feelings and influence our physiological functioning (Schweitzer *et al.*, 2004). Different colours affect the moods, behaviours of people and enhance brain activity which also helps in treating mental stress, anxiety, insomnia, headaches and depression (Schweitzer *et al.*, 2004). Calming and restoring colours are used in places where the mental stress is at a higher level among people or in places where high attention is required. It can also reduce the feeling of loneliness (Zhang *et al.*, 2018).

*3.2.10 Interior appearance and thermal environment.* In the study made by [Mahmood and Tayib \(2019\)](#), the interior space can feel homely, light with different colours, textures and views. Ceilings can be designed to look interesting and clean ([Mahmood and Tayib, 2019](#)). The thermal environment should be at a comfortable level with respect to people which has an effect on the betterment of people's mood ([Schweitzer et al., 2004](#)).

[Schreuder et al. \(2016\)](#) found that if a hospital is in need of increasing the healing nature, one main thing any hospital should change is their patients' room which will have a stronger impact with respect to appearance, colours and materials ([Schreuder et al., 2016](#)).

### *3.3 Home as a healing place*

A home is a place where a person has a physical, mental and social connection with the environment. It will reflect our style, culture and it will also depict a person's individuality. It is considered to be a place with ultimate safety and security. Even though the private nature of a home has changed, the want for healing has been increased in today's situation considering the pandemic ([Marshall, 2008](#)).

## **4. Discussions**

This systematic review has analysed the influence of the built environment on the healing of mental health of patients and families. The review enveloped different strategies and subjective thoughts about healing. In spite of the fact that we recognized a few broad considerations, there was a common need to think of the effect of results in a holistic way. As specified within the preceding segment, a bedroom with just one patient explains both privacy, security and consolation of the quiet and is hence put in both subject bunches.

In spite of the reality that privacy is a basic element of an individual in a healing centre, the rapid change of making "residentiality" in cutting-edge HCFs has been discussed all through. These findings trace the differential ideas in association to the "healing environment". Thus, it requires clear portrayals.

The healing environment in HCFs is very different from the healing environment in residences. Even though the parameters are same, the usage of those parameters might differ based on the type of surroundings, economy, private or public space. Plants and gardens as relationships with plants provide a powerful ongoing connection with life. Greeneries can be used for isolating effects of buildings. It can lift the spirits and calm the mind. In HCFs, there are restrictions on the usage of certain plants because of the medicinal restrictions. Few patients may or may not be allergic to certain plant types. But in residences, there will be liberty to choose the kind of surrounding a person wants. Indoor plants can visually and functionally bring the outdoors in. The plants can boost up your energy. Trees can be planted for the sounds they themselves make when the wind blows through them. The type of activities which happens in a particular place will have a major impact on the healing nature. The activities we engage in our daily life like sleep, food preparation, eating, bathrooms, workplace, relaxation, birth, children, the elderly and dying.

## **5. Conclusion**

In HCFs design and construction, it is necessary to deal with the healing method, and therefore the physical environmental impacts of the patient, family and worker's well-being have been investigated. This literature review focuses mainly with respect to HCFs. It has been noted that the "residentiality" has been focused on HCFs, but considering the current situation, during a pandemic, even our respective homes need healing as everyone has been in some sort of mental health issues like mental stress, anxiety and depression.

In short, its additionally necessary to grasp the link between an individual and the residential environment. It is also important to find out in which typology will people feel better to reside in such as an individual house or an apartment. There are different mitigation strategies for reducing the infection of the COVID-19 virus. However, there is very little research about the strategies which can be used by people in users' and the designers' perspective to deal with psychological mental health problems during the pandemic. Although we continue to know more about a persons' mental health, it is also equally important to understand the impact of any built environment on psychological health.

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