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How Built Environment shapes the Mental Health

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ABSTRACT

Architecture is all about understanding the impact of design on satisfaction, mental health and general wellbeing . "We shape our building and building shape us", mused Winston Churchill in 1943 while considering the repair of the bomb-ravaged House of Commons. Built Environment has a significant impact on health and well-being. Unsatisfactory spatial relations and low quality of built environment may cause numerous stressors and reflect in users' health, both in their physical conditions as well as mental health problems. In this article the different mental health problems and their possible solutions with built environment planning are reviewed and discussed. This article also focuses on to develop a more holistic approach that encourages mental health and help patients live happier and healthier life.

Introduction

About 165 million people worldwide are affected by mental diseases each year, making them a significant global health issue(Trautmann et al., 2016). More than half of the total population of middle- and high-income countries, at some point in their lives, experience mental health issues (Benjet et al., 2016). Moreover, mental disorders account for much more than chronic physical illnesses like cancer or diabetes due to their high levels of anguish, functional limitations, and significant financial burdens (Koenen et al., 2017). Additionally, it is speculated that the long-term prevalence of mental diseases is on the rise with increase in the population (Lange, 2018).Mental health disorders have debilitating effects particularly when it comes to society, family life and relations at workplace (Elraz, 2018). Every person retort and responds to the physical environments in their own ways, therefore, throughout the years, architects have concentrated on developing projects that are associated with social interaction(Leung & Chow 2016). An understanding amongst the architects and interior designers regarding mental disorders and their causative factors or at least exacerbating factors is an added skill which can help them develop better buildings. Introducing variations and adding nature into the built environment can help reduce the stress (Roberts et al., 2018). Monotonous concrete jungles with fixed patterns, narrow spaces and no recreational space is the worst that a bad designer can do to a person in mental stress (Conway & Krueger, 2020).

Mental health is cardinal to architecture as the physical settings have the potential to increase or

reduce the symptoms and indicators of mental disorders (Seppänen et al., 2018) . Considering the importance of physical environment design for the well-being of people suffering from mental illness, architects intend to develop precise design guidelines that are safe for people with mental illnesses. A current, systematic observation is necessary to focus on what has been done so far about the impact of architecture and design research on psychiatric disorder prediction or interference (Cramer & Borsboom, 2015). Studies have shown that physical environment design might result in mental problems and symptoms (Koohsari et al., 2019) . Dementia patients, for instance, mistake dark spots for holes. Therefore, the placement of lighting in a way that frequently darks can cause problems for people with dementia and make them walk in an odd and occasionally unsafe way (Kane & Cutler, 2017).

Additionally, some exits must be concealed for dementia patients by using flora or cloaking paint that is the same hue as the walls. Dementia patients may therefore become anxious if they are unable to open the doors (Van et al., 2019). Moreover, design elements like acute angles, blind advertisements, and thin trails might raise tension and put veterans at risk for developing post-annoying tension sickness. Whilst dealing with people with autism another example is students with autism who could yell or act out aggressively if they are placed in a classroom that differs from other typical classroom environments they have previously attended (Irish, 2019).

Despite the fact that they are no longer the main source of mental diseases, physical environments can help in reducing indicators and symptoms of mental health problems (Dash et al., 2016). Building design, for instance, may enhance the imaginative and visual abilities of dementia patients by giving clear indicators about the environment, preventing interest in disruptive objects, and may emphasize significant characteristics of the living spaces. Furthermore, exposure to dawn light can shorten the hospital stay for bipolar unhappy patients, according to an analyst of interior design (Alzoubi & Al-Rqaibat 2015). Another study revealed that creating yoga-specific spaces in medical facilities can improve the precision, attention, and deliberation of schizophrenia patients. Schizophrenia patients' feelings of alienation from society can be lessened by planning a roof as a place to enjoy the cityscape (Bahrami et al., 2021).

Methodology

Peer-reviewed papers that measured the effect of architectural layout on enhancing or decreasing intellectual ailment indicators were used to gather data in order to determine how many researchers are linking environmental layout with intellectual problems and which intellectual problems they may be focusing on the most. Data had been amassed from manuscripts posted between 2000 and 2020 inclusive. Databases had been amassed through the usage of the net through the subsequent websites: Google, Google Scholar, etc. The websites provided sufficient information to create an excellent understanding of the current state of physical environment design studies and intellectual issues. Key phrases that had been enough for this paper’s intention had been used for the systematic search.

Neurodevelopmental problems, bipolar and related disorders, psychotic disorders, stressor-related issues, somatic symptoms and related issues, eating problems, sleep-wake problems, impulse control disorders, addictive issues, neurocognitive issues, schizophrenia, obsessive compulsive disorders, are all discussed in this study.

Architectural elements such as space, aural support, and environmental factors, along -a variety of home gaps as well as doors, hallways, room designs, blind spots, rails, moniker toggles, seats, streaming sites, and straight sightlines, were measured about environments and their effects on mental issues research. In this study, there were four categories of physical settings: Residential (dwelling) services; national healthcare facilities; training facilities and contemporary settings.

MENTAL DISORDER AND PHYSICAL ENVIRONMENT

Housing

Most of the studies on housing and fitness have targeted bodily fitness. Nonetheless, residence

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kind (e.g., high-upward push), ground stage, and housing value (e.g., structural issues) have all been connected to intellectual fitness (Kellert, 2012)

House Type: Research on residence type supports the idea that multiple living spaces and high upward push residences are detrimental to moms of younger children's mental health and probably to that of the younger children as well (Gascon et al, 2015). These results seem to be particularly prevalent among low-income families. Nearly most of the research employs cross-sectional studies with socioeconomic status arithmetic controls (SES). They generally tend to depend on self-file procedures of mental misery that contain subclinical signs and indications of hysteria and depression (Noda, 2015). The supposed link between high-upward push housing and mental misery are social separation of moms and restrained play possibilities for kids (Florida, 2019). In numerous high-upward push buildings, especially for low-income families, inadequate assets are allocated to areas for the improvement and preservation of social interaction. Vestibules, lounges, and club areas are added in the high-end apartment buildings to offset the effect of loneliness (Dengler, 2018). The lack of nearby play places is commonly addressed by parents of smaller children in large multi-family homes by keeping their children inside their studios(Braide, 2019). Such situations intensify intra-familial conflicts, restrict opportunities for social play, and block parents' first steps toward understanding their fellow citizens.

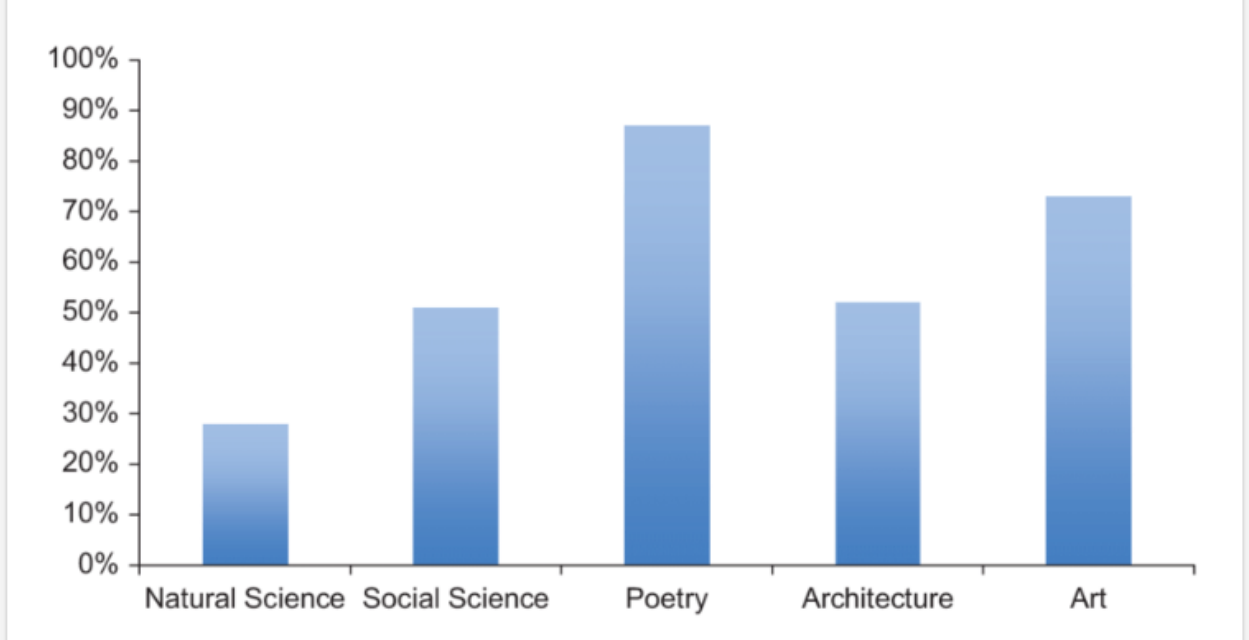

Figure 1: Percentage likelihood of having a mental disorder during the lifetime
Source (Feist, 2011)

Housing Quality

Housing satisfaction revolves around pleasing components of structure, renovation, upkeep and amenities (for example, pools, play areas, cafeteria, gym). These factors are also related to both physical and mental wellbeing. The best methods for evaluating intellectual capacity and high-quality housing are cross-sectional, and many of them rely on respondent assessments of high-quality housing(Sibley& Weiner, 2011). Most of the available data is from the studies performed on high end apartments, none the less many have also considered the socioeconomic status as well.

Mental well-being can affect one's judgment regarding housing satisfaction, several of the obvious correlations between high end housing and well-being can be false. For the sample, folks who are depressed would possibly report poor satisfaction even from the high-end housing. On the other hand, several researchers have demonstrated that once people move into better housing facility, their intellectual fitness increases in comparison to people who do not move (Forsyth, 2015). Some workplace issues may also lead to the opposite bias, creating an ironic relationship between housing and intellectual fitness. For instance, a lot of housing high-satisfaction research has focused on institutional or low-profit populations (such as army or university dormitories).

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These are short stay residents, which leads to a downward bias in approximations of covariation with fitness repercussions (Olsen et al., 2014). The situation is further complicated when questionnaire-based research is performed with yes or no answers. So, we can conclude that the satisfaction is a complicated criterion. In general, we can conclude that people living in high end housing facilities have increasing loneliness and depression, although they tend to be relatively more satisfied. In the case of low-end housing facilities, the people tend to have more anxiety and mental stress, however they are less likely to be depressed(Santiago et al.,2011)

Frequent shifting often seen in low and very low-income groups, and these tend to affect the extremes of ages. Young children who have developed friendships, familiarity to the surroundings and developed confidence tend to get effected mentally and then ultimately physically as their exercise and diet habits are affected. On the other hand, elderly individuals find it hard to make new friends and feel alienated in the new house (Österlind et al.,(2017). Parents need to be extra vigilant in care of kids in sub-standard housing facilities as these have low safe guards such as smoke detectors, temperature control and intense traffic(Wilcox, 2018).

Neighborhood Quality:

It is well established that both physical and mental health are related to the built environment, which ultimately determines the neighborhood quality. People living in deprived areas have poorer mental health than those in less deprived areas and researchers have explored the residential factors that might influence this inequality. (Paul et al., 2015).

It is challenging to separate the high level of satisfaction with the housing unit from the neighborhood in which it is located. The neighborhood quality has been observed to be the best in middle and upper middle socioeconomic housing facilities(Galster, 2012). The facilities have relatively acceptable facilities with educated neighbors and at the same time limited barriers to social interactions. Low socioeconomic housing facilities suffer from lack of facilities which often overwhelms the positive effects of social interaction. On the other hand, high end house have good facilities without much interaction(Weissbecker et al. 2019) . It is discovered that housing areas with balcony access have lower depression rates. Balcony access homes are multifamily structures in which individual apartments instantly open into open pathways connected to a main staircase. These walkways are relatively public and this can have both negative and positive impact depending upon the neighborhood. Humans are not meant to live in isolation. We must understand the importance of social interaction which can be promoted by proper planning of the housing facilities (Chu et al, 2004).

Institutional Settings

Weak/old members of a society who can't stay on their own might also live in institutional surroundings. This might not be much relevant in our local and regional scenario at the moment; however, it is an important issue in the west. We must develop an understanding of these buildings and their impact on health as with passing time we as architects of the developing world, would ultimately be designing such facilities in the future. In this situation we need to develop understanding of the lives of Alzheimer's sufferers, residents of old homes and psychiatric patients before designing such facilities (Gorman, 2017).

The concept that "medical care cannot be separated from the buildings in which it is delivered," this concept holds true especially in the case of psychiatric wards (Coidakis-Barss, 2015).Once in the domains of a general hospital, the psychiatric ward might suffer from the tendency of hospital architects and designers to focus on providing adequate space for new technology, and on maximizing functional efficiency (Pasmore et al,.2019). It is of importance that architects, and psychiatrists sit together and discuss the designs so that the patients can and their families can get best of the care.

The psychiatric unit of the general hospital offers unique opportunities for the psychiatrist, nurse, administrator, architect, and designer to pool their talents for the benefit of patients with mental disorders(Mak, 2020). As Sir Winston Churchill's aphorism implies, buildings are shaped

by people for people. When well designed, they can help ailing people get into better shape.

Noise:

This is one of the most important aspects, however it is often ignored. Our ears and brain are always working and even during sleep our ears pick signals and brains analyses them(Mitchell 2020). This is protective mechanism since the early days of humans on this planet. Sounds can have both positive and negative impacts on our health. A green surrounding absorbing the sounds along with bird sounds in the mornings can have a good impact on our mental health(Warren et al.,2006). Noise is the unwanted sound or sound that exceeds certain intensity. In general, the natural sounds have a pleasing effect whereas the artificial sounds such as lawnmower sound or traffic noise have the potential to increase stress levels (Mohamed et al., 2021). Noise is more of a problem of the middle and low socioeconomic housing facilities which are often congested with high population density(Casey et al, 2017).

In these busy days most of the urban dwellers have tough working hours and often spend limited time at home and of this limited time much is spent in sleep. A bad overnight sleep often results in poor work performance the next day and ultimately stress and anxiety. So built environment that fails to offer good quality sleep leads to serious dissatisfaction. Noise results in difficulty in falling asleep, poor quality and depth of sleep and then finally waking too early(Zaharna & Guilleminault, 2010).

So, people living in noisy surroundings are more likely to be aggressive, agitated, frustrated, and stressed. It's the responsibility of the architects to design-built structures in a way to maximize mitigation of noise pollution (Hu, 2020).

Indoor Air Quality

Falling air quality was a problem of the west half a decade ago, however since then they have made significant progress in taking the factories away from the cities, shutting down coal power plants, promoting green energy and electric cars with a relatively stable population(Hernandez, 2018).So, we have an example to follow, however up till now we are heading in the wrong direction. Poor air quality is still a problem in major cities of China, but the country has made significant progress and recently its pollution levels have started falling(Vennemo, et al 2020). On the regional perspective the cities of Lahore and New Delhi are worst hit by air pollution, and we see no evidence of any steps in right direction(Selvaraj et al., 2020).We have seen a recent increase in awareness amongst the general population regarding air quality, thanks to the social media.

Poor air quality has serious effects on the health of our lungs and heart and increases the risks of cancer. These physical effects of air pollution are well documented, however its impact on the mental health is less studied. Of the available literature we can easily conclude that poor air quality leads to depression and the effects are seen in mostly amongst outdoor workers and lower income groups living in overpopulated areas(Manisalidis, et al., (2020).

There is need for us to understand our changing environment. There are variations in air quality according to weather and the worst air quality is noticed in dry months of winters. We as architects need to understand the changing weather and environmental conditions and change our approach in designing the houses(Oanh et al., 2006). While ventilation is an important aspect, during these months in the urban settings of Lahore the housing facilities should be designed to minimize the ventilation as the outside air is full of pollution. There is also need for us to understand the importance of HVAC systems and to minimize indoor pollution by effectively managing cooking and heating systems.

Light:

The effects of light on our behaviors are well known as it helps our brains to develop circadian rhythm and sleep patterns. Architects and designers need to understand the light, its qualities, and its impact on the mental health(Figueiro, (2013). The first feature of light is its brightness which is the amount of light given by a source. Bright light leads to aggression and nasty decisions while on the other dim light leaves a gloomy effect. So right amount of light with fair distribution in a steady manner will be the ideal(Blume et al., (2019). The next important aspect of light is intensity of

colors. Feelings and emotions are exacerbated by increase in saturation while dull colors can make the emotions damp. Hue is the shade or color. Different colors have different effects on our behaviors. In general, the shades or colors created by the natural light and refreshing. Blue or white light increases the energy level and is a good option for the study rooms and office environments while it can have a bad effect in case of bedrooms where it can disturb sleep patterns(Edensor e et al., 2015) The blue light has an exciting effect on our brains which should be used in a tactful manner by the designers.

Amber light has a soothing effect on our brains and this characteristic can be used to our advantage by utilizing it in evenings in the bedrooms. Amber light increases the secretion of melatonin which induces better sleep(Kuijsters et al., (2015).

Seasonal disorder is a condition which affects most of us in varying intensities. It means that during certain seasons individuals feel drained out exhausted and depressed. Most of the times it is the winter months and to be more precise it's the winter rainy season. Some of the individuals with allergies may be afraid of the spring and forced to remain indoors, ending up depressed and gloomy(Tähkämö et al, (2019). Architects and designers need to understand the needs and health condition of the clients while planning the built environment and interiors. An understanding of the seasonal disorder reveals that the extent of depression is inversely proportional to the exposure to daylight. Houses should be designed in manner to maximize exposure to daylight during the winters.

Day light becomes a difficult thing to manage in our local scenarios as it is associated with increased heat and cooling load during summers. To manage such situations, we should evaluate the local weather conditions and manage the house face while planning towns.

Discussion

For the first time, our data demonstrated an excellent understanding of architectural studies on the expense of surrounding mental problems. In addition, although anxiety, temper, and substance usage disorders are the most prevalent mental illnesses universal, less research has been done on their physical environments than has been done on dementia and autism. For example, there were numerous architectural research courses on the effects of physical environment projects on the two mental diseases autism and Alzheimers. Though there were no peer-reviewed architectural documents about the effects of built environment design on additional mental disorders, such as changes in intellectual, impulse-control, dissociative, somatic side effects, and issues associated, with eating, sleeping, and walking problems, disruptive, and behavior problems, obsessive-compulsive, and related problems, and persona issues (Fried et al., 2016).

According to the additional studies, it is still unclear how the physical environment layout affects dementia and autism associated with the other types of mental diseases. For instance, there is a need for training amenities for children with autism at a specific stage of their development. Autism influences youngsters withinside the early tiers of lifestyle, and its signs and symptoms grow to be clean as early because of 3 years of age. In this manner quickly after, youngsters with autism will want specialized daycares and coaching centers. Assumed the unique desires of these youngsters, clean requirements for daycare and lecture room designs are wanted.

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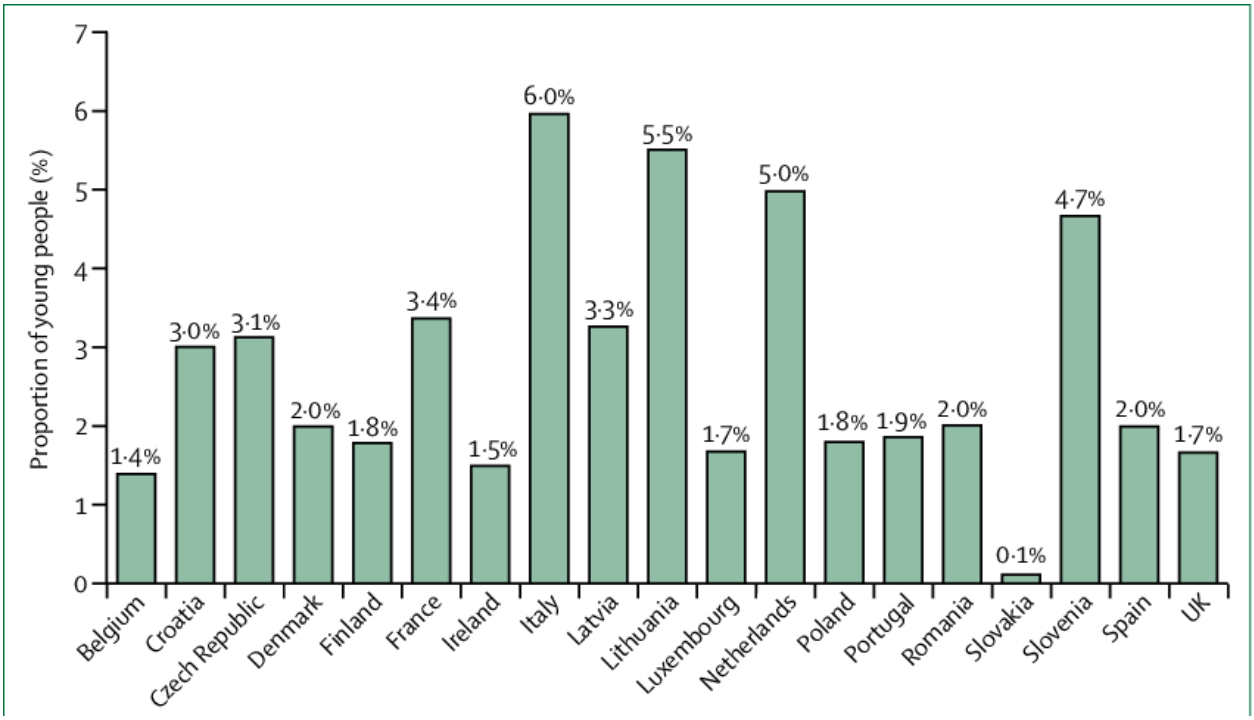

Figure 2: Percentage of children and adolescents treated in child and adolescent mental health
Source (Signorini, 2017)

In dementia, though, the infection generally grows at a complicated phase and the sufferers begin to have sluggish worsening of their reasoning and memory. With those intellectual regulations in dementia, households begin to search for secure housing centers and environments that may shield their cherished ones from the bewilderment signs and indications and self-injuries. On the opposite hand, in mental illnesses that show up in initial maturity, along with ingesting problems, schizophrenia, and hopelessness, one of the viable motives for ahead much less hobby from bodily surroundings layout researchers is that sufferers and their households do now no longer appear to are trying to find a lot assist concerning specs of particularly constructed environments (Gadelkarim, 2017). Though, research is hard to affirm this matter. Another viable thing of the imbalanced studies layout research concerning mental disorders is probably the dearth withinside knowledge of what would possibly release a part of a person's mental disorder signs and symptoms along with severe conditions of schizophrenia while the affected person cannot have specific emotions approximately the suitable bodily surroundings. All mental disorders may have a widespread effect on the exceptional lifestyles of people struggling from mental disorders and their households and might purpose pressure on the fitness device and society's standards.

Studies agrees with the previous studies that there is a need of architectural layout research in offering secure surroundings and as assistant to human beings with mental illnesses. Though Connellan et al.'s look at the point of interest turned into layout functions and the way they are changed to help human beings with mental illnesses (Shrivastava & Shrivastava, 2019).

Architeccts are required to know which mental illnesses are receiving the most attention in architectural and interior studies and which mental illnesses are receiving relatively less attention concerning their connection to physical settings. Researher intended for this assessment to stimulate architecture researchers to evaluate the impact of the building on all mental diseases without exclusion, particularly those mental illnesses that have not previously been taken into account in conducting this research ("Supplemental material for sleep and mental disorders: A meta-analysis of Polysomnographic research," 2016). Further studies are necessary to determine the extent to which people are aware of the role those physical settings play in causing or stopping mental illness signs. In autistic sufferers, an area is subdivided into numerous separate areas helping in developing an experience of shape and decreased sensory inputs found in one room (Lavhare & Kulkarni, 2021). Architects need a more powerful and vigorous file in terms of design for all mental disorders. A group of interdisciplinary academics gathered data from peer-reviewed articles about how

architectural design might improve or lessen the symptoms of mental illnesses (Jones et al., 2017).

Conclusion

Mental health issues globally associated with intense distress, incapacities, and financial constraints. Studies recommend that bodily surroundings layout can cause or decrease mental disorder signs and symptoms. The amount of architectural strategy research linked to any type of mental condition anticipation or interference, however, is not widely known. Within the search strategy, keywords such as architecture, interior project, physical environment, and mental problems were castoff. Utilizing web resources, databases have been built.

Our facts confirmed that there had been a whole lot of research approximately dementia and autism; little research approximately schizophrenia, nervousness, stress-associated problems, and depressive problems; and no research approximately the relaxation of mental illnesses. Mental fitness specialists should join with architects to cope with the particular demanding situations and designing spaces for such people.

Also, open areas, situational recognition presenting factors withinside the surrounding surroundings which includes open ground plans, or the shortage of litter can loosen up veterans who're tormented by post-annoying pressure sickness. There is a need to understand the extent to which scholars are relating environmental design studies with a mental disorder and which psychiatric condition they are concentrating on the most because it is already recognized that physical environment designs can either cause or stop the signs and indications of mental disorders.

The current assessment may potentially draw attention to the design skills that architects used to detect mental illnesses in physical spaces. This article will give readers an overall idea how architecture and mental health is related. The goal is to encourage more architectural research into how physical atmosphere can influence the signs or symptoms of all kinds of mental disorders. It also aims to encourage partnerships between architects and psychologists to deliver a better consideration of structure designs that provision intellectual balance and well-being.

It is very clear that the built environment has a powerful impact on human life and health both in positive and negative way. There is a need for strong support towards the planning of a better built environment for all, which will lead to better health of the whole population, both mental and physical.

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