

The influences of biophilic design on mental health in coworking space

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ARTICLE INFO	ABSTRACT
<p><i>Article history:</i> Received July 04, 2024 Received in revised form Sept. 22, 2024 Accepted December 22, 2024 Available online April 01, 2025</p> <p><i>Keywords:</i> Biophilia Emotion Mental disorder Urban</p> <p>*Corresponding author: Hakimi Ahmad Interior Architecture, School of Housing, Building and Planning University Sains Malaysia Email: kimi@usm.my</p>	<p><i>In the contemporary urban landscape, the design of co-working space holds significant implication for mental health well-being. Biophilia has contributed to creating built environment within the sense of nature which it can affect the human mental health and physical. Malaysia one of the developed countries among the Southeast Asia has been records that more than half of Malaysian employees admitted experience of the mental health disorder in co-working living space. The physical attributes provide psychological respite to the residents, alleviating tension and mental exhaustion by natural resources. To achieve this, some of systematic method alongside the narrative approach has been made, some of the studies has been found that the biophilia approach in space can help to reduce the human mental disorder such as stress, depression and anxiety. This research aims to examine which part of the element of biophilia are effective to reduce the human mental health and how the biophilia can connect between human feeling and emotion. As the result, this research has found out that these biophilia elements can give the positive impact to human mental health and enhancing the feeling and emotion. In contrast, the biophilia is the free resources that can heals our mental health by seeing the green environment and by appreciate the environment are enough to keep our mind relax and give our inner peace.</i></p>

Introduction

The word Biophilia is derived from two Greek words “Bio” meaning life, and “Philia”, meaning of “love” or “lover of” (Topgül 2019). In term of design, biophilic means the connection between human and nature in the urban living area. Biophilic design is to improve the mental health and give the concentration to the human especially the employee who are working in the urban cities that lack of nature element. On the other hand, biophilic design is crucial for offering chances to live and work in stress-free environments with improved general health and wellbeing through reestablishing a connection with nature (Zhong, Schröder, and Bekkering 2022; Zhao, Zhan, and Xu 2022). This is because

the biophilic can enhance the employee focus, concentration and helps to improve the motivation with the presence of biophilic element in building space.

However, another name for biophilic is healing architectural design. Biophilic design is mainly concerned with improving healing or recovery, learning and productivity in hospitals, schools and workplaces (Zhong, Schröder, and Bekkering 2022; Rahardjo and Purwanto 2024; Peters and D’Penna 2020). In other word, the possibility of improving urban sustainability can be increased by including biophilic elements into planning and design (Lee and Kim 2021; Szewrański, Mrówczyńska, and Hoof 2025).

The theory of biophilia, which holds that people have a strong affinity for the natural world and its components (Rogers 2024; Gaekwad et al.

2022). By allowing the natural element in the co-working space, it can create a connection between indoor and outdoor, and it providing a sense of openness and a visual connection of nature. The more of opening in the co-working space, the more enhance the mood productivity for the employee in the co-working space. The researcher in Japan has found that it has an invisible chemical called phytoncides in some trees can reduce stress hormones, lower anxiety, and improve the blood pressure and immunity (Nature Sense). In addition, biophilic can positively affect the human motivation and enhance the expression mood every employee because, according to the (Elantary 2024), there is lack of available knowledge about the interactions between individuals and plants, as well as the underlying processes of nature therapy. Moreover, the presence of greenery view in some working space can be as the therapy area for the employee and give the employee the self-motivated and consider as the self-therapy.

Co-working is well known as the shared office with other company with other type of profession. In Malaysia, the reason of the co-working office is created is to cut the cost of rental. However, the environment in the co-working living space are very cubicles, limiting the free flow of communication, very dim and no greenery effect, the rigid structure of traditional office space, crowded and limit space, and lastly lack of the natural light. This all of the issues can affect the employee mental health. A study found that 42% of worker felt their job significantly contributed to their mental health issues and nearly 18% pointed to working alone as the sole cause of their mental health conditions (Belloni, Carrino, and Meschi 2022; Kirkbride et al. 2024).

This study is to investigate the influences of biophilic design on mental health in co-working living space. The reason why this research paper is established because there is lack of research that investigate the the influences of biophilic on mental health in co-working living space. Moreover, this research paper aim is to examine which part of the biophilic element can reduce the human mental health and improve the employee motivation. So, to improve the employee mental health quality and performance, the researcher

will propose the effectiveness of biophilic element use in co-working living space.

The impact of biophilic in the working space

According the article from the American Heart Association, spend time in nature to reduce stress and anxiety, it means the biophilic design can influences people to reduce the issues of mental health disorder. In addition, the article 14 patterns of biophilic design (W. Browning, Ryan, and Clancy 2014) have been state the advantages of the biophilic design such as the Visual connection with nature, non-visual connection with nature, non-rhythmic sensory stimuli, Thermal and airflow variability, Presence of water, Dynamic and diffuse light, and lastly the Connection with natural and system.

Based on the table 1, there have 14 types of patterns in biophilic design and benefits. However, the presence of water, is very effective to reduce stress, increased feeling of tranquility, lower heart rate and also blood pressure. According to the planning officer at Senate of Canada (Sari, Suwartha, and Junaidi 2021), the sight and sound of flowing water can create a soothing atmosphere, helping reduce stress and promote relaxation. However, practice mindfulness meditation by focusing on the sensation of water, whether it's the sound of rain, the feel of water on your skin in the shower, or the rhythmic motion of waves can give help to reduce anxiety and improve the overall wellbeing (Sari, Suwartha, and Junaidi 2021).

In order to give the surrounding of co-working full of peaceness, the use of vegetation in the working space aslo can helps employee to reduce stress. A study out of the University of Hyogo in Awaji, Japan (Masahiro Toyoda, Yuko Yokota, Marni Barnes and Midori Kaneko) has examined before and after putting the small plant on the desk can reduce the stress. This investigate has been participant by sixty-three office workers in Japan and the participant are directed to take a three-minute rest while sitting at their desks when they felt fatigue. As a result, the ratio of the participant whose pulse rate lowered significantly after a three-minute rest with interaction with their desk plant proved definitive (Bilia and Bergonzi 2020; Toyoda et al. 2020).

Table 1. Shows type of patterns in the article of 14 patterns in biophilic by W. Browning, Ryan, and Clancy (2014)

14 PATTERNS	• STRESS REDUCTION	COGNITIVE PERFORMANCE	EMOTION, MOOD & PREFERENCE	
NATURE IN THE SPACE	Visual Connection with Nature	Lowered blood pressure and heart rate (Brown, Barton & Gladwell, 2013; van den Berg, Hartig, & Staats, 2007; Tsunetsugu & Miyazaki, 2005)	Improved mental engagement/ attentiveness (Biederman & Vessel, 2006)	Positively impacted attitude and overall happiness (Barton & Pretty, 2010)
	Non-Visual Connection with Nature	Reduced systolic blood pressure and stress hormones (Park, Tsunetsugu, Kasetani et al., 2009; Hartig, Evans, Jamner et al., 2003; Orsega-Smith, Mowen, Payne et al., 2004; Ulrich, Simons, Losito et al., 1991)	Positively impacted on cognitive performance (Mehta, Zhu & Cheema, 2012; Ljungberg, Neely, & Lundström, 2004)	Perceived improvements in mental health and tranquility (Li, Kobayashi, Inagaki et al., 2012; Jahnecke, et al., 2011; Tsunetsugu, Park, & Miyazaki, 2010; Kim, Ren, & Fielding, 2007; Stigsdotter & Grahn, 2003)
	Non-Rhythmic Sensory Stimuli	Positively impacted on heart rate, systolic blood pressure and sympathetic nervous system activity (Li, 2009; Park et al., 2008; Kahn et al., 2008; Beauchamp, et al., 2003; Ulrich et al., 1991)	Observed and quantified behavioral measures of attention and exploration (Windhager et al., 2011)	
	Thermal & Airflow Variability	Positively impacted comfort, well-being and productivity (Heerwagen, 2006; Tham & Willem, 2005; Wigö, 2005)	Positively impacted concentration (Hartig et al., 2003; Hartig et al., 1991; R. Kaplan & Kaplan, 1989)	Improved perception of temporal and spatial pleasure (alliesthesia) (Parkinson, de Dear & Candido, 2012; Zhang, Arens, Huizenga & Han, 2010; Arens, Zhang & Huizenga, 2006; Zhang, 2003; de Dear & Brager, 2002; Heschong, 1979)
	Presence of Water	Reduced stress, increased feelings of tranquility, lower heart rate and blood pressure (Alvarsson, Wiens, & Nilsson, 2010; Pheasant, Fisher, Watts et al., 2010; Biederman & Vessel, 2006)	Improved concentration and memory restoration (Alvarsson et al., 2010; Biederman & Vessel, 2006) Enhanced perception and psychological responsiveness (Alvarsson et al., 2010; Hunter et al., 2010)	Observed preferences and positive emotional responses (Windhager, 2011; Barton & Pretty, 2010; White, Smith, Humphryes et al., 2010; Karmanov & Hamel, 2008; Biederman & Vessel, 2006; Heerwagen & Orians, 1993; Ruso & Atzwanger, 2003; Ulrich, 1983)
	Dynamic & Diffuse Light	Positively impacted circadian system functioning (Figueiro, Brons, Pitnick et al., 2011; Beckett & Roden, 2009) Increased visual comfort (Elyezadi, 2012; Kim & Kim, 2007)		
	Connection with Natural Systems			Enhanced positive health responses; Shifted perception of environment (Kellert et al., 2008)
NATURAL ANALOGUES	Biomorphic Forms & Patterns		Observed view preference (Vessel, 2012; Joye, 2007)	
	Material Connection with Nature		Decreased diastolic blood pressure (Tsunetsugu, Miyazaki & Sato, 2007) Improved creative performance (Lichtenfeld et al., 2012)	Improved comfort (Tsunetsugu, Miyazaki & Sato 2007)
	Complexity & Order	Positively impacted perceptual and physiological stress responses (Salingaros, 2012; Joye, 2007; Taylor, 2006; S. Kaplan, 1988)		Observed view preference (Salingaros, 2012; Hagerhall, Laike, Taylor et al., 2008; Hagerhall, Purcella, & Taylor, 2004; Taylor, 2006)
NATURE OF THE SPACE	Prospect	Reduced stress (Grahn & Stigsdotter, 2010)	Reduced boredom, irritation, fatigue (Clearwater & Coss, 1991)	Improved comfort and perceived safety (Herzog & Bryce, 2007; Wang & Taylor, 2006; Petherick, 2000)
	Refuge		Improved concentration, attention and perception of safety (Grahn & Stigsdotter, 2010; Wang & Taylor, 2006; Wang & Taylor, 2006; Petherick, 2000; Ulrich et al., 1993)	
	Mystery			Induced strong pleasure response (Biederman, 2011; Salimpoor, Benovoy, Larcher et al., 2011; Ikemi, 2005; Blood & Zatorre, 2001)
	Risk/Peril			Resulted in strong dopamine or pleasure responses (Kohno et al., 2013; Wang & Tsien, 2011; Zald et al., 2008)

© 2014 Terrapin Bright Green / 14 Patterns of Biophilic Design

In addition, the thermal and natural airflow also give the positive impact to the employee in the co-working space, with a lot of openness in the co-working space helps to give the employee to feel the comfort, well-being and the productivity. According to the 14 patterns biophilic design, by welcoming the natural airflow in some spaces, it very positively to give the concentration and emotion, mood and preference (Ryan and Browning 2018).The natural airflow can helps to improved perception of temporal and spatial pleasure. However, the impact of bad ventilation

in the spaces also can affect the mental health such as the mood and well-being and also it can give the end user the discomfort and stress (Perfect Pollucon Services).

Next, the natural light in spaces. As we know the natural light is the part of the biophilic element. to makesure the design building or the interior are very looks biophilic, the designer must use all the element in the biophilic. This is why the natural lighting is very important to enhance the visual comfort and it positively impact the circadian system functioning (Ryan and

Browning 2018). However, by enabling daylight effectively in indoor environment therefore present a powerful opportunity for promoting improved nighttime sleep and better mood in human, while reducing energy from electric lighting (Ru et al. 2023; Shishegar and Boubekri 2022).

This four part of biophilic, the presence of water, the vegetation, the thermal and airflow and also the natural light can help the employee reduce the stress, enhance the emotion and feeling, improve the mood and well-being and also can help to motivate the employee itself. Moreover, the co-working space need to apply the biophilic design in the office area to avoid from the employee mental health dropped. In addition, the co-working space need to have some of open space such as the open-air balcony with the small green plant, so the employee can do their work while connect with the nature

Lack of the biophilic in co-working space

The biophilic design in architecture is an emerging concept in architecture that relates to human health, ecology and sustainability. The integrate of biophilia in building give the architectural information with building material, healthy architectural spaces, location, topography, local vegetation, and micro and macro climate. According to the study, the cause of most of the Malaysian employee get stress is because of the frustration, demands, workload, and this cause the most of the employee get stress, depression and anxiety. Based on the nature of Malaysia Civil Defense Force (MCDF) work, stress is a major issue. There are many factors of stress, operational, organizational and lifestyle to name a few, Organizational stress highlights employee's attachment to the organization, operational stress highlight employees experience doing the work, and lifestyle stress highlights individual ways of living.

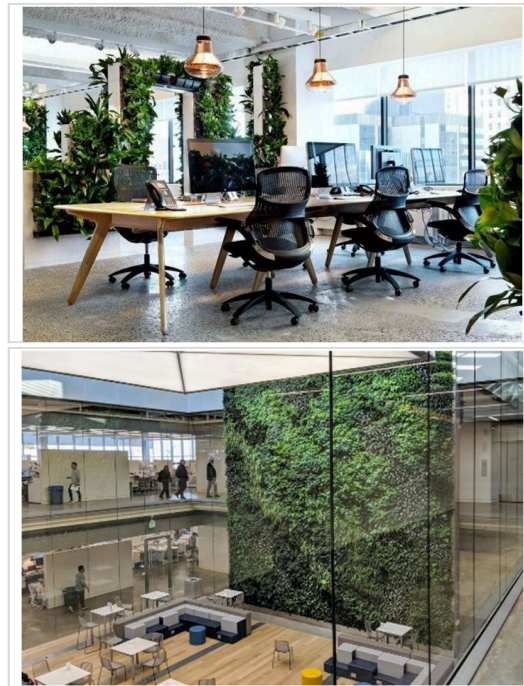


Figure 1. The example of open spaces layout with the biophilic design in the co-working space area

Above shows the example of open space layout with the presence of vegetation in the office. With the open spaces and the presence of vegetation, the space are looks more quality and give the productivity for the employee. In addition, it can help to enhance the mood of the employee in the office space and close the gap of the connection between human and nature. However, by planting the plant in the co-working space area can give the employee to reduce stress. Several scientific studies have highlighted the calming of effects of green spaces, while, in one study, participant who spent time in a forested area had markedly lower cortisol levels, a stress hormone, compared to those in urban (de Bloom et al. 2017; He et al. 2024).

Trees provide the medicine for humanity. Some several researchers have investigated that the 25% of all medications contain one or more active chemical that may be found in the abundance forest (Chaachouay and Zidane 2024; Hidayat et al. 2021). However, to reduce the stress among of the employee in the co-working space, the biophilic design are very effective to reduce and to control the high risk of stress in co-working space but however, to create the biophilic design also need a high cost but by using the artificial

plant which is it is low and its much cheaper than buying the real plant.

Boring layout in the co-working effect the whole surrounding in the space such as the cubicles design layout, the rigid structure, and lack of the personal touch of biophilic can increase the number of stresses among of the employee. Moreover, a recent survey by Harvard Business Review found that more respondents found working from a co-working site to be socially fulfilling compared to working from the office (64%) or home (67%) (B. Browning and Cooper 2016).

Methods

This section discusses resarch methods and ways to obtaining the information and data. However, this method is used to ensure the objectives of the study can be achieved by following the qualitative approach which is by collecting data by spreading the questionnaire forms to gain the thought of the people about the biophilic related with co-working space. In addition, the case study has been carried out to ensure the data collect for this research paper are valid and reliable data.

Questionnaire

This method is conducting by spreading the google form questionnaire to the employee who are working in the co-working space and also spreading this to the other worker who have experience the mental health in their office work. However, this questionnaire is divided by three section which is in the section A, section B and section C. For the first section is demographic section, section B is the biophilic understanding information, and the section C is the mental health issues in working space.

Section A: Demographic

Q1	Age
Q2	Gender
Q3	Marital Status
Q4	Education Level

Section B: Biohilic understanding information

Q1	How important natural element in your working space?
Q2	Are there live plants in your immediate working space?

Q3 How do the plants in your workspace affect your mood and productivity ?

Q4 What extent do you feel that biophilic design element enhance your overall well-being?

Q5 How much natural light does in your working space?

Section C: Mental health issues in working space

Q1 How aware are you of the mental health resources available in your working space?

Q2 How often do you feel stressed at work ?

Q3 What is primary sources of your work-related stress ?

Q4 How would you rate your current work-life balance?

Q5 Do you think biophilic can help to reduce mental health in co-working space ?

Observation

Through of this study, the researcher observes that majority of the employee or respondent are agree with the effectiveness of the biophilic design can reduce their stress. Moreover, most of the employee or respondent are experience the stress in their working space and most of them are voting the primary of stress in the working space is because to many workloads and the management style. However, the researcher observes that most of the employee who are stress in their office is majority at the age 25 above. This is meand that the use of the biophilic element in the co-working space are very effectiveness to reduce their stress among of the employee itself.

Case studies

M Summit Coworking Space in Georgetown, Pulau Pinang

Location



Figure 2. Site location in Georgetown, Penang

M Summit Coworking Space is located in the Georgetown Penang, in detail this coworking

office is located near with Jalan Magazine. The M Summit coworking space is the office that provides the Private room, Office Suites and Virtual Office and the facilities are complete with the 24-hour air-conditioning, free gym usage, free printing and free parking. However, if the person who wanted to access this M Summit coworking they need to buy the day pass because this office is inside the hotel building. However, with the full of the facilities, it can easier the enduser to use the equipment that has been provides by the M Summit coworking office.



Figure 3. Shows the interior of the M Summit coworking office design

However, in term of the interior design, there is no effect of greenery inside of this office, the owner of this office just uses the material that similar with the trees such as the use of the floor material and the use of the artificial light is very dim. Moreover, with this design of the interior, the probability the user to get stress and bored very high. But this design can be improved by using the biophilic design such as the wall can be the features wall like vegetation wall, and the colour of the interior space can use the bright colour such as the white or the beige colour to give the interior looks more aesthetic. Moreover, to give the enduser connect with the nature, maybe some of the furniture can use from the originally from the nature like the tree texture material.

In addition, since that this coworking space located at the highest floor, there have a exclusive view of Penang which its good to have a good view because this is the part of the Biophilic design. According to the Iskalo Development Corp, 2024 natural light can increased the productivity. In a 2003, the California Energy Commision study, the employee working in natural light setting were obeserved to have higher levels of concentration and better short-

term memory recall. In addition, according to the studies, the natural light in the office also can be translates to more alert, engaged and creative employees (Caldwell et al. 2019; Knoop et al. 2020).

Next, the biophilic design is the design that connect with human and nature not only the vegetation but it includes the thermal air, the presence of water, vegetation, thermal and airflow, the dynamic and diffuse light, visual connection with nature, non-visual connection with nature. Moreover, since that the location is in the middle of the Georgetown, that is hard to get near with the nature, but however, since that the interior can be improve a lot with the biophilic, it can use the artificial plant to decorate the entire space such as the ceiling design using the artificial plant, provide the aquarium as the presence of water or also can provides the display terrarium in the interior space.

Issues and challenges of mental health in Malaysia.

Mental disorder is one of the most serious issues in Malaysia. In the recent year, the mental disorder is a great public health concern throughtout the world 2030. Moreover, these issues contribute to a substantial propotion of health problems in most countries mental health issues are expected to be the major problems among Malaysians. Mental health problems are among the most imporant contributors to the burden of disease and disability in worldwide. This global burden of mental health disorder is a significant of public health issues (Kastrup 2010). The major source of people having the mental illness is because the loss of productivity and well-being as mental health is essential for economic development.

The World Health Organization (WHO) defines the mental health as state of well-being om which the individual realizes their own abilites to cope the level of stresses of life which is can be productivity and fruitfully and ability to make contribution to their community from the Malaysia landscape the Ministry of Health. In Malaysia, the age of 16 and above reach until 29.2% as approximately 4.2 million. This current situation can be determined as the red zone situation because it very worrying as the finding the indicates that twofold increase for the report's cases related to the mental health problems may bring the devastating impac towards their self and tends to develop suicidal behaviour.

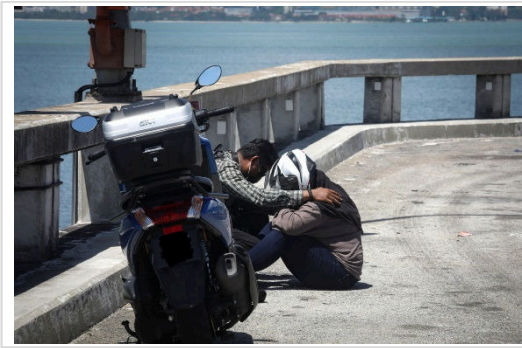


Figure 4. Shows two newsmen save women from suicide from the Penang bridge (Nasib 2022)

In Pulau Pinang, Malaysia has report 16 cases that cause of suicidal in Pulau Pinang bridge in 2021 and however, in 2022 police receive 22 cases about the suicidal in Pulau Pinang. Most of the cases are cause by the loss sense of life and their take the short way to end their life by deciding to suicide. However, based on this case study, the data shows that the issues and challenge of mental health in Malaysia si because of lack of the awareness and ignorance. The respondent belief that the cause of issues mental illness is because of they are not being given enough exposure and attention in the mass media space.

However, some of the respondent pointed that person who has teh mental illness is because of the due to complacent behaviour of the mental health sufferers. Moreover, the research by Kaur et al. (2014) has describe that almost one in five Malaysian adolescents are depressed. One of the reasons why people are having the depression is because of the insufficiency of knowledge about thepsychiatric illness and treatment options for the illnesses (Keles, McCrae, and Grealish 2020).

In addition, in globally, its more than 70% of people who having the mental illness are not receiving the treatment from the health care staff. Moreover, the public must know that to have the enough knowledge about the mental illness because it believes that it can ensure the people with minor or major symptoms will get the proper treatment for them. The other issues that can cause of mental health in Malaysia is because of the stigma in Malaysia. The stigma of the nehatve perception that can cause the prejudice which its leads to the streatype and discrimination among of the group of the people.

Results and discussion

The study on the influences of the biophilic on mental health in the coworking spaces aims to eluciade the relationship between natural elements in the workspace and well-being of its occupants. In this section, its present the findings driven from the data collection and anlysis by using the multi-method like spreading the questionnaire and case studies. However, by combining these methods, researcher aimed the data, validate the findings, and provide a comprehensive analysis.

The implement of the biophilic in the coworking spaces

From these studies, we can see that by applying the biophilic element in the space can helps to reduce the stress, depression and anxiety among of the employee. The benefits from the biophilic design are not only give the employee reduce the stress but it also can improve the employee mental health. Moreover, by create the surrounding full of element biophilic, it can enhance the whole interior space and give the aesthetic value in the entire spaces. According the one of the greatest architects of all time, Frank Lloyd Wright said that the” study nature, love nature, stay close to nature, it will never fail you” (RIOT 2024). By applying the biophilic design into the space it can help us to reduce the stress and enhance the quality of space. Moreover, the key principles of biophilic design are the natural environment like the basic things in the biophilic design which is using the earthy colors, expose with the natural sunlight, put the vegetation in space and also let the air flow from outside to inside the space.

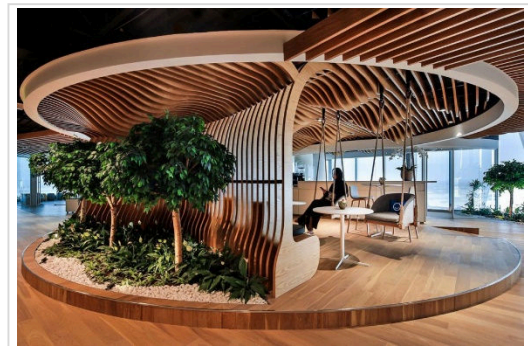


Figure 5. Shows the natural shapes in the working space

Next, the natural shapes in the coworking spaces. The natural shapes are lines and from that occur in nature such example the arches and vault, recreating the shelves inspired by rock, make the flow of the water paths and other things that naturally occur. However, the natural shapes are not can be use for the design layout, but it also can be use to design the furniture in space, for example the shape of artificial lamp structure and the curvy sofa. Its important to apply the natural shapes in the coworking space because it can create the surrounding more enjoyable and improve the quality of the surrounding. Moreover, the natural shapes also help the employee in coworking space have a sense of calmness (Zhong, Schröder, and Bekkering 2022; McEwan et al. 2020; Barker Scott and Manning 2024).

To give the entire coworking more sense of the biophilic design, the using of the colour tone also plays the important roll to give the aesthetic value. Like example colour that we can use in the entire space to match with the biophilic design, such as the green colour. In the pscycology of colour, the green colour is the dominant to the colour of nature, the symbolizing the lushness of forest and its richness of natural colour claiming by the author of Color Psychology (Ksolymosi 2017). Moreover, the green colour is the symbol of the harmony, tranquility, and peace, it can enhance stability and endurance. However, in the pscycology of color, the green colour can said as the therapeutic effects, the sensse of security, influence the calmness and cognitive benefits (AnDarach 2023). Moreover, white colour creates a sense of cleanliness and freshness, and it's giving the space bright and inviting feel. Moreover, it can enhance the coworking space and also helps to enhance the use of the artificial lighting and making the space spacious and airy.

The presence of water in the coworking spaces. The water can help to reduce the stress, increase the feelings of tranquility, lower heart rate and blood pressure (W. Browning, Ryan, and Clancy 2014; Prameshwary, Sakina, and Saragih 2021). However, the presence of water can give the employee in coworking space the sense of calmness like the sound of water flow or drop it can give the entire space more dramatic and give the employee the relaxing and peaceness. In addition, it also helps to stabilize the rate of pulse. In facts, the presence of water pattern has evolved from research on visual prefereance for and positive emotional responses to environments containing water element, reduce stress, increased

feeling of tranquility, lower heart rate and blood pressure from exposure to water features, improved concentration and memory restoration induced by complex, naturally fluctuating visual stimuli and enhanced perception and psychological and physiological responsiveness when multiple sense are stimulated simultaneously (Saltafossi et al. 2023).

Referring to figures 5, the uses of nature material like timber wood for the ceiling and the flooring give the impact to the entire space, its not only produce the sense of nature but it also provides the comfort for the enduser. However, the use of natural material is very good for the interior space, it can close the gap relationship between human and nature. Using the natural material in interior spaces also are very good idea because since that we are live in the modern era, where the technologies have conquerer the world, it is a good idea to make our interior space that have the sense of nature by using the natural material in space.

Moreover, welcoming the natural light into space elps to enhance the coworking space and also it can give the feel of welcoming for the employee. Meanwhile, based on this case study, we can see how the important the use of the natural light in the space, it can give the employee the concentration and more focus doing their work activities. In addition, the natural light is known for its ability to improve mood, increase productivity and reduce stress Regular exposure to sunlight has direct benefits on sleep and cognitive performance. Bringing daylight indoor creates a healthier and more pleasant environment for living, working or studying. Moreover, the natural daylight also can have positive impacts on thermal efficiency by allowing for better indoor temperature management. Natural light can also affect the mood of space. Bright light can give the feel of the cheerful and energetic, while the dim light can give the feel of cozy and intimate.

Next, provides the open air to let the natural air from outside flow inside the interior space. In the 14 pattern biophilic design, the thermal and airflow are positively impacting the comfort, well-being and productivity (W. Browning, Ryan, and Clancy 2014). Morover, according to the 14 biophilic design also, the other benefits of the open air are it can positively give the people concentration and its also can improve the perception of temporal and spatial pleasure (W. Browning, Ryan, and Clancy 2014). This is means that the thermal and airflow variability can helps

to reduce the mental health issues in coworking space such as stress, depression and anxiety. In addition, with the good air quality that flow in the coworking space can enhance the mood of the employee and the air flow can give the employee the sense of touch that can improve the social community in the office and make the feeling and emotion of the employee always be positive.

Conclusions

By starting with the topic of the influences of biophilia for mental health in co working spaces, the paper digs deeper into the aspects of psychology to understand how the Malaysian who are experience the mental disorder handle their self when facing the hard situation. However, in this context of biophilia, it refers how the element in Biophilia can help to reduce the issues of the mental illness and how the biophilia providing the solution to people who are having the mental disorder such as stress, depression and anxiety. The ability of the biophilia is positively approve that it can help to reduce the mental health by enough bring the four elements in the co-working living space such as the presence of water, the thermal & airflow variability, the dynamic & Diffuse light and also the presence of green vegetation in the co-working living space or residential building. however, the biophilia also can enhance the feeling and emotion of the person who are having or experience the mental illness in the co-working spaces.

In short, this study is to examine how the influences of biophilia can help people to reduce the mental health issues and to understand what causes the people who are experience the mental health issues. However, the injection of biophilia in the co-working spaces takes the holistic view of well-being and the built environment, where the presence of the biophilia in interior spaces can enhance the motivation and mood of the people while working. In additionally, some of the public must take serious about the mental health to avoid from the serious cases happened such as the suicide and others bad activities happened.

Moreover, the Malaysian people who are have the experience and has been recover from the mental health issues must help and guide the new people who have the mental health issues. Furthermore, the public awareness about the mental health must be spread to prevent the bad

happened issues. Last but not least, the people who are having the mental health must do the treatment and meet the counsellor to get the advices.

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Author(s) contribution

Zulfaqar Zamri contributed to the research concepts preparation, methodologies, investigations, data analysis, visualization, articles drafting and revisions.

Hakimi Ahmad contribute to the research concepts preparation and literature reviews, data analysis, of article drafts preparation and validation.

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