On Strategies of Residential Indoor Healing Landscape Construction under the Era of Epidemic

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Abstract: The indoor healing landscape has a positive influence on people’s mind and physical health, indicated from the studies. This research aims to discuss the residents’ emotional problems during the home quarantine under the context of COVID-19 and put forward the strategies to construct a residential indoor healing landscape system based on disaster psychology, which is conducive to relieve residents’ emotional problems. Firstly, the general introduction includes the adverse effects on residents’ minds and physical health from major public health emergencies and the function of indoor healing landscape; secondly, the questionnaires are used to discover the residents’ emotional problems during the epidemic; finally, the strategies to construct the residential indoor healing landscapes are put forward to therefore regulate residents’ mind and physical health during home quarantine and working and living at home after the epidemic.

1. Introduction
In January 2020, Corona Virus Disease, COVID-19, spread throughout China, posing a huge threat to human physical and mental health. According to statistics from National Health Commission of the People’s Republic of China[1], until 8: 00 on August 21th , 2020, the cumulative number of confirmed cases is totally 90,053 and the number of the death is totally 4,716 in China; The cumulative number of confirmed cases abroad has reached 22,759,106, and the cumulative number of death is 791,587[2]. As indicted by a survey released by the World Health Organization (WHO) in 2019, the incidence of common mental disorders, such as depression and anxiety, is expected to more than double during the major emergency crisis[3]. Studies have shown that this COVID-19 has brought anxiety, terror, paranoia, depression and other psychological distress to some extent, and during the severe period of
the epidemic, home quarantine has further aggravated the physical and mental pressure on the residents[4].

Residence is the closest indoor space to the people and also the space where the residents stay for the longest time, except for the work and outdoor activities. The residential indoor space can provide the most direct and convenient experience of healing landscape for the residents indicated, from the research of healing landscape. This paper targets the strategies of healing landscape design and discusses the methods of residential indoor healing landscape, which can alleviate the residents’ mind and physical health under epidemic, and it’s anticipated to serve as a reference to the academic research and practice in related fields.

2. Introduction of indoor healing landscape research
Currently, the research of healing landscape mainly focuses on the outdoor environment, including medical service agencies, residential outdoor environment, city public space, recreational service facilities and campus landscape, but little on the indoor healing landscape, which only refers to windowscape and indoor natural elements.

As for windowscape, some research discusses the connection of indoor and outdoor through windowscape to realize the positive influence on the users. With the sample survey and practical studies, Matsuoka, RH and Shi et al.proved that the combination of outdoor trees and shrubs and natural landscape could relax people’s muscles and relieve people’s cognitive fatigue; Wilson and Jie Yin et al. proved that the quality of indoor restoration could be improved and the users’ stress could be reduced by the introduction of natural wind, sunshine, natural sound and other elements are introduced through windowscape[5].

As for natural elements, the research mainly focuses on the compensation effect on the indoor environment and the positive effect on the users through the introduction of indoor natural elements; Choi, JY, Alvarsson, Munyan III, and Kirkevold et al. proved that the adding of natural elements and natural simulation to the indoor environment can improve immunity, reduce pain and anxiety and make people more active. Wang, R. and Felsten, G’s research proved that adding natural elements in indoor environment is an effective way to make up for environmental restoration when outdoor natural elements are scarce. Jie Yin and Felsten, G et al. proved that the introduction of indoor natural elements could restore physiological stress[6].

3. Survey on residents' physical and mental condition and home environment under COVID-19

3.1. Survey objects and methods
Online questionnaires are used to explore and evaluate the emotion, indoor environment, activities and relationships among them during home staying and further determine the residents’ preference for healing landscape. Finally, the number of valid questionnaires collected is 263, covering all 23 provinces, municipalities, autonomous regions, municipalities and overseas regions (the United States). Among them, women accounts for 59.32%; people (≤18 years old) accounts for 6.46%, people (19-30 years old) accounts for 33.46%, people (31-50 years old) accounts for 24.71%, people (51-70 years old) accounts for 28.9%, people (≥70 years old) accounts for 6.46%, and the average age is 49 years old. the number of students accounts for 35.74%, the number of office workers accounts for 26.24%, the number of individuals and freelancers accounts for 9.13%, and the number of retirees accounts for 35.74%. SPSS software is used to perform statistical analysis on the collected result data. The value of p is preset at 0.05 and 0.01. If p<0.05, the indicators will be considered to be significantly different, and if p<0.01, the indicators will be considered to be extremely different.

3.2. Survey results and analysis

3.2.1. Residents’ emotion evaluation. As indicated from the results, there are three types of negative emotions: anxiety, sadness and fear during home staying and residents generally
believe that one of the sources for negative emotions is the lack of contact with others (54.75%). Residents generally spend more time on memories and thinking (58.94%). The ratio for the combination of negative emotions reaches 63.12%. The recall of negative events will significantly reduce and promote the positive emotions.

3.2.2. The influence of environment and activities on residents’ emotion at home. Pearson correlation of quantitative data for basic information, environment, activities and emotions at home is calculated using SPSS. In terms of basic information, gender and negative emotions at home are significantly negatively correlated (P=0.009), which means that men are more likely to have negative emotions (see Table 1); in terms of home environment, the perception of outdoor green is significantly positively correlated with no negative emotions at home (P=0.000), and is also positively correlated with no muscle tightness, unrelaxation, and thinking of life meaning (P=0.013, P=0.047); indoor green perception is significantly positively correlated with no negative emotions at home (P=0.002), and is also positively correlated with no muscle tightness, unrelaxation, and thinking of life meaning at home (P=0.030, P=0.040) (see Table 2). In terms of home activities, the viewing of the outdoor scenery through the widow could slightly reduce muscle tension and discomfort (P=0.043), but it could trigger memories and thinking (P=0.005); plants caring could promote people to think about the life meaning (P=0.036); the painting could trigger memories of embarrassment and mistakes (P=0.002), and could slightly encourage people to examine themselves (P=0.050); In addition, supportive activities in the community could encourage residents to think about the life meaning (P=0.024).

| Tab.1 Pearson correlation analysis of residents' basic information and emotion at home |
|---------------------------------|-------------|----------------|-----------------|-----------------|------------------|-----------------|-----------------|----------------|
| Gender | coefficient | -0.161** | -0.015 | -0.001 | 0.040 | 0.060 | 0.104 | 0.025 | 0.118 | -0.066 |
|        | p         | 0.009 | 0.803 | 0.988 | 0.520 | 0.336 | 0.091 | 0.682 | 0.056 | 0.289 |
| Age   | coefficient | 0.098 | -0.018 | -0.080 | 0.002 | 0.027 | 0.057 | -0.025 | -0.189** | -0.011 |
|        | p         | 0.112 | 0.772 | 0.195 | 0.971 | 0.658 | 0.356 | 0.692 | 0.002 | 0.861 |
| * p<0.05 ** p<0.01 |

| Tab.2 Pearson correlation analysis of environment, green perception and emotion at home |
|---------------------------------|-------------|----------------|-----------------|-----------------|------------------|-----------------|-----------------|----------------|
| Outdoor green | coefficient | 0.214** | 0.152* | 0.034 | -0.046 | -0.002 | -0.083 | 0.074 | 0.108 | 0.122* |
|        | p         | 0.000 | 0.013 | 0.584 | 0.457 | 0.971 | 0.181 | 0.233 | 0.080 | 0.047 |
| Indoor green | coefficient | 0.195** | 0.134* | 0.009 | -0.100 | -0.007 | -0.050 | 0.086 | 0.061 | 0.127* |
|        | p         | 0.002 | 0.030 | 0.888 | 0.106 | 0.912 | 0.423 | 0.164 | 0.324 | 0.040 |
3.3 Survey results

As shown in survey results, the negative emotions caused by COVID-19, include anxiety, sadness, fear and lack of connection with others, and men are more likely to have negative emotions. As for the relationship between home environment and negative emotions, the perception of indoor green could be enhanced through increasing the number of the plants or setting up balcony gardens and roof gardens. The higher the perception of outdoor and indoor green, the less the negative emotion and physical discomfort and the more thinking of life meaning. Natural simulation of equipment is also effective. As for activities at home, plant caring or outside viewing through the window all have a positive influence on residents’ mind and bodies. Creating activities could trigger negative memories and contact with natural materials and supportive activities from the community could promote the thinking of life meaning.

4. The construction of residential indoor healing landscape

4.1. The construction of indoor healing landscape based on five senses

The five-sense experience means the possible activities in a landscape environment with five senses: vision, audition, smell, touch, and taste. The stimulation of five senses can significantly reduce the blood pressure and heart rate with the relaxation of brain waves. The changes in the physiological state will promote the relaxing nutritional system, inhibit the exciting motor system, break the unbalance between nutrition and motor system under stress stimulation and further reduce anxiety, fear and other emotions.

Natural elements can be introduced to make a stress-free and sensory stimulation environment for the construction of healing environment. In terms of vision, the residents’ preference is taken into account to introduce single-color plants, natural landscape murals and wallpapers with neutral color; in terms of audition, natural sounds are introduced to create a quiet and relaxing atmosphere; in terms of smell, the selection of the plants focus on the floral, woody and beneficial plants with beneficial volatile or using plant aromatherapy and essential oils; in terms of touch, the plants with rough texture is reduced, avoiding the plants with special textures. In terms of taste, the edible plants with fruit picking can be selected.

4.2. The construction of indoor healing landscape based on horticultural creation

The activities of horticultural creation can prevent the surface consciousness from being backlogged, which could lead to psychological illness. And the communication and fusion between consciousness and unconsciousness will make people more vigorous and energetic, and the final artwork is the mapping of memory images.

Therefore, considering that the materials should be accessible, the activities should be suitable for home environment and the activities should be easier for promotion, the following strategies are put
forward with the aim to mobilize memories. Firstly, natural materials can be used for indoor painting activities. That means all the natural materials can be used as painting materials, such as plants, fallen flowers, fallen leaves and fruits. A free illustration on the paper is available. Materials are easier to mobilize memory and fascinate thinking due to their life characteristics as time passes by. Secondly, natural materials can be used to finish the diaries of nature, which can mobilize memories.

4.3. The social support network construction of healing landscape based on social platform

The online social support network is established for individuals, families, neighborhoods, communities and societies to further make up the absent of social network, fill up the gap of social contact and buffer negative emotions during home quarantine. Residents generally hope to establish online interaction with others and prefer courses of meditation relaxing and horticultural skills. The construction of horticultural therapy social platform should take into account these preferences and community workers, psychologists and registered horticultural therapists could be called to constitute the psychological support and intervention group of network community, which consider the horticultural therapy and disaster psychology as the base of the courses. The horticultural therapy activities could include natural plants science, horticultural skill training and home meditation; The disaster psychology activities could include real-time epidemic information disclosure platform, psychological counseling interview meetings, and community entertainment activities. With the above activities, people could establish the connection and feel the support from social network, the mutual support and encourage and relieves their negative emotions.

5. Conclusion

The residential indoor is hugely potential in restoration, which is also the most frequent and closest environment for residents to contact in daily life. People will stay longer in residential indoor space as the new modes of work promote, such as home office. Therefore, the construction of indoor healing environment, in which the natural elements are used to construct indoor healing space, is greatly important to promote residents’ mind and physical health, relieve the pressure from daily work and life and cope with the emergencies, such as COVID-19.

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