



Interior Design Students' Perception on Interior Health and Comfort in Shop House Design for New Normal Era

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ABSTRACT

Objective – The 2020 Covid-19 outbreak has deeply redefined our relationship to public spaces. Public preference has shifted from indoor to outdoor areas which provide open-air spaces to reduce the possibility of Covid-19 transmission. Therefore, shop house foodservice retailers that operated in big cities may find it challenging to meet the new expectation. The Greenship (green building assessment tools in Indonesia) however, has made a checklist on how to achieve better indoor environment quality (IEQ) under the IHC (indoor health and comfort) category.

Methodology – The method used for this research was the systematic literature review and typology studies with a proposed conceptual design made by students in Design Interior and Styling for Commercial and Retail Space studio academic year 2020/2021 as samples.

Findings – The result shows that almost all students only took care of 5 categories out of 11 categories provided in the IHC category. The highest categories to get attention are indoor pollutant source control and outside view and daylight. The research shows attempts of students to achieve better IEQ but they are unaware that a guide and reference can as well be found in Greenship Interior Space.

Novelty - This paper examines young interior designers' perceptions of healthy interior elements that need to be implemented for the purpose of adapting to the new normal.

Type of Paper: Review

JEL Classification: I23, I29.

Keywords: Shop House, New Normal, Food Service, Retails, Healthy Building, Greenship, Indoor Health, and Comfort.

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1. Introduction

Since 2009, the foodservice industry in Indonesia has closely put its focus on social media actualization through photos of the most current food and Instagram worthy photo spots. The interior design of public commercial spaces was designed to be highly related to beauty and form in an enclosed and well-controlled space to ensure occupants' comfort so that they can stay longer inside and spend more.

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Since personal consumption is the backbone of the domestic economy, the foodservice industry contributes significantly to Indonesia's business activities (*Major Restaurants Temporarily Close as COVID-19 Outbreak Worsens*, 2020). However, the outbreak of Covid-19 in 2020 has fundamentally redefined our relationship to public space. Fear of transmission (both direct and indirect) has swept all sectors and paralyzing public spaces, including the food and beverage industry (Septyaningsih, 2021) (Honey-Rosés et al., 2020). Since its occurrence, the Covid-19 pandemic has brought indoor environment quality into the spotlight. In a very short period of time, there is growing interest to incorporate health factor in building design and many start to understand that healthy building factors are not a luxury but a considerably normal approach to ensure building occupants, who spend 90% of their time indoors even in normal days, can work optimally (Kehrt, 2020). Few design adaptation considerations have been discussed by the interior design practitioner's community hand in hand with Indonesia's Minister of Health. Some decree for transmission mitigation has been launched as well. However, the grassroots implementation is still open for review.

On the other hand, the existence of green building principles and assessment tools that supposedly ensures the occupant's health and comfort has been around for years. The application of green building principles is known to provide better indoor environment quality performance (including lighting quality, ventilation, and O₂, and Volatile Organic Compound (VOC) concentrations in space) (Lim et al., 2012). Creating a good indoor environmental quality, in a way, is hoped to reduce the transmission of the Covid-19 virus. The green building categories may be seen as a possibility to be the starting point for proper implementation of health protocols and also an adaptation of interior design that supports a healthier space.

This paper will review the grassroots implementation of the green building standard, specifically in interior health and comfort. Specifically for this research, the green building standard to be referenced is Greenship Interior Space by (Green Building Council Indonesia. (n.d.), 2021). This research took 30 interior design students in Design Interior and Styling for Commercial and Retail Space studio academic year 2020/2021 who made conceptual designs for a cafe in a shop house as samples. This research aimed to investigate their awareness of new normal and design adaptation for better indoor health and comfort divided in their design methodology implementation and outcomes.

2. Literature Review

2.1 Covid-19 Mitigation Rules for Cafe and Restaurant in Indonesia

Covid-19 spreads primarily when people are in physical proximity or in direct contact with each other. Infection with this virus occurs through droplets when people cough, sneeze, sing, talk, and breathe. Under certain conditions, people infected with the Covid-19 virus, especially those who are asymptomatic, appear to be infected with people who are more than 1.5 meters away. This is known as an air borne infection and has occurred in confined spaces with poor ventilation. Apart from air-borne, we can get infected with Covid-19 by touching the surface or object to which the virus is attached and then touching your mouth, nose, or eyes (Prevention, 2021).

Indonesia's Minister of Health has launched a decree (Keputusan Menteri Kesehatan Republik Indonesia Nomor Hk.01.07/Menkes/382/2020) to set up community health protocol in public places and facilities for the prevention and control of Covid-19. This regulation regulates health protocols to be implemented by business actors, workers, and visitors to food and beverage businesses. This regulation generally regulates the availability of facilities that support hygiene and indirect contact. To name a few, mandatory use of masks and personal protective equipment, mandatory visitors limitation up to 50% of the area, improvement of online services, non-cash payments, availability of barriers between visitors, room cleaning, optimization of air circulation and sunlight, and air conditioning filtration.

2.2 Indoor Environment Adaptation for Cafe and Restaurant

To ensure high performance interior environment quality (IEQ), there are 7 interior system performance that shall be considered. Among all those indoor environment quality criteria's, the performance of thermal/ventilation (which will be highly related to indoor air quality), visual performance (availability of natural daylighting), and well performing space planning are the most prominent aspects being highlighted.

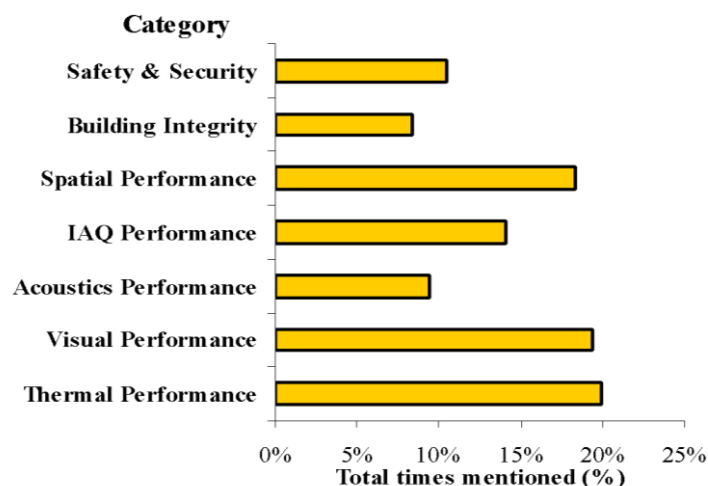


Figure 1. User's Ranking of Interior System Performance Based on Importance (Source: Lee Siew Eang, 2011)

As mentioned above, cafes and restaurants commonly found in Indonesia, tend to be designed in a controlled enclosed space to ensure occupants' comfort. However, this condition is not suitable during the pandemic situation. In a poorly ventilated indoor space, airborne transmission chance is higher due to eating and drinking activities that require us to open our masks. To improve ventilation performance, proper operation of the ventilation system, as well as increasing the fresh air intake and indoor circulation is necessary. Cross ventilation is important to ensure purging of indoor air pollution. In ideal situations, we can consider having the windows and doors open regularly, prioritizing outdoor seating, and using the building's mechanical ventilation system to improve indoor air control. By using additional mechanical ventilation, proper routine maintenance is required. This may include inspection of the filter housing and rack as well as regular filter checks to ensure that it is properly installed within its useful life span. It is also necessary to run the ACMV system for up to 2 hours before and after busy hours (Prevention, 2021).

Visual performance is encouraged to make use of as much natural daylighting as possible in respect of improving cross ventilation as well. Natural daylight benefits our health as it may boost vitamin D production (one of the most needed at the moment) and ward off seasonal depression. Therefore, outdoor seating or even openings exposed to fresh air and natural daylight is high in demand. In addition, natural light is composed of full-spectrum colors, which reproduces more true colors than artificial light. It is also beneficial to make the food and drink displays look more appetizing.

Change of layout is needed to improve spatial performance and to ensure social distancing. Limitation on seating capacity up to 50% of total area occupancy has been regulated by the government decree (Kementrian Kesehatan Republik Indonesia, 2020). Due to limitation and social distancing, food and beverage business owners shall prioritize the option for take away service before the dine in. Even though the dine in experience is irreplaceable, communal health is a priority. Some additional adaptations are required for example, restaurants to provide pre-ordering options to limit the time spent in the restaurant. This means that the signage system is no longer secondary. Food receipt and station signs are important. Individual stalls can be

considered a good approach. If necessary, place physical landmarks or signs such as tape on the floor or sidewalk to make sure people are at least 1 meter away. Barriers are useful to maintain physical distance. At a certain degree of transmission in the area, the sitting area should no longer accommodate large groups. Interior designers shall work hand in hand with UI/UX designers to discourage crowds (Prevention, 2021).

2.2 Green ship Indoor Space

According to the official website of the (Green Building Council Indonesia. (n.d.), 2021), Greenship Interior Space is a building certification system for interior design aimed at providing appropriate comfort, health and productivity to building residents. Each category consists of several criteria, such as prerequisites, credit points, and bonus points. The Greenship interior space certification system has a maximum of 93 points. The building must meet the requirements to qualify for this certification. The Greenship Interior Space rating system assessment categories and credit percentage are presented as follows as seen in Figure 2 (Green Building Council Indonesia. (n.d.), 2021):

1. Appropriate Site Development (ASD) - 12%
2. Energy Efficiency and Conservation (EEC) - 13%
3. Water Conservation (WAC) - 8%
4. Material Resources and Cycle (MRC) - 27%
5. Indoor Health and Comfort (IHC) - 28%
6. Building and Environmental Management (BEM) - 12%

The green building certification itself in Indonesia is still far from being in demand. According to the Chairperson of the (Green Building Council Indonesia. (n.d.), 2021) (GBCI) Iwan Prijanto, the number of certified green buildings in Indonesia currently is still minimal. There were only 49 buildings that received green building certificates. Meanwhile, the other 69 buildings are only in the early stages, namely the recognition design for the final assessment. The buildings that meet the criteria are scattered throughout Indonesia. However, most of them are concentrated in Jakarta area (Hamonangan, 2019). This paper will not go deeper into the certification issues, but rather to look for the criteria's that may suit the need of adaptation in a pandemic situation.

Among 6 assessment categories, the IHC category has the highest percentage in the rating tools because indoor health and comfort play an important role in the occupant's health and comfort. IHC is an analysis instrument used to establish a high-quality indoor space for the health and comfort of its inhabitants with 11 criteria (Wardhani & Susan, 2021). According to (Wardhani & Susan, 2021), in relevance to Covid-19 adaptation, some adaptation of IHC 11 criteria's should be made especially to ensure better performance in indoor air quality (indoor pollutant control and mitigation), thermal comfort, the providence of natural daylight, and space planning (Cummings & Waring, 2020) (Leslie et al., 2022).

3. Research Methodology

This research was conducted in a qualitative approach. The population is 140 interior design students in Design Interior and Styling for Commercial and Retail Space studio academic year 2020/2021 (equivalent to 3rd-year students) with 30 students who design food and beverage commercial space in shop houses taken as samples. This is the only batch that designs commercial space for the new normal approach during the pandemic by the time this paper is produced. The population has been briefed for their design project assignment and divided into groups based on their selected commercial facility to design at the beginning of the studio in August 2020. They are required to design with adaptation to the new normal for their assigned project. The data from samples were taken by the end of their design process (December 2020) to be

analyzed on their choices of data mining sources and design decisions. During the design process, the researcher was not involved in the studio nor in communication with the samples to make sure did no research interest influence their design process.

The methodology used for this research was systematic literature review (SLR) and typology studies. A systematic literature review was used to define, study, analyze, and classify available design adaptation of indoor health and comfort to mitigate the transmission in the public spaces. Typology studies were conducted by comparing literature reviews and proposed conceptual design made by students in Design Interior and Styling for Commercial and Retail Space studio.

To start the SLR method, researchers start by defining the research question, how did the adaptation to Covid-19 pandemic situation affect the food and beverage interior design approach in shop houses design, while shop houses oftentimes are designed with a single ventilation system only? After defining the research question, researchers continue the process by getting relevant sources to answer research questions with related keywords: shop house, new normal, food and beverage, healthy building, and indoor environment quality. Then the data collected through literature study are selected through inclusion and exclusion criteria and classified for further use for comparison with typology. The source for the literature review will be from journals, online articles such as online newspapers, online corporate or government articles, and standards in the range of 2019-2021. The period of the time range is short due to the Covid-19 theme that happened from 2019. The typology studies were conducted to compare the data gained in SLR with the conceptual design from samples to gain insight on how the perception of healthy building in the new normal era and which aspect the samples tend to be focusing on.

4. Results

The research object was using a shophouse that is used for the food and beverage industry of Design Interior and Styling for Commercial and Retail Space studio. The object was located in Bali and is used as a cake and bakery cafe named The Hun's Man Cafe. It specialized in food and beverage with the basic ingredients of white bread. The Hun's Man Cafe will combine 2 units of the shophouse and utilize the first floor only of the total 2 floors building. The Hun's Man Cafe's existing site had one big opening just like any shophouse facing the street and hoover gang besides the building that separated it with the paddy field on the side. By the time the design studio was held, the Hun's Man was still under renovation for it will switch from semi online to a full offline store.

The conceptual designs are produced in 5 steps design thinking method. The process starts with empathize stage to understand the site and literature review, to define the analysis and design statement, ideate to pitch design ideas which will be produced in drawings at the prototype stage, and last is the test stage to gain evaluation (Dam, R.F., & Siang, 2021). The final conceptual designs from 30 samples show similar approaches were taken that applied pragmatic practices used on the field rather than the idealistic approach mentioned in the literature studies. This cannot be separated from the tendency of students to seek data from the basis of popular articles and pragmatic on-field practices, instead of journals and electronic books. The quality of data analysis and its relation to design decisions are generally also carried out asynchronously to one another and students tend to explore more forms and aesthetic approaches. This resulted in the application of passive systems being less than optimal because most of them directly created closed spaces with artificial ventilation that tend to be considered comfortable. The details of each design approach are presented in Table 2 by using IHC as a checklist as follows:

Table 2. Indoor Health and Comfort Criteria Application in Design

Code	Criteria	Availability (Y/N)	Note
IHC P	No Smoking Campaign	N	No smoking campaign or signage implementation in any student's design works.
IHC 1	Outdoor Air Introduction	Y	Providing outdoor dining area with simple plant selection. Aesthetic purpose only, based on the owner's request. Operable windows were present in few students' work, but in a very minimum amount.
IHC 2	CO2 Monitoring	N	No counting of occupants limitation provided in the programming, as well as no proper new normal rules for food and beverage industry found in the empathize stage to show their sufficient knowledge. Instead, a new normal workspace in the pantry was found. Seating arrangements applied social distancing with bigger circulation alleys, but the seating arrangements were still designed as usual without partition or hinder the face to face seating arrangement.
IHC 3	Chemical Pollutant	N	Material and finishing found to be the same as business as usual.
IHC 4	Indoor Pollutant Source Control	Y	The students were aware of dust so they chose smooth surfaces. They are also aware that the kitchen can produce smoke and food odors, so that massive full wall separation is given.
IHC 5	Biological Pollutant	N	No sign of antimicrobial agents, UV light, ionization units, or HEPA filter found in any drawings or programming. Seating arrangement as pre covid-19 situation.
IHC 6	Visual Comfort	Y	The students provided artificial lamps to give a general ambiance. No emphasis, play of contrast, and consideration of colour rendition made in particular.
IHC 7	Outside View and Daylight	Y	The students provided openings for access to views and harnessing the natural daylight with consideration to building orientation.
IHC 8	Thermal Comfort	N	Not enough study given to justify their thermal comfort design approach. Students directly prompt to apply mechanical ventilation, shown in the define (programming) stage. The outdoor dining area was not provided with additional mechanical ventilation in respect to Bali high in humidity.
IHC 9	Acoustic Level	N	The acoustic consideration only applies to application of sound systems as background noise. Due to floor to ceiling height, cocktail effects may emerge.
IHC 10	Interior Plants	Y	Most of the students applied artificial plants for indoor plants, for relaxing atmosphere only and considering the owner's

			request. In fact plants efficiency still need further studies (Cummings, 2020)
IHC 11	Pest Management	N	No pest management documented in the design document.

5. Discussion

The government mitigation rules, IEQ performance aspects, and IHC criteria can be categorized to show mutually supportive functions and efforts. All aspects available in government mitigation rules and IEQ performance have been facilitated on the application of IHC criteria as seen in Figure 4. IHC criteria show a detailed breakdown so that it will be easier to use for designers and the public as a guide for a healthier and more comfortable indoor environment. Therefore all samples were described and assessed based on the Greenship IHC category to serve as a checklist to clearly identify the comfort and health criteria of which are a concern for students. The details are presented in Table 2.

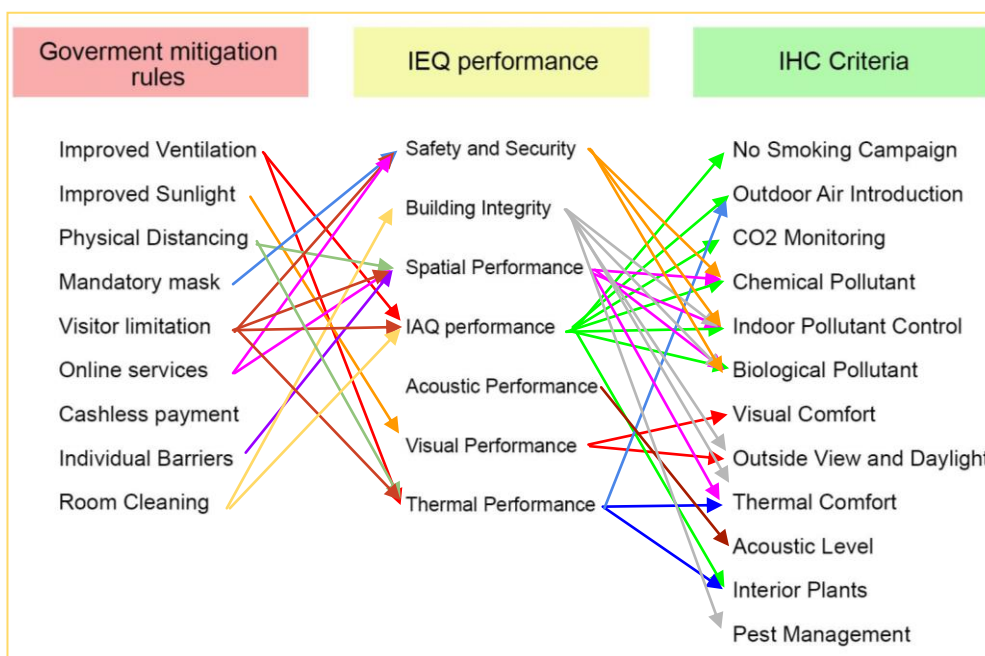


Figure 2. Corresponding Diagram (Source: author)

From table 2, we can see that only 5 out of 11 indoor health and comfort criteria were addressed by the students. The highest and the most influential in pandemic indoor adaptation design, from the 5 addressed criteria, were indoor pollutant source control and outside view and daylight. These 2 however, were possible due to site position and architectural design that enables hover gang on the side. The students still lack in site analysis strength to apply passive approach before directly going into the active design approach. The inability to do site-visitation played a big role for design students to learn of the environment. The site limitations and requests from the owners influenced the design decisions taken.

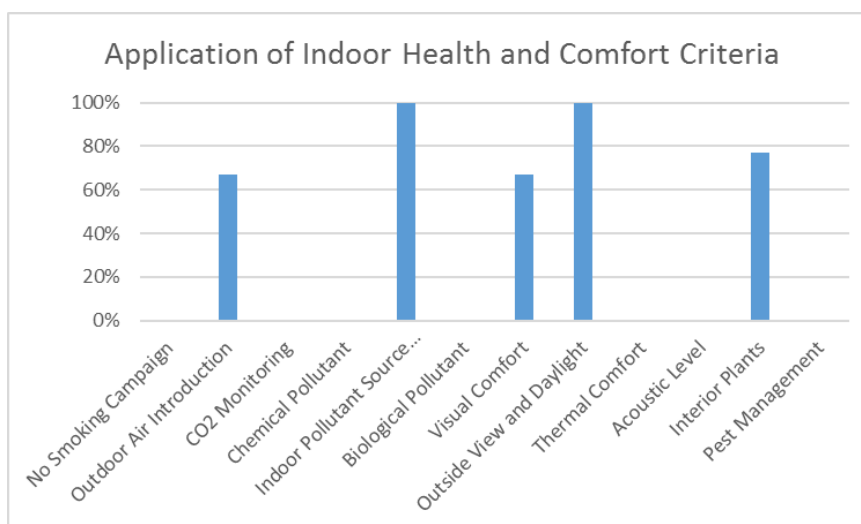


Figure 3. Indoor Health and Comfort Criteria Applied by the Students (Source: author)

6. Conclusion

Since its occurrence, the Covid-19 pandemic has brought indoor environment quality into the spotlight. In a very short period of time, the interest to incorporate health factors in building design has sparked and many started to understand that healthy building factors are not a luxury but a considerably normal approach to ensure building occupants can work optimally. Few design adaptation considerations have been discussed and encouraged by interior design practitioners and communities as well as a decree from Indonesia's Minister of Health has been launched.

The application of green building principles is known to provide better indoor environment quality. However, the young designers that put further indoor health and comfort criteria's consideration are very rare to be found. In the design studios, students showed minimum awareness to indoor comfort and health practice, even to those empirical, easy to find on a daily basis covid-19 adaptation such as providence of water basin at the entrance, hand sanitizer station, and acrylic barriers. Nevertheless, some indoor health and comfort criteria that still had the attention were outdoor air introduction, indoor pollutant source control, outside view and daylight introduction, and interior plants. This was generally due to site limitations, requests from the owners, and limited awareness from interior designers to indoor health and comfort.

To improve design students' awareness and perception of healthy building in the new normal era, continuous and regular reminders from mentors and lecturers should be given. With deadlines and students' points of view of assignment, they may tend to fulfill the theme of the assignment only as it is. The studio instructor may consider types of assignments that can repeat concepts in the previous design studios and lectures to ensure students can remember and correlate the knowledge they already have. Such as green building assessment is not a new thing as it was delivered in the second year of the sample study period, but instructors need to help students to recall and connect it to the current assignment. The updated chips of information should be given as a trigger for students to research independently.

This research, however, is subject to several limitations. The first is the sample size and profile. The population in this study makes use of interior design students in one private university so their behavior, design taste, and working style tend to be homogeneous. The second limitation is the timing of the study that hinders the researcher from conducting an in-depth interview for fear of influencing the samples' design decision. The third limitation is the age of data. This research makes use of a set of data that are related to the

current situation (Covid-19) so that this research will be highly time constrained in terms of ability to apply. Further study with heterogeneous samples and the ability to follow up samples' decisions in a focus group discussion after the end of their study period will ensure better understanding and sharper results.

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